



**Consumers
Power**

**POWERING
MICHIGAN'S PROGRESS**

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May 31, 1990

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
EMERGENCY PLAN EXERCISE SCENARIO

Consumers Power Company's submittal dated March 23, 1990 indicated that following the Palisades Plant 1990 annual Emergency Plan Exercise a copy of the scenario would be submitted to the Document Control Desk and the Palisades Plant NRC Resident Inspector.

Attached to this letter is a copy of the scenario used in the Palisades Plant 1990 Annual Exercise in fulfillment of the referenced commitment.

Brian D Johnson
Staff Licensing Engineer

CC Administrator, Region III, USNRC (w/o attachment)
NRC Resident Inspector - Palisades (w/attachment)

Attachment

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A CMS ENERGY COMPANY

Docket # 50-255
Accession # 9006060243
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Regulatory Docket File

ATTACHMENT

Consumers Power Company
Palisades Plant
Docket 50-255

EMERGENCY PLAN EXERCISE SCENARIO

May 31, 1990

PALEX 90

MI0589-0138A-TP20-TP13

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SCOPE AND OBJECTIVES

1.0 SCOPE AND OBJECTIVES

1.1 SCOPE

PALEX 90 is designed to meet exercise requirements specified in 10 CFR 50, Appendix E, Section IV.F. It will postulate events which would require activation of major portions of the site emergency plan. Offsite participants include the State of Michigan, Allegan County, Berrien County and Van Buren County.

1.2 OBJECTIVES

The exercise will demonstrate the following items as dictated by the scenario:

1. Assessment and Classification

- a. Recognition of emergency conditions
- b. Timely classification of emergency conditions in accordance with emergency action levels

2. Communication

- a. Initial notification within specified time constraints (state and local - 15 minutes, NRC - 1 hour)
- b. Subsequent notification in accordance with procedure
- c. Notification and coordination with other organizations, as required (other utilities, contractors, fire or medical services)
- d. Provision of accurate and timely information to support news release activity

3. Radiological Assessment and Control

- a. Calculation of dose projection based on sample results or monitor readings
- b. Performance of in-plant and offsite field surveys and collection of environmental samples
- c. Trending of radiological data
- d. Formulation of appropriate protective action recommendations
- e. Contamination and exposure control

- f. Collection and analysis of a post-accident primary coolant sample*

4. Emergency Response Facilities

- a. Activation, staffing and operation at appropriate classifications and within specified time constraints
- b. Adequacy of emergency equipment and supplies
- c. Adequacy of emergency communication systems
- d. Access control

5. Emergency Management

- a. Command and control with transfer of responsibilities from Control Room to Technical Support Center to Emergency Operations Facility
- b. Assembly and accountability within approximately 30 minutes
- c. Coordination with State of Michigan emergency response organization
- d. Mitigation of operational and radiological conditions
- e. Mobilization of emergency teams

6. Reentry and Recovery

- a. Assessment of damage and formulation of recovery plan outline
- b. Identification of constraints, requirements and organization to implement the plan

7. Exercise Control

- a. Provision for adequate free play
- b. Accurate assessment of player performance

*If the panel is unavailable due to modifications, the post-accident sample will be either demonstrated administratively or rescheduled at an acceptable date.

EXERCISE CONDUCT

2.0 EXERCISE CONDUCT

2.1 EXERCISE ORGANIZATION

The exercise organization is comprised of Controllers, Evaluators, Players and Observers, all of whom are issued armbands for identification.

Controllers are responsible for providing messages and data to Players. They also ensure that exercise activity progresses as planned. Controllers are authorized to modify scenario data and provide clarification to Players as judged appropriate. They must not, however, prompt Players unless the exercise or plant operation is jeopardized by inappropriate Player response. If a Player must be prompted, it must be brought to the attention of the Lead Facility Controller or Exercise Coordinator and prior to doing so if possible. Controllers also serve as Evaluators in most cases.

Evaluators observe Player activity and judge effectiveness of response. Consumers Power Company Evaluators are required to submit signed Evaluator Checklists to their Lead Facility Controller. NRC evaluators will be present for exercises.

Observers may be present at any location where exercise activity occurs. Observers are not allowed to speak to players during the course of the exercise.

Players include all personnel responding to simulated exercise conditions.

2.2 CONTROLLER ORGANIZATION

The Exercise Coordinator is in charge of overall exercise conduct. Responsibilities include conducting preexercise Controller meetings, NRC entrance meeting, joint critiques, and NRC exit critique; approving major scenario deviations; resolving exercise questions; and terminating the exercise.

A Lead Facility Controller is assigned to each Emergency Response Facility and is responsible for addressing Player inquiries, authorizing player prompting, conducting a post-exercise facility critique, collecting and submitting completed Evaluator Checklists to the Exercise Coordinator.

Controllers and Evaluators will refer all Player inquiries to the Lead Facility Controller. If unable to resolve a question, the Lead Facility Controller will seek clarification from the Exercise Coordinator.

2.3 EXERCISE DATA AND MESSAGES

Messages and data to drive Player response are contained in the scenario appendices.

Information not to be distributed to players is marked "Controller Use Only." It is ultimately each Controller's responsibility to ensure that only appropriate information is distributed to Players.

2.4. EXERCISE GROUND RULES FOR PLAYERS

1. Perform all actions to the extent possible in accordance with the emergency plan and procedures as if it were a real emergency. Unless authorized by the Controller, you should not simulate your actions. Verbal approval from a Controller/Evaluator is required prior to simulating any action. If authorized to simulate an action, tell the Controller/Evaluator how it would be performed.
2. Periodically speak out loud, identifying your key actions and decisions to the Controller/Evaluators. This may seem artificial, but it will assist in the evaluation process. If you are in doubt, ask for clarification. The Controller/Evaluator will not prompt or coach you.
3. Know the overall Controller organization. Identify your Controller and NRC evaluators. Controllers also serve as Evaluators.
4. The Controller periodically will issue messages or instructions designed to initiate response actions. Messages must be accepted immediately. They are essential to successful performance.
5. If the Controller intervenes, obey the Controller's directions. This is essential to the overall success of the exercise. If you disagree with your Controller, you can ask him to reconsider. You must, however, accept his/her word as final and proceed. Respond to Controller's questions.
6. You must play as if simulated radiation levels are actually present. This may require that you wear dosimeters and anti-Cs, observe good radiation protection practices, and be aware of and minimize your radiation exposure. Identify the individuals responsible for informing you of these items. Follow their instructions.
7. If you are entering normal nuclear station radiation areas, observe all rules and procedures. No one, including Controller/Evaluators, is exempt from normal station radiological practices and procedures.
8. Demonstrate knowledge of emergency operations and procedures. Utilize status boards, logbooks, and message forms, as much as possible, to document and record your actions, instructions and reports to your other players.
9. Do not enter into conversations unrelated to the drill with other Players. You may answer questions directed to you by federal evaluators. If the question is misdirected to you or you do not know the answer, refer them to the team leader or the Controller.

10. Keep a list of items for improvement. Provide this to your team leader. Team leaders will ensure these are considered. If necessary, they will identify them to the Controller during the critique which follows the drill/exercise. Areas for improvement or lessons learned, when identified, will improve overall emergency preparedness.

2.5 CRITIQUES

Following termination of the exercise, facility critiques will be conducted by Lead Facility Controllers.

A joint critique will be conducted following facility critiques. Lead Facility Controllers will present overall observations made at facility critiques. Players may attend if they wish.

Following the joint critique, the NRC exit critique will be conducted. This exit provides an opportunity for CPCo personnel to clarify or question issues which may become part of the formal NRC exercise report.

The Senior Nuclear Emergency Planner is responsible for evaluation, assignment, completion and documentation of all critique comments.

2.6 EVALUATOR CHECKLISTS

The checklists provided in this section are to be used in judging Player and Controller ability to meet stated exercise objectives. These facility specific checklists cross-reference all applicable exercise objectives and prior exercise weaknesses. In sum, they serve as the basis of exercise evaluation.

Evaluators are encouraged to comment on issues where they may see opportunity for improvement or a problem even if they are not included on the checklist.

Each Evaluator must submit to the Exercise Coordinator a completed, signed, and dated checklist at the conclusion of the exercise. Items marked "inadequate" shall be fully explained in the "comments" section. Comments continuation sheets are provided in this section.

Lead Facility Controllers will conduct critiques using these checklists as guides.

2.6.1 Control Room Evaluator Checklist

Name: _____

Date: _____

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|--|----------------------|------------------------------------|-----------------|
| 1A Recognition of emergency conditions | _____ | _____ | _____ |
| 1B Timely classification of emergency conditions in accordance with emergency actions levels | _____ | _____ | _____ |
| 2A Notification of state and local governments within 15 minutes and NRC within one hour | _____ | _____ | _____ |
| 2B Subsequent notification in accordance with procedure (state, local, NRC) | _____ | _____ | _____ |
| 2C Notification and coordination for offsite assistance | _____ | _____ | _____ |
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4A Notification of OSC and TSC staff to activate at alert classification | _____ | _____ | _____ |
| 4B Adequacy of equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications equipment | _____ | _____ | _____ |
| 4D Access control | _____ | _____ | _____ |
| 5A Command and control with clear transfer of responsibility from Control Room to TSC | _____ | _____ | _____ |
| 5D Mitigation of hypothetical operational problems | _____ | _____ | _____ |
| 5E Mobilization of emergency teams | _____ | _____ | _____ |
| 6A Assessment of damage | _____ | _____ | _____ |
| 6B Identification of reentry/recovery restraints | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.2 Operational/Maintenance Support Center Evaluator Checklist

Name: _____

Date: _____

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|---|----------------------|------------------------------------|-----------------|
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4A Activated at alert classification and staffed in accordance with SEP | _____ | _____ | _____ |
| 4B Adequacy of equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications | _____ | _____ | _____ |
| 4D Access control | _____ | _____ | _____ |
| 5A Transfer of offsite RMT control to EOF | _____ | _____ | _____ |
| 5D Mitigation of hypothetical operational conditions | _____ | _____ | _____ |
| 5E Mobilization of teams at appropriate times | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.3 Onsite RMT Evaluator Checklist

Name: _____

Date: _____

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|--|----------------------|------------------------------------|-----------------|
| 3B Performance of in-plant field surveys | _____ | _____ | _____ |
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4A Activation at alert classification | _____ | _____ | _____ |
| 4B Adequacy of equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications | _____ | _____ | _____ |
| 5E Mobilized at appropriate time | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.4 Offsite RMT Evaluator Checklist

Name: _____

Date: _____

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|---|------------------|----------------------------|-----------------|
| 3B Performance of offsite field surveys and collection of environmental samples | _____ | _____ | _____ |
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4A Activation at site area emergency classification | _____ | _____ | _____ |
| 4B Adequacy of equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications | _____ | _____ | _____ |
| 5A Transfer of control from OSC to EOF | _____ | _____ | _____ |
| 5E Mobilized at appropriate time | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.5 Security Evaluator Checklist

Name: _____

Date: _____

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|---|----------------------|------------------------------------|-----------------|
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4B Adequacy of emergency equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications | _____ | _____ | _____ |
| 4D Access control of site, Control Room, TSC, OSC, EOF and JPIC | _____ | _____ | _____ |
| 5B Assembly and accountability within approxi- mately 30 minutes | _____ | _____ | _____ |
| 5E Mobilization at appropriate time | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.6 Technical Support Center Evaluator Checklist

Name: _____

Date: _____

| Objective | Fully Met | Met, Problem Noted* | Not Met* |
|---|--------------|---------------------------|----------|
| 1A Recognition of emergency conditions | _____ | _____ | _____ |
| 1B Timely classification of emergency conditions in accordance with emergency action levels | _____ | _____ | _____ |
| 2B Notification of State and NRC (and possibly locals) at 15-minute intervals or as mutually agreed | _____ | _____ | _____ |
| 2C Notification and coordination with other organizations as required (fire, medical) | _____ | _____ | _____ |
| 2D Provision of accurate and timely information to support press release activity | _____ | _____ | _____ |
| 3A Calculation of dose protections based on sample results or monitor readings | _____ | _____ | _____ |
| 3C Trending of radiological data | _____ | _____ | _____ |
| 3D Formulation of appropriate protective action recommendations | _____ | _____ | _____ |
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4A Activation, staffing and operational within one-half hour of alert declaration | _____ | _____ | _____ |
| 4B Adequacy of emergency equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications | _____ | _____ | _____ |
| 4D Access control | _____ | _____ | _____ |
| 5A Command and control with clear transfer of responsibilities from Control Room and to EOF | _____ | _____ | _____ |
| 5B Assembly and accountability within approximately 30 minutes | _____ | _____ | _____ |
| 5C Coordination with State of Michigan emergency organization | _____ | _____ | _____ |

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.6 Technical Support Center Evaluator Checklist (Contd)

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|--|----------------------|------------------------------------|-----------------|
| 5D Mitigation of operational and radiological conditions | _____ | _____ | _____ |
| 5E Mobilization of emergency teams | _____ | _____ | _____ |
| 6A Assessment of damage and formulation of recovery plan | _____ | _____ | _____ |
| 6B Identification of constraints, requirements and organization to implement the recovery plan | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.7 Emergency Operations Facility Evaluator Checklist

Name: _____

Date: _____

| Objective | Fully Met | Met, Problem Noted* | Not Met* |
|--|--------------|---------------------------|----------|
| 1A Recognition of emergency conditions | _____ | _____ | _____ |
| 1B Timely classification of emergency conditions in accordance with emergency action levels | _____ | _____ | _____ |
| 2B Notification of State and NRC at 15-minute intervals or as mutually agreed | _____ | _____ | _____ |
| 2C Notification and coordination with other organizations as required (other utilities, contractors, fire, medical services) | _____ | _____ | _____ |
| 2D Provision of accurate and timely information to support news release activity | _____ | _____ | _____ |
| 3A Calculation of dose projections based on sample results or monitor readings | _____ | _____ | _____ |
| 3C Trending of radiological data | _____ | _____ | _____ |
| 3D Formulation of appropriate protective action recommendations | _____ | _____ | _____ |
| 3E Contamination and exposure control | _____ | _____ | _____ |
| 4A Activated and staffed at site area emergency and operational within about an hour of declaration | _____ | _____ | _____ |
| 4B Adequacy of emergency equipment and supplies | _____ | _____ | _____ |
| 4C Adequacy of communications systems | _____ | _____ | _____ |
| 4D Access control | _____ | _____ | _____ |
| 5A Command and control with clear transfer of responsibilities from TSC and OSC | _____ | _____ | _____ |
| 5C Coordination with State of Michigan emergency organization | _____ | _____ | _____ |

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.7 Emergency Operations Facility Evaluator Checklist (Contd)

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|--|----------------------|------------------------------------|-----------------|
| 5D Mitigation of operational and radiological conditions | _____ | _____ | _____ |
| 6A Assessment of damage and formulation of recovery plan | _____ | _____ | _____ |
| 6B Identification of constraints, requirements and organization to implement the recovery plan | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.8 Controller/Evaluator Performance Checklist (To Be Completed by Lead Controllers)

Name: _____

Date: _____

| <u>Objective</u> | <u>Fully Met</u> | <u>Met, Problem Noted*</u> | <u>Not Met*</u> |
|--|------------------|----------------------------|-----------------|
| 7A Provision for maximum free play | _____ | _____ | _____ |
| 7B Accurate assessment of player performance | _____ | _____ | _____ |

Comments:

Signature: _____

*Explain items checked in detail under comments. If not observed, mark NA (not applicable).

2.6.9 Evaluator Checklist Comment Continuation Sheet

Area: _____

Date: _____

Name: _____

Comments:

Signature: _____

PALEX - 90
Sequence of Events

| <u>Scenario Time</u> | <u>Event</u> |
|--------------------------|--|
| -0030 | Initial conditions - normal full power. Equipment out of service - none. Alarms - none. PCS leak rate (most recent results): 0.08 gpm identified, 0.034 gpm unidentified, 0.114 gpm total. Estimated primary to secondary leak rate: 0.001 gpm. |
| 0000 | Control Room indications of steam generator tube leakage received. |
| 0010 | Steam generator tube leakage quantified at 50-60 gpm. |
| 0015 | Plant shutdown at maximum attainable rate should be commenced and an "Alert" must be declared. |
| 0048 | Leaking generator tentatively identified as "B" S/G; shutdown continues at maximum attainable rate. |
| 0210 | "B" S/G main steam isolation valve fails closed, resulting in a turbine and reactor trip. On the trip, a weld cracks at the base of a "B" S/G relief valve column, resulting in a steam line break outside containment. The following transient results in 0.1% failed fuel. |
| 0215 | "General Emergency" must be declared. |
| 0217 | "B" S/G isolated, deliberate PCS pressure reduction commenced. Steaming path established via "A" S/G MSIV bypass valve. Cooldown rate is uncontrolled and release is in progress due to steam line break. |
| 0224 | SIAS received. |
| 0239 | SIAS reset and primary coolant pump P-50B restarted. |
| 0245 | "B" S/G is empty, release continues due to differential pressure. Cooldown rate is now controllable. |
| 0250 | Fuel damage estimated at 0.1%. |
| 0400 | Steaming path shifted to "A" S/G atmospheric dump valves. |

| <u>Scenario Time</u> | <u>Event</u> |
|--------------------------|---|
| 0538 | Shutdown cooling system in service. |
| 0600 | Release rate at minimum due to cooldown and depressurization; recovery phase demonstrated. |
| 0600+ | Secure from the drill. |

PALEX - 90
Narrative Summary

0800

(-0030) Initial Conditions

- A. The plant is at full power, at the end of core life (10.5 gwd/mtu).
- B. No equipment is in a degraded mode.
- C. No alarm conditions exist.
- D. Meteorological conditions are as follows:
 - 1. Wind Speed: 8.5 mph
 - 2. Wind Direction: 214°
 - 3. Stability: F
 - 4. Ambient Temperature: 65°F
- E. Primary and Secondary Chemistry:
 - 1. Primary System Chemistry
 - a. pH: 6.8
 - b. Boron: 105 ppm
 - c. Dissolved O₂: <.02 ppm
 - d. H₂: 24 cc/kg
 - e. Total beta gamma activity: 1.43 microcuries/ml
 - f. Iodine dose equivalent: 3.1 E-2 microcuries/ml
 - g. Total PCS gas activity: 4.42 microcuries/ml
 - h. PCS Xe-133 specific isotope activity: 413 microcuries/kg
 - 2. Secondary System Chemistry
 - a. Primary to secondary leak rate: 0.001 gpm
 - b. Offgas Xe-133: 5.50 E-5 microcuries/ml
 - c. Condenser air inleakage: 4 cfm
 - d. A and B S/G gross gamma activities: <5.6 E-6 microcuries/ml

F. Primary Coolant System Leak Rate (Most Recent Results):

1. Identified: 0.08 gpm
2. Unidentified: 0.034 gpm
3. Total: 0.114 gpm

0830-0845
(0000-0015)

A. The exercise begins when a through-wall crack develops in a tube in the "B" steam generator, resulting in a 57 gpm primary-to-secondary leak. Symptoms of a steam generator tube leak are indicated in the Control Room.

B. Expected Actions:

1. Respond to alarms in accordance with alarm response procedures.
2. Conclude that steam generator tube leakage is indicated and refer to ONP 23.2, "Steam Generator Tube Leak," and Site Emergency Implementation Procedure EI-1.
3. SS directs plant shutdown at the maximum attainable rate (for drill purposes, 30%/hr has been selected).
4. SS directs steam generator and offgas sampling and radiation surveys of main steam piping to determine the affected S/G.
5. SS assumes Site Emergency Director position and:
 - a. Classifies an "Alert" per EI-1 based on "primary to secondary leakage rate >50 gpm but less than charging pump capacity."
 - b. Directs public address announcement and sounding of the emergency siren.
 - c. Delegates actions/notifications identified in EI-1 and marked on EI-2.1, Attachment 1, including emergency staff augmentation, personnel accountability, activation of TSC/OSC, onsite monitoring and offsite dose estimates.
 - d. Requires the completion of the emergency notification forms of EI-3, Attachment 1 and NOD Form 3160.
 - e. Commences 15-minute status notifications per EI-3.

0845-1040
(0015-0210)

- A. Plant Shutdown continues at 30%/hr.
- B. The steam generator tube leak is tentatively identified as being located in the "B" S/G.
- C. No other equipment malfunctions are noted.
- D. Expected Actions:
 - 1. Complete starting of TSC/OSC and turnover of responsibilities/plant status.
 - 2. Continue shutdown at the present rate, as changing flow is adequate and no further S/G tube degradation is noted.
 - 3. Confirm "B" S/G as the affected S/G and isolate functions in accordance with ONP 23.2.
 - 4. Monitor condenser offgas for release calculations and perform confirmatory samples.
 - 5. Perform PCS isotopic analysis for iodine.

1040-1045
(0210-0215)

- A. As plant shutdown continues, the "B" S/G main steam isolation valve CV-0501 fails closed, which results in a turbine and reactor trip.
- B. On the trip, a weld cracks at the base of a "B" S/G relief valve column (RV-0707), resulting in a 500,000 lbm/hr steam line break outside containment.
- C. The resulting uncontrolled cooldown and pressure transient damages approximately 40 fuel rods in various core locations for a total of 0.1% failed fuel.
- D. Expected Actions:
 - 1. Complete EOP-1, standard post-trip actions.
 - 2. Due to multiple malfunctions, EOP-9.0, "Functional Recovery Procedure" will be invoked and safety function status checks completed.
 - 3. The Site Emergency Director will reclassify the event as a "General Emergency" per EOP-9.0, based on "Loss of 2 of 3 fission product barriers with potential loss of third fission product barrier" (the

fuel damage attendant to the trip will not be immediately apparent) and will:

- a. Delegate actions/notifications identified in EI-1 and marked on EI-2.1, Attachment 1, including environmental assessment, estimation of core damage, and backup notification to Van Buren and Allegan counties.
- b. Activate the EOF and JPIC and dispatch utility liaisons.
- c. Evacuate unnecessary personnel.

1045-1115
(0215-0245)

- A. Operations continue EOP-9.0 response. Safety function status checks are performed, the "B" steam generator is completely isolated (same isolation points required for both the excess steam demand event and the concurrent tube rupture), and PCS pressure is deliberately reduced to actuate safety injection. All primary coolant pumps are stopped.
- B. The existence of fuel damage, S/G tube rupture, and steam line break results in an unisolable release containing iodine which will jeopardize protective action guidelines to the 10-mile EPZ and which will not be capable of being stopped until the PCS is cooled below 210°F and depressurized.
- C. PCS cooldown is uncontrolled at this point due to the insoluble steam line break, until the "B" S/B empties.
- D. Expected Actions:
 1. Assess fuel damage.
 2. Provide protective action recommendations to state and local officials as appropriate.
 3. Verify adequate feedwater reserves to support cooldown.
 4. Verify SIAS functions when received.
 5. Verify natural circulation cooling.
 6. ~~Verify safety injection throttling criteria met; throttle and reset SIAS as conditions permit.~~
 7. Restart at least one primary coolant pump when conditions permit to assist in cooldown and pressure control.
 8. Reduce PCS pressure and temperature as low as possible as quickly as possible to minimize the release.

1115-1344
(0245-0514)

- A. Cooldown continues to shutdown cooling entry conditions; cooldown rate can now be controlled, as the "B" steam generator has blown dry.
- B. The release continues at a decreasing rate as "B" steam generator differential pressure decreases. Until the PCS is cooled below 210°F and depressurized; however, all material transferred via the "B" S/G tube rupture will be released via the "B" S/G steam line break.
- C. Expected Actions:
 - 1. Continue to cooldown and depressurize as required to meet shutdown cooling entry conditions and minimize release.
 - 2. Determine if PCS activity is acceptable for circulation outside of containment and implement appropriate radiological controls in anticipation of shutdown cooling operations.
 - 3. Revise protective action recommendations as required.

1344-1430
(0514-0600)

- A. The PCS has been cooled to less than 300°F and is at the minimum pressure for primary coolant pump operations.
- B. The release continues via the steam line break at a low rate.
- C. Expected Actions:
 - 1. Implement plans for reentry/recovery.
 - 2. Consider options to eliminate release path via steam line break as radiation levels and steam pressure decrease, eg, erection of temporary barriers/enclosures.
 - 3. Verify shutdown cooling entry conditions are met.
 - 4. Provide TSC/PRC resolution of technical issues, eg, waiving requirements for continued PCP operation while on shutdown cooling to support early PCS depressurization and termination of release.
- D. The recovery phase is demonstrated when the reduction of the release rate by shutdown cooling system operation is proven.

1430+
(0600+) Terminate Exercise

MI0190-0050B-TP04-TP21

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See initial conditions and data sheets.

Message:

Announce the following over the plant's public address system when directed by the controller: "Attention all personnel. The annual emergency exercise will commence shortly. All announcements related to the exercise will be preceded by and followed by the statement, 'This is a drill.' Only drill participants are required to respond to the drill announcements."

FOR CONTROLLER USE ONLY

- Controller Notes:
1. Discuss conduct and objectives of the drill with the players.
 2. Act as off-going SS and give turnover to players.
 3. Answer questions as appropriate.
 4. Ensure players have all normally accessible procedures and reference materials available
 5. Operators should familiarize themselves with the simulated conditions as indicated by the information and data provided.

Action Expected:

Initial Conditions -0800

- A. The plant is at full power, at the end of core life (10.5 gwd/mtu).
- B. No equipment is in a degraded mode.
- C. No alarm conditions exist.
- D. Meteorological conditions are as follows:
 - 1. Wind Speed: 8.5 mph
 - 2. Wind Direction: 214°
 - 3. Stability: F
 - 4. Ambient Temperature: 65°F
- E. Primary and Secondary Chemistry:
 - 1. Primary System Chemistry
 - a. pH: 6.8
 - b. Boron: 105 ppm
 - c. Dissolved O₂: <.02 ppm
 - d. H₂: 24 cc/kg
 - e. Total beta gamma activity: 1.43 microcuries/ml
 - f. Iodine dose equivalent: 3.1 E-2 microcuries/ml
 - g. Total PCS gas activity: 4.42 microcuries/ml
 - h. PCS Xe-133 specific isotope activity: 413 microcuries/kg
 - 2. Secondary System Chemistry
 - a. Primary to secondary leak rate: 0.001 gpm
 - b. Offgas Xe-133: 5.50 E-5 microcuries/ml
 - c. Condenser air inleakage: 4 cfm
 - d. A and B S/G gross gamma activities: <5.6 E-6 microcuries/ml

PALEX 90
Message No 1

Time: 0800
Scenario Time: 0030
Page 3 of 3

F. Primary Coolant System Leak Rate (most recent results):

1. Identified: 0.08 gpm
2. Unidentified: 0.034 gpm
3. Total: 0.114 gpm

Date May 22, 1990

Message # 1

PALEX 90
Time 0800

Problem Time -0030

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>68</u> B <u>70</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | | |
|----------------------------|------------------------------|----------------------------|------------------------------|---------------------------------|--|
| CCW Cooler Outlet Temp | A <u>74</u> F | B <u>75</u> F | | | |
| Containment Spray Pumps | P-54A <u>OFF</u> | P-54B <u>OFF</u> | P-54C <u>OFF</u> | LPSI Pumps | P-54C <u>OFF</u> P-67A <u>OFF</u> P-67B <u>OFF</u> |
| HPSI Pumps | P-66A <u>OFF</u> | P-66B <u>OFF</u> | | Safety Injection Suction Supply | |
| | Train A | Train B | | | |
| CV-3057 (SIRW) <u>OPEN</u> | CV-3029 (Sump) <u>CLOSED</u> | CV-3031 (SIRW) <u>OPEN</u> | CV-3030 (Sump) <u>CLOSED</u> | | |

C-02

CVCS

| | | | |
|---------------------------------|---|-----------------------------|---|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>100</u> F | Flow | <u>38</u> gpm |
| Letdown Line Temp | <u>270</u> F | Line Temp | <u>400</u> F |
| Letdown Flow | <u>40</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>OFF</u> P-55C <u>OFF</u> |
| Temp <u>105</u> F | Pressure <u>33</u> psi | Level <u>78</u> % | Volume Control Tank |
| | | | PCP Control Bleedoff Pressure <u>62</u> psig |
| SDCS from PCS (R) | <u>80</u> F | | Shutdown Cooling System |
| | | | SDCS to PCS (R) <u>80</u> F |
| Temp <u>100</u> F | Pressure <u>3.50</u> psig | Level <u>68</u> % | Quench Tank |
| | | | Primary Coolant System |
| Pressurizer Pressure (R) | <u>2060</u> psia | | |
| PCS Tave (R) | Loop 1 (TR-0111) <u>561</u> | Loop 2 (TR-0121) <u>561</u> | |
| Pressurizer Level (R) | LRC-0101A <u>55</u> % | LRC-0101B <u>55</u> % | LIA-0102A <u>44</u> % |
| Pzr Htr Amps | LCC 15 <u>153</u> | LCC 16 <u>153</u> | |
| PORV | PRV-1042B <u>CLOSED</u> | PRV-1043B <u>CLOSED</u> | Block Valve |
| PCPs | P-50A <u>ON</u> | P-50B <u>ON</u> | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| Reactor Power Level | NI-01 <u>1</u> NI-02 <u>1</u> NI-03 <u>85</u> NI-04 <u>100</u> | P-50C <u>ON</u> | P-50D <u>ON</u> |
| | NI-05 <u>97</u> NI-06 <u>99</u> NI-07 <u>98</u> NI-08 <u>98</u> | | |

C-01

AFW System

| | | | | | |
|--|---|-------------------------|-----------------------------|------------------------------------|--|
| AFW Pump | P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> | AFW Pump Amps | P-8A <u>0</u> P-8B <u>0</u> P-8C <u>0</u> amps |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | | | AFW Disch Press | P-8A & P-8B <u>0</u> P-8C <u>0</u> psig |
| | | | | <u>Secondary System</u> | |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MOV-0510 <u>CLOSED</u> | MSIV's | CV-0501 <u>OPEN</u> | CV-0510 <u>OPEN</u> |
| MFP Suction Pressure | <u>365</u> psig | MFP Discharge Pressure | A <u>840</u> | B <u>820</u> psi | |
| Moisture Separator Drain Tank Level | <u>64</u> % | Condenser Hotwell Level | <u>65</u> % | | |
| Atmospheric Dump Valves | <u>CLOSED</u> | Condenser Vacuum | <u>26.60</u> in Hg. | | |
| Heater Drain Pump Status | P-10A <u>ON</u> | P-10B <u>ON</u> | Gland Seal Condenser Vacuum | <u>14</u> in Hg. | |
| | | | Condensate Pump Status | P-2A <u>ON</u> P-2B <u>ON</u> | |
| | | | PIP | | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | | | | |
| Gross MW | <u>805</u> | Net MW | <u>763</u> | Core Exit Thermocouple Temperature | <u>593.60</u> F |
| Control Rod Position | GP1 <u>131</u> GP2 <u>131</u> GP3 <u>131</u> GP4 <u>131</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> | | | | |
| Stuck Rods | <u>NONE</u> | # | | | |

Date May 22, 1990

Message # 1

PALEX 90
Time 0800

Scenario Time -0030

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|--------------|
| T-81 Level | <u>91 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level T-2 | <u>82 %</u> |
| Instrument Air Pressure | <u>104</u> psig | | | Temperature | <u>107 F</u> |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105 F</u> | Humidity | <u>8 %</u> |
| S/G A Compartment | | Temperature | <u>90 F</u> | Humidity | <u>11 %</u> |
| S/G B Compartment | | Temperature | <u>90 F</u> | Humidity | <u>13 %</u> |
| SIRW Tank Level | <u>97 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>49</u> | B <u>51</u> | C <u>47</u> | D <u>56</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>220</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO

Containment High Pressure Alarm NO

Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|-----------------------|--------------------------------------|
| Concentrated Boric Acid Tank Levels | T53A <u>100 %</u> | T53B <u>100 %</u> |
| Reactor Vessel DP | <u>28</u> psid | |
| PORV Discharge Temperature | <u>105 F</u> | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> |
| PCP Current (Amps) | P-50A <u>600</u> | P-50C <u>622</u> |
| PCS Flow | <u>75 %</u> | P-50D <u>600</u> |
| Loop Thot (F) | Loop 1 <u>586</u> | Pressurizer Level (cold) <u>46 %</u> |
| Loop Tcold (F) | Loop 1 <u>533</u> | Loop 2 <u>586</u> |
| Tcold Wide range | Loop 1 <u>530</u> | Loop 2 <u>535</u> |
| Subcooling | Temp <u>53.10</u> F | Loop 2 <u>540</u> |
| PCS Pressure (R) | WR <u>2070</u> | Press <u>664</u> psi |
| | | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>65 %</u> | (NR) <u>63 %</u> |
| Press | <u>690</u> psia | <u>700</u> psia |
| Flow | Steam <u>5.60</u> PPH | Feed <u>5.35</u> PPH |
| | Feed <u>5.60</u> PPH | Steam <u>5.40</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|----------------------|------------------------|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>26.60</u> | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> |
| | P-50C <u>1.50</u> | P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>420</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>320</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u><1</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>2.50E+1</u> |
| Stack Monitors | RIA-2325 <u>3.00E+2</u> cpm | RIA-2326 <u>1.20E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

PALEX 90
Message No 2

Time: 0830
Scenario Time: 0000

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

"Gaseous Waste Monitoring High Radiation" alarm is received. R1A-0631 off-gas monitor is off scale high.

FOR CONTROLLER USE ONLY

Controller Notes:

The exercise begins when a through-wall crack develops in a tube in the "B" steam generator, resulting in a 57 gpm primary-to-secondary leak. Symptoms of a steam generator tube leak are indicated in the Control Room.

Action Expected:

Operators should refer to ARP 8.

PALEX 90
Message No 3

Time: 0833
Scenario Time: 0003

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

Charging pump P-55B has started in auto.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Operators should refer to ONP 23.2.

PALEX 90
Message No 4

Time: 0834
Scenario Time: 0004

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

Charging pump P-55C has started in auto.

FOR CONTROLLER USE ONLY

Controller Notes:

If an operator is dispatched to manually isolate the blowdown tank to maintain steam generator sampling capability, he will be detained.

Action Expected:

Operators should verify proper plant response, isolate letdown and then request steam generator samples, off-gas sample, and radiation surveys of steam lines.

PALEX 90
Message No 5

Time: 0840
Scenario Time: 0010

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

RIA-2324, S/G "B" main steam line monitor is increasing. Letdown has been isolated; VCT level change indicates a primary to secondary leak of 50-60 gpm.

FOR CONTROLLER USE ONLY

Controller Notes:

Scenario data is based on a 30% per hour shutdown rate. Provide this information verbally to operators if a different rate is selected.

Action Expected:

Operators should commence plant shutdown at maximum attainable rate. An alert should be declared.

PALEX 90
Message No 6

Time: 0845
Scenario Time: 0015

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Date May 22, 1990

Message # 6

PALEX 90

Time 0845

Problem Time 0015

C-08

SW Pumps P-7A ON P-7B ON P-7C OFF SW Critical Hdr Press A 68 B 70 psig
 CCW Pumps P-52A ON P-52B OFF P-52C OFF FPC Pumps P-51A ON P-51B OFF
 Fire Pumps P-9A OFF P-9B OFF P-41 OFF
 Containment Cooler Recirc Fans
 V1A ON V2A ON V3A ON V4A ON V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 68 F B 70 F
 Containment Spray Pumps P-54A OFF P-54B OFF P-54C OFF
 HPSI Pumps P-66A OFF P-66B OFF LPSI Pumps P-67A OFF P-67B OFF
 Safety Injection Suction Supply
 Train A Train B
 CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown Charging
 Intermediate Press Letdown Temp 100 F Flow 52 gpm
 Letdown Line Temp 180 F Line Temp 255 F
 Letdown Flow 0 gpm Pumps P-55A ON P-55B ON P-55C OFF
 Temp 95 F Pressure 36 psi Level 82 % Volume Control Tank
 PCP Control Bleedoff Pressure 65 psig
 Shutdown Cooling System
 SDCS from PCS (R) 80 F SDCS to PCS (R) 80 F
 Quench Tank
 Temp 100 F Pressure 3.70 psig Level 76 %
 Primary Coolant System
 Pressurizer Pressure (R) 2060 psia
 PCS Tave (R) Loop 1 (TR-0111) 561 Loop 2 (TR-0121) 561
 Pressurizer Level (R) LRC-0101A 54 % LRC-0101B 53 % LIA-0102A 45 %
 Pzr Htr Amps LCC 15 152 LCC 16 152
 PORV PRV-1042B CLOSED PRV-1043B CLOSED Block Valve MOV-1042A CLOSED MOV-1043A CLOSED
 PCPs P-50A ON P-50B ON P-50C ON P-50D ON
 Reactor Power Level NI-01 1 NI-02 1 NI-03 80 NI-04 100
 NI-05 96 NI-06 98 NI-07 96 NI-08 96

C-01

AFW System

AFW Pump P-8A OFF P-8B OFF P-8C OFF AFW Pump Amps P-8A 0 P-8B 0 P-8C 0 amps
 AFW Pump P-8B Steam Pressure 0 psig AFW Disch Press P-8A & P-8B 0 P-8C 0 psig
 Secondary System
 MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED MSIV's CV-0501 OPEN CV-0510 OPEN
 MFP Suction Pressure 380 psig MFP Discharge Pressure A 840 B 820 psi
 Moisture Separator Drain Tank Level 64 % Condenser Hotwell Level 65 %
 Atmospheric Dump Valves CLOSED Condenser Vacuum 26.80 in Hg.
 Heater Drain Pump Status P-10A ON P-10B ON Gland Seal Condenser Vacuum 14 in Hg.
 Condensate Pump Status P-2A ON P-2B ON
 PIP
 (Demand Log + Constant, Rod, or Flux/Temp)
 Gross MW 800 Net MW 758 Core Exit Thermocouple Temperature 585 F
 Control Rod Position GP1 131 GP2 131 GP3 131 GP4 131 GP5(P) 131 GP6(A) 131 GP7(B) 131
 Stuck Rods NONE

Date May 22, 1990

Message # 6

PALEX 90

Time 0845

Scenario Time 0015

C-13

| | | |
|---|---|---|
| T-81 Level <u>92</u> % | T-939 Level <u>68</u> % | Condensate Storage Tank Level T-2 <u>82</u> % |
| Instrument Air Pressure <u>105</u> psig | | |
| Containment Building Pressure <u>.10</u> psig | Dome Temperature <u>105</u> F | Humidity <u>10</u> % |
| S/G A Compartment | Temperature <u>100</u> F | Humidity <u>10</u> % |
| S/G B Compartment | Temperature <u>90</u> F | Humidity <u>10</u> % |
| SIRW Tank Level <u>97</u> % | | |
| WR Containment Pressure (R) <u>15</u> psia | | |
| Containment Sump Level <u>0</u> % | Containment Water Level (R) <u>590.40</u> % | |
| SI Tank Level (%) A <u>50</u> B <u>50</u> C <u>47</u> D <u>55</u> | | |
| SI Tank Pressure (psig) A <u>210</u> B <u>215</u> C <u>220</u> D <u>215</u> | | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|---|--------------------------------------|--|
| Concentrated Boric Acid Tank Levels | T53A <u>100</u> % | T53B <u>100</u> % |
| Reactor Vessel DP | <u>28</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) RV-1039 | <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) P-50A <u>600</u> | P-50B <u>610</u> | P-50C <u>620</u> P-50D <u>600</u> |
| PCS Flow <u>75</u> % | Pressurizer Level (cold) <u>47</u> % | |
| Loop Thot (F) Loop 1 <u>586</u> | Loop 2 <u>587</u> | |
| Loop Tcold (F) Loop 1 <u>535</u> | Loop 2 <u>535</u> | |
| Tcold Wide range Loop 1 <u>530</u> | Loop 2 <u>540</u> | |
| Subcooling Temp <u>53</u> | F Press <u>662</u> psi | |
| PCS Pressure (R) WR <u>2070</u> | NR <u>600</u> psia | |
| Level (WR) <u>65</u> % (NR) <u>62</u> % | Steam Generator A | Steam Generator B |
| Press <u>710</u> psia | | (WR) <u>65</u> % (NR) <u>63</u> % |
| Flow Steam <u>5.40</u> PPH Feed <u>5.40</u> PPH | | <u>710</u> psia |
| | | Steam <u>5.30</u> PPH Feed <u>5.30</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------------------|-------------------------------------|-------------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) <u>26.60</u> | | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> P-50B <u>1.50</u> | P-50C <u>1.50</u> P-50D <u>1.50</u> |

C-04

| | | |
|-----------------------------|------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS Voltage <u>2450</u> | Amps <u>400</u> | |
| 1-D BUS Voltage <u>2450</u> | Amps <u>380</u> | |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u><1</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>6.50E+1</u> |
| Stack Monitors | RIA-2325 <u>6.00E+2</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

FOR DRILL USE ONLY

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
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| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

PALEX 90
Message No 7

Time: 0849
Scenario Time: 0019

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

"Process Liquid Monitoring High Radiation" alarm received. R1A-0707, S/G blowdown monitor, is in alert and bottom blowdown Valves CV-0770 and CV-0771, which were open, are now closed.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Operators should refer to ARP 8 and notify chemistry of loss of S/G sample capability.

PALEX 90
Message No 8 (Contingency)

Time: 0850
Scenario Time: 0020

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Shift Supervisor

Simulated Plant Conditions:

Message:

Declare an Alert based on primary to secondary leakage rate of >50 gpm but less than charging pump capacity.

FOR CONTROLLER USE ONLY

Controller Notes:

Deliver this message only if an Alert has not been declared by this time.

Action Expected:

PALEX 90
Message No 9

Time: 0030
Scenario Time: 0900

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Operators should continue ONP 23.2 actions.

