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TITLE: DETERMINATION OF EXTENT OF CORE DAMAGE

TRANSMITTAL: LISTED BELOW ARE NEW/REVISED PROCEDURES WHICH MUST BE IMMEDIATELY INSERTED INTO OR DISCARDED FROM YOUR PROCEDURE MANUAL.

Action Required	Section or Description
REMOVE AND DESTROY	EI-11, R/6, ENTIRE PROCEDURE
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SIGN, DATE, AND RETURN THE ACKNOWLEDGEMENT FORM WITHIN 10 DAYS TO THE PALISADES PLANT DOCUMENT CONTROL.

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A045

Procedure No EI-11
Revision 6
Issued Date 6/24/02

PALISADES NUCLEAR PLANT
EMERGENCY IMPLEMENTING PROCEDURE

TITLE: DETERMINATION OF EXTENT OF CORE DAMAGE

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User Reviewer **Date**

TITLE: DETERMINATION OF EXTENT OF CORE DAMAGE

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ATTACHMENTS

Attachment 1, "Fuel Failure Based on Radiation Monitor Data"
Attachment 2, "Percent Fuel Failure Based on RIA-2321 and RIA-2322 Data"
Attachment 3, "Percent Fuel Failure Based on RIA-2315 Data"

TITLE: DETERMINATION OF EXTENT OF CORE DAMAGE

USER ALERT
CONTINUOUS USE PROCEDURE

Read each step of the procedure prior to performing that step. When sign-offs are required, sign off each step as complete before proceeding to the next step.

1.0 PERSONNEL RESPONSIBILITY

The Technical Support Center (TSC) Staff shall implement this procedure. **IF** this procedure is implemented before activation of the TSC, **THEN** the Site Emergency Director (SED) shall assign this task.

2.0 PURPOSE

Provide a method of estimating the degree of core damage during Loss of Coolant Accident (LOCA) using the Containment High Range Monitors (RIA-2321 and RIA-2322) or by an alternate method using Area Radiation Monitor (RIA-2315) when the high range monitors become inoperable.

3.0 REFERENCES

3.1 SOURCE DOCUMENTS

3.1.1 Reg Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a LOCA for PWRs"

3.1.2 Engineering Analysis Cable-26-87-01

3.1.3 Palisades Site Emergency Plan, Section 4, "Emergency Conditions"

3.1.4 NUREG 0654, Section I, "Accident Assessment"

3.2 REFERENCE DOCUMENTS

3.2.1 Palisades Administrative Procedure 10.46, "Plant Records"

3.2.2 Palisades Administrative Procedure 10.41, "Procedure Initiation and Revision" |e

TITLE: DETERMINATION OF EXTENT OF CORE DAMAGE

4.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

NOTE: **IF** release has not occurred, **THEN** the methods in Section 5.0 of this procedure will not be accurate.

4.1 Estimation of core damage from Containment High Range Monitors and Area Radiation Monitor RIA-2315 is based on the release of the Primary Coolant System and/or activity into containment.

4.2 The attached curves are based on equilibrium core activities and Regulatory Guide 1.4 release rates. Depending on core life and operating history at time of accident, these curves may give conservative results for dose calculations (overestimation of long lived fission products) or under predicted physical (nonradiological) core damage.

4.3 Containment Isolation Monitors RE-1805, RE-1806, RE-1807, and RE-1808 should not be used for estimating core damage.

4.3.1 These monitors respond to radiation levels from airborne radioactivity and activity in the Letdown Heat Exchanger. They are expected to move upscale within 20 minutes following exposure to high moisture levels and elevated temperatures (reference Engineering Analysis CABLE-26-87-01).

4.4 **IF** either Containment High Range Monitor RIA-2321 or RIA-2322 is functional, **THEN** utilize to measure exposure rate and estimate extent of core damage. **IF** no High Range Monitors are functional, **THEN** go to Section 5.2 of this procedure and use Area Radiation Monitor RIA-2315.

4.5 Curves in Attachments 2 and 3 assume containment spray initiation occurred prior to a time lapse of two hours following the accident. Dose rates will be higher after two hours if there is no containment spray (approximately a factor of 10 at 30 days).