Date May 22, 1990

Message # 2

PALEX 90
Time 0900

Problem Time 0030

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>68</u> B <u>70</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | | |
|---------------------------------|-------------|----------------|---------------|----------------|--|
| CCW Cooler Outlet Temp | A | <u>73</u> F | B | <u>73</u> F | |
| Containment Spray Pumps | P-54A | <u>OFF</u> | P-54B | <u>OFF</u> | P-54C <u>OFF</u> |
| HPSI Pumps | P-66A | <u>OFF</u> | P-66B | <u>OFF</u> | LPSI Pumps P-67A <u>OFF</u> P-67B <u>OFF</u> |
| Safety Injection Suction Supply | | | | | |
| Train A | | | Train B | | |
| CV-3057 (SIRW) | <u>OPEN</u> | CV-3029 (Sump) | <u>CLOSED</u> | CV-3031 (SIRW) | <u>OPEN</u> CV-3030 (Sump) <u>CLOSED</u> |

C-02

CVCS

| | | | |
|---------------------------------|---|-------------------------------|--|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>100</u> F | Flow | <u>86</u> gpm |
| Letdown Line Temp | <u>135</u> F | Line Temp | <u>210</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>ON</u> P-55C <u>OFF</u> |
| Temp <u>102</u> F | Pressure <u>34</u> psi | Level <u>80</u> % | Volume Control Tank |
| SDCS from PCS (R) | <u>80</u> F | PCP Control Bleedoff Pressure | <u>65</u> psig |
| Temp <u>100</u> F | Pressure <u>3.70</u> psig | Level <u>76</u> % | Shutdown Cooling System |
| Pressurizer Pressure (R) | <u>2060</u> psia | SDCS to PCS (R) | <u>80</u> F |
| PCS Tave (R) | <u>558</u> | Quench Tank | |
| Pressurizer Level (R) | Loop 1 (TR-0111) <u>558</u> | Primary Coolant System | |
| Pzr Htr Amps | LRC-0101A <u>56</u> % | Loop 2 (TR-0121) <u>558</u> | |
| PORV | LCC 15 <u>153</u> | LRC-0101B <u>55</u> % | LIA-0102A <u>45</u> % |
| PCPs | PRV-1042B <u>CLOSED</u> | LCC 16 <u>153</u> | Block Valve |
| Reactor Power Level | PRV-1043B <u>CLOSED</u> | P-50A <u>ON</u> | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| | NI-01 <u>1</u> NI-02 <u>1</u> NI-03 <u>85</u> NI-04 <u>100</u> | P-50B <u>ON</u> | P-50C <u>ON</u> P-50D <u>ON</u> |
| | NI-05 <u>87</u> NI-06 <u>89</u> NI-07 <u>89</u> NI-08 <u>88</u> | | |

C-01

| | | | | | | | |
|--|---|-------------------------|---|------------------------------------|------------------|----------------------------------|-------------------------------|
| AFW Pump | P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> | AFW System | AFW Pump Amps | P-8A <u>0</u> P-8C <u>0</u> amps | |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | AFW Disch Press | P-8A & P-8B <u>0</u> P-8C <u>0</u> psig | Secondary System | | | |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MSIV's | CV-0501 <u>OPEN</u> CV-0510 <u>OPEN</u> | MFP Suction Pressure | <u>410</u> psig | MFP Discharge Pressure | A <u>870</u> B <u>860</u> psi |
| Moisture Separator Drain Tank Level | <u>64</u> % | Condenser Hotwell Level | <u>64</u> % | Atmospheric Dump Valves | <u>CLOSED</u> | Condenser Vacuum | <u>26.80</u> in Hg. |
| Heater Drain Pump Status | P-10A <u>ON</u> | Condensate Pump Status | P-2A <u>ON</u> P-2B <u>ON</u> | Gland Seal Condenser Vacuum | <u>14</u> in Hg. | | |
| PIP | | | | | | | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | | | | | | |
| Gross MW | <u>763</u> | Net MW | <u>721</u> | Core Exit Thermocouple Temperature | <u>580</u> F | | |
| Control Rod Position | GP1 <u>131</u> GP2 <u>131</u> GP3 <u>131</u> GP4 <u>106</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> | | | | | | |
| Stuck Rods | <u>NONE</u> | | | | | | |

Date May 22, 1990

Message # 9

PALEX 90
Time 0900

Scenario Time 0030

C-13

| | | |
|---|---|---|
| T-81 Level <u>92 %</u> | T-939 Level <u>68 %</u> | Condensate Storage Tank Level T-2 <u>82 %</u> |
| Instrument Air Pressure <u>97 psig</u> | | |
| Containment Building Pressure <u>.10 psig</u> | Dome Temperature <u>105 F</u> | Humidity <u>10 %</u> |
| S/G A Compartment | Temperature <u>100 F</u> | Humidity <u>10 %</u> |
| S/G B Compartment | Temperature <u>90 F</u> | Humidity <u>10 %</u> |
| SI RW Tank Level <u>97 %</u> | | |
| WR Containment Pressure (R) <u>15 psia</u> | | |
| Containment Sump Level <u>0 %</u> | Containment Water Level (R) <u>590.40 %</u> | |
| SI Tank Level (%) | A <u>50</u> B <u>51</u> C <u>47</u> D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>210</u> B <u>215</u> C <u>220</u> D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|---|---------------------|--|
| Concentrated Boric Acid Tank Levels | T53A <u>100 %</u> | T53B <u>100 %</u> |
| Reactor Vessel DP | <u>28 psid</u> | |
| PORV Discharge Temperature | <u>105 F</u> | |
| Pzr Safety Valve Discharge Temp (F) RV-1039 | <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>600</u> | P-50B <u>610</u> P-50C <u>620</u> P-50D <u>600</u> |
| PCS Flow | <u>74 %</u> | Pressurizer Level (cold) <u>47 %</u> |
| Loop Thot (F) | Loop 1 <u>582</u> | Loop 2 <u>582</u> |
| Loop Tcold (F) | Loop 1 <u>533</u> | Loop 2 <u>534</u> |
| Tcold Wide range | Loop 1 <u>530</u> | Loop 2 <u>540</u> |
| Subcooling | Temp <u>58.10</u> F | Press <u>714</u> psi |
| PCS Pressure (R) | WR <u>2070</u> | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) <u>65 %</u> | (NR) <u>62 %</u> | (WR) <u>64 %</u> (NR) <u>62 %</u> |
| Press <u>730</u> psia | | <u>730</u> psia |
| Flow Steam <u>5</u> PPH | Feed <u>5</u> PPH | Steam <u>4.90</u> PPH Feed <u>4.90</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|----------------------|---|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>26.70</u> | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> P-50C <u>1.50</u> P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>380</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|--|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u><1</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>7.00E+1</u> |
| Stack Monitors | RIA-2325 <u>6.50E+2</u> cpm | RIA-2326 <u>5.50E+2</u> cpm RIA-2327 <u>2.00E-1</u> mr/hr |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

FOR DRILL USE ONLY

| | | | | | | |
|--|--|---|---|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERSVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |

PALEX 90
Message No 10

Time: 0910
Scenario Time: 0040

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Chemistry

Simulated Plant Conditions:

Message:

Initial off-gas sample corresponds to a 55 gpm primary to secondary leak

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Chemistry should immediately notify the SED.

PALEX 90
Message No 11

Time: 0915
Scenario Time: 0045

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Date May 22, 1990

Message # 11

PALEX 90

Time 0915

Problem Time 0045

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>69</u> B <u>71</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | |
|---------------------------------|------------------------------|----------------------------|------------------------------|-----------------------------------|
| CCW Cooler Outlet Temp | A <u>75</u> F | B <u>73</u> F | | |
| Containment Spray Pumps | P-54A <u>OFF</u> | P-54B <u>OFF</u> | P-54C <u>OFF</u> | P-54D <u>OFF</u> |
| HPSI Pumps | P-66A <u>OFF</u> | P-66B <u>OFF</u> | LPSI Pumps | P-67A <u>OFF</u> P-67B <u>OFF</u> |
| Safety Injection Suction Supply | | | | |
| Train A | | Train B | | |
| CV-3057 (SIRW) <u>OPEN</u> | CV-3029 (Sump) <u>CLOSED</u> | CV-3031 (SIRW) <u>OPEN</u> | CV-3030 (Sump) <u>CLOSED</u> | |

C-02

CVCS

| | | | |
|---------------------------------|---|---|--|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>100</u> F | Flow | <u>86</u> gpm |
| Letdown Line Temp | <u>150</u> F | Line Temp | <u>215</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>ON</u> P-55C <u>OFF</u> |
| Temp <u>105</u> F | Pressure <u>30</u> psi | Level <u>74</u> % | Volume Control Tank |
| | | | PCP Control Bleedoff Pressure <u>60</u> psig |
| | | | <u>Shutdown Cooling System</u> |
| SDCS from PCS (R) | <u>80</u> F | | SDCS to PCS (R) <u>80</u> F |
| | | | <u>Quench Tank</u> |
| Temp <u>100</u> F | Pressure <u>3.70</u> psig | Level <u>76</u> % | Primary Coolant System |
| Pressurizer Pressure (R) | <u>2060</u> psia | | |
| PCS Tave (R) | Loop 1 (TR-0111) <u>555</u> | Loop 2 (TR-0121) <u>555</u> | |
| Pressurizer Level (R) | LRC-0101A <u>54</u> % | LRC-0101B <u>53</u> % | LIA-0102A <u>45</u> % |
| Pzr Htr Amps | LCC 15 <u>152</u> | LCC 16 <u>152</u> | |
| PORV PRV-1042B <u>CLOSED</u> | PRV-1043B <u>CLOSED</u> | Block Valve | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| PCPs | P-50A <u>ON</u> | P-50B <u>ON</u> | P-50C <u>ON</u> P-50D <u>ON</u> |
| Reactor Power Level | NI-01 <u>1</u> NI-02 <u>1</u> NI-03 <u>75</u> NI-04 <u>95</u> | NI-05 <u>80</u> NI-06 <u>82</u> NI-07 <u>82</u> NI-08 <u>81</u> | |

C-01

| | | | |
|--|---|---|--|
| <u>AFW System</u> | | <u>AFW System</u> | |
| AFW Pump P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> | AFW Pump Amps P-8A <u>0</u> P-8B <u>0</u> P-8C <u>0</u> amps |
| AFW Pump P-8B Steam Pressure <u>0</u> psig | | | AFW Disch Press P-8A & P-8B <u>0</u> P-8C <u>0</u> psig |
| <u>Secondary System</u> | | | |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MOV-0510 <u>CLOSED</u> | MSIV's CV-0501 <u>OPEN</u> CV-0510 <u>OPEN</u> |
| MFP Suction Pressure | <u>460</u> psig | MFP Discharge Pressure | A <u>900</u> B <u>890</u> psi |
| Moisture Separator Drain Tank Level | <u>64</u> % | Condenser Hotwell Level | <u>67</u> % |
| Atmospheric Dump Valves | <u>CLOSED</u> | Condenser Vacuum | <u>26.90</u> in Hg. |
| Heater Drain Pump Status | P-10A <u>ON</u> | P-10B <u>ON</u> | Gland Seal Condenser Vacuum <u>14</u> in Hg. |
| | | Condensate Pump Status | P-2A <u>ON</u> P-2B <u>ON</u> |
| PIP | | | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | | |
| Gross MW <u>699</u> | Net MW <u>658</u> | Core Exit Thermocouple Temperature <u>576</u> F | |
| Control Rod Position | GP1 <u>131</u> GP2 <u>131</u> GP3 <u>131</u> GP4 <u>101</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> | | |
| Stuck Rods | <u>NONE</u> | | |

PALEX 90
Message No 12

Time: 0918
Scenario Time: 0048

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Chemistry

Simulated Plant Conditions:

Message:

Initial S/G samples obtained before blowdown valves auto closed are as follows:

- A. $<5.6 \text{ E-6 } \mu\text{Ci/mL}$
- B. $2.0 \text{ E-5 } \mu\text{Ci/mL}$

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Chemistry should immediately notify the SED and Control Room.

PALEX 90
Message No 13

Time: 0930
Scenario Time: 0100

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Continue ONP 23.2 actions including "B" S/G preliminary isolation.

Date May 22, 1990

Message # 13

PALEX 90
Time 0930

Problem Time 0100

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>69</u> B <u>71</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | | |
|---------------------------------|-------------|----------------|---------------|----------------|--|
| CCW Cooler Outlet Temp | A | <u>75</u> F | B | <u>73</u> F | |
| Containment Spray Pumps | P-54A | <u>OFF</u> | P-54B | <u>OFF</u> | P-54C <u>OFF</u> |
| HPSI Pumps | P-66A | <u>OFF</u> | P-66B | <u>OFF</u> | LPSI Pumps P-67A <u>OFF</u> P-67B <u>OFF</u> |
| Safety Injection Suction Supply | | | | | |
| Train A | | | Train B | | |
| CV-3057 (SIRW) | <u>OPEN</u> | CV-3029 (Sump) | <u>CLOSED</u> | CV-3031 (SIRW) | <u>OPEN</u> CV-3030 (Sump) <u>CLOSED</u> |

C-02
CVCS

| | | | |
|---------------------------------|---|-------------------------------|---|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>100</u> F | Flow | <u>40</u> gpm |
| Letdown Line Temp | <u>150</u> F | Line Temp | <u>350</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>OFF</u> P-55C <u>OFF</u> |
| Temp <u>105</u> F | Pressure <u>23</u> psi | Level <u>56</u> % | Volume Control Tank |
| SDCS from PCS (R) | <u>80</u> F | PCP Control Bleedoff Pressure | <u>55</u> psig |
| Temp <u>100</u> F | Pressure <u>4</u> psig | Level <u>76</u> % | Shutdown Cooling System |
| Pressurizer Pressure (R) | <u>2060</u> psia | SDCS to PCS (R) | <u>80</u> F |
| PCS Tave (R) | <u>550</u> | Quench Tank | |
| Pressurizer Level (R) | LRC-0101A <u>51</u> % | Primary Coolant System | |
| Pzr Htr Amps | LCC 15 <u>152</u> | Loop 1 (TR-0111) <u>550</u> | Loop 2 (TR-0121) <u>550</u> |
| PORV PRV-1042B <u>CLOSED</u> | PRV-1043B <u>CLOSED</u> | LRC-0101B | <u>50</u> % LIA-0102A <u>44</u> % |
| PCPs | P-50A <u>ON</u> | LCC 16 | <u>152</u> |
| Reactor Power Level | NI-01 <u>1</u> NI-02 <u>1</u> NI-03 <u>60</u> NI-04 <u>90</u> | Block Valve | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| | NI-05 <u>72</u> NI-06 <u>74</u> NI-07 <u>75</u> NI-08 <u>74</u> | P-50B | <u>ON</u> P-50C <u>ON</u> P-50D <u>ON</u> |

C-01

| | | | |
|--|---|-------------------------|--|
| <u>AFW System</u> | | | |
| AFW Pump | P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | AFW Pump Amps | P-8A <u>0</u> P-8C <u>0</u> amps |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MOV-0510 <u>CLOSED</u> | MSIV's CV-0501 <u>OPEN</u> CV-0510 <u>OPEN</u> |
| MFP Suction Pressure | <u>480</u> psig | MFP Discharge Pressure | A <u>900</u> B <u>880</u> psi |
| Moisture Separator Drain Tank Level | <u>64</u> % | Condenser Hotwell Level | <u>67</u> % |
| Atmospheric Dump Valves | <u>CLOSED</u> | Condenser Vacuum | <u>27</u> in Hg. |
| Heater Drain Pump Status | P-10A <u>ON</u> | P-10B <u>ON</u> | Gland Seal Condenser Vacuum <u>14</u> in Hg. |
| | | Condensate Pump Status | P-2A <u>ON</u> P-2B <u>ON</u> |
| PIP | | | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | | |
| Gross MW | <u>625</u> | Net MW | <u>585</u> Core Exit Thermocouple Temperature <u>569</u> F |
| Control Rod Position | GP1 <u>131</u> GP2 <u>131</u> GP3 <u>131</u> GP4 <u>130</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> | | |
| Stuck Rods | <u>NONE</u> | | |

Date May 22, 1990

Message # 13

PALEX 90

Time 0930

Scenario Time 0100

C-13

| | | | | | | |
|-------------------------------|-----------------|-----------------------------|--------------|-------------------------------|-------------|-------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>69 %</u> | Condensate Storage Tank Level | T-2 | <u>94 %</u> |
| Instrument Air Pressure | <u>100</u> psig | | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> | |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> | |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> | |
| SIRW Tank Level | <u>97 %</u> | | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>48</u> | B <u>51</u> | C <u>46</u> | D <u>55</u> | | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>220</u> | D <u>215</u> | | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | | | | |
|-------------------------------------|-----------------------|----------------------|--------------------------|--------------------|-------------------|
| Concentrated Boric Acid Tank Levels | T53A | <u>100 %</u> | T53B | <u>98 %</u> | |
| Reactor Vessel DP | | <u>28</u> psid | | | |
| PORV Discharge Temperature | | <u>105</u> F | | | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 | <u>105</u> | RV-1040 | <u>105</u> | |
| | | | RV-1041 | <u>105</u> | |
| PCP Current (Amps) | P-50A | <u>600</u> | P-50B | <u>615</u> | |
| | | | P-50C | <u>620</u> | |
| PCS Flow | | <u>75 %</u> | P-50D | <u>600</u> | |
| | | | Pressurizer Level (cold) | <u>46 %</u> | |
| Loop Thot (F) | Loop 1 | <u>570</u> | Loop 2 | <u>570</u> | |
| Loop Tcold (F) | Loop 1 | <u>529</u> | Loop 2 | <u>530</u> | |
| Tcold Wide range | Loop 1 | <u>530</u> | Loop 2 | <u>535</u> | |
| Subcooling | Temp | <u>69.20</u> F | Press | <u>825</u> psi | |
| PCS Pressure (R) | WR | <u>2070</u> | NR | <u>600</u> psia | |
| | Steam Generator A | | Steam Generator B | | |
| Level (WR) | <u>65 %</u> | (NR) | <u>62 %</u> | (WR) | <u>65 %</u> |
| | | (NR) | <u>63 %</u> | (NR) | <u>63 %</u> |
| Press | <u>740</u> psia | | | <u>740</u> psia | |
| Flow | Steam <u>4.20</u> PPH | Feed <u>4.20</u> PPH | | Steam <u>4</u> PPH | Feed <u>4</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | | | |
|-----------------------|-------------|--------------|-----------|--------------|
| AFW Flow to A S/G | From P-8A&B | <u>0</u> | From P-8C | <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B | <u>0</u> | From P-8C | <u>0</u> gpm |
| Condensor Vacuum (R) | | <u>26.90</u> | | |
| PCP Seal Leakoff Flow | P-50A | <u>1.50</u> | P-50B | <u>1.50</u> |
| | | | P-50C | <u>1.50</u> |
| | | | P-50D | <u>1.50</u> |

C-04

| | | | | |
|----------------------------|---------|--------------|------|--------------|
| Diesel Generator Frequency | 1-1 | <u>60.50</u> | 1-2 | <u>60.50</u> |
| 1-C BUS | Voltage | <u>2450</u> | Amps | <u>420</u> |
| 1-D BUS | Voltage | <u>2450</u> | Amps | <u>330</u> |

C-11 Back C-11A

| | | | | |
|--|----------|--------------------|----------|----------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 | <u>4.00E-2</u> | RIA-1806 | <u>2.00E-2</u> |
| | RIA-1807 | <u>2.50E-2</u> | RIA-1808 | <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 | <u><1</u> | RIA-2322 | <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R | <u>0</u> | AI-2401L | <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 | <u>2.50E+1</u> | RIA-2323 | <u>7.00E+1</u> |
| Stack Monitors | RIA-2325 | <u>5.00E+2</u> cpm | RIA-2326 | <u>1.50E+2</u> cpm |
| | | | RIA-2327 | <u>2.00E-1</u> mr/hr |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

C15-65-575

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
Page 1 of 28

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE
FOR DRILL USE ONLY

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

PALEX 90
Message No 14

Time: 0940
Scenario Time: 0110

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Chemistry

Simulated Plant Conditions:

Message:

Backup off-gas sample confirms 55 gpm primary to secondary leak.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Immediately notify SED and Control Room.

PALEX 90
Message No 15

Time: 0942
Scenario Time: 0112

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

All blowdown valves on "B" S/G are closed. Steam dump control HIC-0780A is in manual and "B" S/G atmospheric steam dumps are isolated.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Operator should begin reducing "B" S/G level.

PALEX 90
Message No 16

Time: 0945
Scenario Time: 0115

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data sheets

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue ONP 23.2 actions.

Date May 22, 1990

Message # 16

PALEX 90

Time 0945

Problem Time 0115

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>69</u> B <u>71</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | | |
|---------------------------------|------------------------------|----------------------------|------------------------------|------------------|-----------------------------------|
| CCW Cooler Outlet Temp | A <u>75</u> F | B <u>73</u> F | | | |
| Containment Spray Pumps | P-54A <u>OFF</u> | P-54B <u>OFF</u> | | P-54C <u>OFF</u> | |
| HPSI Pumps | P-66A <u>OFF</u> | P-66B <u>OFF</u> | | LPSI Pumps | P-67A <u>OFF</u> P-67B <u>OFF</u> |
| Safety Injection Suction Supply | | | | | |
| Train A | | | Train B | | |
| CV-3057 (SIRW) <u>OPEN</u> | CV-3029 (Sump) <u>CLOSED</u> | CV-3031 (SIRW) <u>OPEN</u> | CV-3030 (Sump) <u>CLOSED</u> | | |

C-02
CVCS

| | | | |
|---------------------------------|---|---|--|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>100</u> F | Flow | <u>87</u> gpm |
| Letdown Line Temp | <u>140</u> F | Line Temp | <u>210</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>ON</u> P-55C <u>OFF</u> |
| Temp <u>105</u> F | Pressure <u>24</u> psi | Level <u>52</u> % | Volume Control Tank |
| SDCS from PCS (R) <u>80</u> F | | | PCP Control Bleedoff Pressure <u>52</u> psig |
| | | | Shutdown Cooling System |
| | | | SDCS to PCS (R) <u>80</u> F |
| | | | Quench Tank |
| Temp <u>102</u> F | Pressure <u>4</u> psig | Level <u>76</u> % | Primary Coolant System |
| Pressurizer Pressure (R) | <u>2060</u> psia | | |
| PCS Tave (R) | Loop 1 (TR-0111) <u>551</u> | Loop 2 (TR-0121) <u>550</u> | |
| Pressurizer Level (R) | LRC-0101A <u>50</u> % | LRC-0101B <u>49</u> % | LIA-0102A <u>44</u> % |
| Pzr Htr Amps | LCC 15 <u>152</u> | LCC 16 <u>152</u> | |
| PORV PRV-1042B <u>CLOSED</u> | PRV-1043B <u>CLOSED</u> | Block Valve | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| PCPs | P-50A <u>ON</u> | P-50B <u>ON</u> | P-50C <u>ON</u> P-50D <u>ON</u> |
| Reactor Power Level | NI-01 <u>1</u> NI-02 <u>1</u> NI-03 <u>60</u> NI-04 <u>90</u> | NI-05 <u>65</u> NI-06 <u>67</u> NI-07 <u>66</u> NI-08 <u>66</u> | |

C-01

| | | | |
|--|---|-------------------------|--|
| <u>AFW System</u> | | | |
| AFW Pump P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> | AFW Pump Amps P-8A <u>0</u> P-8B <u>0</u> P-8C <u>0</u> amps |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | | AFW Disch Press P-8A & P-8B <u>0</u> P-8C <u>0</u> psig |
| <u>Secondary System</u> | | | |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MOV-0510 <u>CLOSED</u> | MSIV's CV-0501 <u>OPEN</u> CV-0510 <u>OPEN</u> |
| MFP Suction Pressure | <u>460</u> psig | MFP Discharge Pressure | A <u>910</u> B <u>905</u> psi |
| Moisture Separator Drain Tank Level | <u>64</u> % | Condenser Hotwell Level | <u>67</u> % |
| Atmospheric Dump Valves | <u>CLOSED</u> | Condenser Vacuum | <u>27.20</u> in Hg. |
| Heater Drain Pump Status | P-10A <u>ON</u> | P-10B <u>ON</u> | Gland Seal Condenser Vacuum <u>14</u> in Hg. |
| | | Condensate Pump Status | P-2A <u>ON</u> P-2B <u>ON</u> |
| <u>PIP</u> | | | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | | |
| Gross MW | <u>557</u> | Net MW | <u>515</u> Core Exit Thermocouple Temperature <u>558</u> F |
| Control Rod Position | GP1 <u>131</u> GP2 <u>131</u> GP3 <u>131</u> GP4 <u>119</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> | | |
| Stuck Rods | <u>NONE</u> | | |

Date May 22, 1990

Message # 16

PALEX 90

Time 0945

Scenario Time 0115

C-13

| | | | |
|--|---|--|----------------------|
| T-81 Level <u>92 %</u> | T-939 Level <u>69 %</u> | Condensate Storage Tank Level T-2 <u>100 %</u> | |
| Instrument Air Pressure <u>100 psig</u> | Containment Building Pressure <u>.10 psig</u> | Dome Temperature <u>105 F</u> | Humidity <u>10 %</u> |
| S/G A Compartment | S/G B Compartment | Temperature <u>100 F</u> | Humidity <u>10 %</u> |
| SIRW Tank Level <u>97 %</u> | WR Containment Pressure (R) <u>15 psia</u> | Temperature <u>90 F</u> | Humidity <u>10 %</u> |
| Containment Sump Level <u>0 %</u> | SI Tank Level (%) <u>A 48 B 51 C 44 D 55</u> | Containment Water Level (R) <u>590.40 %</u> | |
| SI Tank Pressure (psig) <u>A 210 B 215 C 220 D 215</u> | | | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|--|--------------------------------------|-----------------------------------|
| Concentrated Boric Acid Tank Levels | T53A <u>100 %</u> | T53B <u>98 %</u> |
| Reactor Vessel DP <u>28 psid</u> | | |
| PORV Discharge Temperature <u>105 F</u> | | |
| Pzr Safety Valve Discharge Temp (F) RV-1039 <u>105</u> | RV-1040 <u>105</u> | RV-1041 <u>105</u> |
| PCP Current (Amps) P-50A <u>600</u> | P-50B <u>610</u> | P-50C <u>620</u> P-50D <u>600</u> |
| PCS Flow <u>75 %</u> | Pressurizer Level (cold) <u>45 %</u> | |
| Loop Thot (F) Loop 1 <u>567</u> | Loop 2 <u>567</u> | |
| Loop Tcold (F) Loop 1 <u>532</u> | Loop 2 <u>532</u> | |
| Tcold Wide range Loop 1 <u>530</u> | Loop 2 <u>540</u> | |
| Subcooling Temp <u>71.20 F</u> | Press <u>845 psi</u> | |
| PCS Pressure (R) WR <u>2070</u> | NR <u>600 psia</u> | |

| | | | |
|----------------------------|----------------------|-----------------------|----------------------|
| Steam Generator A | | Steam Generator B | |
| Level (WR) <u>65 %</u> | (NR) <u>62 %</u> | (WR) <u>65 %</u> | (NR) <u>60 %</u> |
| Press <u>780 psia</u> | | <u>790 psia</u> | |
| Flow Steam <u>3.80 PPH</u> | Feed <u>3.80 PPH</u> | Steam <u>3.60 PPH</u> | Feed <u>3.60 PPH</u> |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|--------------------------------|----------------------|------------------------|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| Condensor Vacuum (R) <u>27</u> | | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> |
| | P-50C <u>1.50</u> | P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>340</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u><1</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>7.00E+1</u> |
| Stack Monitors | RIA-2325 <u>5.00E+2</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

PALEX 90
Message No 17

Time: 1000
Scenario Time: 0130

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operator

Simulated Plant Conditions: See alarm and data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Date May 22, 1990

Message # 17

PALEX 90
Time 1000

Problem Time 0130

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>68</u> B <u>70</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | | |
|---------------------------------|-------------|----------------|---------------|----------------|--|
| CCW Cooler Outlet Temp | A | <u>75</u> F | B | <u>73</u> F | |
| Containment Spray Pumps | P-54A | <u>OFF</u> | P-54B | <u>OFF</u> | P-54C <u>OFF</u> |
| HPSI Pumps | P-66A | <u>OFF</u> | P-66B | <u>OFF</u> | LPSI Pumps P-67A <u>OFF</u> P-67B <u>OFF</u> |
| Safety Injection Suction Supply | | | | | |
| Train A | | | Train B | | |
| CV-3057 (SIRW) | <u>OPEN</u> | CV-3029 (Sump) | <u>CLOSED</u> | CV-3031 (SIRW) | <u>OPEN</u> CV-3030 (Sump) <u>CLOSED</u> |

C-02

CVCS

| | | | |
|---------------------------------|------------------------|-------------------|--|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>101</u> F | Flow | <u>87</u> gpm |
| Letdown Line Temp | <u>130</u> F | Line Temp | <u>207</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>ON</u> P-55C <u>OFF</u> |
| Temp <u>103</u> F | Pressure <u>29</u> psi | Level <u>69</u> % | Volume Control Tank |
| | | | PCP Control Bleedoff Pressure <u>55</u> psig |
| SDCS from PCS (R) | <u>80</u> F | | Shutdown Cooling System |
| | | | SDCS to PCS (R) <u>80</u> F |
| | | | Quench Tank |
| Temp <u>102</u> F | Pressure <u>4</u> psig | Level <u>76</u> % | |

Primary Coolant System

| | | | |
|--------------------------|---|------------------|---|
| Pressurizer Pressure (R) | <u>2060</u> psia | Loop 2 (TR-0121) | <u>547</u> |
| PCS Tave (R) | Loop 1 (TR-0111) <u>547</u> | LRC-0101B | <u>48</u> % LIA-0102A <u>43</u> % |
| Pressurizer Level (R) | LRC-0101A <u>49</u> % | LCC 16 | <u>152</u> |
| Pzr Htr Amps | LCC 15 <u>152</u> | Block Valve | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| PORV | PRV-1042B <u>CLOSED</u> PRV-1043B <u>CLOSED</u> | P-50A <u>ON</u> | P-50B <u>ON</u> P-50C <u>ON</u> P-50D <u>ON</u> |
| PCPs | | NI-01 <u>1</u> | NI-02 <u>1</u> NI-03 <u>50</u> NI-04 <u>80</u> |
| Reactor Power Level | | NI-05 <u>60</u> | NI-06 <u>62</u> NI-07 <u>61</u> NI-08 <u>62</u> |

C-01

AFW System

| | | | | | |
|-------------------------------------|------------------------|-------------------------|-----------------------------|-------------------------------|--|
| AFW Pump | P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> | AFW Pump Amps | P-8A <u>0</u> P-8B <u>0</u> P-8C <u>0</u> amps |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | | | AFW Disch Press | P-8A & P-8B <u>0</u> P-8C <u>0</u> psig |
| <u>Secondary System</u> | | | | | |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MOV-0510 <u>CLOSED</u> | MSIV's | CV-0501 <u>OPEN</u> | CV-0510 <u>OPEN</u> |
| MFP Suction Pressure | <u>480</u> psig | MFP Discharge Pressure | A <u>930</u> | B <u>920</u> psi | |
| Moisture Separator Drain Tank Level | <u>64</u> % | Condenser Hotwell Level | <u>68</u> % | | |
| Atmospheric Dump Valves | <u>CLOSED</u> | Condenser Vacuum | <u>27.20</u> in Hg. | | |
| Heater Drain Pump Status | P-10A <u>ON</u> | P-10B <u>ON</u> | Gland Seal Condenser Vacuum | <u>14</u> in Hg. | |
| | | | Condensate Pump Status | P-2A <u>ON</u> P-2B <u>ON</u> | |
| | | | PIP | | |

(Demand Log + Constant, Rod, or Flux/Temp)

| | | | | | |
|----------------------|---|--------|------------|------------------------------------|--------------|
| Gross MW | <u>483</u> | Net MW | <u>444</u> | Core Exit Thermocouple Temperature | <u>562</u> F |
| Control Rod Position | GP1 <u>131</u> GP2 <u>131</u> GP3 <u>131</u> GP4 <u>123</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> | | | | |
| Stuck Rods | <u>NONE</u> | | | | |

Date May 22, 1990

Message # 17

PALEX 90

Time 1000

Scenario Time 0130

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|--------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>69 %</u> | Condensate Storage Tank Level T-2 | <u>100 %</u> |
| Instrument Air Pressure | <u>100</u> psig | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>97 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40</u> % | | |
| SI Tank Level (%) | A <u>48</u> | B <u>50</u> | C <u>45</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>220</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|---|--|
| Concentrated Boric Acid Tank Levels | T53A <u>100 %</u> | T53B <u>97 %</u> |
| Reactor Vessel DP | <u>28</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>600</u> | P-50B <u>615</u> P-50C <u>620</u> P-50D <u>600</u> |
| PCS Flow | <u>75 %</u> | Pressurizer Level (cold) <u>44 %</u> |
| Loop Thot (F) | Loop 1 <u>563</u> | Loop 2 <u>563</u> |
| Loop Tcold (F) | Loop 1 <u>529</u> | Loop 2 <u>529</u> |
| Tcold Wide range | Loop 1 <u>528</u> | Loop 2 <u>538</u> |
| Subcooling | Temp <u>76.50</u> F | Press <u>895</u> psi |
| PCS Pressure (R) | WR <u>2070</u> | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>65 %</u> | (NR) <u>40 %</u> |
| Press | <u>780</u> psia | <u>790</u> psia |
| Flow | Steam <u>3.30</u> PPH Feed <u>3.30</u> PPH | Steam <u>3.10</u> PPH Feed <u>3.10</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|----------------------|---|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>27.20</u> | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> P-50C <u>1.50</u> P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>340</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|--|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u><1</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>7.00E+1</u> |
| Stack Monitors | RIA-2325 <u>5.00E+2</u> cpm | RIA-2326 <u>1.50E+2</u> cpm RIA-2327 <u>2.00E-1</u> mr/hr |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)
FOR DRILL USE ONLY**

| | | | | | | |
|--|--|---|---|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERSVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

11-28-87

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL SKT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |

PALEX 90
Message No 18

Time: 1015
Scenario Time: 0145

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message: "B" main feed pump has been secured in accordance with GOP 8.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue ONP 23.2 actions.

Date May 22, 1990

Message # 18

PALEX 90

Time 1015

Problem Time 0145

C-08

SW Pumps P-7A ON P-7B ON P-7C OFF SW Critical Hdr Press A 69 B 70 psig
 CCW Pumps P-52A ON P-52B OFF P-52C OFF FPC Pumps P-51A ON P-51B OFF
 Fire Pumps P-9A OFF P-9B OFF P-41 OFF

Containment Cooler Recirc Fans
 V1A ON V2A ON V3A ON V4A ON V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F B 73 F
 Containment Spray Pumps P-54A OFF P-54B OFF P-54C OFF
 HPSI Pumps P-66A OFF P-66B OFF LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply
 Train A Train B
 CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown Charging
 Intermediate Press Letdown Temp 100 F Flow 86 gpm
 Letdown Line Temp 130 F Line Temp 200 F
 Letdown Flow 0 gpm Pumps P-55A ON P-55B ON P-55C OFF

Temp 102 F Pressure 40 psi Level 90 %
 SDCS from PCS (R) 80 F Volume Control Tank
 PCP Control Bleedoff Pressure 60 psig
Shutdown Cooling System
 SDCS to PCS (R) 80 F
Quench Tank
 Temp 100 F Pressure 4 psig Level 76 %
Primary Coolant System
 Pressurizer Pressure (R) 2060 psia
 PCS Tave (R) Loop 1 (TR-0111) 546 Loop 2 (TR-0121) 546
 Pressurizer Level (R) LRC-0101A 49 % LRC-0101B 48 % LIA-0102A 43 %
 Pzr Htr Amps LCC 15 152 LCC 16 152
 PORV PRV-1042B CLOSED PRV-1043B CLOSED Block Valve MOV-1042A CLOSED MOV-1043A CLOSED
 PCPs P-50A ON P-50B ON P-50C ON P-50D ON
 Reactor Power Level NI-01 1 NI-02 1 NI-03 45 NI-04 70
 NI-05 51 NI-06 53 NI-07 54 NI-08 54

C-01

AFW System
 AFW Pump P-8A OFF P-8B OFF P-8C OFF AFW Pump Amps P-8A 0 P-8C 0 amps
 AFW Disch Press P-8A & P-8B 0 P-8C 0 psig

Secondary System
 MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED MSIV's CV-0501 OPEN CV-0510 OPEN
 MFP Suction Pressure 500 psig MFP Discharge Pressure A 900 B 500 psi
 Moisture Separator Drain Tank Level 64 % Condenser Hotwell Level 67 %
 Atmospheric Dump Valves CLOSED Condenser Vacuum 27.40 in Hg.
 Heater Drain Pump Status P-10A ON P-10B ON Gland Seal Condenser Vacuum 14 in Hg.
 Condensate Pump Status P-2A ON P-2B ON
 PIP

(Demand Log + Constant, Rod, or Flux/Temp)
 Gross MW 419 Net MW 378 Core Exit Thermocouple Temperature 559 F
 Control Rod Position GP1 131 GP2 131 GP3 131 GP4 123 GP5(P) 131 GP6(A) 131 GP7(B) 131
 Stuck Rods NONE

Date May 22, 1990

Message # 18

PALEX 90

Time 1015

Scenario Time 0145

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-------------------------------|------------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>69 %</u> | Condensate Storage Tank Level | T-2 <u>100 %</u> |
| Instrument Air Pressure | <u>100</u> psig | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>97 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40</u> % | | |
| SI Tank Level (%) | A <u>58</u> | B <u>51</u> | C <u>44</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>220</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|---|--|
| Concentrated Boric Acid Tank Levels | T53A <u>100 %</u> | T53B <u>96 %</u> |
| Reactor Vessel DP | <u>28</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>600</u> | P-50B <u>615</u> P-50C <u>620</u> P-50D <u>600</u> |
| PCS Flow | <u>75 %</u> | Pressurizer Level (cold) <u>45 %</u> |
| Loop Thot (F) | Loop 1 <u>558</u> | Loop 2 <u>558</u> |
| Loop Tcold (F) | Loop 1 <u>530</u> | Loop 2 <u>530</u> |
| Tcold Wide range | Loop 1 <u>528</u> | Loop 2 <u>538</u> |
| Subcooling | Temp <u>80.30</u> F | Press <u>928</u> psi |
| PCS Pressure (R) | WR <u>2070</u> | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>65 %</u> (NR) <u>60 %</u> | (WR) <u>40 %</u> (NR) <u>40 %</u> |
| Press | <u>810</u> psia | <u>810</u> psia |
| Flow | Steam <u>2.90</u> PPH Feed <u>2.90</u> PPH | Steam <u>2.60</u> PPH Feed <u>2.50</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|----------------------|---|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>27.30</u> | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> P-50C <u>1.50</u> P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>340</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|--|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u><1</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>7.00E+1</u> |
| Stack Monitors | RIA-2325 <u>5.00E+2</u> cpm | RIA-2326 <u>1.50E+2</u> cpm RIA-2327 <u>2.00E-1</u> mr/hr |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)
FOR DRILL USE ONLY

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

610-58-0-0700

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision 39
Page 2 of 30

**TITLE: TURBINE CONDENSER AND FEEDWATER
FOR DRILL USE ONLY**

SCHEME K01 (C11)

| | | | | | |
|--|--|--|--|--|---|
| AFAS FOGG SUBSYSTEM TRIP REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL REFLASH 72 |

PALEX 90
Message No 19

Time: 1030
Scenario Time: 0200

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data sheets

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue ONP 23.2 actions.

Date May 22, 1990

Message # 19

PALEX 90
Time 1030

Problem Time 0200

C-08

| | | | | | |
|---------------|-----------------|------------------|------------------|--------------------------------|---|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>OFF</u> | SW Critical Hdr Press | A <u>69</u> B <u>71</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>OFF</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | Containment Cooler Recirc Fans | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | V1B <u>ON</u> | V2B <u>ON</u> V3B <u>ON</u> V4B <u>ON</u> |

C-03

| | | | | |
|-------------------------|------------------|------------------|------------------|-----------------------------------|
| CCW Cooler Outlet Temp | A <u>75</u> F | B <u>73</u> F | | |
| Containment Spray Pumps | P-54A <u>OFF</u> | P-54B <u>OFF</u> | P-54C <u>OFF</u> | |
| HPSI Pumps | P-66A <u>OFF</u> | P-66B <u>OFF</u> | LPSI Pumps | P-67A <u>OFF</u> P-67B <u>OFF</u> |

Safety Injection Suction Supply

| | |
|----------------------------|------------------------------|
| Train A | Train B |
| CV-3057 (SIRW) <u>OPEN</u> | CV-3029 (Sump) <u>CLOSED</u> |
| CV-3031 (SIRW) <u>OPEN</u> | CV-3030 (Sump) <u>CLOSED</u> |

C-02

CVCS

| | |
|--|---|
| <u>Letdown</u> | <u>Charging</u> |
| Intermediate Press Letdown Temp <u>100</u> F | Flow <u>60</u> gpm |
| Letdown Line Temp <u>130</u> F | Line Temp <u>240</u> F |
| Letdown Flow <u>0</u> gpm | Pumps P-55A <u>ON</u> P-55B <u>ON</u> P-55C <u>OFF</u> |
| Temp <u>103</u> F | Volume Control Tank |
| Pressure <u>39</u> psi | PCP Control Bleedoff Pressure <u>60</u> psig |
| Level <u>88</u> % | <u>Shutdown Cooling System</u> |
| SDCS from PCS (R) <u>80</u> F | SDCS to PCS (R) <u>80</u> F |
| Temp <u>102</u> F | <u>Quench Tank</u> |
| Pressure <u>4</u> psig | Level <u>76</u> % |
| Pressurizer Pressure (R) <u>2060</u> psia | <u>Primary Coolant System</u> |
| PCS Tave (R) Loop 1 (TR-0111) <u>544</u> | Loop 2 (TR-0121) <u>544</u> |
| Pressurizer Level (R) LRC-0101A <u>48</u> % | LRC-0101B <u>47</u> % LIA-0102A <u>42</u> % |
| Pzr Htr Amps LCC 15 <u>152</u> | LCC 16 <u>152</u> |
| PORV PRV-1042B <u>CLOSED</u> | Block Valve MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| PCPs P-50A <u>ON</u> | P-50B <u>ON</u> P-50C <u>ON</u> P-50D <u>ON</u> |
| Reactor Power Level | NI-01 <u>1</u> NI-02 <u>1</u> NI-03 <u>40</u> NI-04 <u>60</u> |
| | NI-05 <u>43</u> NI-06 <u>44</u> NI-07 <u>46</u> NI-08 <u>46</u> |

C-01

AFW System

| | | | | |
|---|--|--------------------------------------|--|----------------------------------|
| AFW Pump P-8A <u>OFF</u> | P-8B <u>OFF</u> | P-8C <u>OFF</u> | AFW Pump Amps | P-8A <u>0</u> P-8C <u>0</u> amps |
| AFW Pump P-8B Steam Pressure <u>0</u> psig | AFW Disch Press P-8A & P-8B <u>0</u> | P-8C <u>0</u> psig | <u>Secondary System</u> | |
| MSIV Bypass MOV-0501 <u>CLOSED</u> | MOV-0510 <u>CLOSED</u> | MSIV's CV-0501 <u>OPEN</u> | CV-0510 <u>OPEN</u> | |
| MFP Suction Pressure <u>530</u> psig | MFP Discharge Pressure A <u>910</u> | B <u>520</u> psi | | |
| Moisture Separator Drain Tank Level <u>64</u> % | Condenser Hotwell Level <u>67</u> % | Condenser Vacuum <u>27.50</u> in Hg. | | |
| Atmospheric Dump Valves <u>CLOSED</u> | Heater Drain Pump Status P-10A <u>ON</u> | P-10B <u>ON</u> | Gland Seal Condenser Vacuum <u>14</u> in Hg. | |
| | Condensate Pump Status P-2A <u>ON</u> | P-2B <u>ON</u> | | |

(Demand Log + Constant, Rod, or Flux/Temp)

| | | |
|-------------------------------------|-------------------------------|--|
| Gross MW <u>358</u> | Net MW <u>316</u> | Core Exit Thermocouple Temperature <u>555</u> F |
| Control Rod Position GP1 <u>131</u> | GP2 <u>131</u> GP3 <u>131</u> | GP4 <u>116</u> GP5(P) <u>131</u> GP6(A) <u>131</u> GP7(B) <u>131</u> |
| Stuck Rods <u>NONE</u> | | |

Date May 22, 1990

Message # 19

PALEX 90

Time 1030

Scenario Time 0200

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|--------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level T-2 | <u>100 %</u> |
| Instrument Air Pressure | <u>98 psig</u> | | | | |
| Containment Building Pressure | <u>.10 psig</u> | Dome Temperature | <u>105 F</u> | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100 F</u> | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90 F</u> | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>97 %</u> | | | | |
| WR Containment Pressure (R) | <u>15 psia</u> | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>47</u> | B <u>51</u> | C <u>43</u> | D <u>56</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>220</u> | C <u>220</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|--|---|
| Concentrated Boric Acid Tank Levels | T53A <u>100 %</u> | T53B <u>96 %</u> |
| Reactor Vessel DP | <u>28 psid</u> | |
| PORV Discharge Temperature | <u>105 F</u> | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>600</u> | P-50B <u>620</u> P-50C <u>630</u> P-50D <u>600</u> |
| PCS Flow | <u>75 %</u> | Pressurizer Level (cold) <u>44 %</u> |
| Loop Thot (F) | Loop 1 <u>555</u> | Loop 2 <u>555</u> |
| Loop Tcold (F) | Loop 1 <u>530</u> | Loop 2 <u>530</u> |
| Tcold Wide range | Loop 1 <u>528</u> | Loop 2 <u>538</u> |
| Subcooling | Temp <u>83.80 F</u> | Press <u>957 psi</u> |
| PCS Pressure (R) | WR <u>2060</u> | NR <u>600 psia</u> |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>65 %</u> | (NR) <u>62 %</u> |
| Press | <u>820 psia</u> | (WR) <u>40 %</u> (NR) <u>40 %</u> |
| Flow | Steam <u>2.40 PPH</u> Feed <u>2.40 PPH</u> | <u>820 psia</u> Steam <u>2.20 PPH</u> Feed <u>2.10 PPH</u> |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|----------------------|---|
| AFW Flow to A S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| Condensor Vacuum (R) | <u>27.50</u> | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> P-50C <u>1.50</u> P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>400</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>340</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|---|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-2</u> | RIA-1806 <u>2.00E-2</u> |
| | RIA-1807 <u>2.50E-2</u> | RIA-1808 <u>2.00E-2</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.00E+0</u> | RIA-2322 <u>1.10E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>7.00E+1</u> |
| Stack Monitors | RIA-2325 <u>5.00E+2 cpm</u> | RIA-2326 <u>1.50E+2 cpm</u> RIA-2327 <u>2.00E-1 mr/hr</u> |

PALEX 90
Message No 20

Time: 1040
Scenario Time: 0210

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

"B" S/G MSIV CV-0501 has gone shut resulting in a turbine and reaction trip. You now hear a loud noise of escaping steam.

FOR CONTROLLER USE ONLY

Controller Notes:

With the trip, a weld cracks at the base of "B" S/G relief column (RV-0707) resulting in a 500,000 lbm/hr steam line break outside containment. Upon recognition, the SED will declare a General Emergency based on "loss of 2 of 3 fission product barriers with a potential for loss of third fission product barrier."

Action Expected:

Operators should carry out EOP 1.0 standard post trip actions and investigate steam noise which is from a large plume in the vicinity of the first relief stack off the "B" S/G relief header.

PALEX 90
Message No 21

Time: 1044
Scenario Time: 0214

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

Both MSIVs are closed due to "B" S/G pressure <800 psi. T_{ave} is <525°F;
emergency boration is now in progress.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Continue EOP 1.0 actions and respond to alarms and appropriate ARPs.

PALEX 90
Message No 22

Time: 1045
Scenario Time: 0215

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See alarm and data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

RIA-0202A and RIA-0202B are off scale high; operator review of alarms should result in this question.

Action Expected:

Operators should diagnose via EOP 9.0 and carry out safety function status checks. Carrying out EOP 9.0 actions for an excess steam demand event will completely isolate "B" S/G for both the excess steam demand event and for the concurrent tube rupture.

Date May 22, 1990

Message # 22

PALEX 90

Time 1045

Problem Time 0215

C-08

SW Pumps P-7A ON P-7B ON P-7C OFF SW Critical Hdr Press A 69 B 71 psig
 CCW Pumps P-52A ON P-52B ON P-52C OFF FPC Pumps P-51A ON P-51B OFF
 Fire Pumps P-9A OFF P-9B OFF P-41 OFF

Containment Cooler Recirc Fans
 V1A ON V2A ON V3A ON V4A ON V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F B 73 F
 Containment Spray Pumps P-54A OFF P-54B OFF P-54C OFF
 HPSI Pumps P-66A OFF P-66B OFF LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply
 Train A Train B
 CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown Charging
 Intermediate Press Letdown Temp 100 F Flow 133 gpm
 Letdown Line Temp 150 F Line Temp 132 F
 Letdown Flow 0 gpm Pumps P-55A ON P-55B ON P-55C ON

Temp 103 F Pressure 33 psi Level 78 %
 Volume Control Tank PCP Control Bleedoff Pressure 62 psig
 SDCS from PCS (R) 80 F Shutdown Cooling System
 SDCS to PCS (R) 80 F
 Quench Tank Level 76 %

Temp 100 F Pressure 4 psig
 Primary Coolant System
 Pressurizer Pressure (R) 1979 psia
 PCS Tave (R) Loop 1 (TR-0111) 520 Loop 2 (TR-0121) 517
 Pressurizer Level (R) LRC-0101A 28 % LRC-0101B 28 % LIA-0102A 35 %
 Pzr Htr Amps LCC 15 0 LCC 16 0
 PORV PRV-1042B CLOSED PRV-1043B CLOSED Block Valve MOV-1042A CLOSED MOV-1043A CLOSED
 PCPS P-50A ON P-50B ON P-50C ON P-50D ON
 Reactor Power Level NI-01 1 NI-02 1 NI-03 5.00E-3 NI-04 8.00E-3
 NI-05 0 NI-06 0 NI-07 0 NI-08 0

C-01

AFW System
 AFW Pump P-8A ON P-8B OFF P-8C OFF AFW Pump Amps P-8A 82 P-8C 0 amps
 AFW Pump P-8B Steam Pressure 0 psig AFW Disch Press P-8A & P-8B 1300 P-8C 0 psig

Secondary System
 MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED MSIV's CV-0501 CLOSED CV-0510 CLOSED
 MFP Suction Pressure 550 psig MFP Discharge Pressure A 500 B 500 psi
 Moisture Separator Drain Tank Level 58 % Condenser Hotwell Level 65 %
 Atmospheric Dump Valves CLOSED Condenser Vacuum 28.10 in Hg.
 Heater Drain Pump Status P-10A OFF P-10B OFF Gland Seal Condenser Vacuum 14 in Hg.
 Condensate Pump Status P-2A ON P-2B OFF
 PIP

(Demand Log + Constant, Rod, or Flux/Temp)
 Gross MW 0 Net MW 0 Core Exit Thermocouple Temperature 520 F
 Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0 GP5(P) 131 GP6(A) 0 GP7(B) 0
 Stuck Rods NONE

Date May 22, 1990

Message # 22

PALEX 90

Time 1045

Scenario Time 0215

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-------------------------------|------------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level | T-2 <u>100 %</u> |
| Instrument Air Pressure | <u>105</u> psig | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>97 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>47</u> | B <u>51</u> | C <u>42</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|----------------------|--|
| Concentrated Boric Acid Tank Levels | T53A <u>98 %</u> | T53B <u>90 %</u> |
| Reactor Vessel DP | <u>28</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>600</u> | P-50B <u>620</u> P-50C <u>630</u> P-50D <u>600</u> |
| PCS Flow | <u>75 %</u> | Pressurizer Level (cold) <u>35 %</u> |
| Loop Thot (F) | Loop 1 <u>520</u> | Loop 2 <u>518</u> |
| Loop Tcold (F) | Loop 1 <u>520</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>520</u> | Loop 2 <u>520</u> |
| Subcooling | Temp <u>114.40</u> F | Press <u>1171</u> psi |
| PCS Pressure (R) | WR <u>2000</u> | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) <u>40 %</u> | (NR) <u>39 %</u> | (WR) <u>0 %</u> (NR) <u>2 %</u> |
| Press <u>820</u> psia | | <u>750</u> psia |
| Flow Steam <u>0</u> PPH | Feed <u>0</u> PPH | Steam <u>.50</u> PPH Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|------------------------|---|
| AFW Flow to A S/G | From P-8A&B <u>165</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>165</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>28.10</u> | |
| PCP Seal Leakoff Flow | P-50A <u>1.50</u> | P-50B <u>1.50</u> P-50C <u>1.50</u> P-50D <u>1.50</u> |

C-04

| | | |
|----------------------------|---------------------|-----------------|
| Diesel Generator Frequency | 1-1 <u>60</u> | 1-2 <u>60</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>510</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>200</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|--|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>5.00E-1</u> | RIA-1806 <u>5.00E-1</u> |
| | RIA-1807 <u>1.00E+0</u> | RIA-1808 <u>1.00E+0</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>2.00E+0</u> | RIA-2322 <u>2.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.50E+1</u> | RIA-2323 <u>4.50E+5</u> |
| Stack Monitors | RIA-2325 <u>5.00E+2</u> cpm | RIA-2326 <u>1.50E+2</u> cpm RIA-2327 <u>2.00E-1</u> mr/hr |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)
FOR DRILL USE ONLY

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

C1E-68-0770W

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
Page 1 of 28

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE
FOR DRILL USE ONLY

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK HI LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
Page 2 of 28

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE
FOR DRILL USE ONLY.

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKER TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

MAD-0-89-274

MAD-0-89-274

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
Revision 46
Page 1 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL CKT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |



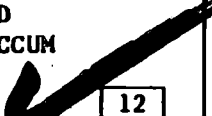
**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision 39
Page 1 of 30

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

FOR DRILL USE ONLY

| | | | | | |
|--|---|---|---|---|--|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM  12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |




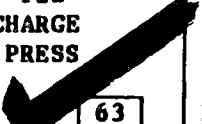
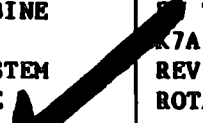

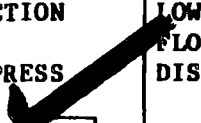


**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision '39
Page 2 of 30

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP  REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP  REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS  REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL REFLASH 72 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No. 36
Revision 0
Page 1 of 13

TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

FOR DRILL USE ONLY

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

AUX FW SYSTEM

STATUS ARRAY "B"

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0736B | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

AUX FW SYSTEM









STATUS ARRAY "C"

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 2
Revision 37
Page 1 of 14

TITLE: GENERATOR SCHEME EK-03 (EC-11)

FOR DRILL USE ONLY

| | | | | | |
|---|--|--|--|---|--|
| GENERATOR TRIP  1 | GENERATOR ACB TRIP  7 | GENERATOR EXCITER FLD BREAKER TRIP  13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD  14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION  3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP  10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE  12 | TURBINE PANEL TROUBLE  18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 3
Revision 46
Page 2 of 20

TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR
FOR DRILL USE ONLY

SCHEME **EK-05 (**EC-11)

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP | PREFERRED AC BUS NO 1 TROUBLE | DIESEL GEN BKR 152-107 TRIP | DIESEL GEN BKR 152-213 TRIP |
| 37 | 43 | 49 | 55 |
| MCC NO 7 BKR 52-1103 TRIP | PREFERRED AC BUS NO 3 TROUBLE | DIESEL GEN NO 1-1 FAIL TO START | DIESEL GEN NO 1-2 FAIL TO START |
| 38 | 44 | 50 | 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP | PREFERRED AC BUS NO 2 TROUBLE | DIESEL GEN NO 1-1 TROUBLE | DIESEL GEN NO 1-2 TROUBLE |
| 39 | 45 | 51 | 57 |
| MCC NO 8 BKR 52-1201 TRIP | PREFERRED AC BUS NO 4 TROUBLE | DIESEL GEN NO 1-1 START SIGNAL BLOCKED | DIESEL GEN NO 1-2 START SIGNAL BLOCKED |
| 40 | 46 | 52 | 58 |
| BATTERY CHARGERS TROUBLE | 125 V DC BUS GROUND | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD | DIESEL OIL STORAGE TANK T-10 LOW LEVEL |
| 3 | 41 | 6 | 53 |
| ANNUNCIATOR DC FAILURE | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL |
| 7 | 42 | 48 | 54 |
| | | | 60 |

70N-089-138

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 21
Revision 39
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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

FOR DRILL USE ONLY

| RACK A | | | | RACK B | | | |
|---|---|--------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |

| RACK C | | | | RACK D | | | |
|--------------------------------------|-----------------------------------|-----------------------------------|---|------------------------------------|---|---|---|
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 23
Revision 44
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TITLE: STATION POWER AND COOLING TOWERS

EK-33 (EC-126)

FOR DRILL USE ONLY

| | | | | | | | |
|---|--|--|---|---|---|--|---|
| START-UP TRANS No 1-3 PROT CKT UNDERVOLTAGE 1 | 4160V BUS IF INCOMING BKR 252-301 TRIP 5 | 4160 BUS IG INCOMING BKR 252-401 TRIP 9 | STA PWR TRANS No 71 BKR 252-304 TRIP OR UV 13 | STA PWR TRANS No 72 BKR 252-404 TRIP OR UV 17 | CLG TWR E-30A DELUGE SYSTEM TROUBLE 21 | FEEDWATER PURITY ALARM CONDITION SERIOUS 25 | CLG TWR E-30B DELUGE SYSTEM TROUBLE 29 |
| START-UP TRANSFORMER No 1-3 SUDDEN PRESS 2 | 4160V BUS IF INCOMING BKR 252-302 TRIP 6 | 4160 BUS IG INCOMING BKR 252-402 TRIP 10 | STA PWR TRANS No 73 BKR 252-305 TRIP OR UV 14 | STA PWR TRANS No 74 BKR 252-405 TRIP OR UV 18 | CLG TWR E-30A FIRE 22 | FEEDWATER PURITY ALARM CONDITION NON-SERIOUS 26 | CLG TWR E-30B FIRE 30 |
| START-UP TRANSFORMER No 1-3 TRIP 3 | 4160V BUS IF CONTROL CKT UNDERVOLTAGE 7 | 4160 BUS IG CONTROL CKT UNDERVOLTAGE 11 | STA PWR TRANS No 75 BKR 252-306 TRIP OR UV 15 | STA PWR TRANS No 76 BKR 252-406 TRIP OR UV 19 | 23 | DATA LOGGER ALERT 27 | 31 |
| START-UP TRANSFORMER No 1-3 TROUBLE 4 | 4160V BUS IF UNDERVOLTAGE 8 | 4160 BUS IG UNDERVOLTAGE 12 | RESERVE TRANSFORMER TROUBLE 16 | BATTERY VENTILATION D01, D02, FANS V15A & V15B 20 | BATTERY VENTILATION D204 FAN V-928 24 | INSTRUMENT RM DC FAILURE BATTERY CHARGER INVERTER TROUBLE 28 | BATTERY ROOMS 1 AND/OR 2 LOW TEMPERATURE 32 |

MESSAGE 22 1045 PAGE 12 OF 13

PALISADES NUCLEAR PLANT
ALARM PROCEDURE

Proc No ARP 33
Revision 6
Page 1 of 11

TITLE: AUXILIARY SYSTEMS SCHEME EK-02 (EC-11A)

FOR DRILL USE ONLY

| | | | | | |
|---|--|--|--|--|--|
| CONT GAMMA RIA-2321 HIGH 1 | CONT GAMMA RIA-2322 HIGH 2 | CONT H ₂ MONT C-161 HIGH 3 | CONT H ₂ MONT C-162 HIGH 4 | MAIN STEAM E-50B RIA-2323 HIGH 5 | MAIN STEAM E-50A RIA-2324 HIGH 6 |
| CONT GAMMA RIA-2321 ALERT 13 | CONT GAMMA RIA-2322 ALERT 14 | CONT H ₂ HEAT TRACE C-163 FAIL 15 | CONT H ₂ HEAT TRACE C-164 FAIL 16 | MAIN STEAM E-50B RIA-2323 ALERT 17 | MAIN STEAM E-50A RIA-2324 ALERT 18 |
| CONT GAMMA RIA-2321 FAIL 25 | CONT GAMMA RIA-2322 FAIL 26 | CONT H ₂ MONT C-161 FAIL 27 | CONT H ₂ MONT C-162 FAIL 28 | MAIN STEAM E-50B RIA-2323 FAIL 29 | MAIN STEAM E-50A RIA-2324 FAIL 30 |
| CR HVAC FAN LOW FLOW V94-V95-V96 V26A-V26B 37 | CONTROL ROOM HVAC FILTER HIGH DIFF PRESS VF95-VF96 VF26A-VF26B 38 | 39 | 40 | 41 | 42 |
| CONTROL ROOM LOW PRESSURE DPIC-1659/1660 49 | CR FILTER HIGH TEMP VF26A-VF26B 50 | 51 | 52 | 53 | 54 |
| 61 | 62 | 63 | 64 | 65 | 66 |

PALEX 90
Message No 23

Time: 1047
Scenario Time: 0217

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

"B" S/G isolated in accordance with EOP 9.0, steaming path established via "A"
S/G MSIV bypass valve.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Continue EOP 9.0 actions and commence deliberate PCS pressure reduction to
bring in SIAS.

PALEX 90
Message No 24

Time: 1054
Scenario Time: 0224

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message: SIAS initiated due to deliberate PCS pressure reduction.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Verify correct SIAS functions.

PALEX 90
Message No 25 (Contingency)

Time: 1057
Scenario Time: 0227

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: SED

Simulated Plant Conditions:

Message:

Declare a general emergency based on loss of 2 of 3 fission product barriers with potential loss of third fission product barriers.

FOR CONTROLLER USE ONLY

Controller Notes:

This message may be delayed if declaration is imminent.

Action Expected:

PALEX 90
Message No 25

Time: 1057
Scenario Time: 0227

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message: PCS pressure approaching 1,300 psi.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Should stop all PCPs.

PALEX 90
Message No 26

Time: 1100
Scenario Time: 0230

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See alarm and data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

The simulator models RIA-2323 (B steam line ∞) as off-scale high. This is probably too high for drill purposes. HP will have to provide a reading to determine appropriate protective action recommendations. Also, various area monitors in the vicinity of the steam lines will be off-scale due to shine.
[NOT ACCOUNTED FOR IN DATA OR ALARMS.] NORM

Action Expected:

Continue EOP 9.0 actions and verify safety injection throttling criteria met.

PA0190-0158A-TP21-TP13

Date May 22, 1990

Message # 26

PALEX 90

Time 1100

Problem Time 0230

C-08

SW Pumps P-7A ON P-7B ON P-7C ON SW Critical Hdr Press A 80 B 82 psig
 CCW Pumps P-52A ON P-52B ON P-52C OFF FPC Pumps P-51A ON P-51B OFF
 Fire Pumps P-9A OFF P-9B OFF P-41 OFF
 Containment Cooler Recirc Fans
 V1A ON V2A ON V3A ON V4A ON V1B OFF V2B OFF V3B OFF V4B OFF

C-03

CCW Cooler Outlet Temp A 72 F B 70 F
 Containment Spray Pumps P-54A OFF P-54B OFF P-54C OFF
 HPSI Pumps P-66A ON P-66B ON LPSI Pumps P-67A ON P-67B ON
 Safety Injection Suction Supply
 Train A Train B
 CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown Charging
 Intermediate Press Letdown Temp 100 F Flow 133 gpm
 Letdown Line Temp 130 F Line Temp 150 F
 Letdown Flow 0 gpm Pumps P-55A ON P-55B ON P-55C ON
 Temp 100 F Pressure 34 psi Level 80 % Volume Control Tank
 SDCS from PCS (R) 80 F PCP Control Bleedoff Pressure 45 psig
 Shutdown Cooling System
 SDCS to PCS (R) 80 F
 Quench Tank
 Temp 100 F Pressure 4 psig Level 76 %
 Primary Coolant System
 Pressurizer Pressure (R) 1175 psia
 PCS Tave (R) Loop 1 (TR-0111) 515 Loop 2 (TR-0121) 515
 Pressurizer Level (R) LRC-0101A 15 % LRC-0101B 15 % LIA-0102A 26 %
 Pzr Htr Amps LCC 15 0 LCC 16 0
 PORV PRV-1042B CLOSED PRV-1043B CLOSED Block Valve MOV-1042A CLOSED MOV-1043A CLOSED
 PCPs P-50A OFF P-50B OFF P-50C OFF P-50D OFF
 Reactor Power Level NI-01 1 NI-02 1 NI-03 1.00E-7 NI-04 5.00E-7
 NI-05 0 NI-06 0 NI-07 0 NI-08 0

C-01

AFW System
 AFW Pump P-8A ON P-8B OFF P-8C OFF AFW Pump Amps P-8A 70 P-8C 0 amps
 AFW Pump P-8B Steam Pressure 0 psig AFW Disch Press P-8A & P-8B 1500 P-8C 0 psig
Secondary System
 MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED MSIV's CV-0501 CLOSED CV-0510 CLOSED
 MFP Suction Pressure 530 psig MFP Discharge Pressure A 500 B 500 psi
 Moisture Separator Drain Tank Level 56 % Condenser Hotwell Level 65 %
 Atmospheric Dump Valves CLOSED Condenser Vacuum 28.20 in Hg.
 Heater Drain Pump Status P-10A OFF P-10B OFF Gland Seal Condenser Vacuum 14 in Hg.
 Condensate Pump Status P-2A ON P-2B OFF
 PIP
 (Demand Log + Constant, Rod, or Flux/Temp)
 Gross MW 0 Net MW 0 Core Exit Thermocouple Temperature 486 F
 Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0 GP5(P) 131 GP6(A) 0 GP7(B) 0
 Stuck Rods NONE

Date May 22, 1990

Message # 26

PALEX 90
Time 1100

Scenario Time 0230

C-13

| | | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-------------------------------|-------------|-------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>69 %</u> | Condensate Storage Tank Level | T-2 | <u>98 %</u> |
| Instrument Air Pressure | | | <u>105</u> psig | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> | |
| S/G A Compartment | | Temperature | <u>105</u> F | Humidity | <u>10 %</u> | |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> | |
| SIRW Tank Level | <u>97 %</u> | | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>47</u> | B <u>51</u> | C <u>42</u> | D <u>55</u> | | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | | |

Panel K-13

SIAS Alarm YES Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | | | | |
|-------------------------------------|--------------------|-------------------|-------------------|-----------------|-------------------|
| Concentrated Boric Acid Tank Levels | T53A | <u>76 %</u> | T53B | <u>75 %</u> | |
| Reactor Vessel DP | | <u>0</u> psid | | | |
| PORV Discharge Temperature | | <u>105</u> F | | | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 | <u>105</u> | RV-1040 | <u>105</u> | |
| PCP Current (Amps) | P-50A | <u>0</u> | P-50B | <u>0</u> | |
| PCS Flow | | <u>4 %</u> | P-50C | <u>0</u> | |
| Loop Thot (F) | Loop 1 | <u>515</u> | Loop 2 | <u>515</u> | |
| Loop Tcold (F) | Loop 1 | <u>515</u> | Loop 2 | <u>515</u> | |
| Tcold Wide range | Loop 1 | <u>482</u> | Loop 2 | <u>482</u> | |
| Subcooling | Temp | <u>80</u> | F Press | <u>583</u> psia | |
| PCS Pressure (R) | WR | <u>1160</u> | NR | <u>600</u> psia | |
| | Steam Generator A | | Steam Generator B | | |
| Level (WR) | <u>42 %</u> | (NR) | <u>40 %</u> | (WR) | <u>-75 %</u> |
| Press | <u>590</u> psia | | | (NR) | <u>0 %</u> |
| Flow | Steam <u>0</u> PPH | Feed <u>0</u> PPH | | | <u>460</u> psia |
| | | | Steam | <u>.40</u> PPH | Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | | | |
|-----------------------|-------------|--------------|-----------|--------------|
| AFW Flow to A S/G | From P-8A&B | <u>190</u> | From P-8C | <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B | <u>0</u> | From P-8C | <u>0</u> gpm |
| Condensor Vacuum (R) | | <u>28.10</u> | | |
| PCP Seal Leakoff Flow | P-50A | <u>.90</u> | P-50B | <u>.90</u> |
| | | | P-50C | <u>.90</u> |
| | | | P-50D | <u>.90</u> |

C-04

| | | | | |
|----------------------------|---------|-------------|------|------------|
| Diesel Generator Frequency | 1-1 | <u>60</u> | 1-2 | <u>60</u> |
| 1-C BUS | Voltage | <u>2450</u> | Amps | <u>470</u> |
| 1-D BUS | Voltage | <u>2450</u> | Amps | <u>350</u> |

C-11 Back C-11A

| | | | | |
|--|----------|--------------------|----------|----------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 | <u>5.00E-1</u> | RIA-1806 | <u>5.00E-1</u> |
| | RIA-1807 | <u>1.00E+0</u> | RIA-1808 | <u>1.00E+0</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 | <u>2.00E+0</u> | RIA-2322 | <u>2.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R | <u>0</u> | AI-2401L | <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 | <u>1.60E+2</u> | RIA-2323 | <u>4.50E+5</u> |
| Stack Monitors | RIA-2325 | <u>1.50E+3</u> cpm | RIA-2326 | <u>1.50E+2</u> cpm |
| | | | RIA-2327 | <u>2.00E-1</u> mr/hr |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 7
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TITLE: AUXILIARY SYSTEMS
FOR DRILL USE ONLY

SCHEME **EK-11 (**EC-13)

| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 45 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILER OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

FOR DRILL USE ONLY

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAM HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAM HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAM HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAM HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

11-58-0-0700

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

~~FOR DRILL USE ONLY~~

| | | | | | |
|---|--|--|--|---|--|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI-LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE SCHEME **EK-07 (**EC-12)
FOR DRILL USE ONLY.

| | | | | | |
|--|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BORONETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
Revision 46
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |




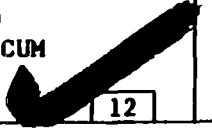
**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision 39
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

FOR DRILL USE ONLY




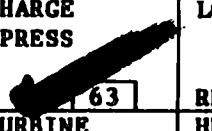
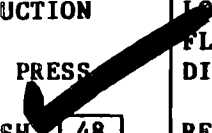


| | | | | | |
|--|---|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | KO - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACUUM  12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: **TURBINE CONDENSATE AND FEEDWATER**
FOR DRILL USE ONLY

SCHEME K01 (C11)

| | | | | | |
|--|---|--|--|--|---|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM 44 | FW PUMP P1B TURBINE K7B LOW VACUUM 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS  63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL 72 |

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PALISADES NU. 4 PLANT
ALARM AND RESPONSE PROCEDURE

Proc No. 36
Revision 0
Page 1 of 13

TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

AUX FW SYSTEM
STATUS ARRAY "B"

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0731A | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

AUX FW SYSTEM
STATUS ARRAY "C"

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 2
Revision 37
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | 2-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 3
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR SCHEME **EK-05 (**EC-11)

| | | | | | |
|--|--|---|--|--|---|
| 4160 V BUS 1A BKR 252-101 TRIP <div style="text-align: right;">1</div> | 4160 V BUS 1A BKR 252-102 TRIP <div style="text-align: right;">7</div> | 4160 V BUS 1A AND/OR 1B UNDERVOLTAGE <div style="text-align: right;">13</div> | 4160 V STANDBY POWER NOT AVAILABLE <div style="text-align: right;">2</div> <div style="text-align: right;">19</div> | START-UP TRANSFORMERS TRIP <div style="text-align: right;">25</div> | STA PWR TRANSF NO 11 & 19 BKR 152-115 TRIP OR UV <div style="text-align: right;">31</div> |
| 4160 V BUS 1B BKR 252-201 TRIP <div style="text-align: right;">2</div> | 4160 V BUS 1B BKR 252-202 TRIP <div style="text-align: right;">8</div> | LC 90 + 91 U/V BKR TRIP <div style="text-align: right;">14</div> | 2400 V BUS 1 E BKR 152-310 TRIP <div style="text-align: right;">20</div> | START-UP TRANSFORMER NO 1-1 SUDDEN PRESS <div style="text-align: right;">26</div> | SPARE <div style="text-align: right;">32</div> |
| 2400 V BUS 1C BKR 152-105 TRIP <div style="text-align: right;">3</div> | 2400 V BUS 1C BKR 152-106 TRIP <div style="text-align: right;">9</div> | 2400 V BUS 1C AND/OR 1D UNDERVOLTAGE <div style="text-align: right;">15</div> | 2400 V STANDBY POWER NOT AVAILABLE <div style="text-align: right;">21</div> | START-UP TRANSFORMER NO 1-2 SUDDEN PRESS <div style="text-align: right;">27</div> | STA PWR TRANSF NO 12 & 20 BKR 152-201 TRIP OR UV <div style="text-align: right;">33</div> |
| 2400 V BUS 1D BKR 152-203 TRIP <div style="text-align: right;">4</div> | 2400 V BUS 1D BKR 152-202 TRIP <div style="text-align: right;">10</div> | K-05 ANNUNCIATOR ½ AMP FUSE BLOWN <div style="text-align: right;">16</div> | BUS FAIL TO TRANSFER <div style="text-align: right;">5</div> <div style="text-align: right;">22</div> | PRESSURIZER HTR TRANSF NO 15 AND 16 HIGH-LOW PRESS <div style="text-align: right;">3</div> <div style="text-align: right;">28</div> | ELEVATOR TROUBLE <div style="text-align: right;">34</div> |
| 2400 V BUS 1E BKR 152-302 TRIP <div style="text-align: right;">5</div> | 2400 V BUS 1E BKR 152-303 TRIP <div style="text-align: right;">11</div> | 2400 V BUS 1E UNDERVOLTAGE <div style="text-align: right;">17</div> | BUS TRANSFER CONTROL CKT UNDERVOLTAGE <div style="text-align: right;">23</div> | START-UP TRANSFORMER PROT CKT UNDERVOLTAGE <div style="text-align: right;">29</div> | STA PWR TRANSF NO 13 AND 77 BKR 152-110 TRIP OR UV <div style="text-align: right;">35</div> |
| SWYD AUX PWR BREAKER 152-108 TRIP <div style="text-align: right;">6</div> | SWYD AUX PWR AND STA PWR TRANSF 78 152-306 TRIP <div style="text-align: right;">12</div> | 2400 V BUS 1C, 1D AND/OR 1E GROUND <div style="text-align: right;">18</div> | LOAD SHEDDING/ SAFEGUARDS BUS CONTROL CKT UNDERVOLTAGE <div style="text-align: right;">24</div> | START-UP TRANSFORMERS TROUBLE <div style="text-align: right;">30</div> | STA PWR TRANSF NO 14 BKR 152-304 TRIP OR UV <div style="text-align: right;">36</div> |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 3
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|--|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDERTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 21
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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

| | | | |
|--|--|--|--|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP <input type="checkbox"/> | HIGH POWER RATE CHANNEL TRIP <input type="checkbox"/> | LOW FLOW CHANNEL TRIP <input checked="" type="checkbox"/> | LOW LEVEL SG1 CHANNEL TRIP <input type="checkbox"/> |
| 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP <input type="checkbox"/> | HIGH POWER RATE CHANNEL PRE-TRIP/ASI <input type="checkbox"/> | LOW FLOW CHANNEL PRE-TRIP <input checked="" type="checkbox"/> | LOW LEVEL SG1 CHANNEL PRE-TRIP <input type="checkbox"/> |
| 5 | 6 | 7 | 8 |

RACK B

| | | | |
|---|--|---|--|
| LOW LEVEL SG2 CHANNEL TRIP <input checked="" type="checkbox"/> | LO PRESSURE SG1 CHANNEL TRIP <input type="checkbox"/> | LO PRESSURE SG2 CHANNEL TRIP <input checked="" type="checkbox"/> | HI PRESSURE PRESSURIZER CHANNEL TRIP <input type="checkbox"/> |
| 1 | 2 | 3 | 4 |
| LOW LEVEL SG2 CHANNEL PRE-TRIP <input checked="" type="checkbox"/> | LO PRESSURE SG1 CHANNEL PRE-TRIP <input type="checkbox"/> | LO PRESSURE SG2 CHANNEL PRE-TRIP <input checked="" type="checkbox"/> | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP <input type="checkbox"/> |
| 5 | 6 | 7 | 8 |

RACK C

| | | | |
|--|--|--|--|
| TM/LO PRESSURE CHANNEL TRIP <input checked="" type="checkbox"/> | LOSS OF LOAD CHANNEL TRIP <input type="checkbox"/> | CHANNEL DEVIATION LEVEL 1 5% <input type="checkbox"/> | CHANNEL DEVIATION LEVEL 2 10% <input type="checkbox"/> |
| 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP <input checked="" type="checkbox"/> | CONTAINMENT HI PRESSURE TRIP <input type="checkbox"/> | DROPPED ROD <input checked="" type="checkbox"/> | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) <input type="checkbox"/> |
| 5 | 6 | 7 | 8 |

RACK D

| | | | |
|---|---|---|---|
| ZERO POWER MODE BYPASS <input type="checkbox"/> | LOSS OF LOAD TRIP CHANNEL BYPASSED <input checked="" type="checkbox"/> | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A <input checked="" type="checkbox"/> | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B <input checked="" type="checkbox"/> |
| 1 | 2 | 3 | 4 |
| PANEL C06 VENTILATION HI TEMP <input type="checkbox"/> | RATE TRIP CHANNEL ENABLED <input type="checkbox"/> | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C <input checked="" type="checkbox"/> | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D <input checked="" type="checkbox"/> |
| 5 | 6 | 7 | 8 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 23
Revision 44
Page 1 of 16

TITLE: STATION POWER AND COOLING TOWERS

EK-33 (EC-126)

| | | | | | | | |
|---|--|--|---|---|---|--|---|
| START-UP TRANS No 1-3 PROT CKT UNDERVOLTAGE 1 | 4160V BUS IF INCOMING BKR 252-301 TRIP 5 | 4160 BUS IG INCOMING BKR 252-401 TRIP 9 | STA PWR TRANS No 71 BKR 252-304 TRIP OR UV 13 | STA PWR TRANS No 72 BKR 252-404 TRIP OR UV 17 | CLG TWR E-30A DELUGE SYSTEM TROUBLE 21 | FEEDWATER PURITY ALARM CONDITION SERIOUS 25 | CLG TWR E-30A DELUGE SYSTEM TROUBLE 29 |
| START-UP TRANSFORMER No 1-3 SUDDEN PRESS 2 | 4160V BUS IF INCOMING BKR 252-302 TRIP 6 | 4160 BUS IG INCOMING BKR 252-402 TRIP 10 | STA PWR TRANS No 73 BKR 252-305 TRIP OR UV 14 | STA PWR TRANS No 74 BKR 252-405 TRIP OR UV 18 | CLG TWR E-30A FIRE 22 | FEEDWATER PURITY ALARM CONDITION NON-SERIOUS 26 | CLG TWR E-30A FIRE 30 |
| START-UP TRANSFORMER No 1-3 TRIP 3 | 4160V BUS IF CONTROL CKT UNDERVOLTAGE 7 | 4160 BUS IG CONTROL CKT UNDERVOLTAGE 11 | STA PWR TRANS No 75 BKR 252-306 TRIP OR UV 15 | STA PWR TRANS No 76 BKR 252-406 TRIP OR UV 19 | 23 | DATA LOGGER ALERT 27 | 31 |
| START-UP TRANSFORMER No 1-3 TROUBLE 4 | 4160V BUS IF UNDERVOLTAGE 8 | 4160 BUS IG UNDERVOLTAGE 12 | RESERVE TRANSFORMER TROUBLE 16 | BATTERY VENTILATION D01, D02, FANS V15A & V15B 20 | BATTERY VENTILATION D204 FAN V-928 24 | INSTRUMENT RM DC FAILURE BATTERY CHARGER INVERTER TROUBLE 28 | BATTERY ROOMS 1 AND/OR 2 LOW TEMPERATURE 32 |

MESSAGE 26

1100

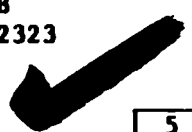
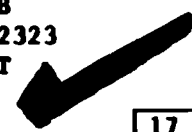
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PALISADES NUCLEAR PLANT
ALARM PROCEDURE

Proc No ARP 33
Revision 6
Page 1 of 11

TITLE: AUXILIARY SYSTEMS SCHEME EK-02 (EC-11A)

| | | | | | |
|---|--|--|--|--|--|
| CONT GAMMA RIA-2321 HIGH 1 | CONT GAMMA RIA-2322 HIGH 2 | CONT H ₂ MONT C-161 HIGH 3 | CONT H ₂ MONT C-162 HIGH 4 | MAIN STEAM E-50B RIA-2323 HIGH 5  | MAIN STEAM E-50A RIA-2324 HIGH 6 |
| CONT GAMMA RIA-2321 ALERT 13 | CONT GAMMA RIA-2322 ALERT 14 | CONT H ₂ HEAT TRACE C-163 FAIL 15 | CONT H ₂ HEAT TRACE C-164 FAIL 16 | MAIN STEAM E-50B RIA-2323 ALERT 17  | MAIN STEAM E-50A RIA-2324 ALERT 18 |
| CONT GAMMA RIA-2321 FAIL 25 | CONT GAMMA RIA-2322 FAIL 26 | CONT H ₂ MONT C-161 FAIL 27 | CONT H ₂ MONT C-162 FAIL 28 | MAIN STEAM E-50B RIA-2323 FAIL 29 | MAIN STEAM E-50A RIA-2324 FAIL 30 |
| CR HVAC FAN LOW FLOW V94-V95-V96 V26A-V26B 37 | CONTROL ROOM HVAC FILTER HIGH DIFF PRESS VF95-VF96 VF26A-VF26B 38 | | | | |
| CONTROL ROOM LOW PRESSURE DPIC-1659/1660 49 | CR FILTER HIGH TEMP VF26A-VF26B 50 | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PALEX 90
Message No 27

Time: 1104
Scenario Time: 0234

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

Safety injection throttling criteria met; SIAS reset and blocked.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Verify PCP restart criteria met and restart at least one PCP, preferably P-50B.

PALEX 90
Message No 28

Time: 1109
Scenario Time: 0239

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message: PCP P-50B is in service.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Continue PCS pressure reduction to as low as possible to minimize S/G depressurization and minimize release.

PALEX 90
Message No 29

Time: 1115
Scenario Time: 0245

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message: "B" S/G is empty.

FOR CONTROLLER USE ONLY

Controller Notes:

Release rate is now decreasing. Peak rate was at 1100.

Action Expected:

Continue EOP 9.0 action including preparations for shutdown cooling system operation.

Date May 22, 1990

Message # 29

PALEX 90
Time 1115

Problem Time 0245

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 77 B 79 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B OFF V2B OFF V3B OFF V4B OFF

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B ON

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A ON P-67B ON

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02
CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 170 F
Letdown Flow 20 gpm

Charging

Flow 40 gpm
Line Temp 310 F
Pumps P-55A ON P-55B OFF P-55C OFF

Temp 95 F Pressure 38 psi Level 88 %

Volume Control Tank
PCP Control Bleedoff Pressure 45 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System
SDCS to PCS (R) 80 F

Temp 102 F Pressure 4 psig

Quench Tank
Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 958 psia
PCS Tave (R) 515
Pressurizer Level (R) Loop 1 (TR-0111) 44 %
LRC-0101A 44 %
PZR Htr Amps LCC 15 150
PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON
Reactor Power Level NI-01 20 NI-02 30 NI-03 5.00E-7 NI-04 8.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 44 % LIA-0102A 42 %
LCC 16 150
Block Valve MOV-1042A CLOSED MOV-1043A CLOSED
P-50C OFF P-50D OFF

C-01

AFW Pump P-8A ON P-8B OFF P-8C OFF
AFW Pump P-8B Steam Pressure 0 psig

AFW System
AFW Pump Amps P-8A 72 P-8C 0 amps
AFW Disch Press P-8A & P-8B 1500 P-8C 0 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 OPEN
MFP Suction Pressure 530 psig
Moisture Separator Drain Tank Level 54 %
Atmospheric Dump Valves CLOSED
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 520 B 520 psi
Condenser Hotwell Level 65 %
Condenser Vacuum 28.20 in Hg.
Gland Seal Condenser Vacuum 14 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)
Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 430 F
GP5(P) 3.90 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 29

PALEX 90

Time 1115

Scenario Time 0245

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-------------------------------|-----------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>69 %</u> | Condensate Storage Tank Level | T-2 <u>96 %</u> |
| Instrument Air Pressure | <u>105</u> psig | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>96 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40</u> % | | |
| SI Tank Level (%) | A <u>46</u> | B <u>51</u> | C <u>40</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>220</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|--------------------|--|
| Concentrated Boric Acid Tank Levels | T53A <u>58 %</u> | T53B <u>58 %</u> |
| Reactor Vessel DP | <u>0</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>720</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>44 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>442</u> | Loop 2 <u>450</u> |
| Subcooling | Temp <u>109</u> | F Press <u>614</u> psi |
| PCS Pressure (R) | WR <u>950</u> | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) <u>45 %</u> | (NR) <u>42 %</u> | (WR) <u>-138 %</u> (NR) <u>0 %</u> |
| Press <u>400</u> psia | | <u>230</u> psia |
| Flow Steam <u>0</u> PPH | Feed <u>0</u> PPH | Steam <u>.30</u> PPH Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>200</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>28.10</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.90</u> P-50B <u>.90</u> | P-50C <u>.90</u> P-50D <u>.90</u> |

C-04

| | | |
|----------------------------|---------------------|-----------------|
| Diesel Generator Frequency | 1-1 <u>60</u> | 1-2 <u>60</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>420</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>470</u> |

C-11 Back C-11A



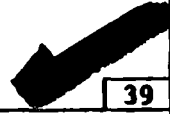




| | | |
|--|-----------------------------|--|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.50E-1</u> | RIA-1806 <u>4.50E-1</u> |
| | RIA-1807 <u>9.00E-1</u> | RIA-1808 <u>9.00E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>2.00E+0</u> | RIA-2322 <u>2.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.60E+2</u> | RIA-2323 <u>4.50E+5</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm RIA-2327 <u>2.00E-1</u> mr/hr |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 4
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Page 1 of 28

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (EC-12)**

| | | | | | |
|--|---|---|---|--|---|
| <p>REGEN HT EX TUBE OUTLET HI TEMP</p> <p>1</p> | <p>VOLUME TANK</p> <p>7</p> | <p>CONC BORIC ACID TANK 53A HI-LO TEMP</p> <p>13</p> | <p>CONC BORIC ACID TANK 53B HI-LO TEMP</p> <p>19</p> | <p>BORIC ACID PUMPS P56A AND P56B TRIP</p> <p>25</p> | <p>QUENCH TANK HI TEMP</p> <p>31</p> |
| <p>RELIEF VALVE 2006 DISCH HI TEMP</p> <p>2</p> | <p>VOLUME CONTROL TANK HI-LO PRESS</p> <p>8</p> | <p>CONC BORIC ACID TANK 53A HI LEVEL</p> <p>14</p> | <p>CONC BORIC ACID TANK 53B HI LEVEL</p> <p>20</p> | <p>BORIC ACID PUMPS P56A AND P56B OVERLOAD</p> <p>26</p> | <p>QUENCH TANK HI PRESS</p> <p>32</p> |
| <p>LETDOWN HT EX TUBE OUTLET HI TEMP</p> <p>3</p> | <p>VOLUME CONTROL TANK HI-LO LEVEL</p> <p>9</p> | <p>CONC BORIC ACID TANK 53A LO LEVEL</p> <p>15</p> | <p>CONC BORIC ACID TANK 53B LO LEVEL</p> <p>21</p> | <p>CHARGING PUMPS P55A, P55B, P55C TRIP</p> <p>27</p> | <p>QUENCH TANK HI-LO LEVEL</p> <p>33</p> |
| <p>LETDOWN HT EX TUBE INLET HI- LO PRESS</p> <p>4</p> | <p>VOLUME CONTROL TANK LO-LO LEVEL</p> <p>10</p> | <p>CONC BORIC ACID TANK 53A LO-LO LEVEL</p> <p>16</p> | <p>CONC BORIC ACID TANK 53B LO-LO LEVEL</p> <p>22</p> | <p>CHARGING PUMP P55A OIL HI TEMP</p> <p>28</p> | <p>CHARGING PUMPS SEAL COOLING LO PRESS</p> <p>34</p> |
| <p>PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW</p> <p>5</p> | <p>PRI MAKEUP WATER FLOW OFF NORMAL</p> <p>11</p> | <p>CONC BORIC ACID FLOW OFF NORMAL</p> <p>17</p> | <p>CONC BORIC ACID TANK LO LEVEL</p> <p>23</p> | <p>BORIC ACID TANK HTRS CONTROL CKT FAILURES</p> <p>29</p> | <p>CHARGING LO FLOW</p> <p>35</p> |
| <p>LETDOWN HX COOLING EXCESS FLOW</p> <p>6</p> | <p>SHUTDOWN COOLING MOV OVERLOAD</p> <p>12</p> | <p>VOLUME CONTROL TANK MOV OVERLOAD</p> <p>18</p> | <p>BORIC ACID TANK MOV OVERLOAD</p> <p>24</p> | <p>BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO</p> <p>30</p> | <p>BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE</p> <p>36</p> |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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72-0-84-274

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|--|--|---|---|---|--|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW ✓ 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL ✓ 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION ✓ 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL ✓ 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL ✓ 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION ✓ 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW ✓ 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL ✓ 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION ✓ 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW ✓ 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL ✓ 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL ✓ 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT ✓ 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL ✓ 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD ✓ 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP ✓ 72 |


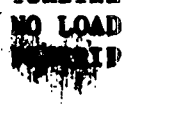
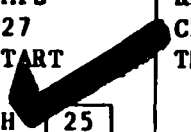
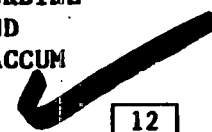
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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision 39
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|---|--|--|--|---|---|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START REFLASH 25  | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | KO - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM  12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |










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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|---|---|---|--|---|--|
| AFAS FOGG SUBSYSTEM TRIP  REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP  REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP  REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SC ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL REFLASH 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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Revision U
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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|--|--|--|--|--|---|---|--|---|---|
| SG E-50A LVL SNSR CHNL TRIP 1-1 | SG E-50B LVL SNSR CHNL TRIP 1-2 | FOGG A SNSR CHNL TRIP 1-3 | FOGG B SNSR CHNL TRIP 1-4 | AFAS ACTUATION CHNL TRIP 1-5 | FOGG A ACTUATION CHNL TRIP 1-6 | FOGG B ACTUATION CHNL TRIP 1-7 | AFAS-FOGG SNSR CHNL LOP 1-8 | AFAS-FOGG AUTO TEST FAILURE 1-9 | AFAS-FOGG ACT CHNL LOP 1-10 |
| SG E-50A LVL SNSR CHNL BYP 2-1 | SG E-50B LVL SNSR CHNL BYP 2-2 | FOGG A SNSR CHNL BYPASSED 2-3 | FOGG B SNSR CHNL BYPASSED 2-4 | AFAS ACTUATION CHNL BLKD 2-5 | FOGG A ACTUATION CHNL BLKD 2-6 | FOGG B ACTUATION CHNL BLKD 2-7 | SPARE 2-8 | AFAS-FOGG TEST BLK INITIATED 2-9 | AFW BYPASS VALVE OPEN 2-10 |
| SG E-50A ISOLATED 3-1 | SG E-50B ISOLATED 3-2 | SG ISOL VLV CLOSED 3-3 | P-8A TRIPPED 3-4 | P-8A FAILED TO AUTO START 3-5 | P-8C TRIPPED 3-6 | P-8C FAILED TO AUTO START 3-7 | P-8A/B LO SUCTION TRIPPED 3-8 | P-8C LO SUCTION TRIPPED 3-9 | ISOL VLV HS IN OPEN POS 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|--|--|--|
| AUTO START TEST PUMP P-8A 1-1 | AUTO START TEST PUMP P-8B 1-2 | IN TEST CV-0727 & CV-0749 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A 2-1 | AUX RELAY PWR AVAIL PUMP P-8B 2-2 | SPARE 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|--|--|--|
| AUTO START TEST PUMP P-8C 1-1 | IN TEST CV-0736A & CV-0736B 1-2 | AUX RELAY PWR AVAIL PUMP P-8C 1-3 |
|--|--|--|

**AUX FW SYSTEM
STATUS ARRAY "C"**

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 2
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | 03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 | 125 V DC BUS GROUND 41 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE 42 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

TAN-0-89-138

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

| RACK A | | | | RACK B | | | |
|---|---|-----------------------------------|---|-------------------------------------|---|---|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |
| RACK C | | | | RACK D | | | |
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-AT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-AT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-AT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-AT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM PROCEDURE**

Proc No ARP 33
Revision 6
Page 1 of 11

TITLE: AUXILIARY SYSTEMS SCHEME EK-02 (EC-11A)

| | | | | | |
|---|--|--|--|--|--|
| CONT GAMMA RIA-2321 HIGH 1 | CONT GAMMA RIA-2322 HIGH 2 | CONT H ₂ MONT C-161 HIGH 3 | CONT H ₂ MONT C-162 HIGH 4 | MAIN STEAM E-50B RIA-2323 HIGH 5 | MAIN STEAM E-50A RIA-2324 HIGH 6 |
| CONT GAMMA RIA-2321 ALERT 13 | CONT GAMMA RIA-2322 ALERT 14 | CONT H ₂ HEAT TRACE C-163 FAIL 15 | CONT H ₂ HEAT TRACE C-164 FAIL 16 | MAIN STEAM E-50B RIA-2323 ALERT 17 | MAIN STEAM E-50A RIA-2324 ALERT 18 |
| CONT GAMMA RIA-2321 FAIL 25 | CONT GAMMA RIA-2322 FAIL 26 | CONT H ₂ MONT C-161 FAIL 27 | CONT H ₂ MONT C-162 FAIL 28 | MAIN STEAM E-50B RIA-2323 FAIL 29 | MAIN STEAM E-50A RIA-2324 FAIL 30 |
| CR HVAC FAN LOW FLOW V94-V95-V96 V26A-V26B 37 | CONTROL ROOM HVAC FILTER HIGH DIFF PRESS VF95-VF96 VF26A-VF26B 38 | 39 | 40 | 41 | 42 |
| CONTROL ROOM LOW PRESSURE DPIC-1659/1660 49 | CR FILTER HIGH TEMP VF26A-VF26B 50 | 51 | 52 | 54 | 54 |
| 61 | 62 | 63 | 64 | 65 | 66 |

PALEX 90
Message No 30

Time: 1120
Scenario Time: 0250

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Chemistry

Simulated Plant Conditions:

Message:

Boron sample is greater than cold shutdown boron concentration.

FOR CONTROLLER USE ONLY

Controller Notes:

Deliver this message only if asked about boron sample.

Action Expected:

Chemistry should at about this time be providing post-accident sample results to the TSC and Control Room.

PALEX 90
Message No 31

Time: 1130
Scenario Time: 0300

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message: Start-up NI fuses installed.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Commence EOP 9.0 Att E-13 preparation for shutdown cooling.

Date May 22, 1990

Message # 31

PALEX 90
Time 1130

Problem Time 0300

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 77 B 79 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B OFF V2B OFF V3B OFF V4B OFF

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 130 F
Letdown Flow 13 gpm

Charging

Flow 80 gpm
Line Temp 150 F
Pumps P-55A ON P-55B OFF P-55C ON

Temp 100 F Pressure 33 psi Level 79 %

Volume Control Tank
PCP Control Bleedoff Pressure 40 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System

SDCS to PCS (R) 80 F

Temp 103 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 653 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 40 %
Pzr Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON
Reactor Power Level NI-01 15 NI-02 30 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 40 % LIA-0102A 40 %
LCC 16 0
Block Valve MOV-1042A CLOSED MOV-1043A CLOSED
P-50C OFF P-50D OFF

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C OFF
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 75 P-8C 0 amps
AFW Disch Press P-8A & P-8B 1350 P-8C 0 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 OPEN
MFP Suction Pressure 530 psig
Moisture Separator Drain Tank Level 52 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 520 B 520 psi
Condenser Hotwell Level 67 %
Condenser Vacuum 28.20 in Hg.
Gland Seal Condenser Vacuum 14 in Hg.
Condensate Pump Status P-2A OFF P-2B ON

PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 451 F
GP5(P) 3.90 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 31

PALEX 90
Time 1130

Scenario Time 0300

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>91 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level T-2 | <u>95 %</u> |
| Instrument Air Pressure | <u>105</u> psig | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>96 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | Containment Water Level (R) | <u>590.40 %</u> | | |
| Containment Sump Level | <u>0 %</u> | B <u>51</u> | C <u>40</u> | D <u>55</u> | |
| SI Tank Level (%) | A <u>46</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | | | | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|---|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>57 %</u> |
| Reactor Vessel DP | <u>0</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>720</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>42 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>450</u> | Loop 2 <u>450</u> |
| Subcooling | Temp <u>40</u> | F Press <u>198</u> psi |
| PCS Pressure (R) | WR <u>620</u> | NR <u>600</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>45 %</u> (NR) <u>44 %</u> | (WR) <u>-138 %</u> (NR) <u>0 %</u> |
| Press | <u>400</u> psia | <u>20</u> psia |
| Flow | Steam <u>.30</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>240</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>28.10</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.90</u> P-50B <u>.90</u> | P-50C <u>.90</u> P-50D <u>.90</u> |

C-04

| | | |
|----------------------------|---------------------|-----------------|
| Diesel Generator Frequency | 1-1 <u>60</u> | 1-2 <u>60</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>300</u> |

C-11 Back C-11A








| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.50E-1</u> | RIA-1806 <u>4.50E-1</u> |
| | RIA-1807 <u>9.00E-1</u> | RIA-1808 <u>9.00E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.90E+0</u> | RIA-2322 <u>1.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>2.00E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N2 HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

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**PALISADES NUCLEAR PLANT
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (EC-12)**

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI-LO TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

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**PALISADES REAR PLANT
ALARM AND RESPONSE PROCEDURE**

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Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|-------------------------------------|--|---|---|---|---|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPEND-ENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPEND-ENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPEND-ENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|---|--|---|---|---|--|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW ✓ 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW ✓ 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL ✓ 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW ✓ 55 | STEAM GEN **E-50A HI LEVEL ✓ 61 | LOOP 1 LOOP 2 T _{av} DEVIATION ✓ 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW ✓ 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW ✓ 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL ✓ 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW ✓ 56 | STEAM GEN **E-50A LO LEVEL ✓ 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION ✓ 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW ✓ 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW ✓ 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL ✓ 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW ✓ 57 | STEAM GEN **E-50B HI LEVEL ✓ 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION ✓ 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW ✓ 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW ✓ 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL ✓ 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW ✓ 58 | STEAM GEN **E-50B LO LEVEL ✓ 64 | STEAM GEN VALVES ISOLATION LOCKOUT ✓ 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT ✓ 41 | EMERGENCY ROD DRIVE POWER INTERRUPT ✓ 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD ✓ 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS ✓ 59 | STEAM GEN LO PRESS CONTROL UNDERVLTGE ✓ 65 | SECONDARY DATA PROCESSOR ABNORMAL ✓ 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT ✓ 42 | DROPPED ROD ✓ 48 | ROD DRIVE SEAL LEAK OFF HI TEMP ✓ 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS ✓ 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH ✓ 66 | REACTOR TRIP ✓ 72 |

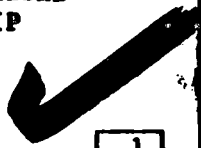


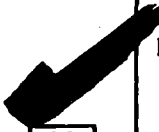
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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|---|--|---|---|--|---|
| TURBINE TRIP  <div style="text-align: right;">1</div> | TURBINE NO LOAD TRIP  <div style="text-align: right;">7</div> | EH SYSTEM LOW-LOW LEVEL TRIP <div style="text-align: right;">13</div> | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH <div style="text-align: right;">19</div> | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH <div style="text-align: right;">25</div> | TURBINE LO RES VAPOR EXT C5 TRIP <div style="text-align: right;">31</div> |
| TURBINE OVERSPEED TRIP <div style="text-align: right;">2</div> | BEARING OIL PRESSURE PRETRIP <div style="text-align: right;">8</div> | EH FLUID HIGH-LOW LEVEL <div style="text-align: right;">14</div> | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH <div style="text-align: right;">20</div> | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD <div style="text-align: right;">26</div> | TURBINE GEN LO RES HIGH-LOW LEVEL <div style="text-align: right;">32</div> |
| TURBINE ROTOR ECCENTRICITY POSITION <div style="text-align: right;">3</div> | THRUST BEARING PRETRIP <div style="text-align: right;">9</div> | EH SYSTEM HIGH TEMP/PRESS REFLASH <div style="text-align: right;">15</div> | EH SYSTEM FILTER HIGH dP <div style="text-align: right;">21</div> | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD <div style="text-align: right;">27</div> | A OR B FW COALESCER HIGH D/P <div style="text-align: right;">33</div> |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT <div style="text-align: right;">4</div> | VACUUM PRETRIP <div style="text-align: right;">10</div> | EH SYSTEM RETURN HIGH PRESS <div style="text-align: right;">16</div> | EXHAUST HOOD HIGH TEMP 250° <div style="text-align: right;">22</div> | TURBINE SHAFT AT REST <div style="text-align: right;">28</div> | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE <div style="text-align: right;">34</div> |
| TURBINE HIGH VIBRATION <div style="text-align: right;">5</div> | VACUUM LOW <div style="text-align: right;">11</div> | TURBINE GEN BEARING HIGH TEMP <div style="text-align: right;">17</div> | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH <div style="text-align: right;">23</div> | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN <div style="text-align: right;">29</div> | TURBINE/GEN LIFT PUMP TROUBLE <div style="text-align: right;">35</div> |
| EXHAUST HOOD HIGH TEMP 175° <div style="text-align: right;">6</div> | RELATCH TURBINE AND VACCUM  <div style="text-align: right;">12</div> | TURBINE GEN LUBE OIL HIGH TEMP <div style="text-align: right;">18</div> | GLAND SEAL CONDENSER E19 LOW VACUUM <div style="text-align: right;">24</div> | STEAM AND FEEDWATER PENETRATION HIGH TEMP <div style="text-align: right;">30</div> | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL <div style="text-align: right;">36</div> |




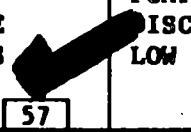






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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM 44 | FW PUMP P1B TURBINE K7B LOW VACUUM 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION  60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK HIGH-LOW LEVEL 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0731A | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

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PALISADES NUCLEAR PLANT
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
Revision 46
Page 2 of 20

TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 21
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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

| | | | |
|---|---|--------------------------------|-------------------------------------|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 |

RACK B

| | | | |
|-------------------------------------|---------------------------------------|---------------------------------------|---|
| LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |

RACK C

| | | | |
|--------------------------------------|-----------------------------------|-----------------------------------|---|
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 |

RACK D

| | | | |
|------------------------------------|---|---|---|
| ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM PROCEDURE

Proc No ARP 33
Revision 6
Page 1 of 11

TITLE: AUXILIARY SYSTEMS SCHEME EK-02 (EC-11A)

| | | | | | |
|---|--|--|--|--|--|
| CONT GAMMA RIA-2321 HIGH | CONT GAMMA RIA-2322 HIGH | CONT H ₂ MONT C-161 HIGH | CONT H ₂ MONT C-162 HIGH | MAIN STEAM E-50B RIA-2323 HIGH | MAIN STEAM E-50A RIA-2324 HIGH |
| 1 | 2 | 3 | 4 | 5 | 6 |
| CONT GAMMA RIA-2321 ALERT | CONT GAMMA RIA-2322 ALERT | CONT H ₂ HEAT TRACE C-163 FAIL | CONT H ₂ HEAT TRACE C-164 FAIL | MAIN STEAM E-50B RIA-2323 ALERT | MAIN STEAM E-50A RIA-2324 ALERT |
| 13 | 14 | 15 | 16 | 17 | 18 |
| CONT GAMMA RIA-2321 FAIL | CONT GAMMA RIA-2322 FAIL | CONT H ₂ MONT C-161 FAIL | CONT H ₂ MONT C-162 FAIL | MAIN STEAM E-50B RIA-2323 FAIL | MAIN STEAM E-50A RIA-2324 FAIL |
| 25 | 26 | 27 | 28 | 29 | 30 |
| CR HVAC FAN LOW FLOW V94-V95-V96 V26A-V26B | CONTROL ROOM HVAC FILTER HIGH DIFF PRESS VF95-VF96 VF26A-VF26B | | | | |
| 37 | 38 | 39 | 40 | 41 | 42 |
| CONTROL ROOM LOW PRESSURE DPIC-1659/1660 | CR FILTER HIGH TEMP VF26A-VF26B | | | | |
| 49 | 50 | 51 | 52 | 53 | 54 |
| | | | | | |
| 61 | 62 | 63 | 64 | 65 | 66 |

PALEX 90
Message No 32

Time: 1145
Scenario Time: 0315

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

Both diesel generators secured. P66A HPSI pump disabled per EOP 9.0.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Continue EOP 9.0 actions.

Date May 22, 1990

Message # 32

PALEX 90
Time 1145

Problem Time 0315

C-08

SW Pumps P-7A ON P-7B ON P-7C ON SW Critical Hdr Press A 77 B 79 psig
CCW Pumps P-52A ON P-52B ON P-52C OFF FPC Pumps P-51A ON P-51B OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

V1A ON V2A ON V3A ON V4A ON Containment Cooler Recirc Fans
V1B OFF V2B OFF V3B OFF V4B OFF

C-03

CCW Cooler Outlet Temp A 75 F B 73 F
Containment Spray Pumps P-54A OFF P-54B OFF P-54C OFF
HPSI Pumps P-66A OFF P-66B OFF LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 80 F
Letdown Flow 10 gpm

Temp 87 F Pressure 27 psi Level 63 %

SDCS from PCS (R) 80 F

Temp 102 F Pressure 4 psig

Pressurizer Pressure (R) 589 psia

PCS Tave (R) 515

Pressurizer Level (R) LRC-0101A 38 %

Pzr Htr Amps LCC 15 0

PORV PRV-1042B CLOSED PRV-1043B CLOSED

PCPs P-50A OFF P-50B ON

Reactor Power Level NI-01 15 NI-02 30 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Charging

Flow 92 gpm
Line Temp 100 F
Pumps P-55A ON P-55B ON P-55C OFF

Volume Control Tank
PCP Control Bleedoff Pressure 30 psig

Shutdown Cooling System
SDCS to PCS (R) 80 F

Quench Tank
Level 76 %

Primary Coolant System

Loop 2 (TR-0121) 515

LRC-0101B 39 % LIA-0102A 40 %

LCC 16 0

Block Valve MOV-1042A CLOSED MOV-1043A CLOSED

P-50C OFF P-50D OFF

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C ON AFW Pump Amps P-8A 75 P-8C 70 amps
AFW Pump P-8B Steam Pressure 0 psig AFW Disch Press P-8A & P-8B 1450 P-8C 1250 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 OPEN MSIV's CV-0501 CLOSED CV-0510 CLOSED

MFP Suction Pressure 530 psig MFP Discharge Pressure A 520 B 520 psi

Moisture Separator Drain Tank Level 50 % Condenser Hotwell Level 67 %

Atmospheric Dump Valves OPEN Condenser Vacuum 28.20 in Hg.

Heater Drain Pump Status P-10A OFF P-10B OFF Gland Seal Condenser Vacuum 14 in Hg.

Condensate Pump Status P-2A OFF P-2B ON

PIP

(Demand Log + Constant, Rod, or Flux/Temp)
Gross MW 0 Net MW 0 Core Exit Thermocouple Temperature 437 F

Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0 GP5(P) 3.90 GP6(A) 0 GP7(B) 0

Stuck Rods NONE

C-13

T-81 Level 92 % T-939 Level 69 % Condensate Storage Tank Level T-2 94 %
 Instrument Air Pressure 100 psig
 Containment Building Pressure .10 psig Dome Temperature 105 F Humidity 10 %
 S/G A Compartment Temperature 100 F Humidity 10 %
 S/G B Compartment Temperature 90 F Humidity 10 %
 SIRW Tank Level 96 %
 WR Containment Pressure (R) 15 psia
 Containment Sump Level 0 %
 SI Tank Level (%) A 46 B 51 C 40 D 55
 SI Tank Pressure (psig) A 210 B 215 C 215 D 215

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

Concentrated Boric Acid Tank Levels T53A 57 % T53B 56 %
 Reactor Vessel DP 0 psid
 PORV Discharge Temperature 105 F
 Pzr Safety Valve Discharge Temp (F) RV-1039 105 RV-1040 105 RV-1041 105
 PCP Current (Amps) P-50A 0 P-50B 720 P-50C 0 P-50D 0
 PCS Flow 22 % Pressurizer Level (cold) 40 %
 Loop Thot (F) Loop 1 515 Loop 2 515
 Loop Tcold (F) Loop 1 515 Loop 2 515
 Tcold Wide range Loop 1 430 Loop 2 435
 Subcooling Temp 47 F Press 218 psi
 PCS Pressure (R) WR 550 NR 550 psia
 Steam Generator A Steam Generator B
 Level (WR) 38 % (NR) 35 % (WR) -138 % (NR) 0 %
 Press 350 psia 10 psia
 Flow Steam .30 PPH Feed 0 PPH
 Note: Steam and Feed Flow X 1000000

C-11

AFW Flow to A S/G From P-8A&B 265 From P-8C 165 gpm
 AFW Flow to B S/G From P-8A&B 0 From P-8C 0 gpm
 Condensor Vacuum (R) 28.10
 PCP Seal Leakoff Flow P-50A .90 P-50B .90 P-50C .90 P-50D .90

C-04

Diesel Generator Frequency 1-1 60.50 1-2 60.50
 1-C BUS Voltage 2450 Amps 350
 1-D BUS Voltage 2450 Amps 340

C-11 Back C-11A








Containment Area Monitors (R/Hr) RIA-1805 4.00E-1 RIA-1806 4.00E-1
 RIA-1807 8.70E-1 RIA-1808 8.70E-1
 High Range Containment Monitors (R/Hr) RIA-2321 1.80E+0 RIA-2322 1.00E+0
 Containment Hydrogen Concentration (%) AI-2401R 0 AI-2401L 0
 Main Steam Line Gamma (cpm) RIA-2324 1.90E+2 RIA-2323 OFFSCALE
 Stack Monitors RIA-2325 1.50E+3 cpm RIA-2326 1.50E+2 cpm RIA-2327 2.00E-1 mr/hr

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N2 HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

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**PALISADE NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (EC-12)**

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI-LO PRESS 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc NO ARP 4
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|-------------------------------------|--|---|---|---|---|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPEND-ENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPEND-ENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPEND-ENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 43 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTIN UNDERVLTC 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTC REFLASH 66 | REACTOR TRIP 72 |



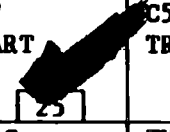
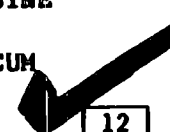
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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 1
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Page 1 of 30

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD PRETRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START REFLASH 25  | TURBINE LO RES VAPOR EXT CS TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | KO - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM  | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |








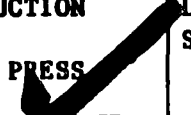

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision '39
Page 2 of 30

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM 44 | FW PUMP P1B TURBINE K7B LOW VACUUM 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | HEAT SEP RAIN TANK T5 HIGH-LOW LEVEL 72 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No P 36
Revision 0
Page 1 of 13

TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|--|--|--|--|--|---|---|--|---|---|
| SG E-50A LVL SNSR CHNL TRIP 1-1 | SG E-50B LVL SNSR CHNL TRIP 1-2 | FOGG A SNSR CHNL TRIP 1-3 | FOGG B SNSR CHNL TRIP 1-4 | AFAS ACTUATION CHNL TRIP 1-5 | FOGG A ACTUATION CHNL TRIP 1-6 | FOGG B ACTUATION CHNL TRIP 1-7 | AFAS-FOGG SNSR CHNL LOP 1-8 | AFAS-FOGG AUTO TEST FAILURE 1-9 | AFAS-FOGG ACT CHNL LOP 1-10 |
| SG E-50A LVL SNSR CHNL BYP 2-1 | SG E-50B LVL SNSR CHNL BYP 2-2 | FOGG A SNSR CHNL BYPASSED 2-3 | FOGG B SNSR CHNL BYPASSED 2-4 | AFAS ACTUATION CHNL BLKD 2-5 | FOGG A ACTUATION CHNL BLKD 2-6 | FOGG B ACTUATION CHNL BLKD 2-7 | SPARE 2-8 | AFAS-FOGG TEST BLK INITIATED 2-9 | AFW BYPASS VALVE OPEN 2-10 |
| SG E-50A ISOLATED 3-1 | SG E-50B ISOLATED 3-2 | SG ISOL VLV CLOSED 3-3 | P-8A TRIPPED 3-4 | P-8A FAILED TO AUTO START 3-5 | P-8C TRIPPED 3-6 | P-8C FAILED TO AUTO START 3-7 | P-8A/B LO SUCTION TRIPPED 3-8 | P-8C LO SUCTION TRIPPED 3-9 | ISOL VLV HS IN OPEN POS 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|--|--|--|
| AUTO START TEST PUMP P-8A 1-1 | AUTO START TEST PUMP P-8B 1-2 | IN TEST CV-0727 & CV-0749 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A 2-1 | AUX RELAY PWR AVAIL PUMP P-8B 2-2 | SPARE 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|--|--|--|
| AUTO START TEST PUMP P-8C 1-1 | IN TEST CV-07368 & CV-07369 1-2 | AUX RELAY PWR AVAIL PUMP P-8C 1-3 |
|--|--|--|

**AUX FW SYSTEM
STATUS ARRAY "C"**

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 2
Revision 37
Page 1 of 14

FOR DRILL USE ONLY TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | 03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
Revision 46
Page 2 of 20

TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP | PREFERRED AC BUS NO 1 TROUBLE | DIESEL GEN BKR 152-107 TRIP | DIESEL GEN BKR 152-213 TRIP |
| 37 | 43 | 49 | 55 |
| MCC NO 7 BKR 52-1103 TRIP | PREFERRED AC BUS NO 3 TROUBLE | DIESEL GEN NO 1-1 FAIL TO START | DIESEL GEN NO 1-2 FAIL TO START |
| 38 | 44 | 50 | 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP | PREFERRED AC BUS NO 2 TROUBLE | DIESEL GEN NO 1-1 TROUBLE | DIESEL GEN NO 1-2 TROUBLE |
| 39 | 45 | 51 | 57 |
| MCC NO 8 BKR 52-1201 TRIP | PREFERRED AC BUS NO 4 TROUBLE | DIESEL GEN NO 1-1 START SIGNAL BLOCKED | DIESEL GEN NO 1-2 START SIGNAL BLOCKED |
| 40 | 46 | 52 | 58 |
| BATTERY CHARGERS TROUBLE | 125 V DC BUS GROUND | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD | DIESEL OIL STORAGE TANK T-10 LOW LEVEL |
| 3 | 41 | 47 | 53 |
| ANNUNCIATOR DC FAILURE | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL |
| 7 | 42 | 48 | 54 |
| | | | 60 |

72N-0-89-138

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 21
Revision 39
Page 1 of 20

TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

| | | | |
|--|--------------------------------------|---------------------------|--------------------------------|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP | HIGH POWER RATE CHANNEL TRIP | LOW FLOW CHANNEL TRIP | LOW LEVEL SG1 CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP | HIGH POWER RATE CHANNEL PRE-TRIP/ASI | LOW FLOW CHANNEL PRE-TRIP | LOW LEVEL SG1 CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK B

| | | | |
|--------------------------------|----------------------------------|----------------------------------|--|
| LOW LEVEL SG2 CHANNEL TRIP | LO PRESSURE SG1 CHANNEL TRIP | LO PRESSURE SG2 CHANNEL TRIP | HI PRESSURE PRESSURIZER CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| LOW LEVEL SG2 CHANNEL PRE-TRIP | LO PRESSURE SG1 CHANNEL PRE-TRIP | LO PRESSURE SG2 CHANNEL PRE-TRIP | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK C

| | | | |
|---------------------------------|------------------------------|------------------------------|--------------------------------------|
| TM/LO PRESSURE CHANNEL TRIP | LOSS OF LOAD CHANNEL TRIP | CHANNEL DEVIATION LEVEL 1 5% | CHANNEL DEVIATION LEVEL 2 10% |
| 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP | CONTAINMENT HI PRESSURE TRIP | DROPPED ROD | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) |
| 5 | 6 | 7 | 8 |

RACK D

| | | | |
|-------------------------------|------------------------------------|--|--|
| ZERO POWER MODE BYPASS | LOSS OF LOAD TRIP CHANNEL BYPASSED | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B |
| 1 | 2 | 3 | 4 |
| PANEL C06 VENTILATION HI TEMP | RATE TRIP CHANNEL ENABLED | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D |
| 5 | 6 | 7 | 8 |

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM PROCEDURE

Proc No ARP 33
Revision 6
Page 1 of 11

TITLE: AUXILIARY SYSTEMS SCHEME EK-02 (EC-11A)

| | | | | | |
|---|--|--|--|--|--|
| CONT GAMMA RIA-2321 HIGH <div style="text-align: right;">1</div> | CONT GAMMA RIA-2322 HIGH <div style="text-align: right;">2</div> | CONT H ₂ MONT C-161 HIGH <div style="text-align: right;">3</div> | CONT H ₂ MONT C-162 HIGH <div style="text-align: right;">4</div> | MAIN STEAM E-50B RIA-2323 HIGH <div style="text-align: right;">5</div> | MAIN STEAM E-50A RIA-2324 HIGH <div style="text-align: right;">6</div> |
| CONT GAMMA RIA-2321 ALERT <div style="text-align: right;">13</div> | CONT GAMMA RIA-2322 ALERT <div style="text-align: right;">14</div> | CONT H ₂ HEAT TRACE C-163 FAIL <div style="text-align: right;">15</div> | CONT H ₂ HEAT TRACE C-164 FAIL <div style="text-align: right;">16</div> | MAIN STEAM E-50B RIA-2323 ALERT <div style="text-align: right;">17</div> | MAIN STEAM E-50A RIA-2324 ALERT <div style="text-align: right;">18</div> |
| CONT GAMMA RIA-2321 FAIL <div style="text-align: right;">25</div> | CONT GAMMA RIA-2322 FAIL <div style="text-align: right;">26</div> | CONT H ₂ MONT C-161 FAIL <div style="text-align: right;">27</div> | CONT H ₂ MONT C-162 FAIL <div style="text-align: right;">28</div> | MAIN STEAM E-50B RIA-2323 FAIL <div style="text-align: right;">29</div> | MAIN STEAM E-50A RIA-2324 FAIL <div style="text-align: right;">30</div> |
| CR HVAC FAN LOW FLOW V94-V95-V96 V26A-V26B <div style="text-align: right;">37</div> | CONTROL ROOM HVAC FILTER HIGH DIFF PRESS VF95-VF96 VF26A-VF26B <div style="text-align: right;">38</div> | <div style="text-align: right;">39</div> | <div style="text-align: right;">40</div> | <div style="text-align: right;">41</div> | <div style="text-align: right;">42</div> |
| CONTROL ROOM LOW PRESSURE DPIC-1659/1660 <div style="text-align: right;">49</div> | CR FILTER HIGH TEMP VF26A-VF26B <div style="text-align: right;">50</div> | <div style="text-align: right;">51</div> | <div style="text-align: right;">52</div> | <div style="text-align: right;">53</div> | <div style="text-align: right;">54</div> |
| <div style="text-align: right;">61</div> | <div style="text-align: right;">62</div> | <div style="text-align: right;">63</div> | <div style="text-align: right;">64</div> | <div style="text-align: right;">65</div> | <div style="text-align: right;">66</div> |

PALEX 90
Message No 33

Time: 1200
Scenario Time: 0330

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 33

PALEX 90
Time 1200

Problem Time 0330

C-08

| | | | | | |
|---------------|-----------------|-----------------|------------------|--------------------------------|--|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>ON</u> | SW Critical Hdr Press | A <u>77</u> B <u>79</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>ON</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | Containment Cooler Recirc Fans | |
| | | | | V1B <u>OFF</u> | V2B <u>OFF</u> V3B <u>OFF</u> V4B <u>OFF</u> |

C-03

| | | | | | |
|-------------------------|-------------|----------------|---------------|---------------------------------|-----------------------------------|
| CCW Cooler Outlet Temp | A | <u>74</u> F | B | <u>72</u> F | |
| Containment Spray Pumps | P-54A | <u>OFF</u> | P-54B | <u>OFF</u> | P-54C <u>OFF</u> |
| HPSI Pumps | P-66A | <u>OFF</u> | P-66B | <u>OFF</u> | P-67A <u>OFF</u> P-67B <u>OFF</u> |
| | | | | LPSI Pumps | P-67A <u>OFF</u> P-67B <u>OFF</u> |
| | | | | Safety Injection Suction Supply | |
| | | | | Train A | Train B |
| CV-3057 (SIRW) | <u>OPEN</u> | CV-3029 (Sump) | <u>CLOSED</u> | CV-3031 (SIRW) | <u>OPEN</u> |
| | | | | CV-3030 (Sump) | <u>CLOSED</u> |

C-02

CVCS

| | | | |
|---------------------------------|---|---|---|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>102</u> F | Flow | <u>132</u> gpm |
| Letdown Line Temp | <u>70</u> F | Line Temp | <u>60</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>ON</u> P-55C <u>ON</u> |
| Temp <u>75</u> F | Pressure <u>33</u> psi | Level <u>78</u> % | Volume Control Tank |
| | | | PCP Control Bleedoff Pressure <u>30</u> psig |
| SDCS from PCS (R) | <u>80</u> F | | Shutdown Cooling System |
| | | | SDCS to PCS (R) <u>80</u> F |
| Temp <u>102</u> F | Pressure <u>4</u> psig | Level <u>76</u> % | Quench Tank |
| | | | Primary Coolant System |
| Pressurizer Pressure (R) | <u>553</u> psia | Loop 1 (TR-0111) | <u>515</u> |
| PCS Tave (R) | <u>515</u> | Loop 2 (TR-0121) | <u>515</u> |
| Pressurizer Level (R) | LRC-0101A <u>33</u> % | LRC-0101B | <u>33</u> % LIA-0102A <u>38</u> % |
| Pzr Htr Amps | LCC 15 <u>0</u> | LCC 16 | <u>0</u> |
| PORV | PRV-1042B <u>CLOSED</u> | Block Valve | MOV-1042A <u>CLOSED</u> MOV-1043A <u>CLOSED</u> |
| PCPs | P-50A <u>OFF</u> P-50B <u>ON</u> | P-50C | <u>OFF</u> P-50D <u>OFF</u> |
| Reactor Power Level | NI-01 <u>12</u> NI-02 <u>18</u> NI-03 <u>1.00E-7</u> NI-04 <u>1.00E-7</u> | NI-05 <u>0</u> NI-06 <u>0</u> NI-07 <u>0</u> NI-08 <u>0</u> | |

C-01

| | | | | | |
|--|---|------------------------------------|---|------------------------|---|
| AFW Pump | P-8A <u>ON</u> | P-8B <u>OFF</u> | P-8C <u>ON</u> | AFW System | |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | AFW Pump Amps | P-8A <u>82</u> P-8C <u>73</u> amps | AFW Disch Press | P-8A & P-8B <u>1300</u> P-8C <u>1200</u> psig |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> | MOV-0510 | <u>OPEN</u> | Secondary System | |
| MFP Suction Pressure | <u>530</u> psig | MSIV's | CV-0501 <u>CLOSED</u> CV-0510 <u>CLOSED</u> | MFP Discharge Pressure | A <u>520</u> B <u>520</u> psi |
| Moisture Separator Drain Tank Level | <u>48</u> % | Condenser Hotwell Level | <u>67</u> % | Condenser Vacuum | <u>28.20</u> in Hg. |
| Atmospheric Dump Valves | <u>OPEN</u> | Gland Seal Condenser Vacuum | <u>14</u> in Hg. | Condensate Pump Status | P-2A <u>OFF</u> P-2B <u>ON</u> |
| Heater Drain Pump Status | P-10A <u>OFF</u> P-10B <u>OFF</u> | PIP | | | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | Core Exit Thermocouple Temperature | <u>410</u> F | | |
| Gross MW | <u>0</u> | Net MW | <u>0</u> | | |
| Control Rod Position | GP1 <u>0</u> GP2 <u>0</u> GP3 <u>0</u> GP4 <u>0</u> | GP5(P) | <u>3.90</u> GP6(A) <u>0</u> GP7(B) <u>0</u> | | |
| Stuck Rods | <u>NONE</u> | | | | |

Date May 22, 1990

Message # 33

PALEX 90

Time 1200

Scenario Time 0330

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level T-2 | <u>90 %</u> |
| Instrument Air Pressure | <u>100</u> psig | | | | |
| Containment Building Pressure | <u>.10</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>96 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>46</u> | B <u>51</u> | C <u>40</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>210</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|---|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>55 %</u> |
| Reactor Vessel DP | <u>0</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>730</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>38 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>405</u> | Loop 2 <u>410</u> |
| Subcooling | Temp <u>67</u> | F Press <u>276</u> psi |
| PCS Pressure (R) | WR <u>540</u> | NR <u>560</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>30 %</u> (NR) <u>30 %</u> | (WR) <u>-138 %</u> (NR) <u>0 %</u> |
| Press | <u>270</u> psia | <u>10</u> psia |
| Flow | Steam <u>.20</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>350</u> | From P-8C <u>265</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condenser Vacuum (R) | <u>28.10</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.90</u> P-50B <u>.90</u> | P-50C <u>.90</u> P-50D <u>.90</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>380</u> |

C-11 Back C-11A





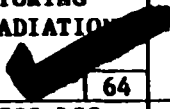
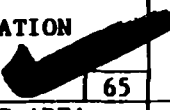

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>4.00E-1</u> | RIA-1806 <u>4.00E-1</u> |
| | RIA-1807 <u>8.50E-1</u> | RIA-1808 <u>8.50E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.80E+0</u> | RIA-2322 <u>1.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.80E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

CIC-13-8-77

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 4
Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BORONOMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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NEW-0-84-274

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|---|--|---|--|--|--|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW ✓ 47 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW ✓ 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL ✓ 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW ✓ 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL ✓ 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL ✓ 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION ✓ 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW ✓ 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW ✓ 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL ✓ 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION ✓ 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW ✓ 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW ✓ 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL ✓ 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL ✓ 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT ✓ 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL CKT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL ✓ 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD ✓ 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP ✓ 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)









| | | | | | |
|--|-----------------------------------|---|---|---|--|
| TURBINE TRIP 1 | TURBINE NO LOAD TRIP 7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP  REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL REFLASH 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No. P 36
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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHAN TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

AUX FW SYSTEM
STATUS ARRAY "B"

| | | |
|---------------------------------|----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0731 | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

AUX FW SYSTEM
STATUS ARRAY "C"

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 2
Revision 37
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDervOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

| RACK A | | | | RACK B | | | |
|---|---|--------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |

| RACK C | | | | RACK D | | | |
|--------------------------------------|-----------------------------------|-----------------------------------|---|------------------------------------|---|---|---|
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

PALEX 90
Message No 34

Time: 1203
Scenario Time: 0333

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message: LTOP in service with 575 psi setpoint.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

PALEX 90
Message No 35

Time: 1215
Scenario Time: 0345

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See alarm and data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 35

PALEX 90
Time 1215

Problem Time 0345

C-08

| | | | | | |
|---------------|-----------------|-----------------|------------------|--------------------------------|--|
| SW Pumps | P-7A <u>ON</u> | P-7B <u>ON</u> | P-7C <u>ON</u> | SW Critical Hdr Press | A <u>80</u> B <u>79</u> psig |
| CCW Pumps | P-52A <u>ON</u> | P-52B <u>ON</u> | P-52C <u>OFF</u> | FPC Pumps | P-51A <u>ON</u> P-51B <u>OFF</u> |
| Fire Pumps | P-9A <u>OFF</u> | P-9B <u>OFF</u> | P-41 <u>OFF</u> | | |
| V1A <u>ON</u> | V2A <u>ON</u> | V3A <u>ON</u> | V4A <u>ON</u> | Containment Cooler Recirc Fans | |
| | | | | V1B <u>OFF</u> | V2B <u>OFF</u> V3B <u>OFF</u> V4B <u>OFF</u> |

C-03

| | | | | |
|----------------------------|------------------------------|----------------------------|---------------------------------|-----------------------------------|
| CCW Cooler Outlet Temp | A <u>73</u> F | B <u>72</u> F | | |
| Containment Spray Pumps | P-54A <u>OFF</u> | P-54B <u>OFF</u> | P-54C <u>OFF</u> | |
| HPSI Pumps | P-66A <u>OFF</u> | P-66B <u>OFF</u> | LPSI Pumps | P-67A <u>OFF</u> P-67B <u>OFF</u> |
| | | | Safety Injection Suction Supply | |
| | Train A | | Train B | |
| CV-3057 (SIRW) <u>OPEN</u> | CV-3029 (Sump) <u>CLOSED</u> | CV-3031 (SIRW) <u>OPEN</u> | CV-3030 (Sump) <u>CLOSED</u> | |

C-02

CVCS

| | | | |
|---------------------------------|---|---|---|
| <u>Letdown</u> | | <u>Charging</u> | |
| Intermediate Press Letdown Temp | <u>100</u> F | Flow | <u>78</u> gpm |
| Letdown Line Temp | <u>70</u> F | Line Temp | <u>60</u> F |
| Letdown Flow | <u>0</u> gpm | Pumps | P-55A <u>ON</u> P-55B <u>OFF</u> P-55C <u>ON</u> |
| Temp <u>70</u> F | Pressure <u>37</u> psi | Level <u>84</u> % | Volume Control Tank |
| | | | PCP Control Bleedoff Pressure <u>40</u> psig |
| SDCS from PCS (R) | <u>80</u> F | | Shutdown Cooling System |
| | | | SDCS to PCS (R) <u>80</u> F |
| Temp <u>102</u> F | Pressure <u>4</u> psig | Level <u>76</u> % | Quench Tank |
| | | | Primary Coolant System |
| Pressurizer Pressure (R) | <u>424</u> psia | Loop 1 (TR-0111) <u>515</u> | Loop 2 (TR-0121) <u>515</u> |
| PCS Tave (R) | | LRC-0101A <u>42</u> % | LRC-0101B <u>42</u> % LIA-0102A <u>42</u> % |
| Pressurizer Level (R) | | LCC 15 <u>0</u> | LCC 16 <u>0</u> |
| Pzr Htr Amps | | Block Valve | MOV-1042A <u>OPEN</u> MOV-1043A <u>OPEN</u> |
| PORV PRV-1042B <u>CLOSED</u> | PRV-1043B <u>CLOSED</u> | P-50A <u>OFF</u> | P-50B <u>ON</u> P-50C <u>OFF</u> P-50D <u>OFF</u> |
| PCPs | NI-01 <u>18</u> NI-02 <u>28</u> NI-03 <u>1.00E-7</u> NI-04 <u>1.00E-7</u> | NI-05 <u>0</u> NI-06 <u>0</u> NI-07 <u>0</u> NI-08 <u>0</u> | |

C-01

| | | | |
|--|---|------------------------------------|--|
| AFW Pump | P-8A <u>ON</u> P-8B <u>OFF</u> P-8C <u>ON</u> | AFW System | |
| AFW Pump P-8B Steam Pressure | <u>0</u> psig | AFW Pump Amps | P-8A <u>71</u> P-8C <u>80</u> amps |
| | | AFW Disch Press | P-8A & P-8B <u>1320</u> P-8C <u>1150</u> psig |
| MSIV Bypass | MOV-0501 <u>CLOSED</u> MOV-0510 <u>OPEN</u> | Secondary System | |
| MFP Suction Pressure | <u>530</u> psig | MSIV's | CV-0501 <u>CLOSED</u> CV-0510 <u>CLOSED</u> |
| Moisture Separator Drain Tank Level | <u>48</u> % | MFP Discharge Pressure | A <u>520</u> B <u>520</u> psi |
| Atmospheric Dump Valves | <u>OPEN</u> | Condenser Hotwell Level | <u>65</u> % |
| Heater Drain Pump Status | P-10A <u>OFF</u> P-10B <u>OFF</u> | Condenser Vacuum | <u>28.20</u> in Hg. |
| | | Gland Seal Condenser Vacuum | <u>14</u> in Hg. |
| | | Condensate Pump Status | P-2A <u>OFF</u> P-2B <u>ON</u> |
| | | PIP | |
| (Demand Log + Constant, Rod, or Flux/Temp) | | Core Exit Thermocouple Temperature | <u>394</u> F |
| Gross MW <u>0</u> | Net MW <u>0</u> | Control Rod Position | GP1 <u>0</u> GP2 <u>0</u> GP3 <u>0</u> GP4 <u>0</u> GP5(P) <u>3.90</u> GP6(A) <u>0</u> GP7(B) <u>0</u> |
| Control Rod Position | | Stuck Rods | <u>NONE</u> |

Date May 22, 1990

Message # 35

PALEX 90
Time 1215

Scenario Time 0345

C-13

| | | |
|---|---|---|
| T-81 Level <u>92</u> % | T-939 Level <u>68</u> % | Condensate Storage Tank Level T-2 <u>86</u> % |
| Instrument Air Pressure <u>96</u> psig | | |
| Containment Building Pressure <u>.20</u> psig | Dome Temperature <u>105</u> F | Humidity <u>10</u> % |
| S/G A Compartment | Temperature <u>100</u> F | Humidity <u>10</u> % |
| S/G B Compartment | Temperature <u>90</u> F | Humidity <u>10</u> % |
| SIRW Tank Level <u>95</u> % | | |
| WR Containment Pressure (R) <u>15</u> psia | | |
| Containment Sump Level <u>0</u> % | Containment Water Level (R) <u>590.40</u> % | |
| SI Tank Level (%) | A <u>45</u> B <u>51</u> C <u>39</u> D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>200</u> B <u>215</u> C <u>215</u> D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|---|--|---------------------------------------|
| Concentrated Boric Acid Tank Levels | T53A <u>57</u> % | T53B <u>53</u> % |
| Reactor Vessel DP | <u>1</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) RV-1039 | <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) P-50A <u>0</u> | P-50B <u>730</u> | P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow <u>22</u> % | Pressurizer Level (cold) <u>44</u> % | |
| Loop Thot (F) Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Loop Tcold (F) Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Tcold Wide range Loop 1 <u>390</u> | Loop 2 <u>395</u> | |
| Subcooling Temp <u>56</u> | F Press <u>193</u> psi | |
| PCS Pressure (R) WR <u>410</u> | NR <u>425</u> psia | |
| Level (WR) <u>50</u> % (NR) <u>47</u> % | Steam Generator B (WR) <u>-138</u> % (NR) <u>0</u> % | |
| Press <u>230</u> psia | <u>10</u> psia | |
| Flow Steam <u>.10</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH | |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>335</u> | From P-8C <u>290</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>28.10</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.90</u> P-50B <u>.90</u> | P-50C <u>.90</u> P-50D <u>.90</u> |

C-04

| | | |
|----------------------------|------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS Voltage | <u>2450</u> | Amps <u>430</u> |
| 1-D BUS Voltage | <u>2450</u> | Amps <u>340</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.90E-1</u> | RIA-1806 <u>3.90E-1</u> |
| | RIA-1807 <u>8.40E-1</u> | RIA-1808 <u>8.40E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.80E+0</u> | RIA-2322 <u>1.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.60E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 7
Revision 43
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TITLE: AUXILIARY SYSTEMS

SCHEME **EK-11 (**EC-13)

| | | | | | |
|---|---|---|--|---|---|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILER OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

610-28-017M

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
Page 1 of 28

FOR DRILL USE ONLY

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|---|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRES 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRES 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRES 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRES 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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14E-084-274

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
Page 1 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|-------------------------------------|---|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|---|--|---|---|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK-AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK-AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND-ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVOLT 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND-ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTCE REFLASH 66 | REACTOR TRIP 72 |





FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH ΔP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM  12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |










PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|---|--|---|--|---|--|
| AFAS FOGG SUBSYSTEM TRIP  REFLASH <input type="checkbox"/> 37 | FW PUMP P1A TURBINE K7A TRIP  REFLASH <input type="checkbox"/> 43 | FW PUMP P1B TURBINE K7B TRIP  REFLASH <input type="checkbox"/> 49 | CONDENSATE PUMP TRIP REFLASH <input type="checkbox"/> 55 | HOT WELL HI LO LEVEL REFLASH <input type="checkbox"/> 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH <input type="checkbox"/> 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH <input type="checkbox"/> 38 | FW PUMP P1A TURBINE K7A LOW VACUUM REFLASH <input type="checkbox"/> 44 | FW PUMP P1B TURBINE K7B LOW VACUUM REFLASH <input type="checkbox"/> 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH <input type="checkbox"/> 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH <input type="checkbox"/> 62 | FEEDWATER HEATERS HI LEVEL REFLASH <input type="checkbox"/> 68 |
| AUX FEEDWATER PUMP TRIP REFLASH <input type="checkbox"/> 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH <input type="checkbox"/> 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH <input type="checkbox"/> 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  REFLASH <input type="checkbox"/> 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH <input type="checkbox"/> 63 | FEEDWATER HEATER LO LEVEL REFLASH <input type="checkbox"/> 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH <input type="checkbox"/> 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH <input type="checkbox"/> 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH <input type="checkbox"/> 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH <input type="checkbox"/> 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH <input type="checkbox"/> 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH <input type="checkbox"/> 70 |
| SG ISOL ISOL VLV CLOSED REFLASH <input type="checkbox"/> 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH <input type="checkbox"/> 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH <input type="checkbox"/> 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH <input type="checkbox"/> 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH <input type="checkbox"/> 65 | CONDENSATE PUMP ROOM FLOODING REFLASH <input type="checkbox"/> 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH <input type="checkbox"/> 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH <input type="checkbox"/> 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH <input type="checkbox"/> 54 | FW PUMPS LOW SUCTION REFLASH <input type="checkbox"/> 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH <input type="checkbox"/> 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL REFLASH <input type="checkbox"/> 72 |

FOR DRILL USE ONLY

**PALISADES NU: R PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No: P 36
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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|---|--|--|---|---|---|--|---|--|--|
| SG E-50A LVL SNSR CHNL TRIP <input type="checkbox"/> | SG E-50B LVL SNSR CHNL TRIP <input checked="" type="checkbox"/> | FOGG A SNSR CHNL TRIP <input checked="" type="checkbox"/> | FOGG B SNSR CHNL TRIP <input type="checkbox"/> | AFAS ACTUATION CHNL TRIP <input checked="" type="checkbox"/> | FOGG A ACTUATION CHNL TRIP <input checked="" type="checkbox"/> | FOGG B ACTUATION CHNL TRIP <input type="checkbox"/> | AFAS-FOGG SNSR CHNL LOP <input type="checkbox"/> | AFAS-FOGG AUTO TEST FAILURE <input type="checkbox"/> | AFAS-FOGG ACT CHNL LOP <input type="checkbox"/> |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP <input type="checkbox"/> | SG E-50B LVL SNSR CHNL BYP <input type="checkbox"/> | FOGG A SNSR CHNL BYPASSED <input type="checkbox"/> | FOGG B SNSR CHNL BYPASSED <input type="checkbox"/> | AFAS ACTUATION CHNL BLKD <input type="checkbox"/> | FOGG A ACTUATION CHNL BLKD <input type="checkbox"/> | FOGG B ACTUATION CHNL BLKD <input type="checkbox"/> | SPARE <input type="checkbox"/> | AFAS-FOGG TEST BLK INITIATED <input type="checkbox"/> | AFW BYPASS VALVE OPEN <input type="checkbox"/> |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED <input type="checkbox"/> | SG E-50B ISOLATED <input type="checkbox"/> | SG ISOL VLV CLOSED <input type="checkbox"/> | P-8A TRIPPED <input type="checkbox"/> | P-8A FAILED TO AUTO START <input type="checkbox"/> | P-8C TRIPPED <input type="checkbox"/> | P-8C FAILED TO AUTO START <input type="checkbox"/> | P-8A/B LO SUCTION TRIPPED <input type="checkbox"/> | P-8C LO SUCTION TRIPPED <input type="checkbox"/> | ISOL VLV HS IN OPEN POS <input checked="" type="checkbox"/> |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|--|--|---|
| AUTO START TEST PUMP P-8A <input type="checkbox"/> | AUTO START TEST PUMP P-8B <input type="checkbox"/> | IN TEST CV-0727 & CV-0749 <input type="checkbox"/> |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A <input checked="" type="checkbox"/> | AUX RELAY PWR AVAIL PUMP P-8B <input checked="" type="checkbox"/> | SPARE <input type="checkbox"/> |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---|---|--|
| AUTO START TEST PUMP P-8C <input type="checkbox"/> | IN TEST CV-0736A & CV-0736B <input type="checkbox"/> | AUX RELAY PWR AVAIL PUMP P-8C <input checked="" type="checkbox"/> |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE ONLY

TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP ✓ 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD ✓ 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION ✓ 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START ✓ 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP ✓ 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE ✓ 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

78N-0-89-138

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (EC-06)**

| RACK A | | | | RACK B | | | |
|---|---|-----------------------------------|---|-------------------------------------|---|---|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |
| RACK C | | | | RACK D | | | |
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

PALEX 90
Message No 36

Time: 1230
Scenario Time: 0400

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See alarm and data sheets.

Message: Steaming path now "A" S/G atmospheric dump valves.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 36

PALEX 90

Time 1230

Problem Time 0400

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 80 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 132 gpm
Line Temp 60 F
Pumps P-55A ON P-55B ON P-55C ON

Temp 70 F Pressure 32 psi Level 78 %

Volume Control Tank
PCP Control Bleedoff Pressure 30 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System

SDCS to PCS (R) 80 F

Temp 102 F

Pressure 4 psig

Quench Tank

Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 395 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 38 %
Pzr Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON
Reactor Power Level NI-01 20 NI-02 38 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 38 % LIA-0102A 38 %
LCC 16 0
Block Valve MOV-1042A OPEN MOV-1043A OPEN
P-50C OFF P-50D OFF

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C ON
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 70 P-8C 70 amps
AFW Disch Press P-8A & P-8B 1500 P-8C 1200 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 530 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 520 B 520 psi
Condenser Hotwell Level 65 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 360 F
GP5(P) 3.90 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 36

PALEX 90

Time 1230

Scenario Time 0400

C-13

| | | | | | | |
|-------------------------------|-------------|--------------|-------------|-------------------------------|---------------|------------------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level | T-2 | <u>82 %</u> |
| Instrument Air Pressure | | | <u>105</u> | psig | | |
| Containment Building Pressure | | <u>.20</u> | psig | Dome Temperature | <u>110</u> | F Humidity <u>10 %</u> |
| S/G A Compartment | | | | Temperature | <u>100</u> | F Humidity <u>10 %</u> |
| S/G B Compartment | | | | Temperature | <u>90</u> | F Humidity <u>10 %</u> |
| SIRW Tank Level | | <u>96 %</u> | | | | |
| WR Containment Pressure (R) | | <u>15</u> | psia | | | |
| Containment Sump Level | | <u>0 %</u> | | Containment Water Level (R) | <u>590.40</u> | % |
| SI Tank Level (%) | | A <u>42</u> | | B <u>51</u> | C <u>38</u> | D <u>55</u> |
| SI Tank Pressure (psig) | | A <u>200</u> | | B <u>215</u> | C <u>215</u> | D <u>215</u> |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | | | |
|-------------------------------------|-------------------|----------------|--------------------------|-----------------|
| Concentrated Boric Acid Tank Levels | T53A | <u>57 %</u> | T53B | <u>52 %</u> |
| Reactor Vessel DP | | <u>.10</u> | psid | |
| PORV Discharge Temperature | | <u>105</u> | F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 | <u>105</u> | RV-1040 | <u>105</u> |
| | | | RV-1041 | <u>105</u> |
| PCP Current (Amps) | P-50A | <u>0</u> | P-50B | <u>740</u> |
| | | | P-50C | <u>0</u> |
| PCS Flow | | <u>22 %</u> | Pressurizer Level (cold) | <u>41 %</u> |
| Loop Thot (F) | Loop 1 | <u>515</u> | Loop 2 | <u>515</u> |
| Loop Tcold (F) | Loop 1 | <u>515</u> | Loop 2 | <u>515</u> |
| Tcold Wide range | Loop 1 | <u>360</u> | Loop 2 | <u>365</u> |
| Subcooling | Temp | <u>83</u> | F Press | <u>242</u> psi |
| PCS Pressure (R) | WR | <u>380</u> | NR | <u>395</u> psia |
| | Steam Generator A | | Steam Generator B | |
| Level (WR) | <u>35 %</u> | (NR) | <u>32 %</u> | (WR) |
| Press | <u>150</u> psia | | <u>-138 %</u> | (NR) |
| | | | <u>10</u> psia | |
| Flow | Steam | <u>.10</u> PPH | Feed | <u>0</u> PPH |
| | | | Feed | <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | | | |
|-----------------------|-------------|------------|-----------|----------------|
| AFW Flow to A S/G | From P-8A&B | <u>210</u> | From P-8C | <u>225</u> gpm |
| AFW Flow to B S/G | From P-8A&B | <u>0</u> | From P-8C | <u>0</u> gpm |
| Condensor Vacuum (R) | | <u>0</u> | | |
| PCP Seal Leakoff Flow | P-50A | <u>.90</u> | P-50B | <u>.90</u> |
| | | | P-50C | <u>.90</u> |
| | | | P-50D | <u>.90</u> |

C-04

| | | | | |
|----------------------------|---------|--------------|------|--------------|
| Diesel Generator Frequency | 1-1 | <u>60.50</u> | 1-2 | <u>60.50</u> |
| 1-C BUS | Voltage | <u>2450</u> | Amps | <u>450</u> |
| 1-D BUS | Voltage | <u>2450</u> | Amps | <u>350</u> |

C-11 Back C-11A

| | | | | |
|--|----------|--------------------|----------|----------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 | <u>3.80E-1</u> | RIA-1806 | <u>3.80E-1</u> |
| | RIA-1807 | <u>8.40E-1</u> | RIA-1808 | <u>8.40E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 | <u>1.70E+0</u> | RIA-2322 | <u>1.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R | <u>0</u> | AI-2401L | <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 | <u>1.35E+2</u> | RIA-2323 | <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 | <u>1.50E+3</u> cpm | RIA-2326 | <u>1.50E+2</u> cpm |
| | | | RIA-2327 | <u>2.00E-1</u> mr/hr |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 7
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SCHEME **EK-11 (**EC-13)

TITLE: AUXILIARY SYSTEMS

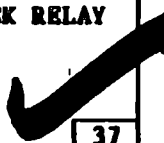




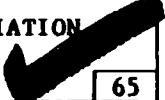

| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT EXCHANGER OFF NORMAL FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
Revision 46
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
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FOR DRILL USE ONLY

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|-------------------------------------|---|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL CKT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|-----------------------------------|---|---|---|--|
| TURBINE TRIP 1 | TURBINE NO LOAD PRETRIP 7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |












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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM  44 | FW PUMP P1B TURBINE K7B LOW VACUUM  50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No. 36
Revision 0
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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHAN TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0737A | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 2
Revision 37
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER OIL BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 3
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FOR DRILL USE ONLY

TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (**EC-11)

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP | PREFERRED AC BUS NO 1 TROUBLE | DIESEL GEN BKR 152-107 TRIP | DIESEL GEN BKR 152-213 TRIP |
| 37 | 43 | 49 | 55 |
| MCC NO 7 BKR 52-1103 TRIP | PREFERRED AC BUS NO 3 TROUBLE | DIESEL GEN NO 1-1 FAIL TO START | DIESEL GEN NO 1-2 FAIL TO START |
| 38 | 44 | 50 | 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP | PREFERRED AC BUS NO 2 TROUBLE | DIESEL GEN NO 1-1 TROUBLE | DIESEL GEN NO 1-2 TROUBLE |
| 39 | 45 | 51 | 57 |
| MCC NO 8 BKR 52-1201 TRIP | PREFERRED AC BUS NO 4 TROUBLE | DIESEL GEN NO 1-1 START SIGNAL BLOCKED | DIESEL GEN NO 1-2 START SIGNAL BLOCKED |
| 40 | 46 | 52 | 58 |
| BATTERY CHARGERS TROUBLE | 125 V DC BUS GROUND | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD | DIESEL OIL STORAGE TANK T-10 LOW LEVEL |
| 3 | 41 | 6 | 53 |
| ANNUNCIATOR DC FAILURE | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL |
| 7 | 42 | 48 | 54 |
| | | | 60 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE ONLY

TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

| RACK A | | | | RACK B | | | |
|--|--------------------------------------|---------------------------|--------------------------------|--------------------------------|----------------------------------|----------------------------------|--|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP | HIGH POWER RATE CHANNEL TRIP | LOW FLOW CHANNEL TRIP | LOW LEVEL SG1 CHANNEL TRIP | LOW LEVEL SG2 CHANNEL TRIP | LO PRESSURE SG1 CHANNEL TRIP | LO PRESSURE SG2 CHANNEL TRIP | HI PRESSURE PRESSURIZER CHANNEL TRIP |
| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP | HIGH POWER RATE CHANNEL PRE-TRIP/ASI | LOW FLOW CHANNEL PRE-TRIP | LOW LEVEL SG1 CHANNEL PRE-TRIP | LOW LEVEL SG2 CHANNEL PRE-TRIP | LO PRESSURE SG1 CHANNEL PRE-TRIP | LO PRESSURE SG2 CHANNEL PRE-TRIP | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 |

| RACK C | | | | RACK D | | | |
|---------------------------------|------------------------------|------------------------------|--------------------------------------|-------------------------------|------------------------------------|--|--|
| TM/LO PRESSURE CHANNEL TRIP | LOSS OF LOAD CHANNEL TRIP | CHANNEL DEVIATION LEVEL 1 5% | CHANNEL DEVIATION LEVEL 2 10% | ZERO POWER MODE BYPASS | LOSS OF LOAD TRIP CHANNEL BYPASSED | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B |
| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP | CONTAINMENT HI PRESSURE TRIP | DROPPED ROD | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) | PANEL C06 VENTILATION HI TEMP | RATE TRIP CHANNEL ENABLED | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D |
| 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 |

PALEX 90
Message No 37

Time: 1245
Scenario Time: 0415

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See alarm and data sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 37

PALEX 90

Time 1245

Problem Time 0415

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 76 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 80 F
Letdown Flow 0 gpm

Charging

Flow 72 gpm
Line Temp 70 F
Pumps P-55A ON P-55B OFF P-55C ON

Temp 65 F Pressure 25 psi Level 60 %

Volume Control Tank
PCP Control Bleedoff Pressure 25 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System
SDCS to PCS (R) 80 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 360 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 42 % LRC-0101B 42 % LIA-0102A 40 %
Pzr Htr Amps LCC 15 0 LCC 16 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED Block Valve MOV-1042A OPEN MOV-1043A OPEN
PCPs P-50A OFF P-50B ON P-50C OFF P-50D OFF
Reactor Power Level NI-01 18 NI-02 38 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C ON
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 75 P-8C 72 amps
AFW Disch Press P-8A & P-8B 1400 P-8C 1175 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 540 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 530 B 530 psi
Condenser Hotwell Level 65 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0 Core Exit Thermocouple Temperature 344 F
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0 GP5(P) 3.90 GP6(A) 0 GP7(B) 0
Stuck Rods NONE

Date May 22, 1990

Message # 37

PALEX 90

Time 1245

Scenario Time 0415

C-13

| | | |
|---|---|---|
| T-81 Level <u>92 %</u> | T-939 Level <u>68 %</u> | Condensate Storage Tank Level T-2 <u>78 %</u> |
| Instrument Air Pressure <u>105</u> psig | | |
| Containment Building Pressure <u>.20</u> psig | Dome Temperature <u>105</u> F | Humidity <u>10 %</u> |
| S/G A Compartment | Temperature <u>100</u> F | Humidity <u>10 %</u> |
| S/G B Compartment | Temperature <u>90</u> F | Humidity <u>10 %</u> |
| SIRW Tank Level <u>94 %</u> | | |
| WR Containment Pressure (R) <u>15</u> psia | | |
| Containment Sump Level <u>0 %</u> | Containment Water Level (R) <u>590.40 %</u> | |
| SI Tank Level (%) A <u>44</u> B <u>51</u> C <u>37</u> D <u>55</u> | | |
| SI Tank Pressure (psig) A <u>200</u> B <u>215</u> C <u>215</u> D <u>215</u> | | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|---|--|---------------------------------------|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>51 %</u> |
| Reactor Vessel DP | <u>1</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) RV-1039 | <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) P-50A <u>0</u> | P-50B <u>740</u> | P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow <u>22 %</u> | Pressurizer Level (cold) <u>42 %</u> | |
| Loop Thot (F) Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Loop Tcold (F) Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Tcold Wide range Loop 1 <u>340</u> | Loop 2 <u>350</u> | |
| Subcooling Temp <u>90</u> | F Press <u>236</u> psi | |
| PCS Pressure (R) WR <u>340</u> | NR <u>345</u> psia | |
| Level (WR) <u>37 %</u> (NR) <u>35 %</u> | Steam Generator B (WR) <u>-138 %</u> (NR) <u>0 %</u> | |
| Press <u>120</u> psia | <u>10</u> psia | |
| Flow Steam <u>.10</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH | |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>280</u> | From P-8C <u>265</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.70</u> P-50B <u>.70</u> | P-50C <u>.70</u> P-50D <u>.70</u> |

C-04

| | | |
|----------------------------|------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS Voltage | <u>2450</u> | Amps <u>440</u> |
| 1-D BUS Voltage | <u>2450</u> | Amps <u>350</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.70E-1</u> | RIA-1806 <u>3.70E-1</u> |
| | RIA-1807 <u>8.30E-1</u> | RIA-1808 <u>8.30E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.70E+0</u> | RIA-2322 <u>1.00E+0</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.35E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 7
Revision 43
Page 2 of 20
SCHEME **EK-11 (**EC-13)

TITLE: AUXILIARY SYSTEMS

| | | | | | |
|---|---|---|--|---|---|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILER OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |







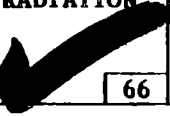
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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
Revision 46
Page 2 of 29

TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|---|--|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI-LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
Page 1 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |






FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision 39
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|---|---|--|--|
| TURBINE TRIP  1 | TURBINE OVERLOAD  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP  10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW  11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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FOR DRILL USE ONLY

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|--|--|---|---|
| AFAS FOGG SUBSYSTEM TRIP 37 | FW PUMP P1A TURBINE K7A TRIP 43 | FW PUMP P1B TURBINE K7B TRIP 49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM 44 | FW PUMP P1B TURBINE K7B LOW VACUUM 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE REFLASH 59 | REHEATER RAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS REFLASH 66 | MOIST SEP DRAIN TANK HIGH-LOW LEVEL REFLASH 72 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No. P 36
Revision 0
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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0731 | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 2
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
Revision 46
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

851-68-0-N21

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 21
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FOR DRILL USE ONLY

TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

| | | | |
|--|--------------------------------------|---------------------------|--------------------------------|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP | HIGH POWER RATE CHANNEL TRIP | LOW FLOW CHANNEL TRIP | LOW LEVEL SG1 CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP | HIGH POWER RATE CHANNEL PRE-TRIP/ASI | LOW FLOW CHANNEL PRE-TRIP | LOW LEVEL SG1 CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK B

| | | | |
|--------------------------------|----------------------------------|----------------------------------|--|
| LOW LEVEL SG2 CHANNEL TRIP | LO PRESSURE SG1 CHANNEL TRIP | LO PRESSURE SG2 CHANNEL TRIP | HI PRESSURE PRESSURIZER CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| LOW LEVEL SG2 CHANNEL PRE-TRIP | LO PRESSURE SG1 CHANNEL PRE-TRIP | LO PRESSURE SG2 CHANNEL PRE-TRIP | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK C

| | | | |
|---------------------------------|------------------------------|------------------------------|-----------------------------------|
| TM/LO PRESSURE CHANNEL TRIP | LOSS OF LOAD CHANNEL TRIP | CHANNEL DEVIATION LEVEL 1 5% | CHANNEL DEVIATION LEVEL 2 10% |
| 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP | CONTAINMENT HI PRESSURE TRIP | DROPPED ROD | LO NEUTRON DETECTOR VOLTAGE (3-8) |
| 5 | 6 | 7 | 8 |

RACK D

| | | | |
|-------------------------------|------------------------------------|--|--|
| ZERO POWER MODE BYPASS | LOSS OF LOAD TRIP CHANNEL BYPASSED | NUCLEAR-AT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A | NUCLEAR-AT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B |
| 1 | 2 | 3 | 4 |
| PANEL C06 VENTILATION HI TEMP | RATE TRIP CHANNEL ENABLED | NUCLEAR-AT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C | NUCLEAR-AT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D |
| 5 | 6 | 7 | 8 |

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM PROCEDURE

Proc No ARP 33
Revision 6
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TITLE: AUXILIARY SYSTEMS SCHEME EK-02 (EC-11A)

| | | | | | |
|---|--|--|--|--|--|
| CONT GAMMA RIA-2321 HIGH 1 | CONT GAMMA RIA-2322 HIGH 2 | CONT H ₂ MONT C-161 HIGH 3 | CONT H ₂ MONT C-162 HIGH 4 | MAIN STEAM E-50B RIA-2323 HIGH 5 | MAIN STEAM E-50A RIA-2324 HIGH 6 |
| CONT GAMMA RIA-2321 ALERT 13 | CONT GAMMA RIA-2322 ALERT 14 | CONT H ₂ HEAT TRACE C-163 FAIL 15 | CONT H ₂ HEAT TRACE C-164 FAIL 16 | MAIN STEAM E-50B RIA-2323 ALERT 17 | MAIN STEAM E-50A RIA-2324 ALERT 18 |
| CONT GAMMA RIA-2321 FAIL 25 | CONT GAMMA RIA-2322 FAIL 26 | CONT H ₂ MONT C-161 FAIL 27 | CONT H ₂ MONT C-162 FAIL 28 | MAIN STEAM E-50B RIA-2323 FAIL 29 | MAIN STEAM E-50A RIA-2324 FAIL 30 |
| CR HVAC FAN LOW FLOW V94-V95-V96 V26A-V26B 37 | CONTROL ROOM HVAC FILTER HIGH DIFF PRESS VF95-VF96 VF26A-VF26B 38 | 39 | 40 | 41 | 42 |
| CONTROL ROOM LOW PRESSURE DPIC-1659/1660 49 | CR FILTER HIGH TEMP VF26A-VF26B 50 | 51 | 52 | 53 | 54 |
| 61 | 62 | 63 | 64 | 65 | 66 |

PALEX 90
Message No 38

Time: 1249
Scenario Time: 0419

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message: P-66B HPSI pump disabled per EOP 9.0.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

PALEX 90
Message No 39

Time: 1254
Scenario Time: 0424

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

Safety injection tanks isolated per EOP 9.0. Shutdown cooling system boron equalized with SIRWT per SOP-3.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

PALEX 90
Message No 40

Time: 1300
Scenario Time: 0430

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 40

PALEX 90
Time 1300

Problem Time 0430

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 76 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 65 F
Letdown Flow 0 gpm

Charging

Flow 73 gpm
Line Temp 60 F
Pumps P-55A ON P-55B OFF P-55C ON

Temp 65 F Pressure 29 psi Level 68 %

Volume Control Tank
PCP Control Bleedoff Pressure 25 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System
SDCS to PCS (R) 80 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 307 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 41 %
Pzr Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON P-50C OFF P-50D OFF
Reactor Power Level NI-01 18 NI-02 25 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 41 % LIA-0102A 40 %
LCC 16 0
Block Valve MOV-1042A OPEN MOV-1043A OPEN

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C ON
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 75 P-8C 70 amps
AFW Disch Press P-8A & P-8B 1400 P-8C 1200 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 540 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 520 B 520 psi
Condenser Hotwell Level 65 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 332 F
GP5(P) 3.90 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 40

PALEX 90

Time 1300

Scenario Time 0430

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>90 %</u> | T-939 Level | <u>68 %</u> | Condensate Storage Tank Level T-2 | <u>75 %</u> |
| Instrument Air Pressure | <u>105 psig</u> | Dome Temperature | <u>105 F</u> | Humidity | <u>10 %</u> |
| Containment Building Pressure | <u>.20 psig</u> | Temperature | <u>100 F</u> | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>90 F</u> | Humidity | <u>10 %</u> |
| S/G B Compartment | | | | | |
| SIRW Tank Level | <u>96 %</u> | | | | |
| WR Containment Pressure (R) | <u>15 psia</u> | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>44</u> | B <u>51</u> | C <u>37</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>200</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|--|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>50 %</u> |
| Reactor Vessel DP | <u>1 psid</u> | |
| PORV Discharge Temperature | <u>105 F</u> | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>740</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>43 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>330</u> | Loop 2 <u>335</u> |
| Subcooling | Temp <u>87</u> | F Press <u>201 psi</u> |
| PCS Pressure (R) | WR <u>280</u> | NR <u>305 psia</u> |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>40 %</u> | (NR) <u>-138 %</u> (NR) <u>0 %</u> |
| Press | <u>100 psia</u> | <u>10 psia</u> |
| Flow | Steam <u>.10 PPH</u> Feed <u>0 PPH</u> | Steam <u>0 PPH</u> Feed <u>0 PPH</u> |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|------------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>230</u> | From P-8C <u>210 gpm</u> |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| Condensator Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.60</u> P-50B <u>.60</u> | P-50C <u>.60</u> P-50D <u>.60</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>440</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>350</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|---|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.60E-1</u> | RIA-1806 <u>3.60E-1</u> |
| | RIA-1807 <u>8.20E-1</u> | RIA-1808 <u>8.20E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.60E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.35E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3 cpm</u> | RIA-2326 <u>1.50E+2 cpm</u> RIA-2327 <u>2.00E-1 mr/hr</u> |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 7
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TITLE: AUXILIARY SYSTEMS

SCHEME **EK-11 (EC-13)**

| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILER OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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FOR DRILL USE ONLY

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 4
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE SCHEME **EK-07 (EC-12)**

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BORONOMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 5
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL CKT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|-----------------------------------|---|---|---|--|
| TURBINE TRIP 1 | TURBINE NO LOAD PRETRIP 7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START REFLASH 25 | TURBINE LO RES VAPOR EXT TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL OVERLOAD 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH DP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP 10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW 11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | KO - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |












PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|--|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM  44 | FW PUMP P1B TURBINE K7B LOW VACUUM  50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK 5 HIGH-LOW LEVEL REFLASH 72 |

PALISADES NU: R PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

FOR DRILL USE ONLY

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

AUX FW SYSTEM
STATUS ARRAY "B"

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0736B | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

AUX FW SYSTEM
STATUS ARRAY "C"

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXCITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 EKR 52-1906 EKR 52-1112 EKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 EKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 EKR 52-2006 EKR 52-1214 EKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 EKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDervOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

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PALISADES NUCLEAR PLANT
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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

| | | | |
|--|--------------------------------------|---------------------------|--------------------------------|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP | HIGH POWER RATE CHANNEL TRIP | LOW FLOW CHANNEL TRIP | LOW LEVEL SG1 CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP | HIGH POWER RATE CHANNEL PRE-TRIP/ASI | LOW FLOW CHANNEL PRE-TRIP | LOW LEVEL SG1 CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK B

| | | | |
|--------------------------------|----------------------------------|----------------------------------|--|
| LOW LEVEL SG2 CHANNEL TRIP | LO PRESSURE SG1 CHANNEL TRIP | LO PRESSURE SG2 CHANNEL TRIP | HI PRESSURE PRESSURIZER CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| LOW LEVEL SG2 CHANNEL PRE-TRIP | LO PRESSURE SG1 CHANNEL PRE-TRIP | LO PRESSURE SG2 CHANNEL PRE-TRIP | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK C

| | | | |
|---------------------------------|------------------------------|------------------------------|--------------------------------------|
| TM/LO PRESSURE CHANNEL TRIP | LOSS OF LOAD CHANNEL TRIP | CHANNEL DEVIATION LEVEL 1 5% | CHANNEL DEVIATION LEVEL 2 10% |
| 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP | CONTAINMENT HI PRESSURE TRIP | DROPPED ROD | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) |
| 5 | 6 | 7 | 8 |

RACK D

| | | | |
|-------------------------------|------------------------------------|--|--|
| ZERO POWER MODE BYPASS | LOSS OF LOAD TRIP CHANNEL BYPASSED | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B |
| 1 | 2 | 3 | 4 |
| PANEL C06 VENTILATION HI TEMP | RATE TRIP CHANNEL ENABLED | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D |
| 5 | 6 | 7 | 8 |

PALEX 90
Message No 41

Time: 1315
Scenario Time: 0445

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 41

PALEX 90
Time 1315

Problem Time 0445

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 76 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 60 gpm
Line Temp 38 F
Pumps P-55A ON P-55B OFF P-55C OFF

Temp 68 F Pressure 40 psi Level 90 %

Volume Control Tank
PCP Control Bleedoff Pressure 40 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System
SDCS to PCS (R) 80 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 260 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 44 %
Pzr Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON P-50C OFF P-50D OFF
Reactor Power Level NI-01 15 NI-02 22 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 44 % LIA-0102A 44 %
LCC 16 0
Block Valve MOV-1042A OPEN MOV-1043A OPEN

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C ON
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 72 P-8C 72 amps
AFW Disch Press P-8A & P-8B 1500 P-8C 1250 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 540 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 520 B 520 psi
Condenser Hotwell Level 65 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 323 F

GP5(P) 3.70 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 41

PALEX 90

Time 1315

Scenario Time 0445

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>67 %</u> | Condensate Storage Tank Level T-2 | <u>80 %</u> |
| Instrument Air Pressure | <u>105 psig</u> | | | | |
| Containment Building Pressure | <u>.20 psig</u> | Dome Temperature | <u>105 F</u> | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100 F</u> | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90 F</u> | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>94 %</u> | | | | |
| WR Containment Pressure (R) | <u>15 psia</u> | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>44</u> | B <u>51</u> | C <u>36</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>200</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | | |
|-------------------------------------|-------------------------------|--------------------------------------|--------------------------------------|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>49 %</u> | |
| Reactor Vessel DP | <u>1 psid</u> | | |
| PORV Discharge Temperature | <u>105 F</u> | | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> | RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>750</u> | P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) | <u>45 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Tcold Wide range | Loop 1 <u>320</u> | Loop 2 <u>325</u> | |
| Subcooling | Temp <u>F</u> | Press <u>psi</u> | |
| PCS Pressure (R) | WR <u>240</u> | NR <u>260 psia</u> | |
| Level (WR) | Steam Generator A <u>37 %</u> | Steam Generator B <u>(WR) -138 %</u> | (NR) <u>0 %</u> |
| Press | <u>90 psia</u> | <u>10 psia</u> | |
| Flow | Steam <u>.10 PPH</u> | Feed <u>0 PPH</u> | Steam <u>0 PPH</u> Feed <u>0 PPH</u> |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>210</u> | From P-8C <u>150 gpm</u> |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| Condenser Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.50</u> P-50B <u>.50</u> | P-50C <u>.50</u> P-50D <u>.50</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>350</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.50E-1</u> | RIA-1806 <u>3.50E-1</u> |
| | RIA-1807 <u>8.00E-1</u> | RIA-1808 <u>8.00E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.60E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.35E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 7
Revision 43
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TITLE: AUXILIARY SYSTEMS

SCHEME **EK-11 (**EC-13)








| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILERS OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
Revision 46
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI TEMP 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
Revision 45
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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112-89-274

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|--|--|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAKAGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAKAGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND-ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL GET UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND-ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |


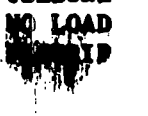

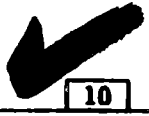

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 1
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FOR DRILL USE ONLY.

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRC OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP  10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW  11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |




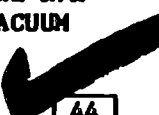
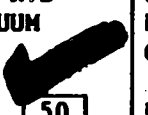






FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM  44 | FW PUMP P1B TURBINE K7B LOW VACUUM  50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER RAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK 15 HIGH-LOW LEVEL 72 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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Revision 0
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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0731A | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
Revision 46
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP | PREFERRED AC BUS NO 1 TROUBLE | DIESEL GEN BKR 152-107 TRIP | DIESEL GEN BKR 152-213 TRIP |
| 37 | 43 | 49 | 55 |
| MCC NO 7 BKR 52-1103 TRIP | PREFERRED AC BUS NO 3 TROUBLE | DIESEL GEN NO 1-1 FAIL TO START | DIESEL GEN NO 1-2 FAIL TO START |
| 38 | 44 | 50 | 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP | PREFERRED AC BUS NO 2 TROUBLE | DIESEL GEN NO 1-1 TROUBLE | DIESEL GEN NO 1-2 TROUBLE |
| 39 | 45 | 51 | 57 |
| MCC NO 8 BKR 52-1201 TRIP | PREFERRED AC BUS NO 4 TROUBLE | DIESEL GEN NO 1-1 START SIGNAL BLOCKED | DIESEL GEN NO 1-2 START SIGNAL BLOCKED |
| 40 | 46 | 52 | 58 |
| BATTERY CHARGERS TROUBLE | 125 V DC BUS GROUND | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD | DIESEL OIL STORAGE TANK T-10 LOW LEVEL |
| 3 | 41 | 6 | 53 |
| ANNUNCIATOR DC FAILURE | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL |
| 7 | 42 | 48 | 54 |
| | | | 60 |

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FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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Revision 39
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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

| RACK A | | | | RACK B | | | |
|--|--------------------------------------|---------------------------|--------------------------------|--------------------------------|----------------------------------|----------------------------------|--|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP | HIGH POWER RATE CHANNEL TRIP | LOW FLOW CHANNEL TRIP | LOW LEVEL SG1 CHANNEL TRIP | LOW LEVEL SG2 CHANNEL TRIP | LO PRESSURE SG1 CHANNEL TRIP | LO PRESSURE SG2 CHANNEL TRIP | HI PRESSURE PRESSURIZER CHANNEL TRIP |
| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP | HIGH POWER RATE CHANNEL PRE-TRIP/ASI | LOW FLOW CHANNEL PRE-TRIP | LOW LEVEL SG1 CHANNEL PRE-TRIP | LOW LEVEL SG2 CHANNEL PRE-TRIP | LO PRESSURE SG1 CHANNEL PRE-TRIP | LO PRESSURE SG2 CHANNEL PRE-TRIP | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 |

| RACK C | | | | RACK D | | | |
|---------------------------------|------------------------------|------------------------------|--------------------------------------|-------------------------------|------------------------------------|--|--|
| TM/LO PRESSURE CHANNEL TRIP | LOSS OF LOAD CHANNEL TRIP | CHANNEL DEVIATION LEVEL 1 5% | CHANNEL DEVIATION LEVEL 2 10% | ZERO POWER MODE BYPASS | LOSS OF LOAD TRIP CHANNEL BYPASSED | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B |
| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP | CONTAINMENT HI PRESSURE TRIP | DROPPED ROD | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) | PANEL C06 VENTILATION HI TEMP | RATE TRIP CHANNEL ENABLED | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D |
| 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 |

PALEX 90
Message No 42

Time: 1330
Scenario Time: 0500

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 actions.

Date May 22, 1990

Message # 42

PALEX 90
Time 1330

Problem Time 0500

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 77 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 75 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 73 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 60 gpm
Line Temp 35 F
Pumps P-55A ON P-55B OFF P-55C OFF

Temp 65 F Pressure 36 psig Level 85 %

Volume Control Tank
PCP Control Bleedoff Pressure 40 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System
SDCS to PCS (R) 80 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 255 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 42 %
PZR Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON
Reactor Power Level NI-01 15 NI-02 22 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 42 % LIA-0102A 42 %
LCC 16 0
Block Valve MOV-1042A OPEN MOV-1043A OPEN
P-50C OFF P-50D OFF

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C ON
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 83 P-8C 76 amps
AFW Disch Press P-8A & P-8B 1300 P-8C 1100 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 540 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 520 B 520 psi
Condenser Hotwell Level 64 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON

PIP

(Demand Log + Constant, Rod, or Flux/Temp)
Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 316 F
GP5(P) 3.70 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 42

PALEX 90

Time 1330

Scenario Time 0500

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>91 %</u> | T-939 Level | <u>67 %</u> | Condensate Storage Tank Level T-2 | <u>82 %</u> |
| Instrument Air Pressure | <u>100</u> psig | | | | |
| Containment Building Pressure | <u>.20</u> psig | Dome Temperature | <u>105</u> F | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100</u> F | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>94 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>44</u> | B <u>51</u> | C <u>36</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>200</u> | B <u>215</u> | C <u>215</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|---|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>48 %</u> |
| Reactor Vessel DP | <u>1</u> psid | |
| PORV Discharge Temperature | <u>105</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>750</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>43 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>315</u> | Loop 2 <u>320</u> |
| Subcooling | Temp <u>87</u> | F Press <u>170</u> psi |
| PCS Pressure (R) | WR <u>248</u> | NR <u>258</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>55 %</u> | (NR) <u>0 %</u> |
| Press | <u>80</u> psia | <u>5</u> psia |
| Flow | Steam <u>.10</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|------------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>350</u> | From P-8C <u>320</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensator Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.40</u> P-50B <u>.40</u> | P-50C <u>.40</u> P-50D <u>.40</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>350</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.40E-1</u> | RIA-1806 <u>3.40E-1</u> |
| | RIA-1807 <u>7.80E-1</u> | RIA-1808 <u>7.80E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.50E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.30E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: AUXILIARY SYSTEMS

SCHEME **EK-11 (EC-13)**








| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILERS OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|---|--|---|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERM  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

C10-58-0-070M

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (EC-12)**

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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FOR DRILL USE ONLY

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1 LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2 LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BORONOMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

176-58-274

176-58-274

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE ONLY

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |





**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE ONLY

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD PRETRIP 7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL OVERLOAD 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP  10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW  11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |










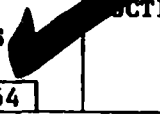

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  37 | FW PUMP P1A TURBINE K7A TRIP  43 | FW PUMP P1B TURBINE K7B TRIP  49 | CONDENSATE PUMP TRIP 55 | HOT WELL HI LO LEVEL 61 | FEEDWATER HEATERS HI HI LEVEL 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED 38 | FW PUMP P1A TURBINE K7A LOW VACUUM  44 | FW PUMP P1B TURBINE K7B LOW VACUUM  50 | CONDENSATE PUMP P2A HIGH TEMP OR OL  REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK T5 HIGH-LOW LEVEL 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHNL TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0731A | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP | PREFERRED AC BUS NO 1 TROUBLE | DIESEL GEN BKR 152-107 TRIP | DIESEL GEN BKR 152-213 TRIP |
| 37 | 43 | 49 | 55 |
| MCC NO 7 BKR 52-1103 TRIP | PREFERRED AC BUS NO 3 TROUBLE | DIESEL GEN NO 1-1 FAIL TO START | DIESEL GEN NO 1-2 FAIL TO START |
| 38 | 44 | 50 | 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP | PREFERRED AC BUS NO 2 TROUBLE | DIESEL GEN NO 1-1 TROUBLE | DIESEL GEN NO 1-2 TROUBLE |
| 39 | 45 | 51 | 57 |
| MCC NO 8 BKR 52-1201 TRIP | PREFERRED AC BUS NO 4 TROUBLE | DIESEL GEN NO 1-1 START SIGNAL BLOCKED | DIESEL GEN NO 1-2 START SIGNAL BLOCKED |
| 40 | 46 | 52 | 58 |
| BATTERY CHARGERS TROUBLE | 125 V DC BUS GROUND | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD | DIESEL OIL STORAGE TANK T-10 LOW LEVEL |
| 3 | 41 | 6 | 53 |
| ANNUNCIATOR DC FAILURE | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL |
| 7 | 42 | 54 | 60 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

| | | | |
|--|--------------------------------------|---------------------------|--------------------------------|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP | HIGH POWER RATE CHANNEL TRIP | LOW FLOW CHANNEL TRIP | LOW LEVEL SG1 CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP | HIGH POWER RATE CHANNEL PRE-TRIP/ASI | LOW FLOW CHANNEL PRE-TRIP | LOW LEVEL SG1 CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK B

| | | | |
|--------------------------------|----------------------------------|----------------------------------|--|
| LOW LEVEL SG2 CHANNEL TRIP | LO PRESSURE SG1 CHANNEL TRIP | LO PRESSURE SG2 CHANNEL TRIP | HI PRESSURE PRESSURIZER CHANNEL TRIP |
| 1 | 2 | 3 | 4 |
| LOW LEVEL SG2 CHANNEL PRE-TRIP | LO PRESSURE SG1 CHANNEL PRE-TRIP | LO PRESSURE SG2 CHANNEL PRE-TRIP | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP |
| 5 | 6 | 7 | 8 |

RACK C

| | | | |
|---------------------------------|------------------------------|------------------------------|--------------------------------------|
| TM/LO PRESSURE CHANNEL TRIP | LOSS OF LOAD CHANNEL TRIP | CHANNEL DEVIATION LEVEL 1 5% | CHANNEL DEVIATION LEVEL 2 10% |
| 1 | 2 | 3 | 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP | CONTAINMENT HI PRESSURE TRIP | DROPPED ROD | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) |
| 5 | 6 | 7 | 8 |

RACK D

| | | | |
|-------------------------------|------------------------------------|--|--|
| ZERO POWER MODE BYPASS | LOSS OF LOAD TRIP CHANNEL BYPASSED | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B |
| 1 | 2 | 3 | 4 |
| PANEL C06 VENTILATION HI TEMP | RATE TRIP CHANNEL ENABLED | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C | NUCLEAR-ΔT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D |
| 5 | 6 | 7 | 8 |

PALEX 90
Message No 43

Time: 1344
Scenario Time: 0514

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message:

PCS temperature is less than 300°F. P-55C charging pump is disabled per SOP-3.
LTOP setpoint reset to 310 psia.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Confirm shutdown cooling entry conditions met and implement 9.0 success
path HR-5 to place shutdown cooling system in service.

PALEX 90
Message No 44

Time: 1345
Scenario Time: 0515

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 HR-5 actions.

Date May 22, 1990

Message # 44

PALEX 90
Time 1345

Problem Time 0515

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 76 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 74 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 72 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 93 gpm
Line Temp 60 F
Pumps P-55A ON P-55B ON P-55C OFF

Temp 63 F Pressure 22 psig Level 50 %

Volume Control Tank

PCP Control Bleedoff Pressure 20 psig

SDCS from PCS (R) 80 F

Shutdown Cooling System

SDCS to PCS (R) 80 F

Temp 102 F

Pressure 4 psig

Quench Tank

Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 250 psia

Loop 1 (TR-0111) 515

Loop 2 (TR-0121) 515

PCS Tave (R)

LRC-0101A 40 %

LRC-0101B 40 %

LIA-0102A 40 %

Pressurizer Level (R)

LCC 15 0

LCC 16 0

Pzr Htr Amps

PRV-1043B CLOSED

Block Valve MOV-1042A OPEN MOV-1043A OPEN

PORV PRV-1042B CLOSED

P-50A OFF P-50B ON

P-50C OFF P-50D OFF

PCPs

Reactor Power Level

NI-01 15 NI-02 20 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C OFF
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 80 P-8C 80 amps
AFW Disch Press P-8A & P-8B 1300 P-8C 1100 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED

MSIV's CV-0501 CLOSED

CV-0510 CLOSED

MFP Suction Pressure 550 psig

MFP Discharge Pressure A 540 B 540 psi

Moisture Separator Drain Tank Level 48 %

Condenser Hotwell Level 64 %

Atmospheric Dump Valves OPEN

Condenser Vacuum 0 in Hg.

Heater Drain Pump Status P-10A OFF P-10B OFF

Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON

PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0

Core Exit Thermocouple Temperature 296 F

Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0

GP5(P) 3.70 GP6(A) 0 GP7(B) 0

Stuck Rods NONE

Date May 22, 1990

Message # 44

PALEX 90

Time 1345

Scenario Time 0515

C-13

| | | | | | |
|-------------------------------|-----------------|--------------|-----------------|-----------------------------------|-----------------|
| T-81 Level | <u>91 %</u> | T-939 Level | <u>65 %</u> | Condensate Storage Tank Level T-2 | <u>84 %</u> |
| Instrument Air Pressure | | | <u>105</u> psig | Dome Temperature | <u>105 F</u> |
| Containment Building Pressure | <u>.20</u> psig | | | Humidity | <u>10 %</u> |
| S/G A Compartment | | | | Temperature | <u>100 F</u> |
| S/G B Compartment | | | | Humidity | <u>10 %</u> |
| SIRW Tank Level | | | <u>94 %</u> | Temperature | <u>90 F</u> |
| WR Containment Pressure (R) | | | <u>15</u> psia | | |
| Containment Sump Level | | | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> |
| SI Tank Level (%) | | A <u>42</u> | B <u>51</u> | C <u>34</u> | D <u>55</u> |
| SI Tank Pressure (psig) | | A <u>200</u> | B <u>215</u> | C <u>210</u> | D <u>215</u> |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | | |
|-------------------------------------|-------------------|--------------------------|---------------------------------------|
| Concentrated Boric Acid Tank Levels | | T53A <u>57 %</u> | T53B <u>48 %</u> |
| Reactor Vessel DP | | <u>1</u> psid | |
| PORV Discharge Temperature | | <u>105 F</u> | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 | <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>750</u> | P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (Cold) | <u>42 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> | |
| Tcold Wide range | Loop 1 <u>300</u> | Loop 2 <u>305</u> | |
| Subcooling | Temp <u>105</u> | F Press <u>187</u> psi | |
| PCS Pressure (R) | WR <u>240</u> | NR <u>250</u> psia | |

| | | | |
|-------|---|---|-------------------|
| | Steam Generator A | | Steam Generator B |
| Level | (WR) <u>75 %</u> (NR) <u>78 %</u> | (WR) <u>-138 %</u> | (NR) <u>0 %</u> |
| Press | <u>60</u> psia | <u>10</u> psia | |
| Flow | Steam <u>.10</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH | |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>350</u> | From P-8C <u>170</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.40</u> P-50B <u>.40</u> | P-50C <u>.40</u> P-50D <u>.40</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>430</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>280</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.30E-1</u> | RIA-1806 <u>3.30E-1</u> |
| | RIA-1807 <u>8.10E-1</u> | RIA-1808 <u>8.10E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.50E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.35E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE ONLY

TITLE: AUXILIARY SYSTEMS

SCHEME **EK-11 (EC-13)**

| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILERS OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

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FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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Revision 46
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**








| | | | | | |
|--|--|---|---|---|---|
| SHIELD CLG PUMPS TRIP 1 | FUEL POOL CLG PUMPS P51A AND/OR P51B TRIP 7 | SAFETY INJ TANK T-82A HI-LO LEVEL 13 | SAFETY INJ TANK T-82B HI-LO LEVEL 19 | SAFETY INJ TANK T-82C HI-LO LEVEL 25 | SAFETY INJ TANK T-82D HI-LO LEVEL 31 |
| REACTOR SHIELD CLG PUMPS DISCH LOW PRESSURE 2 | FUEL POOL CLG PUMPS DISCHARGE LO PRESS 8 | SAFETY INJ TANK T-82A HI LEVEL 14 | SAFETY INJ TANK T-82B HI LEVEL 20 | SAFETY INJ TANK T-82C HI LEVEL 26 | SAFETY INJ TANK T-82D HI LEVEL 32 |
| REACTOR SHIELD CLG LO FLO 3 | SPENT FUEL POOL LO LEVEL 9 | SAFETY INJ TANK T-82A LO LEVEL 15 | SAFETY INJ TANK T-82B LO LEVEL 21 | SAFETY INJ TANK T-82C LO LEVEL 27 | SAFETY INJ TANK T-82D LO LEVEL 33 |
| REACTOR SHIELD CLG HI TEMP 4 | SPENT FUEL POOL HI TEMP 10 | SAFETY INJ TANK T-82A HI-LO PRESS 16 | SAFETY INJ TANK T-82B HI-LO PRESS 22 | SAFETY INJ TANK T-82C HI-LO PRESS 28 | SAFETY INJ TANK T-82D HI-LO PRESS 34 |
| SHIELD CLG SURGE TANK T-62 HI-LO LEVEL 5 | SAFETY INJECTION TEST RUN 11 | SAFETY INJ TANK T-82A HI PRESS 17 | SAFETY INJ TANK T-82B HI PRESS 23 | SAFETY INJ TANK T-82C HI PRESS 29 | SAFETY INJ TANK T-82D HI PRESS 35 |
| LO PRESSURE SAFETY INJ MOV OVERLOAD 6 | HI PRESS SAFETY INJ MOV OVERLOAD 12 | SAFETY INJ TANK T-82A LO PRESS 18 | SAFETY INJ TANK T-82B LO PRESS 24 | SAFETY INJ TANK T-82C LO PRESS 30 | SAFETY INJ TANK T-82D LO PRESS 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

C.12-12-0-077M

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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FOR DRILL USE ONLY

TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI-LO PRESS 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|---|--|--|--|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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FOR DRILL USE ONLY

FILE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK- AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK- AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK- AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND- ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |



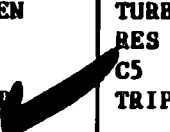


PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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FOR DRILL USE ONLY.

TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH dP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP  10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW  11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|--|--|--|---|
| AFAS FOGG SUBSYSTEM TRIP REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS REFLASH 66 | MOIST SEP DRAIN TANK P5 HIGH-LOW LEVEL REFLASH 72 |

FOR DRILL USE ONLY

**PALISADES NU: R PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHAN TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0736B | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 3
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

72N-0-88-138

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

| RACK A | | | | RACK B | | | |
|---|---|-----------------------------------|---|-------------------------------------|---|---|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |
| RACK C | | | | RACK D | | | |
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

PALEX 90
Message No 45

Time: 1400
Scenario Time: 0530

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets

Message: Heating shutdown cooling system per SOP-3.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue EOP 9.0 HR-5 action.

Date May 22, 1990

Message # 45

PALEX 90
Time 1400

Problem Time 0530

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 76 B 78 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 74 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 72 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A ON P-67B OFF

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02
CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 90 gpm
Line Temp 60 F
Pumps P-55A ON P-55B ON P-55C OFF

Temp 60 F Pressure 20 psig Level 35 %

Volume Control Tank
PCP Control Bleedoff Pressure 20 psig

SDCS from PCS (R) 295 F

Shutdown Cooling System
SDCS to PCS (R) 295 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 235 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 30 %
Pzr Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON P-50C OFF P-50D OFF
Reactor Power Level NI-01 15 NI-02 20 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 30 % LIA-0102A 30 %
LCC 16 0
Block Valve MOV-1042A OPEN MOV-1043A OPEN
P-50C OFF P-50D OFF

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C OFF
AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 70 P-8C 0 amps
AFW Disch Press P-8A & P-8B 1500 P-8C 0 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 550 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves OPEN
Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 540 B 540 psi
Condenser Hotwell Level 65 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 295 F
GP5(P) 0 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 45

PALEX 90

Time 1400

Scenario Time 0530

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>91 %</u> | T-939 Level | <u>64 %</u> | Condensate Storage Tank Level T-2 | <u>86 %</u> |
| Instrument Air Pressure | <u>95 psig</u> | | | | |
| Containment Building Pressure | <u>.20 psig</u> | Dome Temperature | <u>105 F</u> | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100 F</u> | Humidity | <u>10 %</u> |
| S/G B Compartment | | Temperature | <u>90 F</u> | Humidity | <u>10 %</u> |
| SIRW Tank Level | <u>94 %</u> | | | | |
| WR Containment Pressure (R) | <u>15 psia</u> | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>42</u> | B <u>51</u> | C <u>34</u> | D <u>56</u> | |
| SI Tank Pressure (psig) | A <u>200</u> | B <u>215</u> | C <u>210</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|--|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>48 %</u> |
| Reactor Vessel DP | <u>1 psid</u> | |
| PORV Discharge Temperature | <u>105 F</u> | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>105</u> | RV-1040 <u>105</u> RV-1041 <u>105</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>750</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>32 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>295</u> | Loop 2 <u>300</u> |
| Subcooling | Temp <u>101</u> | F Press <u>1730 psi</u> |
| PCS Pressure (R) | WR <u>240</u> | NR <u>240 psia</u> |
| | Steam Generator A | Steam Generator B |
| Level (WR) | <u>75 %</u> | (NR) <u>-138 %</u> |
| Level (NR) | <u>76 %</u> | (WR) <u>0 %</u> |
| Press | <u>60 psia</u> | <u>10 psia</u> |
| Flow | Steam <u>.10 PPH</u> Feed <u>0 PPH</u> | Steam <u>0 PPH</u> Feed <u>0 PPH</u> |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|------------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>170</u> | From P-8C <u>0 gpm</u> |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| Condensator Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.40</u> P-50B <u>.40</u> | P-50C <u>.40</u> P-50D <u>.40</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>420</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>280</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>3.00E-1</u> | RIA-1806 <u>3.00E-1</u> |
| | RIA-1807 <u>7.50E-1</u> | RIA-1808 <u>7.50E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.40E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.20E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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FOR DRILL USE ONLY

TITLE: AUXILIARY SYSTEMS

SCHEME **EK-11 (EC-13)**

| | | | | | |
|--|--|--|---|--|--|
| SERVICE WATER PUMP P-7B OVERLOAD/TRIP 37 | SERVICE WATER PUMP P-7C OVERLOAD/TRIP 43 | SERVICE WATER PUMPS STANDBY PUMP RUNNING 49 | WEST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 55 | CONTAINMENT SPRAY PUMPS P-54A, P-54B, P-54C TRIP (REFLASH) 61 | COMPONENT CLG PUMPS P-52A, P-52B, P-52C TRIP (REFLASH) 67 |
| SERVICE WATER PUMP P-7B BASKET STR HI dP 38 | SERVICE WATER PUMP P-7C BASKET STR HI dP 44 | CONTAINMENT RECIRC FANS TRIP (REFLASH) 50 | EAST RM ENG SAFEGUARD PPS CLG WTR LO FLOW 56 | LPSI PUMP LOW DISCHARGE PRESSURE 62 | COMPONENT CLG PUMPS STANDBY PUMP RUNNING (REFLASH) 68 |
| DIESEL FIRE PUMP P-9B ENGINE TROUBLE 39 | SEQUENCER TROUBLE 45 | CONTAINMENT RECIRC FAN STANDBY FAN RUNNING 51 | LO PRESS SI PUMPS P-67A & P-67B TRIP (REFLASH) 57 | CRITICAL SERV WATER HEADER "B" LO PRESSURE 63 | COMPONENT CLG PUMPS DISCHARGE LO PRESS 69 |
| DIESEL FIRE PUMP RUNNING 40 | CONDENSATE RECEIVER TANK LEVEL HI-LO 46 | SEQUENCER BATTERY LOW VOLTAGE 52 | LPSI PPS P-67A & P-67B STANDBY PUMP RUNNING (REFLASH) 58 | CRITICAL SERV WATER HEADER "A" LO PRESSURE 64 | COMPONENT CLG EX E-54A HI-LO TEMP 70 |
| DIESEL FIRE PUMP P9B FAIL TO START 41 | EVAP HTG BOILER COND RECEIVER T-38-HI/LO LEVEL 47 | SPARE 53 | SAMPLE PANEL C-168 OFF NORMAL 59 | NON-CRITICAL SERVICE WATER LO PRESS 65 | COMPONENT CLG EX E-54B HI-LO TEMP 71 |
| DIESEL FIRE PUMP DAY T-24 HI LO LEVEL 42 | FIRE SYSTEM PANEL C-47/A/B OFF NORMAL 48 | RADWASTE AREA VENT FAN V-10, V-14A/B TRIPPED 54 | RADWASTE PANEL C-105 OFF NORMAL 60 | HEAT BOILERS OFF NORMAL & FUEL OIL TANKS LEVEL (REFLASH) 66 | COMPONENT CLG SURGE TANK T-3 HI-LO LEVEL 72 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 8
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**








| | | | | | |
|--|--|---|---|---|---|
| SHIELD CLG PUMPS TRIP 1 | FUEL POOL CLG PUMPS P51A AND/OR P51B TRIP 7 | SAFETY INJ TANK T-82A HI-LO LEVEL 13 | SAFETY INJ TANK T-82B HI-LO LEVEL 19 | SAFETY INJ TANK T-82C HI-LO LEVEL 25 | SAFETY INJ TANK T-82D HI-LO LEVEL 31 |
| REACTOR SHIELD CLG PUMPS DISCH LOW PRESSURE 2 | FUEL POOL CLG PUMPS DISCHARGE LO PRESS 8 | SAFETY INJ TANK T-82A HI LEVEL 14 | SAFETY INJ TANK T-82B HI LEVEL 20 | SAFETY INJ TANK T-82C HI LEVEL 26 | SAFETY INJ TANK T-82D HI LEVEL 32 |
| REACTOR SHIELD CLG LO FLO 3 | SPENT FUEL POOL LO LEVEL 9 | SAFETY INJ TANK T-82A LO LEVEL 15 | SAFETY INJ TANK T-82B LO LEVEL 21 | SAFETY INJ TANK T-82C LO LEVEL 27 | SAFETY INJ TANK T-82D LO LEVEL 33 |
| REACTOR SHIELD CLG HI TEMP 4 | SPENT FUEL POOL HI TEMP 10 | SAFETY INJ TANK T-82A HI-LO PRESS 16 | SAFETY INJ TANK T-82B HI-LO PRESS 22 | SAFETY INJ TANK T-82C HI-LO PRESS 28 | SAFETY INJ TANK T-82D HI-LO PRESS 34 |
| SHIELD CLG SURGE TANK T-62 HI-LO LEVEL 5 | SAFETY INJECTION TEST RUN 11 | SAFETY INJ TANK T-82A HI PRESS 17 | SAFETY INJ TANK T-82B HI PRESS 23 | SAFETY INJ TANK T-82C HI PRESS 29 | SAFETY INJ TANK T-82D HI PRESS 35 |
| LO PRESSURE SAFETY INJ MOV OVERLOAD 6 | HI PRESS SAFETY INJ MOV OVERLOAD 12 | SAFETY INJ TANK T-82A LO PRESS 18 | SAFETY INJ TANK T-82B LO PRESS 24 | SAFETY INJ TANK T-82C LO PRESS 30 | SAFETY INJ TANK T-82D LO PRESS 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 8
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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (EC-13)**

| | | | | | | |
|--|--|---|--|---|--|---|
| SAFETY INJ BLOCK RELAY SI-1  | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT HI PRESS | ELEC ROOMS HIGH AMBIENT | SV AND/OR PORV OPEN |
| 37 | 43 | 49 | 55 | 61 | 67 | 73 |
| SAFETY INJ BLOCK RELAY SI-2  | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL | CONTAINMENT SUMP HI-HI LEVEL | SIRW TANK T-58 HI-LO LEVEL | CONTAINMENT PRESSURE OFF NORMAL | RADWASTE PANEL C40 OFF NORMAL | LTOP PRE-TRIP |
| 38 | 44 | 50 | 56 | 62 | 68 | 74 |
| SAFETY INJ BLOCKED  | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL | CONTAINMENT SUMP HI LEVEL | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL | CONTAINMENT HI RADIATION | SAFETY INJECTION SIGNAL BLOCK PERMIT  | TURB PLANT SAMPLING PANEL C42 OFF NORMAL |
| 39 | 45 | 51 | 57 | 63 | 69 | 75 |
| SAFETY INJ INITIATION SIGNAL "A" | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL | EAST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | GASEOUS WASTE MONITORING HI RADIATION  | RADIATION MONITOR SAMPLERS FLOW FAILURE | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN |
| 40 | 46 | 52 | 58 | 64 | 70 | 76 |
| SAFETY INJ INITIATION SIGNAL "B" | CONTAINMENT AIR COOLERS SERV WATER LEAK | WEST SAFEGRDS RM SUMP HI LEVEL | SIRW TANK T-58 HI-LO TEMP | PROCESS LIQ MONITORING HI RADIATION  | RADIATION MONITOR SYSTEM CKT FAILURE | CONTAINMENT SPRAY VALVE OPEN |
| 41 | 47 | 53 | 59 | 65 | 71 | 77 |
| SAFETY INJ INITIATED | N ₂ HEADER LO PRESS | TURBINE FLR SUMP HI LEVEL | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE | PLANT AREA MONITORING HI RADIATION  | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV |
| 42 | 48 | 54 | 60 | 66 | 72 | 78 |

11-10-81-375

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (EC-12)**

| | | | | | |
|---|--|--|--|---|--|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI-LO PRESS 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI-LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

FOR DRILL ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 4
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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1 LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BOROMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

NEW-0-88-274

NEW-0-88-274

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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Revision 46
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|---|--|---|---|---|---|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPEND-ENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPEND-ENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPEND-ENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

FOR DRILL USE ONLY

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
Revision 46
Page 2 of 19

TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (EC-12)**

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK-AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK-AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PREPWR DEPEND-ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONTROL SET UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND-ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |


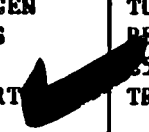
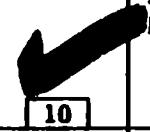

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 1
Revision 39
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

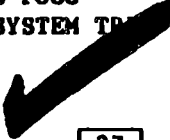

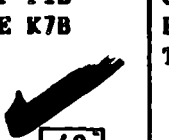


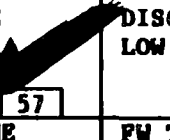
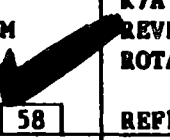

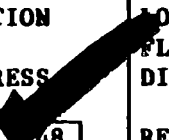


| | | | | | |
|--|--|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD PRETRIP 7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH ΔP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP  10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW  11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 1
Revision '39
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP  REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP  REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM  REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM  REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS T4A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW SUCTION REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK HIGH-LOW LEVEL REFLASH 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No P 36
Revision 0
Page 1 of 13

TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHAN TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

**AUX FW SYSTEM
STATUS ARRAY "B"**

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0736B | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

**AUX FW SYSTEM
STATUS ARRAY "C"**

FOR DRILL USE ONLY

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 2
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TITLE: GENERATOR SCHEME EK-03 (EC-11)

| | | | | | |
|--|---|--|--|---|--|
| GENERATOR TRIP 1 | GENERATOR ACB TRIP 7 | GENERATOR EXCITER FLD BREAKER TRIP 13 | ISOPHASE BUS TROUBLE 19 | UNIT TRANSFORMERS TROUBLE 25 | MAIN TRANSFORMER SUDDEN PRESS 31 |
| HYDROGEN SYSTEM TROUBLE 2 | GENERATOR PROTECTION CONTROL CKTS UNDERVOLTAGE 8 | GENERATOR LOSS OF FIELD 14 | SEAL OIL PUMPS P21 & P22 TRIP REFLASH 20 | STA POWER TRANSFORMER 1-1 SUDDEN PRESS 26 | STA POWER TRANSFORMER 1-2 SUDDEN PRESS 32 |
| VOLTAGE REGULATOR LIMITER OPERATION 3 | K-03 ANNUNCIATOR 0.5 AMP FUSE BLOWN 9 | GEN. FIELD GROUND/BRUSH FAILURE 15 | SEAL OIL BACKUP PUMP P-23, P-24 AUTO START 21 | TRANSFORMER DRAIN BASIN HI LEVEL 27 | SWITCHYARD 125 VDC AND 240 VAC TROUBLE 33 |
| SPARE 4 | GENERATOR VOLTAGE REG TRIP 10 | GEN. FIELD FORCING/OVER EXITATION 16 | SEAL OIL BACKUP P-23 OUT OF SERV OVERLOAD 22 | GEN ACB "CLOSE" CONT AT SWYD 28 | SWITCHYARD CRITICAL TROUBLE 34 |
| SPARE 5 | GENERATOR LOSS OF RELAY/REG POTENTIAL 11 | GENERATOR HI VOLTS/HERTZ 17 | SEAL OIL BACKUP P-24 OUT OF SERV OVERLOAD 23 | PILOT TROUBLE 29 | SWITCHYARD NONCRITICAL TROUBLE 35 |
| GENERATOR END IRON HI TEMP 6 | GENERATOR EXCITER TROUBLE 12 | TURBINE PANEL TROUBLE 18 | GENERATOR LO VAPOR EXTRACTOR C7 TRIP 24 | SWYD PWR PLT INTERPOSING CONTROL CKT UNDERVOLTAGE 30 | SWITCHYARD ACB TRIP 36 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 3
Revision 46
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TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR SCHEME **EK-05 (EC-11)**

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP 37 | PREFERRED AC BUS NO 1 TROUBLE 43 | DIESEL GEN BKR 152-107 TRIP 49 | DIESEL GEN BKR 152-213 TRIP 55 |
| MCC NO 7 BKR 52-1103 TRIP 38 | PREFERRED AC BUS NO 3 TROUBLE 44 | DIESEL GEN NO 1-1 FAIL TO START 50 | DIESEL GEN NO 1-2 FAIL TO START 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP 39 | PREFERRED AC BUS NO 2 TROUBLE 45 | DIESEL GEN NO 1-1 TROUBLE 51 | DIESEL GEN NO 1-2 TROUBLE 57 |
| MCC NO 8 BKR 52-1201 TRIP 40 | PREFERRED AC BUS NO 4 TROUBLE 46 | DIESEL GEN NO 1-1 START SIGNAL BLOCKED 52 | DIESEL GEN NO 1-2 START SIGNAL BLOCKED 58 |
| BATTERY CHARGERS TROUBLE 3 41 | 125 V DC BUS GROUND 47 | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD 6 53 | DIESEL OIL STORAGE TANK T-10 LOW LEVEL 59 |
| ANNUNCIATOR DC FAILURE 7 42 | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE 48 | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL 54 | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL 60 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 21
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FOR DRILL USE ONLY TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

RACK A

RACK B

| | | | | | | | |
|---|---|-------------------------------------|-------------------------------------|--|--|--|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP ✓ 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP ✓ 1 | LO PRESSURE SG1 CHANNEL TRIP ✓ 2 | LO PRESSURE SG2 CHANNEL TRIP ✓ 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP ✓ 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP ✓ 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP ✓ 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP ✓ 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |

RACK C

RACK D

| | | | | | | | |
|---|-----------------------------------|-----------------------------------|---|------------------------------------|--|--|--|
| TM/LO PRESSURE CHANNEL TRIP ✓ 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED ✓ 2 | NUCLEAR-AT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A ✓ 3 | NUCLEAR-AT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B ✓ 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP ✓ 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD ✓ 7 | LO NEUTRON DETECTOR VOLTAGE (CH 3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED ✓ 6 | NUCLEAR-AT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C ✓ 7 | NUCLEAR-AT POWER DEVIATION T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D ✓ 8 |

PALEX 90
Message No 46

Time: 1408
Scenario Time: 0538

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions:

Message: Shutdown cooling system in service, cooling at 40°F/hour.

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

PALEX 90
Message No 47

Time: 1415
Scenario Time: 0545

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected:

Operators should ask the TSC/PRC for direction on which procedure to follow as EOP 9.0 actions are complete and EOP 2.0/EOP 8.0 actions are not applicable.

Date May 22, 1990

Message # 47

PALEX 90
Time 1415

Problem Time 0545

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 74 B 76 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 77 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 75 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B ON

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02

CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 86 gpm
Line Temp 60 F
Pumps P-55A ON P-55B ON P-55C OFF

Temp 60 F Pressure 20 psig Level 32 %

Volume Control Tank
PCP Control Bleedoff Pressure 20 psig

SDCS from PCS (R) 292 F

Shutdown Cooling System
SDCS to PCS (R) 80 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 240 psia

PCS Tave (R) Loop 1 (TR-0111) 515

Pressurizer Level (R) LRC-0101A 40 %

Pzr Htr Amps LCC 15 170

PORV PRV-1042B CLOSED PRV-1043B CLOSED

PCPs P-50A OFF P-50B ON

Reactor Power Level NI-01 15 NI-02 20 NI-03 1.00E-7 NI-04 1.00E-7

NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515

LRC-0101B 40 % LIA-0102A 40 %

LCC 16 170

Block Valve MOV-1042A OPEN MOV-1043A OPEN

P-50C OFF P-50D OFF

NI-05 0 NI-06 0 NI-07 0 NI-08 0

C-01

AFW System

AFW Pump P-8A ON P-8B OFF P-8C OFF

AFW Pump P-8B Steam Pressure 0 psig

AFW Pump Amps P-8A 70 P-8C 0 amps

AFW Disch Press P-8A & P-8B 1500 P-8C 0 psig

Secondary System

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED

MFP Suction Pressure 540 psig

Moisture Separator Drain Tank Level 48 %

Atmospheric Dump Valves CLOSED

Heater Drain Pump Status P-10A OFF P-10B OFF

MSIV's CV-0501 CLOSED CV-0510 CLOSED

MFP Discharge Pressure A 540 B 540 psi

Condenser Hotwell Level 64 %

Condenser Vacuum 0 in Hg.

Gland Seal Condenser Vacuum 0 in Hg.

Condensate Pump Status P-2A OFF P-2B ON

PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0

Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0

Stuck Rods NONE

Core Exit Thermocouple Temperature 289 F

GP5(P) 3.70 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 47

PALEX 90

Time 1415

Scenario Time 0545

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>62 %</u> | Condensate Storage Tank Level T-2 | <u>91 %</u> |
| Instrument Air Pressure | | | <u>105 psig</u> | | |
| Containment Building Pressure | <u>.20 psig</u> | Dome Temperature | <u>105 F</u> | Humidity | <u>10 %</u> |
| S/G A Compartment | | Temperature | <u>100 F</u> | Humidity | <u>15 %</u> |
| S/G B Compartment | | Temperature | <u>90 F</u> | Humidity | <u>15 %</u> |
| SIRW Tank Level | <u>94 %</u> | | | | |
| WR Containment Pressure (R) | <u>15 psia</u> | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>42</u> | B <u>51</u> | C <u>34</u> | D <u>55</u> | |
| SI Tank Pressure (psig) | A <u>200</u> | B <u>215</u> | C <u>210</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|--------------------|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>47 %</u> |
| Reactor Vessel DP | <u>1 psid</u> | |
| PORV Discharge Temperature | <u>100 F</u> | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>100</u> | RV-1040 <u>100</u> RV-1041 <u>100</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>750</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>43 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>292</u> | Loop 2 <u>295</u> |
| Subcooling | Temp <u>108</u> | F Press <u>184 psi</u> |
| PCS Pressure (R) | WR <u>240</u> | NR <u>240 psia</u> |
| | Steam Generator A | Steam Generator B |
| Level (WR) <u>65 %</u> | (NR) <u>63 %</u> | (WR) <u>-138 %</u> (NR) <u>0 %</u> |
| Press <u>50 psia</u> | | <u>10 psia</u> |
| Flow Steam <u>.10 PPH</u> | Feed <u>0 PPH</u> | Steam <u>0 PPH</u> Feed <u>0 PPH</u> |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|------------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>170</u> | From P-8C <u>0 gpm</u> |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0 gpm</u> |
| Condensator Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.40</u> P-50B <u>.40</u> | P-50C <u>.40</u> P-50D <u>.40</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>500</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>470</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|-------------------------------|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>2.90E-1</u> | RIA-1806 <u>2.90E-1</u> |
| | RIA-1807 <u>7.50E-1</u> | RIA-1808 <u>7.50E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.40E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.20E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm |
| | | RIA-2327 <u>2.00E-1</u> mr/hr |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: SAFEGUARD SAFETY INJECTION AND ISOLATION SCHEME **EK-13 (**EC-13)

| | | | | | | |
|--|--|---|--|--|--|---|
| SAFETY INJ BLOCK RELAY SI-1 37 | CONTAINMENT AIR COOLER VHX-1 DRY PAN HI LEVEL 43 | CONTAINMENT SUMP HI-HI LEVEL 49 | SIRW TANK T-58 HI-LO LEVEL 55 | CONTAINMENT HI PRESS 61 | ELEC ROOMS HIGH AMBIENT 67 | SV AND/OR PORV OPEN 73 |
| SAFETY INJ BLOCK RELAY SI-2 38 | CONTAINMENT AIR COOLER VHX-2 DRY PAN HI LEVEL 44 | CONTAINMENT SUMP HI-HI LEVEL 50 | SIRW TANK T-58 HI-LO LEVEL 56 | CONTAINMENT PRESSURE OFF NORMAL 62 | RADWASTE PANEL C40 OFF NORMAL 68 | LTOP PRE-TRIP 74 |
| SAFETY INJ BLOCKED 39 | CONTAINMENT AIR COOLER VHX-3 DRY PAN HI LEVEL 45 | CONTAINMENT SUMP HI LEVEL 51 | SIRW TANK T-58 1/2 TAKEN TWICE LO LEVEL 57 | CONTAINMENT HI RADIATION 63 | SAFETY INJECTION SIGNAL BLOCK PERMIT 69 | TURB PLANT SAMPLING PANEL C42 OFF NORMAL 75 |
| SAFETY INJ INITIATION SIGNAL "A" 40 | CONTAINMENT AIR COOLER VHX-4 DRY PAN HI LEVEL 46 | EAST SAFEGRDS RM SUMP HI LEVEL 52 | SIRW TANK T-58 HI-LO TEMP 58 | GASEOUS WASTE MONITORING HI RADIATION 64 | RADIATION MONITOR SAMPLERS FLOW FAILURE 70 | K-13 ANNUNCIATOR 0.5 AMP FUSE BLOWN 76 |
| SAFETY INJ INITIATION SIGNAL "B" 41 | CONTAINMENT AIR COOLERS SERV WATER LEAK 47 | WEST SAFEGRDS RM SUMP HI LEVEL 53 | SIRW TANK T-58 HI-LO TEMP 59 | PROCESS LIQ MONITORING HI RADIATION 65 | RADIATION MONITOR SYSTEM CKT FAILURE 71 | CONTAINMENT SPRAY VALVE OPEN 77 |
| SAFETY INJ INITIATED 42 | N ₂ HEADER LO PRESS 48 | TURBINE FLR SUMP HI LEVEL 54 | SIRW TANK CONT SUMP CONT POWER UNDERVOLTAGE 60 | PLANT AREA MONITORING HI RADIATION 66 | CONTMT ISO AND SAFETY INJ LEFT SIDE CONT CKT UV 72 | CONTMT ISO AND SAFETY INJ RIGHT SIDE CONT CKT UV 78 |

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PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE: PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|--|---|--|--|---|---|
| REGEN HT EX TUBE OUTLET HI TEMP 1 | VOLUME CONTROL TANK HI-LO PRESS 7 | CONC BORIC ACID TANK 53A HI-LO TEMP 13 | CONC BORIC ACID TANK 53B HI-LO TEMP 19 | BORIC ACID PUMPS P56A AND P56B TRIP 25 | QUENCH TANK HI TEMP 31 |
| RELIEF VALVE 2006 DISCH HI TEMP 2 | VOLUME CONTROL TANK HI-LO PRESS 8 | CONC BORIC ACID TANK 53A HI LEVEL 14 | CONC BORIC ACID TANK 53B HI LEVEL 20 | BORIC ACID PUMPS P56A AND P56B OVERLOAD 26 | QUENCH TANK HI PRESS 32 |
| LETDOWN HT EX TUBE OUTLET HI TEMP 3 | VOLUME CONTROL TANK HI-LO LEVEL 9 | CONC BORIC ACID TANK 53A LO LEVEL 15 | CONC BORIC ACID TANK 53B LO LEVEL 21 | CHARGING PUMPS P55A, P55B, P55C TRIP 27 | QUENCH TANK HI-LO LEVEL 33 |
| LETDOWN HT EX TUBE INLET HI- LO PRESS 4 | VOLUME CONTROL TANK LO-LO LEVEL 10 | CONC BORIC ACID TANK 53A LO-LO LEVEL 16 | CONC BORIC ACID TANK 53B LO-LO LEVEL 22 | CHARGING PUMP P55A OIL HI TEMP 28 | CHARGING PUMPS SEAL COOLING LO PRESS 34 |
| PRI LETDOWN FLO INDICATOR CONTROLLER HI FLOW 5 | PRI MAKEUP WATER FLOW OFF NORMAL 11 | CONC BORIC ACID FLOW OFF NORMAL 17 | CONC BORIC ACID TANK LO LEVEL 23 | BORIC ACID TANK HTRS CONTROL CKT FAILURES 29 | CHARGING LO FLOW 35 |
| LETDOWN HX COOLING EXCESS FLOW 6 | SHUTDOWN COOLING MOV OVERLOAD 12 | VOLUME CONTROL TANK MOV OVERLOAD 18 | BORIC ACID TANK MOV OVERLOAD 24 | BORIC ACID CRITICAL HEAT TRACE TEMP HI-LO 30 | BORIC ACID CRITICAL HEAT TRACE SYS TROUBLE 36 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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TITLE:

PRIMARY SYSTEM VOLUME LEVEL PRESSURE

SCHEME **EK-07 (**EC-12)

| | | | | | |
|---|--|--|--|--|--|
| PRESSURIZER SPRAY LINE 1B LO TEMP 37 | PRESSURIZER PWR OPERATED RELIEF VALVE DISCH HI TEMP 43 | "A" TM/LP SETPOINT LOW 49 | PRESSURIZER SAFETY INJ SIGNAL "A" LO-LO PRESS 55 | PRESSURIZER LEVEL HI-LO 61 | REACTOR VESSEL FLANGE INNER SEAL LEAKAGE 67 |
| PRESSURIZER SPRAY LINE 2A LO TEMP 38 | PRESSURIZER SAFETY VALVE RV 1039 DISCH HI TEMP 44 | "B" TM/LP SETPOINT LOW 50 | PRESSURIZER SAFETY INJ SIGNAL "B" LO-LO PRESS 56 | K-07 ANNUNCIATOR 0.5 AMP FUZE BLOWN 62 | REACTOR VESSEL FLANGE OUTER SEAL LEAKAGE 68 |
| PRESSURIZER SURGE LINE LO TEMP 39 | PRESSURIZER SAFETY VALVE RV 1040 DISCH HI TEMP 45 | "C" TM/LP SETPOINT LOW 51 | PRESSURIZER SAFETY INJ SIGNAL "C" LO-LO PRESS 57 | PRESSURIZER LEVEL CH "A" LO-LO 63 | PRESSURIZER LEVEL HIGH 69 |
| CHARGING PUMPS DISCHARGE LO PRESS 40 | PRESSURIZER SAFETY VALVE RV 1041 DISCH HI TEMP 46 | "D" TM/LP SETPOINT LOW 52 | PRESSURIZER SAFETY INJ SIGNAL "D" LO-LO PRESS 58 | PRESSURIZER LEVEL CH "B" LO-LO 64 | BORONOMETER LO FLOW 70 |
| PRESSURIZER HTR TRANSF #15 AND #16 BREAKERS TRIP 41 | AUX BUILDING RADIATION ZONE DOOR OPEN 47 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 53 | NO PCS PROTECTION CHANNEL A 59 | NO PCS PROTECTION CHANNEL B 65 | VOLUME CONTROL RAD MON HI RADIATION 71 |
| PRESSURIZER HTR BUS GROUND/ UNDERVOLTAGE 42 | REACTOR WATER LEVEL LOW 48 | PRESSURIZER PRESSURE OFF NORMAL HI-LO 54 | PRESSURIZER RELIEF MOV OVERLOAD 60 | LOOP 1 HOT LEG HI TEMP 66 | LOOP 2 HOT LEG HI TEMP 72 |

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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

| | | | | | |
|-------------------------------------|--|---|---|--|--|
| PRI COOLANT PUMP **P-50A TRIP 1 | PRI COOL'T PP **P-50A HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 7 | PRI COOLANT PUMP VIBRATION ALERT 13 | PRI COOLANT PUMP **P-50A REVERSE ROTATION 19 | PRI COOLANT PUMP **P-50A OIL LEVEL HI-LO 25 | PRI COOLANT PUMP **P-50A CLG WTR LO FLOW 31 |
| PRI COOLANT PUMP **P-50B TRIP 2 | PRI COOL'T PP **P-50B HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 8 | PRI COOLANT PUMP VIBRATION DANGER 14 | PRI COOLANT PUMP **P-50B REVERSE ROTATION 20 | PRI COOLANT PUMP **P-50B OIL LEVEL HI-LO 26 | PRI COOLANT PUMP **P-50B CLG WTR LO FLOW 32 |
| PRI COOLANT PUMP **P-50C TRIP 3 | PRI COOL'T PP **P-50C HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 9 | **K-09 ANNUNCIATOR 0.5 Amp FUSE BLOWN 15 | PRI COOLANT PUMP **P-50C REVERSE ROTATION 21 | PRI COOLANT PUMP **P-50C OIL LEVEL HI-LO 27 | PRI COOLANT PUMP **P-50C CLG WTR LO FLOW 33 |
| PRI COOLANT PUMP **P-50D TRIP 4 | PRI COOL'T PP **P-50D HI TEMP LOW L.O. FLOW OVERLOAD REFLASH 10 | CONTROL RODS OUT OF SEQUENCE 16 | PRI COOLANT PUMP **P-50D REVERSE ROTATION 22 | PRI COOLANT PUMP **P-50D OIL LEVEL HI-LO 28 | PRI COOLANT PUMP **P-50D CLG WTR LO FLOW 34 |
| SHUTDOWN ROD POSITION ABNORMAL 5 | ROD POSITION 4 INCHES DEVIATION 11 | ROD WITHDRAWAL PROHIBIT 17 | GROUP 1 PREPWR DEPENDENT INSERTION LIMIT 23 | GROUP 2 PREPWR DEPENDENT INSERTION LIMIT 29 | GROUP 3 PREPWR DEPENDENT INSERTION LIMIT 35 |
| AUTO ROD MOTION CONTINUOUS 6 | ROD POSITION 8 INCHES DEVIATION 12 | AUTO ROD WITHDRAWAL PROHIBIT 18 | GROUP 1 PWR DEPENDENT INSERTION LIMIT 24 | GROUP 2 PWR DEPENDENT INSERTION LIMIT 30 | GROUP 3 PWR DEPENDENT INSERTION LIMIT 36 |

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 5
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TITLE: PRIMARY COOLANT PUMP STEAM GENERATOR AND ROD DRIVES SCHEME **EK-09 (**EC-12)

FOR DRILL USE ONLY

| | | | | | |
|--|---|--|--|--|---|
| PRI COOLANT PUMP **P-50A BACKSTOP OIL LOW FLOW 37 | PRI COOLANT PUMP **P-50A SEAL LEAKAGE FLOW LOW 43 | PRI COOLANT PUMP **P-50A SEAL PRESS OFF NORMAL 49 | PRI COOLANT PUMP **P-50A SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 55 | STEAM GEN **E-50A HI LEVEL 61 | LOOP 1 LOOP 2 T _{av} DEVIATION 67 |
| PRI COOLANT PUMP **P-50B BACKSTOP OIL LOW FLOW 38 | PRI COOLANT PUMP **P-50B SEAL LEAK-AGE FLOW LOW 44 | PRI COOLANT PUMP **P-50B SEAL PRESS OFF NORMAL 50 | PRI COOLANT PUMP **P-50B SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 56 | STEAM GEN **E-50A LO LEVEL 62 | NO 1 REACTOR REGULATOR GROSS DEVIATION 68 |
| PRI COOLANT PUMP **P-50C BACKSTOP OIL LOW FLOW 39 | PRI COOLANT PUMP **P-50C SEAL LEAK-AGE FLOW LOW 45 | PRI COOLANT PUMP **P-50C SEAL PRESS OFF NORMAL 51 | PRI COOLANT PUMP **P-50C SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 57 | STEAM GEN **E-50B HI LEVEL 63 | NO 2 REACTOR REGULATOR GROSS DEVIATION 69 |
| PRI COOLANT PUMP **P-50D BACKSTOP OIL LOW FLOW 40 | PRI COOLANT PUMP **P-50D SEAL LEAKAGE FLOW LOW 46 | PRI COOLANT PUMP **P-50D SEAL PRESS OFF NORMAL 52 | PRI COOLANT PUMP **P-50D SEAL HEAT EX HI TEMP LEAK-AGE HI FLOW 58 | STEAM GEN **E-50B LO LEVEL 64 | STEAM GEN VALVES ISOLATION LOCKOUT 70 |
| GROUP 4 PWR DEPEND-ENT INSERTION LIMIT 41 | EMERGENCY ROD DRIVE POWER INTERRUPT 47 | PRI COOLANT PUMP DC LIFT PUMPS OVERLOAD 53 | PRI COOLANT PUMPS CONT BLEED OFF HDR HIGH PRESS 59 | STEAM GEN LO PRESS CONT UNDERVLTGE 65 | SECONDARY DATA PROCESSOR ABNORMAL 71 |
| GROUP 4 PWR DEPEND-ENT INSERTION LIMIT 42 | DROPPED ROD 48 | ROD DRIVE SEAL LEAK OFF HI TEMP 54 | PRI COOLANT PUMPS CONT BLEED OFF HDR HI-HI PRESS 60 | MAIN STREAM ISOLATION VALVE UNDERVLTGE REFLASH 66 | REACTOR TRIP 72 |






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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 1
Revision 39
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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|--|---|---|--|--|
| TURBINE TRIP  1 | TURBINE NO LOAD TRIP  7 | EH SYSTEM LOW-LOW LEVEL TRIP 13 | EH SYSTEM BACKUP PUMPS P19A AND P19B AUTO START REFLASH 19 | TURBINE GEN OIL PUMPS P26, P27 AUTO START  REFLASH 25 | TURBINE LO RES VAPOR EXT C5 TRIP 31 |
| TURBINE OVERSPEED TRIP 2 | BEARING OIL PRESSURE PRETRIP 8 | EH FLUID HIGH-LOW LEVEL 14 | EH PUMP P19A AND/OR P19B OUT OF SERV OVERLOAD REFLASH 20 | EMERG BRG OIL PUMP P27 OUT OF SERV OVERLOAD 26 | TURBINE GEN LO RES HIGH-LOW LEVEL 32 |
| TURBINE ROTOR ECCENTRICITY POSITION 3 | THRUST BEARING PRETRIP 9 | EH SYSTEM HIGH TEMP/PRESS REFLASH 15 | EH SYSTEM FILTER HIGH ΔP 21 | TURNING GEAR OIL PUMP P26 OUT OF SERV OVERLOAD 27 | A OR B FW COALESCER HIGH D/P 33 |
| TURBINE DIFF EXPANSION ROTOR LONG/SHORT 4 | VACUUM PRETRIP  10 | EH SYSTEM RETURN HIGH PRESS 16 | EXHAUST HOOD HIGH TEMP 250° 22 | TURBINE SHAFT AT REST 28 | TURBINE/GEN LIFT PUMP LOW DISCHARGE PRESSURE 34 |
| TURBINE HIGH VIBRATION 5 | VACUUM LOW  11 | TURBINE GEN BEARING HIGH TEMP 17 | TURBINE PROT AND BLEEDER TRIP CKTS UNDERVOLTAGE REFLASH 23 | K0 - 1 ANNUNCIATOR 1/2 AMP FUSE BLOWN 29 | TURBINE/GEN LIFT PUMP TROUBLE 35 |
| EXHAUST HOOD HIGH TEMP 175° 6 | RELATCH TURBINE AND VACCUM 12 | TURBINE GEN LUBE OIL HIGH TEMP 18 | GLAND SEAL CONDENSER E19 LOW VACUUM 24 | STEAM AND FEEDWATER PENETRATION HIGH TEMP 30 | DIRTY AND/OR CLEAN OIL STORAGE TANK HIGH LEVEL 36 |













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**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

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TITLE: TURBINE CONDENSER AND FEEDWATER

SCHEME K01 (C11)

| | | | | | |
|--|---|--|---|--|---|
| AFAS FOGG SUBSYSTEM TRIP  REFLASH 37 | FW PUMP P1A TURBINE K7A TRIP  REFLASH 43 | FW PUMP P1B TURBINE K7B TRIP  REFLASH 49 | CONDENSATE PUMP TRIP REFLASH 55 | HOT WELL HI LO LEVEL REFLASH 61 | FEEDWATER HEATERS HI HI LEVEL REFLASH 67 |
| AFAS-FOGG SUBSYSTEM BYPASSED REFLASH 38 | FW PUMP P1A TURBINE K7A LOW VACUUM  REFLASH 44 | FW PUMP P1B TURBINE K7B LOW VACUUM  REFLASH 50 | CONDENSATE PUMP P2A HIGH TEMP OR OL REFLASH 56 | CONDENSATE PUMP P2B HIGH TEMP OR OL REFLASH 62 | FEEDWATER HEATERS HI LEVEL REFLASH 68 |
| AUX FEEDWATER PUMP TRIP REFLASH 39 | FW PUMP P1A TURBINE K7A HIGH VIBRATION/THRUST REFLASH 45 | FW PUMP P1B TURBINE K7B HIGH VIBRATION/THRUST REFLASH 51 | CONDENSATE PUMP P2A DISCHARGE LOW PRESS  REFLASH 57 | CONDENSATE PUMP P2B DISCHARGE LOW PRESS REFLASH 63 | FEEDWATER HEATER LO LEVEL REFLASH 69 |
| AUX FEEDWATER LOW SUCTION PRESSURE REFLASH 40 | FW PUMPS LO SUCTION PRESS CHANNEL TRIP REFLASH 46 | TURBINE GEN LO FILTER COALESCER HIGH D/P REFLASH 52 | FW TURBINE K7A OIL SYSTEM TROUBLE  REFLASH 58 | FW TURBINE K7A AND/OR K7B REVERSE ROTATION REFLASH 64 | HEATER DRAIN PUMPS P10A OR P10B TRIP REFLASH 70 |
| SG ISOL ISOL VLV CLOSED REFLASH 41 | FW PUMP P1A TURBINE K7A BEARING HIGH TEMP REFLASH 47 | FW PUMP P1B TURBINE K7B BEARING HIGH TEMP REFLASH 53 | FW TURBINE K7B OIL SYSTEM TROUBLE  REFLASH 59 | REHEATER DRAIN TANKS A AND T4B HIGH LEVEL REFLASH 65 | CONDENSATE PUMP ROOM FLOODING REFLASH 71 |
| FEED PP TURB DRAIN TANKS HI LEVEL REFLASH 42 | FW PUMP P1A LOW SUCTION FLOW/ DISCH PRESS  REFLASH 48 | FW PUMP P1B LOW SUCTION FLOW/ DISCH PRESS  REFLASH 54 | FW PUMPS LOW FLOW/ DISCH PRESS  REFLASH 60 | MAIN STEAM ISO VALVE ACCUMULATOR LOW PRESS  REFLASH 66 | MOIST SEP DRAIN TANK HIGH-LOW LEVEL REFLASH 72 |

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

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FOR DRILL USE ONLY TITLE: AUXILIARY FEEDWATER SYSTEM STATUS ARRAYS

| | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------------|-------------------------------|
| SG E-50A LVL SNSR CHAN TRIP | SG E-50B LVL SNSR CHNL TRIP | FOGG A SNSR CHNL TRIP | FOGG B SNSR CHNL TRIP | AFAS ACTUATION CHNL TRIP | FOGG A ACTUATION CHNL TRIP | FOGG B ACTUATION CHNL TRIP | AFAS-FOGG SNSR CHNL LOP | AFAS-FOGG AUTO TEST FAILURE | AFAS-FOGG ACT CHNL LOP |
| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 |
| SG E-50A LVL SNSR CHNL BYP | SG E-50B LVL SNSR CHNL BYP | FOGG A SNSR CHNL BYPASSED | FOGG B SNSR CHNL BYPASSED | AFAS ACTUATION CHNL BLKD | FOGG A ACTUATION CHNL BLKD | FOGG B ACTUATION CHNL BLKD | SPARE | AFAS-FOGG TEST BLK INITIATED | AFW BYPASS VALVE OPEN |
| 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 |
| SG E-50A ISOLATED | SG E-50B ISOLATED | SG ISOL VLV CLOSED | P-8A TRIPPED | P-8A FAILED TO AUTO START | P-8C TRIPPED | P-8C FAILED TO AUTO START | P-8A/B LO SUCTION TRIPPED | P-8C LO SUCTION TRIPPED | ISOL VLV HS IN OPEN POS |
| 3-1 | 3-2 | 3-3 | 3-4 | 3-5 | 3-6 | 3-7 | 3-8 | 3-9 | 3-10 |

AUX FW SYSTEM STATUS ARRAY "A"

| | | |
|-------------------------------------|-------------------------------------|---------------------------------|
| AUTO START TEST PUMP P-8A | AUTO START TEST PUMP P-8B | IN TEST CV-0727 & CV-0749 |
| 1-1 | 1-2 | 1-3 |
| AUX RELAY PWR AVAIL PUMP P-8A | AUX RELAY PWR AVAIL PUMP P-8B | SPARE |
| 2-1 | 2-2 | 2-3 |

AUX FW SYSTEM
STATUS ARRAY "B"

| | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| AUTO START TEST PUMP P-8C | IN TEST CV-0736A & CV-0736B | AUX RELAY PWR AVAIL PUMP P-8C |
| 1-1 | 1-2 | 1-3 |

AUX FW SYSTEM
STATUS ARRAY "C"

PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE

Proc No ARP 3
Revision 46
Page 2 of 20

FOR DRILL USE ONLY

TITLE: ELECTRICAL AUXILIARIES AND DIESEL GENERATOR

SCHEME **EK-05 (**EC-11)

| | | | |
|---|---|--|--|
| MCC 1/MCC 21-23/25 BKR 52-1906 BKR 52-1112 BKR-52-1901 TRIP | PREFERRED AC BUS NO 1 TROUBLE | DIESEL GEN BKR 152-107 TRIP | DIESEL GEN BKR 152-213 TRIP |
| 37 | 43 | 49 | 55 |
| MCC NO 7 BKR 52-1103 TRIP | PREFERRED AC BUS NO 3 TROUBLE | DIESEL GEN NO 1-1 FAIL TO START | DIESEL GEN NO 1-2 FAIL TO START |
| 38 | 44 | 50 | 56 |
| MCC 2/MCC 22-24/26 BKR 52-2006 BKR 52-1214 BKR 52-2001 TRIP | PREFERRED AC BUS NO 2 TROUBLE | DIESEL GEN NO 1-1 TROUBLE | DIESEL GEN NO 1-2 TROUBLE |
| 39 | 45 | 51 | 57 |
| MCC NO 8 BKR 52-1201 TRIP | PREFERRED AC BUS NO 4 TROUBLE | DIESEL GEN NO 1-1 START SIGNAL BLOCKED | DIESEL GEN NO 1-2 START SIGNAL BLOCKED |
| 40 | 46 | 52 | 58 |
| BATTERY CHARGERS TROUBLE | 125 V DC BUS GROUND | DIESEL GENERATORS 1-1 AND 1-2 OVERLOAD | DIESEL OIL STORAGE TANK T-10 LOW LEVEL |
| 3 | 41 | 6 | 53 |
| ANNUNCIATOR DC FAILURE | 125 V D-C BUS UNDERVOLTAGE/ TROUBLE | DIESEL GEN DAY TANK T-25A HIGH- LOW LEVEL | DIESEL GEN DAY TANK T-25B HIGH- LOW LEVEL |
| 7 | 42 | 48 | 54 |
| | | | 59 |
| | | | 60 |

701-68-0-N02

**PALISADES NUCLEAR PLANT
ALARM AND RESPONSE PROCEDURE**

Proc No ARP 21
Revision 39
Page 1 of 20

FOR DRILL USE ONLY

TITLE: REACTOR PROTECTIVE SYSTEM SCHEME **EK-06 (**EC-06)

| RACK A | | | | RACK B | | | |
|---|---|-----------------------------------|--|-------------------------------------|---|---|---|
| VARIABLE HIGH POWER LEVEL CHANNEL TRIP 1 | HIGH POWER RATE CHANNEL TRIP 2 | LOW FLOW CHANNEL TRIP 3 | LOW LEVEL SG1 CHANNEL TRIP 4 | LOW LEVEL SG2 CHANNEL TRIP 1 | LO PRESSURE SG1 CHANNEL TRIP 2 | LO PRESSURE SG2 CHANNEL TRIP 3 | HI PRESSURE PRESSURIZER CHANNEL TRIP 4 |
| VARIABLE HIGH POWER LEVEL CHANNEL PRE-TRIP 5 | HIGH POWER RATE CHANNEL PRE-TRIP/ASI 6 | LOW FLOW CHANNEL PRE-TRIP 7 | LOW LEVEL SG1 CHANNEL PRE-TRIP 8 | LOW LEVEL SG2 CHANNEL PRE-TRIP 5 | LO PRESSURE SG1 CHANNEL PRE-TRIP 6 | LO PRESSURE SG2 CHANNEL PRE-TRIP 7 | HI PRESSURE PRESSURIZER CHANNEL PRE-TRIP 8 |
| RACK C | | | | RACK D | | | |
| TM/LO PRESSURE CHANNEL TRIP 1 | LOSS OF LOAD CHANNEL TRIP 2 | CHANNEL DEVIATION LEVEL 1 5% 3 | CHANNEL DEVIATION LEVEL 2 10% 4 | ZERO POWER MODE BYPASS 1 | LOSS OF LOAD TRIP CHANNEL BYPASSED 2 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL A 3 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF NORMAL/CALCULATOR TROUBLE CHANNEL B 4 |
| TM/LO PRESSURE CHANNEL PRE-TRIP 5 | CONTAINMENT HI PRESSURE TRIP 6 | DROPPED ROD 7 | LO NEUTRON DETECTOR VOLTAGE (3-8) 8 | PANEL C06 VENTILATION HI TEMP 5 | RATE TRIP CHANNEL ENABLED 6 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL C 7 | NUCLEAR-ΔT POWER DEVIATION/T-INLET OFF-NORMAL/CALCULATOR TROUBLE CHANNEL D 8 |

PALEX 90
Message No 48

Time: 1430
Scenario Time: 0600

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Operators

Simulated Plant Conditions: See data and alarm sheets.

Message:

FOR CONTROLLER USE ONLY

Controller Notes:

Action Expected: Continue per TSC/PRC direction.

Date May 22, 1990

Message # 48

PALEX 90
Time 1430

Problem Time 0600

C-08

SW Pumps P-7A ON P-7B ON P-7C ON
CCW Pumps P-52A ON P-52B ON P-52C OFF
Fire Pumps P-9A OFF P-9B OFF P-41 OFF

SW Critical Hdr Press A 75 B 76 psig
FPC Pumps P-51A ON P-51B OFF

V1A ON V2A ON V3A ON V4A ON

Containment Cooler Recirc Fans
V1B ON V2B ON V3B ON V4B ON

C-03

CCW Cooler Outlet Temp A 92 F
Containment Spray Pumps P-54A OFF
HPSI Pumps P-66A OFF P-66B OFF

B 90 F
P-54B OFF P-54C OFF
LPSI Pumps P-67A OFF P-67B ON

Safety Injection Suction Supply

Train A
CV-3057 (SIRW) OPEN CV-3029 (Sump) CLOSED

Train B
CV-3031 (SIRW) OPEN CV-3030 (Sump) CLOSED

C-02
CVCS

Letdown

Intermediate Press Letdown Temp 100 F
Letdown Line Temp 70 F
Letdown Flow 0 gpm

Charging

Flow 33 gpm
Line Temp 60 F
Pumps P-55A ON P-55B OFF P-55C OFF

Temp 60 F Pressure 20 psi Level 32 %

Volume Control Tank
PCP Control Bleedoff Pressure 20 psig

SDCS from PCS (R) 290 F

Shutdown Cooling System
SDCS to PCS (R) 260 F

Temp 102 F Pressure 4 psig

Quench Tank Level 76 %

Primary Coolant System

Pressurizer Pressure (R) 250 psia
PCS Tave (R) Loop 1 (TR-0111) 515
Pressurizer Level (R) LRC-0101A 42 %
Pzr Htr Amps LCC 15 0
PORV PRV-1042B CLOSED PRV-1043B CLOSED
PCPs P-50A OFF P-50B ON
Reactor Power Level NI-01 15 NI-02 20 NI-03 1.00E-7 NI-04 1.00E-7
NI-05 0 NI-06 0 NI-07 0 NI-08 0

Loop 2 (TR-0121) 515
LRC-0101B 42 % LIA-0102A 40 %
LCC 16 0
Block Valve MOV-1042A OPEN MOV-1043A OPEN
P-50C OFF P-50D OFF

C-01

AFW Pump P-8A ON P-8B OFF P-8C OFF
AFW Pump P-8B Steam Pressure 0 psig

AFW System
AFW Pump Amps P-8A 70 P-8C 0 amps
AFW Disch Press P-8A & P-8B 1500 P-8C 0 psig

MSIV Bypass MOV-0501 CLOSED MOV-0510 CLOSED
MFP Suction Pressure 550 psig
Moisture Separator Drain Tank Level 48 %
Atmospheric Dump Valves CLOSED
Heater Drain Pump Status P-10A OFF P-10B OFF

Secondary System
MSIV's CV-0501 CLOSED CV-0510 CLOSED
MFP Discharge Pressure A 540 B 540 psi
Condenser Hotwell Level 64 %
Condenser Vacuum 0 in Hg.
Gland Seal Condenser Vacuum 0 in Hg.
Condensate Pump Status P-2A OFF P-2B ON
PIP

(Demand Log + Constant, Rod, or Flux/Temp)

Gross MW 0 Net MW 0
Control Rod Position GP1 0 GP2 0 GP3 0 GP4 0
Stuck Rods NONE

Core Exit Thermocouple Temperature 290 F
GP5(P) 3.70 GP6(A) 0 GP7(B) 0

Date May 22, 1990

Message # 48

PALEX 90

Time 1430

Scenario Time 0600

C-13

| | | | | | |
|-------------------------------|-----------------|-----------------------------|-----------------|-----------------------------------|-------------|
| T-81 Level | <u>92 %</u> | T-939 Level | <u>61 %</u> | Condensate Storage Tank Level T-2 | <u>96 %</u> |
| Instrument Air Pressure | <u>100</u> psig | | | | |
| Containment Building Pressure | <u>.20</u> psig | Dome Temperature | <u>100</u> F | Humidity | <u>15 %</u> |
| S/G A Compartment | | Temperature | <u>95</u> F | Humidity | <u>15 %</u> |
| S/G B Compartment | | Temperature | <u>90</u> F | Humidity | <u>15 %</u> |
| SIRW Tank Level | <u>96 %</u> | | | | |
| WR Containment Pressure (R) | <u>15</u> psia | | | | |
| Containment Sump Level | <u>0 %</u> | Containment Water Level (R) | <u>590.40 %</u> | | |
| SI Tank Level (%) | A <u>42</u> | B <u>51</u> | C <u>34</u> | D <u>56</u> | |
| SI Tank Pressure (psig) | A <u>200</u> | B <u>215</u> | C <u>210</u> | D <u>215</u> | |

Panel K-13

SIAS Alarm NO Containment High Pressure Alarm NO Containment High Radiation Alarm NO

C-12

| | | |
|-------------------------------------|---|--|
| Concentrated Boric Acid Tank Levels | T53A <u>57 %</u> | T53B <u>47 %</u> |
| Reactor Vessel DP | <u>1</u> psid | |
| PORV Discharge Temperature | <u>100</u> F | |
| Pzr Safety Valve Discharge Temp (F) | RV-1039 <u>100</u> | RV-1040 <u>100</u> RV-1041 <u>100</u> |
| PCP Current (Amps) | P-50A <u>0</u> | P-50B <u>750</u> P-50C <u>0</u> P-50D <u>0</u> |
| PCS Flow | <u>22 %</u> | Pressurizer Level (cold) <u>47 %</u> |
| Loop Thot (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Loop Tcold (F) | Loop 1 <u>515</u> | Loop 2 <u>515</u> |
| Tcold Wide range | Loop 1 <u>290</u> | Loop 2 <u>290</u> |
| Subcooling | Temp <u>108</u> | F Press <u>184</u> psi |
| PCS Pressure (R) | WR <u>250</u> | NR <u>250</u> psia |
| | Steam Generator A | Steam Generator B |
| Level (WR) <u>75 %</u> | (NR) <u>73 %</u> | (WR) <u>-138 %</u> (NR) <u>0 %</u> |
| Press | <u>60</u> psia | <u>10</u> psia |
| Flow | Steam <u>.10</u> PPH Feed <u>0</u> PPH | Steam <u>0</u> PPH Feed <u>0</u> PPH |

Note: Steam and Feed Flow X 1000000

C-11

| | | |
|-----------------------|-----------------------------------|-----------------------------------|
| AFW Flow to A S/G | From P-8A&B <u>170</u> | From P-8C <u>0</u> gpm |
| AFW Flow to B S/G | From P-8A&B <u>0</u> | From P-8C <u>0</u> gpm |
| Condensor Vacuum (R) | <u>0</u> | |
| PCP Seal Leakoff Flow | P-50A <u>.40</u> P-50B <u>.40</u> | P-50C <u>.40</u> P-50D <u>.40</u> |

C-04

| | | |
|----------------------------|---------------------|------------------|
| Diesel Generator Frequency | 1-1 <u>60.50</u> | 1-2 <u>60.50</u> |
| 1-C BUS | Voltage <u>2450</u> | Amps <u>480</u> |
| 1-D BUS | Voltage <u>2450</u> | Amps <u>300</u> |

C-11 Back C-11A

| | | |
|--|-----------------------------|--|
| Containment Area Monitors (R/Hr) | RIA-1805 <u>2.80E-1</u> | RIA-1806 <u>2.80E-1</u> |
| | RIA-1807 <u>7.40E-1</u> | RIA-1808 <u>7.40E-1</u> |
| High Range Containment Monitors (R/Hr) | RIA-2321 <u>1.40E+0</u> | RIA-2322 <u><1</u> |
| Containment Hydrogen Concentration (%) | AI-2401R <u>0</u> | AI-2401L <u>0</u> |
| Main Steam Line Gamma (cpm) | RIA-2324 <u>1.20E+2</u> | RIA-2323 <u>OFFSCALE</u> |
| Stack Monitors | RIA-2325 <u>1.50E+3</u> cpm | RIA-2326 <u>1.50E+2</u> cpm RIA-2327 <u>2.00E-1</u> mr/hr |

PALEX 90
Message No 49

Time: 1430+
Scenario Time: 1600+

PALISADES NUCLEAR PLANT

EMERGENCY PREPAREDNESS EXERCISE MESSAGE FORM

Message for: Actual Control Room Operators

Simulated Plant Conditions:

Message:

Announce over the plant public address system: "Attention all personnel. The annual emergency exercise has been terminated. All drill participants may return to normal duties unless instructed otherwise."

FOR CONTROLLER USE ONLY

Controller Notes:

Deliver this message when deemed appropriate. Management and support personnel involved in recovery will continue to participate until recovery plan outlines have been completed. Lead controllers shall complete facility critiques as soon as practicable after the exercise is terminated. Release personnel upon receipt of comments/completion of critiques.

Action Expected:

Time 0800Problem Time -0030Message # 1 140C-13

Condensate Storage Tank Level T-2 82 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 107 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 49 B 51 C 47 D 56
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 100 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 615
 P-50C 622 P-50D 600
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 586F
 Loop 2 586F
 (2) Tcold (F) Loop 1A 533F
 Loop 2A 535F
 Loop 1B 533F
 Loop 2B 535F
 (5) Subcooling 53.10F ___ PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 690 psia
 S/G A STM FLW(R) 5.60 X10**6 PPH
 S/G A FD FLW (R) 5.60 X10**6 PPH
 (30) S/G B LEVEL WR 63 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 700 psia
 S/G B STM FLW(R) 5.40 X10**6 PPH
 S/G B FD FLW (R) 5.35 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0800

Problem Time -0030

Message # 1

141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 840 psig
MFP B Discharge Pressure 820 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 26.60 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA

FROM P8A,B 0 From P-8C 0 gpm

(31) AFW FLOW TO SGB

FROM P-8A&B 0 From P-8C 0 gpm

Condensor Vacuum (R) 26.60 IN.HG.

PCP A Leak-off Flow (R) ___ GPM

PCP B Leak-off Flow (R) ___ GPM

PCP C Leak-off Flow (R) ___ GPM

PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors

RIA-1805 4.00E-2 R/Hr

RIA-1806 2.00E-2 R/Hr

RIA-1807 2.50E-2 R/Hr

RIA-1808 2.00E-2 R/Hr

(17) High Range Containment Monitors

RIA-2321 ___ R/Hr

RIA-2322 ___ R/Hr

(19) Containment Hydrogen Concentration

AI-2401R ___ (%)

AI-2401L ___ (%)

(30) Main Steam Line Gamma

RIA-2324 2.50E+1 CPM

RIA-2323 2.50E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0800

Problem Time -0030

Message # 1

142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
P-54A OFF P-54B OFF P-54C OFF

(27) HPSIA, LPSIA, SPRAY A SUCTION
CV-3057(SIRWT) CV-3029(SUMP)
OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
CV-3031(SIRW) CV-3030(Sump)
OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 105 F
(10) VCT Pressure 33 psi
(10) VCT Level 78 %
PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 40 gpm
(26) Charging Flow 38 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 3.50 psig
(9) QUENCH TANK Level 68 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 44 %
LT0103 46 %
(12) PORV PRV-1042B ___ 1043B
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
CHARGING PUMPS
P55A ON P55B OFF P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
PZR HTR AMPS LC15 153 LCC 16 153
(1) PCS TAVE (R) LOOP1(TR-0111) 561 F
LOOP2(TR-0121) 561 F
(25) REACTOR POWER LEVEL
NI1 1 cps NI3 85 % NI7 ___ %
NI2 1 cps NI4 100 % NI8 ___ %
NI-05 97 % NI-09 ___ %
NI-06 99 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 131 GP2 131 GP3 131 GP4 131
GP6(A) 131 GP7(B) 131
Stuck Rods NONE # _____
Core Exit Temp 593.60 F

Time 0845Problem Time 0015Message # 6

140

C-13

Condensate Storage Tank Level T-2 82 %
 Instrument Air Pressure psig
 (15) Containment Building Pressure psig
 (16) S/G A Compartment Temperature F
 S/G A COMPARTMENT Humidity %
 (16) S/G B Compartment Temperature F
 S/G B Humidity %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) %
 (22) SI Tank Level (%)
 A 50 B 50 C 47 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 100 %
 Reactor Vessel DP psid
 (12) PORV Discharge Temperature F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 F
 RV-1040 F
 RV-1041 F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 610
 P-50C 620 P-50D 600
 (6) PCS Flow %
 (3) Thot (F) Loop 1 586F
 Loop 2 587F
 (2) Tcold (F) Loop 1A 535F
 Loop 2A 535F
 Loop 1B 535F
 Loop 2B 535F
 (5) Subcooling 53F PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) %
 (30) S/G A PRESS 710 psia
 S/G A STM FLW(R) 5.40 X10**6 PPH
 S/G A FD FLW (R) 5.40 X10**6 PPH
 (30) S/G B LEVEL WR 65 %
 (30) S/G B LEVEL (R) %
 (30) S/G B PRESS 710 psia
 S/G B STM FLW(R) 5.30 X10**6 PPH
 S/G B FD FLW (R) 5.30 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0845 Problem Time 0015 Message # 6 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 840 psig
MFP B Discharge Pressure 820 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP PB-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 26.80 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 26.60 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 6.50E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0845 Problem Time 0015 Message # 6 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEH CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEH CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 95 F
(10) VCT Pressure 36 psi
(10) VCT Level 82 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 52 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 3.70 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 45 %
 LT0103 47 %
(12) PORV PRV-1042B _____ 1043B _____
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 561 F
 LOOP2(TR-0121) 561 F
(25) REACTOR POWER LEVEL
N11 1 cps N13 80 % N17 ___ %
N12 1 cps N14 100 % N18 ___ %
 NI-05 96 % NI-09 ___ %
 NI-06 98 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 131 GP2 131 GP3 131 GP4 131
GP6(A) 131 GP7(B) 131
Stuck Rods NONE
Core Exit Temp 585 F

Time 0900Problem Time 0030Message # 9

140

C-13

Condensate Storage Tank Level T-2 82 %
 Instrument Air Pressure _____ psig
 (15) Containment Building Pressure _____ psig
 (16) S/G A Compartment Temperature _____ F
 S/G A COMPARTMENT Humidity _____ %
 (16) S/G B Compartment Temperature _____ F
 S/G B Humidity _____ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) _____ %
 (22) SI Tank Level (%)
 A 50 B 51 C 47 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 100 %
 Reactor Vessel DP _____ psid
 (12) PORV Discharge Temperature _____ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 _____ F
 RV-1040 _____ F
 RV-1041 _____ F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 610
 P-50C 620 P-50D 600
 (6) PCS Flow _____ %
 (3) Thot (F) Loop 1 582F
 Loop 2 582F
 (2) Tcold (F) Loop 1A 533F
 Loop 2A 534F
 Loop 1B 533F
 Loop 2B 534F
 (5) Subcooling 58.10F _____ PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) _____ %
 (30) S/G A PRESS 730 psia
 S/G A STM FLW(R) 5 X10**6 PPH
 S/G A FD FLW (R) 5 X10**6 PPH
 (30) S/G B LEVEL WR 64 %
 (30) S/G B LEVEL (R) _____ %
 (30) S/G B PRESS 730 psia
 S/G B STM FLW(R) 4.90 X10**6 PPH
 S/G B FD FLW (R) 4.90 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0900 Problem Time 0030 Message # 9 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 870 psig
MFP B Discharge Pressure 860 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P-8B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 64 %
Condensor Vacuum 26.80 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 26.70 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0900 Problem Time 0030 Message # 9 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031(SIRW) CV-3030(Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 102 F
(10) VCT Pressure 34 psi
(10) VCT Level 80 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 86 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 3.70 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 45 %
 LT0103 47 %
(12) PORV PRV-1042B 1043B
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 153 LCC 16 153
(1) PCS TAVE (R) LOOP1(TR-0111) 558 F
 LOOP2(TR-0121) 558 F
(25) REACTOR POWER LEVEL
NI1 1 cps NI3 85 % NI7 ___ %
NI2 1 cps NI4 100 % NI8 ___ %
 NI-05 87 % NI-09 ___ %
 NI-06 89 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 131 GP2 131 GP3 131 GP4 106
GP6(A) 131 GP7(B) 131
Stuck Rods NONE
Core Exit Temp 580 F

Time 0915

Problem Time 0045

Message # 11

140

C-13

Condensate Storage Tank Level T-2 82 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 50 B 50 C 46 D 56
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 100 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 610
 P-50C 620 P-50D 600
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 577F
 Loop 2 577F
 (2) Tcold (F) Loop 1A 533F
 Loop 2A 533F
 Loop 1B 533F
 Loop 2B 533F
 (5) Subcooling 62.60F ___ PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 750 psia
 S/G A STM FLW(R) 4.60 X10**6 PPH
 S/G A FD FLW (R) 4.60 X10**6 PPH
 (30) S/G B LEVEL WR 65 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 760 psia
 S/G B STM FLW(R) 4.40 X10**6 PPH
 S/G B FD FLW (R) 4.40 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

Time 0915 Problem Time 0045 Message # 11 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 900 psig
MFP B Discharge Pressure 890 psig
AFW Pump P-3C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-3A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 67 %
Condensor Vacuum 26.90 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 26.80 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
2. SURVEILLANCE DUE/PROGRESS
3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0915 Problem Time 0045 Message # 11 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from FCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 105 F
(10) VCT Pressure 30 psi
(10) VCT Level 74 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 86 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 3.70 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 45 %
 LT0103 47 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 555 F
 LOOP2(TR-0121) 555 F
(25) REACTOR POWER LEVEL
N11 1 cps N13 75 % N17 ___ %
N12 1 cps N14 95 % N18 ___ %
 NI-05 80 % NI-09 ___ %
 NI-06 82 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 131 GP2 131 GP3 131 GP4 101
GP6(A) 131 GP7(B) 131
Stuck Rods NONE
Core Exit Temp 576 F

Time 0930Problem Time 0100Message # 13

140

C-13

Condensate Storage Tank Level T-2 94 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 48 B 51 C 46 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 153A 100 %
 153B 98 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 615
 P-50C 620 P-50D 600
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 570F
 Loop 2 570F
 (2) Tcold (F) Loop 1A 529F
 Loop 2A 530F
 Loop 1B 529F
 Loop 2B 530F
 (5) Subcooling 69.20F ___ PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 740 psia
 S/G A STM FLW(R) 4.20 X10**6 PPH
 S/G A FD FLW (R) 4.20 X10**6 PPH
 (30) S/G B LEVEL WR 65 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 740 psia
 S/G B STM FLW(R) 4 X10**6 PPH
 S/G B FD FLW (R) 4 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0930 Problem Time 0100 Message # 13 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 900 psig
MFP B Discharge Pressure 880 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP Pß-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 67 %
Condensor Vacuum 27 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 26.90 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0930 Problem Time 0100 Message # 13 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 105 F
(10) VCT Pressure 23 psi
(10) VCT Level 56 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 40 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 44 %
 LT0103 46 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B OFF P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 550 F
 LOOP2(TR-0121) 550 F
(25) REACTOR POWER LEVEL
N11 1 cps N13 60 % N17 ___ %
N12 1 cps N14 90 % N18 ___ %
 NI-05 72 % NI-09 ___ %
 NI-06 74 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
 GP1 131 GP2 131 GP3 131 GP4 130
 GP6(A) 131 GP7(B) 131
 Stuck Rods NONE
 Core Exit Temp 569 F

Time 0945Problem Time 0115Message # 16

140

C-13

Condensate Storage Tank Level T-2 100 %
 Instrument Air Pressure _____ psig
 (15) Containment Building Pressure _____ psig
 (16) S/G A Compartment Temperature _____ F
 S/G A COMPARTMENT Humidity _____ %
 (16) S/G B Compartment Temperature _____ F
 S/G B Humidity _____ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) _____ %
 (22) SI Tank Level (%)
 A 48 B 51 C 44 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 153A 100 %
 153B 98 %
 Reactor Vessel DP _____ psid
 (12) PORV Discharge Temperature _____ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 _____ F
 RV-1040 _____ F
 RV-1041 _____ F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 610
 P-50C 620 P-50D 600
 (6) PCS Flow _____ %
 (3) Thot (F) Loop 1 567F
 Loop 2 567F
 (2) Tcold (F) Loop 1A 532F
 Loop 2A 532F
 Loop 1B 532F
 Loop 2B 532F
 (5) Subcooling 71.20F _____ PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) _____ %
 (30) S/G A PRESS 780 psia
 S/G A STM FLW(R) 3.80 X10**6 PPH
 S/G A FD FLW (R) 3.80 X10**6 PPH
 (30) S/G B LEVEL WR 65 %
 (30) S/G B LEVEL (R) _____ %
 (30) S/G B PRESS 790 psia
 S/G B STM FLW(R) 3.60 X10**6 PPH
 S/G B FD FLW (R) 3.60 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0945 Problem Time 0115 Message # 16 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 910 psig
MFP B Discharge Pressure 905 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 67 %
Condensor Vacuum 27.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 27 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 0945 Problem Time 0115 Message # 16 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF

(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 105 F
(10) VCT Pressure 24 psi
(10) VCT Level 52 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 87 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 44 %
 LT0103 45 %
(12) PORV PRV-1042B 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED

CHARGING PUMPS

 P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 551 F
 LOOP2(TR-0121) 550 F

(25) REACTOR POWER LEVEL
NI1 1 cps NI3 60 % NI7 ___ %
NI2 1 cps NI4 90 % NI8 ___ %
 NI-05 65 % NI-09 ___ %
 NI-06 67 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
 GP1 131 GP2 131 GP3 131 GP4 119
 GP6(A) 131 GP7(B) 131
 Stuck Rods NONE
 Core Exit Temp 558 F

Time 1000Problem Time 0130Message # 17

140

C-13

Condensate Storage Tank Level T-2 100 %
 Instrument Air Pressure psig
 (15) Containment Building Pressure psig
 (16) S/G A Compartment Temperature F
 S/G A COMPARTMENT Humidity %
 (16) S/G B Compartment Temperature F
 S/G B Humidity %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) %
 (22) SI Tank Level (%)
 A 48 B 50 C 45 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 97 %
 Reactor Vessel DP psid
 (12) PORV Discharge Temperature F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 F
 RV-1040 F
 RV-1041 F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 615
 P-50C 620 P-50D 600
 (6) PCS Flow %
 (3) Thot (F) Loop 1 563F
 Loop 2 563F
 (2) Tcold (F) Loop 1A 529F
 Loop 2A 529F
 Loop 1B 529F
 Loop 2B 529F
 (5) Subcooling 76.50F PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) %
 (30) S/G A PRESS 780 psia
 S/G A STM FLW(R) 3.30 X10**6 PPH
 S/G A FD FLW (R) 3.30 X10**6 PPH
 (30) S/G B LEVEL WR 40 %
 (30) S/G B LEVEL (R) %
 (30) S/G B PRESS 790 psia
 S/G B STM FLW(R) 3.10 X10**6 PPH
 S/G B FD FLW (R) 3.10 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1000 Problem Time 0130 Message # 17 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 930 psig
MFP B Discharge Pressure 920 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 0 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 68 %
Condensor Vacuum 27.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 27.20 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
2. SURVEILLANCE DUE/PROGRESS
3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1000 Problem Time 0130 Message # 17 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF

(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 103 F
(10) VCT Pressure 29 psi
(10) VCT Level 69 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 87 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 43 %
 LT0103 44 %
(12) PORV PRV-1042B 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED

CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 547 F
 LOOP2(TR-0121) 547 F

(25) REACTOR POWER LEVEL
N11 1 cps N13 50 % N17 ___ %
N12 1 cps N14 80 % N18 ___ %
 NI-05 60 % NI-09 ___ %
 NI-06 62 % NI-10 ___ %

PIP
(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
 GP1 131 GP2 131 GP3 131 GP4 123
 GP6(A) 131 GP7(B) 131
 Stuck Rods NONE
 Core Exit Temp 562 F

Time 1015Problem Time 0145Message # 18

140

C-13

Condensate Storage Tank Level T-2 100 %
 Instrument Air Pressure _____ psig
 (15) Containment Building Pressure _____ psig
 (16) S/G A Compartment Temperature _____ F
 S/G A COMPARTMENT Humidity _____ %
 (16) S/G B Compartment Temperature _____ F
 S/G B Humidity _____ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) _____ %
 (22) SI Tank Level (%)
 A 58 B 51 C 44 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 96 %
 Reactor Vessel DP _____ psid
 (12) PORV Discharge Temperature _____ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 _____ F
 RV-1040 _____ F
 RV-1041 _____ F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 615
 P-50C 620 P-50D 600
 (6) PCS Flow _____ %
 (3) Thot (F) Loop 1 558F
 Loop 2 558F
 (2) Tcold (F) Loop 1A 530F
 Loop 2A 530F
 Loop 1B 530F
 Loop 2B 530F
 (5) Subcooling 80.30F _____ PSIA
 (7) PCS WR Pressure (R) 2070 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) _____ %
 (30) S/G A PRESS 810 psia
 S/G A STM FLW(R) 2.90 X10**6 PPH
 S/G A FD FLW (R) 2.90 X10**6 PPH
 (30) S/G B LEVEL WR 40 %
 (30) S/G B LEVEL (R) _____ %
 (30) S/G B PRESS 810 psia
 S/G B STM FLW(R) 2.60 X10**6 PPH
 S/G B FD FLW (R) 2.50 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1015 Problem Time 0145 Message # 18 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 900 psig
MFP B Discharge Pressure 500 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 0 psig
Moisture SEP Drain Tank Level ___ %
Condensator Hotwell Level 67 %
Condensator Vacuum 27.40 in Hg.
Gland Seal Condensator Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLDW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensator Vacuum (R) 27.30 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
2. SURVEILLANCE DUE/PROGRESS
3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1015 Problem Time 0145 Message # 18 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
CV-3057(SIRWT) CV-3029(SUMP)
OPEN CLOSED
(27) HPSIB, LPSIB, SPRAY B SUCTION
CV-3031 (SIRW) CV-3030 (Sump)
OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 102 F
(10) VCT Pressure 40 psi
(10) VCT Level 90 %
PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 86 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 43 %
LT0103 45 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
CHARGING PUMPS
P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 546 F
LOOP2(TR-0121) 546 F
(25) REACTOR POWER LEVEL
NI1 1 cps NI3 45 % NI7 ___ %
NI2 1 cps NI4 70 % NI8 ___ %
NI-05 51 % NI-09 ___ %
NI-06 53 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT, ROD, OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 131 GP2 131 GP3 131 GP4 123
GP6(A) 131 GP7(B) 131
Stuck Rods NONE
Core Exit Temp 559 F

Time 1030

Problem Time 0200

Message # 19

140

C-13

Condensate Storage Tank Level T-2 100 %
 Instrument Air Pressure psig
 (15) Containment Building Pressure psig
 (16) S/G A Compartment Temperature F
 S/G A COMPARTMENT Humidity %
 (16) S/G B Compartment Temperature F
 S/G B Humidity %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) %
 (22) SI Tank Level (%)
 A 47 B 51 C 43 D 56
 SI Tank Pressure (psig)
 A 210 B 220 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 100 %
 T53B 96 %
 Reactor Vessel DP psid
 (12) PORV Discharge Temperature F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 F
 RV-1040 F
 RV-1041 F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 620
 P-50C 630 P-50D 600
 (6) PCS Flow %
 (3) Thot (F) Loop 1 555F
 Loop 2 555F
 (2) Tcold (F) Loop 1A 530F
 Loop 2A 530F
 Loop 1B 530F
 Loop 2B 530F
 (5) Subcooling 83.80F PSIA
 (7) PCS WR Pressure (R) 2060 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) %
 (30) S/G A PRESS 820 psia
 S/G A STM FLW(R) 2.40 X10**6 PPH
 S/G A FD FLW (R) 2.40 X10**6 PPH
 (30) S/G B LEVEL WR 40 %
 (30) S/G B LEVEL (R) %
 (30) S/G B PRESS 820 psia
 S/G B STM FLW(R) 2.20 X10**6 PPH
 S/G B FD FLW (R) 2.10 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1030 Problem Time 0200 Message # 19

141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 910 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 0 psig
Moisture SEP Drain Tank Level ___ %
Condensator Hotwell Level 67 %
Condensator Vacuum 27.50 in Hg.
Gland Seal Condensator Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A OFF P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 0 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensator Vacuum (R) 27.50 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-2 R/Hr
RIA-1806 2.00E-2 R/Hr
RIA-1807 2.50E-2 R/Hr
RIA-1808 2.00E-2 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 7.00E+1 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1030 Problem Time 0200 Message # 19 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF

(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 103 F
(10) VCT Pressure 39 psi
(10) VCT Level 88 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 60 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 2060 psia
(8) PZR Level (R) LT0102A 42 %
 LT0103 44 %
(12) PORV PRV-1042B 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED

CHARGING PUMPS

 P55A ON P55B ON P55C OFF
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 152 LCC 16 152
(1) PCS TAVE (R) LOOP1(TR-0111) 544 F
 LOOP2(TR-0121) 544 F

(25) REACTOR POWER LEVEL
NI1 1 cps NI3 40 % NI7 ___ %
NI2 1 cps NI4 60 % NI8 ___ %
 NI-05 43 % NI-09 ___ %
 NI-06 44 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 131 GP2 131 GP3 131 GP4 116
GP6(A) 131 GP7(B) 131
Stuck Rods NONE
Core Exit Temp 555 F

Time 1045Problem Time 0215Message # 22

140

C-13

Condensate Storage Tank Level T-2 100 %
 Instrument Air Pressure psig
 (15) Containment Building Pressure psig
 (16) S/G A Compartment Temperature F
 S/G A COMPARTMENT Humidity %
 (16) S/G B Compartment Temperature F
 S/G B Humidity %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) %
 (22) SI Tank Level (%)
 A 47 B 51 C 42 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 98 %
 T53B 90 %
 Reactor Vessel DP psid
 (12) PORV Discharge Temperature F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 F
 RV-1040 F
 RV-1041 F

C-12

PCP Current (Amps)
 P-50A 600 P-50B 620
 P-50C 630 P-50D 600
 (6) PCS Flow %
 (3) Thot (F) Loop 1 520F
 Loop 2 518F
 (2) Tcold (F) Loop 1A 520F
 Loop 2A 515F
 Loop 1B 520F
 Loop 2B 515F
 (5) Subcooling 114.40F PSIA
 (7) PCS WR Pressure (R) 2000 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 40 %
 (30) S/G A LEVEL (R) %
 (30) S/G A PRESS 820 psia
 S/G A STM FLW(R) 0 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR 0 %
 (30) S/G B LEVEL (R) %
 (30) S/G B PRESS 750 psia
 S/G B STM FLW(R) .50 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1045 Problem Time 0215 Message # 22 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 500 psig
MFP B Discharge Pressure 500 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 1300 psig
Moisture SEP Drain Tank Level ___ %
Condensator Hotwell Level 65 %
Condensator Vacuum 28.10 in Hg.
Gland Seal Condensator Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B OFF

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 165 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 165 From P-8C 0 gpm
Condensator Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 5.00E-1 R/Hr
RIA-1806 5.00E-1 R/Hr
RIA-1807 1.00E+0 R/Hr
RIA-1808 1.00E+0 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.50E+1 CPM
RIA-2323 4.50E+5 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1045 Problem Time 0215 Message # 22 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 103 F
(10) VCT Pressure 33 psi
(10) VCT Level 78 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 133 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 1979 psia
(8) PZR Level (R) LT0102A 35 %
 LT0103 35 %
(12) PORV PRV-1042B 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B ON P55C ON
(6) PCPS P50A ON P50B ON P50C ON P50D ON
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 520 F
 LOOP2(TR-0121) 517 F
(25) REACTOR POWER LEVEL
N11 1 cps N13 5.00E-3 % N17 ___ %
N12 1 cps N14 8.00E-3 % N18 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 0 GP2 0 GP3 0 GP4 0
GP6(A) 0 GP7(B) 0
Stuck Rods NONE
Core Exit Temp 520 F

Time 1100Problem Time 0230Message # 26

140

C-13

Condensate Storage Tank Level T-2 98 %
 Instrument Air Pressure _____ psig
 (15) Containment Building Pressure _____ psig
 (16) S/G A Compartment Temperature _____ F
 S/G A COMPARTMENT Humidity _____ %
 (16) S/G B Compartment Temperature _____ F
 S/G B Humidity _____ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 97 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) _____ %
 (22) SI Tank Level (%)
 A 47 B: 51 C 42 D 55
 SI Tank Pressure (psig)
 A 210 B: 215 C 215 D 215
 (21) SIAS Alarm YES

C-12

Concentrated Boric Acid Tank Levels
 T53A 76 %
 T53B 75 %
 Reactor Vessel DP _____ psid
 (12) PORV Discharge Temperature _____ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 _____ F
 RV-1040 _____ F
 RV-1041 _____ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 0
 P-50C 0 P-50D 0
 (6) PCS Flow _____ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 80F _____ PSIA
 (7) PCS WR Pressure (R) 1160 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 42 %
 (30) S/G A LEVEL (R) _____ %
 (30) S/G A PRESS 590 psia
 S/G A STM FLW(R) 0 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -75 %
 (30) S/G B LEVEL (R) _____ %
 (30) S/G B PRESS 460 psia
 S/G B STM FLW(R) .40 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

Time 1100 Problem Time 0230 Message # 26 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 500 psig
MFP B Discharge Pressure 500 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B 1500 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 28.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A ON P-2B OFF

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 190 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 5.00E-1 R/Hr
RIA-1806 5.00E-1 R/Hr
RIA-1807 1.00E+0 R/Hr
RIA-1808 1.00E+0 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.60E+2 CPM
RIA-2323 4.50E+5 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
2. SURVEILLANCE DUE/PROGRESS
3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1100 Problem Time 0230 Message # 26 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A ON P-66B ON
(24) LPSI Pumps P-67A ON P-67B ON
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF

(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 100 F
(10) VCT Pressure 34 psi
(10) VCT Level 80 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 133 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 1175 psia
(8) PZR Level (R) LT0102A 26 %
 LT0103 28 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED

CHARGING PUMPS

 P55A ON P55B ON P55C ON
(6) PCPS P50A OFF P50B OFF P50C OFF P50D OFF
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F

(25) REACTOR POWER LEVEL
NI1 1 cps NI3 1.00E-7 % NI7 ___ %
NI2 1 cps NI4 5.00E-7 % NI8 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
 GP1 0 GP2 0 GP3 0 GP4 0
 GP6(A) 0 GP7(B) 0
 Stuck Rods NONE
 Core Exit Temp 486 F

Time 1115Problem Time 0245Message # 29

140

C-13

Condensate Storage Tank Level T-2 96 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 46 B 51 C 40 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 220 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 58 %
 T53B 58 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 720
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 109F ___ PSIA
 (7) PCS WR Pressure (R) 950 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 45 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 400 psia
 S/G A STM FLW(R) 0 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 230 psia
 S/G B STM FLW(R) .30 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1115 Problem Time 0245 Message # 29 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 1500 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 28.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 200 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.50E-1 R/Hr
RIA-1806 4.50E-1 R/Hr
RIA-1807 9.00E-1 R/Hr
RIA-1808 9.00E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.60E+2 CPM
RIA-2323 4.50E+5 CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1115 Problem Time 0245 Message # 29 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B ON
(24) LPSI Pumps P-67A ON P-67B ON
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED
(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 95 F
(10) VCT Pressure 38 psi
(10) VCT Level 88 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 20 gpm
(26) Charging Flow 40 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 958 psia
(8) PZR Level (R) LT0102A 42 %
 LT0103 44 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B OFF P55C OFF
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 150 LCC 16 150
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
N11 20 cps N13 5.00E-7 % N17 ___ %
N12 30 cps N14 8.00E-7 % N18 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
 GP1 0 GP2 0 GP3 0 GP4 0
 GP6(A) 0 GP7(B) 0
 Stuck Rods NONE
 Core Exit Temp 430 F

Time 1130Problem Time 0300Message # 31

140

C-13

Condensate Storage Tank Level T-2 95 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 46 B 51 C 40 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 57 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 720
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 40F ___ PSIA
 (7) PCS WR Pressure (R) 620 PSIA
 (7) PCS NR PRESSURE (R) 600 PSIA
 (30) S/G A LEVEL WR 45 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 400 psia
 S/G A STM FLW(R) .30 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 20 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1130 Problem Time 0300 Message # 31 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P3-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 1350 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 67 %
Condensor Vacuum 28.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 240 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.50E-1 R/Hr
RIA-1806 4.50E-1 R/Hr
RIA-1807 9.00E-1 R/Hr
RIA-1808 9.00E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 2.00E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1130 Problem Time 0300 Message # 31 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED
(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 100 F
(10) VCT Pressure 33 psi
(10) VCT Level 79 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 13 gpm
(26) Charging Flow 80 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 653 psia
(8) PZR Level (R) LT0102A 40 %
 LT0103 42 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
 CHARGING PUMPS
 P55A ON P55B OFF P55C ON
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
N11 15 cps N13 1.00E-7 % N17 ___ %
N12 30 cps N14 1.00E-7 % N18 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT, ROD, OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 0 GP2 0 GP3 0 GP4 0
GP6(A) 0 GP7(B) 0
Stuck Rods NONE
Core Exit Temp 451 F

Time 1145Problem Time 0315Message # 32

140

C-13

Condensate Storage Tank Level T-2 94 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 46 B 51 C 40 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 56 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 720
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 47F ___ PSIA
 (7) PCS WR Pressure (R) 550 PSIA
 (7) PCS NR PRESSURE (R) 550 PSIA
 (30) S/G A LEVEL WR 38 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 350 psia
 S/G A STM FLW(R) .30 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1145 Problem Time 0315 Message # 32 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1250 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 1450 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 67 %
Condensor Vacuum 28.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 265 From P-8C 165 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-1 R/Hr
RIA-1806 4.00E-1 R/Hr
RIA-1807 8.70E-1 R/Hr
RIA-1808 8.70E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.90E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1145 Problem Time 0315 Message # 32 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 87 F
(10) VCT Pressure 27 psi
(10) VCT Level 63 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 10 gpm
(26) Charging Flow 92 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 589 psia
(8) PZR Level (R) LT0102A 40 %
 LT0103 40 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A CLOSED 1043A CLOSED
CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
N11 15 cps N13 1.00E-7 % N17 ___ %
N12 30 cps N14 1.00E-7 % N18 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
 GP1 0 GP2 0 GP3 0 GP4 0
 GP6(A) 0 GP7(B) 0
 Stuck Rods NONE
 Core Exit Temp 437 F

Time 1200Problem Time 0330Message # 33

140

C-13

Condensate Storage Tank Level T-2 90 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 46 B 51 C 40 D 55
 SI Tank Pressure (psig)
 A 210 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 153A 57 %
 153B 55 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 730
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 67F ___ PSIA
 (7) PCS WR Pressure (R) 540 PSIA
 (7) PCS NR PRESSURE (R) 560 PSIA
 (30) S/G A LEVEL WR 30 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 270 psia
 S/G A STH FLW(R) .20 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STH FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1200 Problem Time 0330 Message # 33 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1200 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
1300 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 67 %
Condensor Vacuum 28.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 350 From P-8C 265 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 4.00E-1 R/Hr
RIA-1806 4.00E-1 R/Hr
RIA-1807 8.50E-1 R/Hr
RIA-1808 8.50E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.80E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

Time 1215Problem Time 0345Message # 35

140

C-13

Condensate Storage Tank Level T-2 86 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 95 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 45 B 51 C 39 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 53 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 730
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 56F ___ PSIA
 (7) PCS WR Pressure (R) 410 PSIA
 (7) PCS NR PRESSURE (R) 425 PSIA
 (30) S/G A LEVEL WR 50 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 230 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1215 Problem Time 0345 Message # 35 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1150 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P&B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
1320 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 28.20 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P-8A,B 335 From P-8C 290 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 28.10 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.90E-1 R/Hr
RIA-1806 3.90E-1 R/Hr
RIA-1807 8.40E-1 R/Hr
RIA-1808 8.40E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.60E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

Time 1230Problem Time 0400Message # 36

140

C-13

Condensate Storage Tank Level T-2 82 %
 Instrument Air Pressure psig
 (15) Containment Building Pressure psig
 (16) S/G A Compartment Temperature F
 S/G A COMPARTMENT Humidity %
 (16) S/G B Compartment Temperature F
 S/G B Humidity %
 (16) Dome Temperature 110 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) %
 (22) SI Tank Level (%)
 A 42 B 51 C 38 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 52 %
 Reactor Vessel DP psid
 (12) PORV Discharge Temperature F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 F
 RV-1040 F
 RV-1041 F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 740
 P-50C 0 P-50D 0
 (6) PCS Flow %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 83F PSIA
 (7) PCS WR Pressure (R) 380 PSIA
 (7) PCS NR PRESSURE (R) 395 PSIA
 (30) S/G A LEVEL WR 35 %
 (30) S/G A LEVEL (R) %
 (30) S/G A PRESS 150 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1230 Problem Time 0400 Message # 36 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1200 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B 1500 psig

Moisture SEP Drain Tank Level ___ %
Condensator Hotwell Level 65 %
Condensator Vacuum 0 in Hg.
Gland Seal Condensator Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 210 From P-8C 225 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensator Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.80E-1 R/Hr
RIA-1806 3.80E-1 R/Hr
RIA-1807 8.40E-1 R/Hr
RIA-1808 8.40E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.35E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
2. SURVEILLANCE DUE/PROGRESS
3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES

Time 1245

Problem Time 0415

Message # 37

140

C-13

Condensate Storage Tank Level T-2 78 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 94 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 44 B 51 C 37 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 51 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 740
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 90F ___ PSIA
 (7) PCS WR Pressure (R) 340 PSIA
 (7) PCS NR PRESSURE (R) 345 PSIA
 (30) S/G A LEVEL WR 37 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 120 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1245 Problem Time 0415 Message # 37 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 530 psig
MFP B Discharge Pressure 530 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1175 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 1400 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM F8A,B 280 From P-8C 265 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.70E-1 R/Hr
RIA-1806 3.70E-1 R/Hr
RIA-1807 8.30E-1 R/Hr
RIA-1808 8.30E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.35E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

Time 1300

Problem Time 0430

Message # 40

140

C-13

Condensate Storage Tank Level T-2 75 %
 Instrument Air Pressure _____ psig
 (15) Containment Building Pressure _____ psig
 (16) S/G A Compartment Temperature _____ F
 S/G A COMPARTMENT Humidity _____ %
 (16) S/G B Compartment Temperature _____ F
 S/G B Humidity _____ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) _____ %
 (22) SI Tank Level (%)
 A 44 B 51 C 37 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 153A 57 %
 153B 50 %
 Reactor Vessel DP _____ psid
 (12) PORV Discharge Temperature _____ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 _____ F
 RV-1040 _____ F
 RV-1041 _____ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 740
 P-50C 0 P-50D 0
 (6) PCS Flow _____ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 87F _____ PSIA
 (7) PCS WR Pressure (R) 280 PSIA
 (7) PCS NR PRESSURE (R) 305 PSIA
 (30) S/G A LEVEL WR 40 %
 (30) S/G A LEVEL (R) _____ %
 (30) S/G A PRESS 100 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) _____ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1300 Problem Time 0430 Message # 40 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1200 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P-8B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 1400 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 230 From P-8C 210 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.60E-1 R/Hr
RIA-1806 3.60E-1 R/Hr
RIA-1807 8.20E-1 R/Hr
RIA-1808 8.20E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.35E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

Time 1315

Problem Time 0445

Message # 41

140

C-13

Condensate Storage Tank Level T-2 80 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 94 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 44 B 51 C 36 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 49 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 750
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling F ___ PSIA
 (7) PCS WR Pressure (R) 240 PSIA
 (7) PCS NR PRESSURE (R) 260 PSIA
 (30) S/G A LEVEL WR 37 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 90 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1315 Problem Time 0445 Message # 41 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1250 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P3-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
1500 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM F8A,B 210 From P-8C 150 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.50E-1 R/Hr
RIA-1806 3.50E-1 R/Hr
RIA-1807 8.00E-1 R/Hr
RIA-1808 8.00E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.35E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

Time 1330Problem Time 0500Message # 42

140

C-13

Condensate Storage Tank Level T-2 82 %
 Instrument Air Pressure _____ psig
 (15) Containment Building Pressure _____ psig
 (16) S/G A Compartment Temperature _____ F
 S/G A COMPARTMENT Humidity _____ %
 (16) S/G B Compartment Temperature _____ F
 S/G B Humidity _____ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 94 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) _____ %
 (22) SI Tank Level (%)
 A 44 B 51 C 36 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 215 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 153A 57 %
 153B 48 %
 Reactor Vessel DP _____ psid
 (12) PORV Discharge Temperature _____ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 _____ F
 RV-1040 _____ F
 RV-1041 _____ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 750
 P-50C 0 P-50D 0
 (6) PCS Flow _____ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 87F _____ PSIA
 (7) PCS WR Pressure (R) 248 PSIA
 (7) PCS NR PRESSURE (R) 258 PSIA
 (30) S/G A LEVEL WR 55 %
 (30) S/G A LEVEL (R) _____ %
 (30) S/G A PRESS 80 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) _____ %
 (30) S/G B PRESS 5 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1330 Problem Time 0500 Message # 42 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 520 psig
MFP B Discharge Pressure 520 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1100 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 1300 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 64 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C ON
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 350 From P-8C 320 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.40E-1 R/Hr
RIA-1806 3.40E-1 R/Hr
RIA-1807 7.80E-1 R/Hr
RIA-1808 7.80E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.30E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1330 Problem Time 0500 Message # 42 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED
(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 65 F
(10) VCT Pressure 36 psi
(10) VCT Level 85 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 60 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 255 psia
(8) PZR Level (R) LT0102A 42 %
 LT0103 43 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A OPEN 1043A OPEN
 CHARGING PUMPS
 P55A ON P55B OFF P55C OFF
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
NI1 15 cps NI3 1.00E-7 % NI7 ___ %
NI2 22 cps NI4 1.00E-7 % NI8 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT, ROD, OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 0 GP2 0 GP3 0 GP4 0
GP6(A) 0 GP7(B) 0
Stuck Rods NONE
Core Exit Temp 316 F

Time 1345Problem Time 0515Message # 44

140

C-13

Condensate Storage Tank Level T-2 84 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 94 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 42 B 51 C 34 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 210 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 48 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 750
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 105F ___ PSIA
 (7) PCS WR Pressure (R) 240 PSIA
 (7) PCS NR PRESSURE (R) 250 PSIA
 (30) S/G A LEVEL WR 75 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 60 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1345 Problem Time 0515 Message # 44 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 540 psig
MFP B Discharge Pressure 540 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 1100 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
1300 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 64 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 350 From P-8C 170 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.30E-1 R/Hr
RIA-1806 3.30E-1 R/Hr
RIA-1807 8.10E-1 R/Hr
RIA-1808 8.10E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.35E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1345 Problem Time 0515 Message # 44 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B OFF
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED
(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 63 F
(10) VCT Pressure 22 psi
(10) VCT Level 50 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 93 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 250 psia
(8) PZR Level (R) LT0102A 40 %
 LT0103 42 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A OPEN 1043A OPEN
 CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
NI1 15 cps NI3 1.00E-7 % NI7 ___ %
NI2 20 cps NI4 1.00E-7 % NI8 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 0 GP2 0 GP3 0 GP4 0
GP6(A) 0 GP7(B) 0
Stuck Rods NONE
Core Exit Temp 296 F

Time 1400Problem Time 0530Message # 45

140

C-13

Condensate Storage Tank Level T-2 86 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 94 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 42 B 51 C 34 D 56
 SI Tank Pressure (psig)
 A 200 B 215 C 210 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 48 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 750
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 101F ___ PSIA
 (7) PCS WR Pressure (R) 240 PSIA
 (7) PCS NR PRESSURE (R) 240 PSIA
 (30) S/G A LEVEL WR 75 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 60 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1400 Problem Time 0530 Message # 45 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 540 psig
MFP B Discharge Pressure 540 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B 1500 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 65 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves OPEN
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 170 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 3.00E-1 R/Hr
RIA-1806 3.00E-1 R/Hr
RIA-1807 7.50E-1 R/Hr
RIA-1808 7.50E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.20E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

Time 1415Problem Time 0545Message # 47

140

C-13

Condensate Storage Tank Level T-2 91 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 105 F
 (11) SIRW Tank Level 94 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 42 B 51 C 34 D 55
 SI Tank Pressure (psig)
 A 200 B 215 C 210 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 47 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 750
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 108F ___ PSIA
 (7) PCS WR Pressure (R) 240 PSIA
 (7) PCS NR PRESSURE (R) 240 PSIA
 (30) S/G A LEVEL WR 65 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 50 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

Time 1415 Problem Time 0545 Message # 47 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 540 psig
MFP B Discharge Pressure 540 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B
 1500 psig
Moisture SEP Drain Tank Level ___ %
Condensor Hotwell Level 64 %
Condensor Vacuum 0 in Hg.
Gland Seal Condensor Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 170 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensor Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 2.90E-1 R/Hr
RIA-1806 2.90E-1 R/Hr
RIA-1807 7.50E-1 R/Hr
RIA-1808 7.50E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.20E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT).
2. SURVEILLANCE DUE/PROGRESS
3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1415 Problem Time 0545 Message # 47 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B ON
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 80 F

C-02

(10) VCT Temp 60 F
(10) VCT Pressure 20 psi
(10) VCT Level 32 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 86 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 240 psia
(8) PZR Level (R) LT0102A 40 %
 LT0103 43 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A OPEN 1043A OPEN
 CHARGING PUMPS
 P55A ON P55B ON P55C OFF
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 170 LCC 16 170
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
NI1 15 cps NI3 1.00E-7 % NI7 ___ %
NI2 20 cps NI4 1.00E-7 % NI8 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT,ROD,OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 0 GP2 0 GP3 0 GP4 0
GP6(A) 0 GP7(B) 0
Stuck Rods NONE
Core Exit Temp 289 F

Time 1430

Problem Time 0600

Message # 48

140

C-13

Condensate Storage Tank Level T-2 96 %
 Instrument Air Pressure ___ psig
 (15) Containment Building Pressure ___ psig
 (16) S/G A Compartment Temperature ___ F
 S/G A COMPARTMENT Humidity ___ %
 (16) S/G B Compartment Temperature ___ F
 S/G B Humidity ___ %
 (16) Dome Temperature 100 F
 (11) SIRW Tank Level 96 %
 (15) WR Containment Pressure (R) 15 psia
 (14) Containment Sump Level 0 %
 (14) Containment Water Level (R) ___ %
 (22) SI Tank Level (%)
 A 42 B 51 C 34 D 56
 SI Tank Pressure (psig)
 A 200 B 215 C 210 D 215
 (21) SIAS Alarm NO

C-12

Concentrated Boric Acid Tank Levels
 T53A 57 %
 T53B 47 %
 Reactor Vessel DP ___ psid
 (12) PORV Discharge Temperature ___ F
 (13) Pzr Safety Valve Discharge Temp (F)
 RV-1039 ___ F
 RV-1040 ___ F
 RV-1041 ___ F

C-12

PCP Current (Amps)
 P-50A 0 P-50B 750
 P-50C 0 P-50D 0
 (6) PCS Flow ___ %
 (3) Thot (F) Loop 1 515F
 Loop 2 515F
 (2) Tcold (F) Loop 1A 515F
 Loop 2A 515F
 Loop 1B 515F
 Loop 2B 515F
 (5) Subcooling 108F ___ PSIA
 (7) PCS WR Pressure (R) 250 PSIA
 (7) PCS NR PRESSURE (R) 250 PSIA
 (30) S/G A LEVEL WR 75 %
 (30) S/G A LEVEL (R) ___ %
 (30) S/G A PRESS 60 psia
 S/G A STM FLW(R) .10 X10**6 PPH
 S/G A FD FLW (R) 0 X10**6 PPH
 (30) S/G B LEVEL WR -138 %
 (30) S/G B LEVEL (R) ___ %
 (30) S/G B PRESS 10 psia
 S/G B STM FLW(R) 0 X10**6 PPH
 S/G B FD FLW (R) 0 X10**6 PPH

PANEL K-13

(20) CONTAINMENT HIGH PRESS
 NO
 (20) Containment High Radiation
 NO

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1430 Problem Time 0600 Message # 48 141

C-01

MFP Suction Pressure ___ psig
MFP A Discharge Pressure 540 psig
MFP B Discharge Pressure 540 psig
AFW Pump P-8C Amperes ___ AMPS
AFW Disch Press P-8C 0 psig
AFW Pump P-8A Amperes ___ AMPS
AFW PUMP P8-B Steam Pressure 0 psig
AFW Disch Press P-8A & P-8B

 1500 psig
Moisture SEP Drain Tank Level ___ %
Condensator Hotwell Level 64 %
Condensator Vacuum 0 in Hg.
Gland Seal Condensator Vacuum ___ in Hg.
Atmospheric Dump Valves CLOSED
AFW Pump P-8A ON P-8B OFF P-8C OFF
Heater Drain Pump P-10A ___ P-10B ___
Condensate Pump P-2A OFF P-2B ON

C-11

(31) AFW FLOW TO SGA
FROM P8A,B 170 From P-8C 0 gpm
(31) AFW FLOW TO SGB
FROM P-8A&B 0 From P-8C 0 gpm
Condensator Vacuum (R) 0 IN.HG.
PCP A Leak-off Flow (R) ___ GPM
PCP B Leak-off Flow (R) ___ GPM
PCP C Leak-off Flow (R) ___ GPM
PCP D Leak-off Flow (R) ___ GPM

C-04

(32) D/G Freq 1-1 ___ 1-2 ___
(32) 1-C BUS VOLTS ___ Amps ___
(32) 1-D BUS VOLTS ___ Amps ___

C-11 BACK C-11A

(17) Containment Area Monitors
RIA-1805 2.80E-1 R/Hr
RIA-1806 2.80E-1 R/Hr
RIA-1807 7.40E-1 R/Hr
RIA-1808 7.40E-1 R/Hr
(17) High Range Containment Monitors
RIA-2321 ___ R/Hr
RIA-2322 ___ R/Hr
(19) Containment Hydrogen Concentration
AI-2401R ___ (%)
AI-2401L ___ (%)
(30) Main Steam Line Gamma
RIA-2324 1.20E+2 CPM
RIA-2323 OFFSCALE CPM

EQUIPMENT STATUS:

1. SIGNIFICANT EQUIP OUTAGES
(INOPERABLE EQUIPMENT)
 2. SURVEILLANCE DUE/PROGRESS
 3. ABNORMAL ELECTRICAL LINEUPS
OR OUTAGES
-
-
-
-

SHAVPAL1
MAY/22/1990

T S C S T A T U S P A G E

Time 1430 Problem Time 0600 Message # 48 142

C-08

SW Pumps P-7A ___ P-7B ___ P-7C ___
CCW Pumps P-52A ___ P-52B ___ P-52C ___
FPC Pumps P-51A ___ P-51B ___

CONTAINMENT COOLER RECIRC FANS

V1A ON V2A ON V3A ON V4A ON
V1B ___ V2B ___ V3B ___ V4B ___

C-03

(23) HPSI Pumps P-66A OFF P-66B OFF
(24) LPSI Pumps P-67A OFF P-67B ON
(18) Containment Spray Pumps
 P-54A OFF P-54B OFF P-54C OFF
(27) HPSIA, LPSIA, SPRAY A SUCTION
 CV-3057(SIRWT) CV-3029(SUMP)
 OPEN CLOSED

(27) HPSIB, LPSIB, SPRAY B SUCTION
 CV-3031 (SIRW) CV-3030 (Sump)
 OPEN CLOSED

C-02

Intermediate Press Letdown Temp ___ F
Charging Line Temperature ___ F
Letdown Line Temp ___ F
SDCS from PCS (R) ___ F
SDCS to PCS (R) 260 F

C-02

(10) VCT Temp 60 F
(10) VCT Pressure 20 psi
(10) VCT Level 32 %
 PCP Control Bleedoff Pressure ___ psig
(26) Letdown Flow 0 gpm
(26) Charging Flow 33 gpm
(9) Quench Tank Temp ___ F
(9) Quench TANK Pressure 4 psig
(9) QUENCH TANK Level 76 %
(7) Pressurizer Pressure (R) 250 psia
(8) PZR Level (R) LT0102A 40 %
 LT0103 47 %
(12) PORV PRV-1042B ___ 1043B ___
(12) BLOCK MOV-1042A OPEN 1043A OPEN

CHARGING PUMPS

 P55A ON P55B OFF P55C OFF
(6) PCPS P50A OFF P50B ON P50C OFF P50D OFF
 PZR HTR AMPS LC15 0 LCC 16 0
(1) PCS TAVE (R) LOOP1(TR-0111) 515 F
 LOOP2(TR-0121) 515 F
(25) REACTOR POWER LEVEL
NI1 15 cps NI3 1.00E-7 % NI7 ___ %
NI2 20 cps NI4 1.00E-7 % NI8 ___ %
 NI-05 0 % NI-09 ___ %
 NI-06 0 % NI-10 ___ %

PIP

(DEMAND LOG+CONSTANT, ROD, OR FLUX/TEMP)
Gross MW ___
Net MW ___
(28) Control Rod Position
GP1 0 GP2 0 GP3 0 GP4 0
GP6(A) 0 GP7(B) 0
Stuck Rods NONE
Core Exit Temp 290 F