TITLE: DETERMINATION OF EXTENT OF CORE DAMAGE

5.0 PROCEDURE

USER ALERT
CONTINUOUS USE PROCEDURE

Read each step of the procedure prior to performing that step. When sign-offs are required, sign off each step as complete before proceeding to the next step.

This procedure provides methods for estimating percent of core damage using either the Containment High Range Monitors or the Area Radiation Monitor RIA-2315 located inside the Containment Building.

5.1 ESTIMATING EXTENT OF CORE DAMAGE FROM HIGH RANGE CONTAINMENT MONITORS RIA-2321 AND/OR RIA-2322

5.1.1 Record date and time of accident on Attachment 1, "Fuel Failure Based on Radiation Monitor Data."

5.1.2 Determine the dose rate in rem/hr from Containment Radiation Monitors RIA-2321 and/or RIA-2322. Record dose rate and date/time of reading on Attachment 1. These monitors readings can be found on the Plant Process Computer (PPC), Environmental Systems.

5.1.3 Record normal background reading as determined by trends on Plant computer or by Radiation Protection.

5.1.4 Record Absolute dose rate, which is determined by subtracting normal background, the reading before time of accident, from the monitor dose rate on Attachment 1, "Fuel Failure Based on Radiation Monitor Data."

5.1.5 Determine the elapsed time (in hours) between the time since shutdown and the time the monitor readings were taken. Record on Attachment 1.

5.1.6 Use curves in Attachment 2, "Percent Fuel Failure Based on RIA-2321 and RIA-2322 Data," to determine percent fuel failure. **IF** point determined is between two curves, **THEN** state results as between the two curves (ie, 20-50%).

5.1.7 Record results on Attachment 1, "Fuel Failure Based on Radiation Monitor Data," and continue with Section 5.3 of this procedure.

5.2 ESTIMATING EXTENT OF CORE DAMAGE FROM AREA RADIATION MONITOR RIA-2315

CAUTION

This monitor is not qualified to remain functional under severe temperature and humidity affects resultant of a loss of coolant accident and/or main steam line breach into the Containment Building or during a loss of station offsite power per the criteria of the Electrical Equipment Qualification Program. RIA-2315 response should only be used when RIA-2321 and RIA-2322 monitors are declared inoperable.

5.2.1 Record date and time of accident on Attachment 1, "Fuel Failure Based on Radiation Monitor Data."

5.2.2 Determine the dose rate in mrem/hr from Area Radiation Monitor RIA-2315. Record dose rate and date/time of reading on Attachment 1, "Fuel Failure Based on Radiation Monitor Data."

5.2.3 Record normal background reading as determined by trends on Plant computer or by Radiation Protection.

5.2.4 Record Absolute dose rate, which is determined by subtracting normal background, the reading before time of accident, from the monitor dose rate on Attachment 1, "Fuel Failure Based on Radiation Monitor Data."

5.2.5 Determine the elapsed time (in hours) between the time since shutdown and the time the monitor readings were taken. Record on Attachment 1, "Fuel Failure Based on Radiation Monitor Data."

5.2.6 Use curves in Attachment 3, "Percent Fuel Failure Based on RIA-2315 Data," to determine percent fuel failure. **IF** point determined is between two curves, **THEN** state results as between the two curves (ie, 20-50%).

5.2.7 Record results on Attachment 1, "Fuel Failure Based on Radiation Monitor Data," and continue with Section 5.3 of this procedure.

5.3 REVIEW OF RESULTS

The Operations Group Leader shall review analyses and report results to the SED.

6.0 ATTACHMENTS AND RECORDS

6.1 ATTACHMENTS

6.1.1 Attachment 1, "Fuel Failure Based on Radiation Monitor Data"

6.1.2 Attachment 2, "Percent Fuel Failure Based on RIA-2321 and RIA-2322 Data"

6.1.3 Attachment 3, "Percent Fuel Failure Based on RIA-2315 Data"

6.2 RECORDS

Records generated by this procedure shall be filed in accordance with Palisades Administrative Procedure 10.46, "Plant Records."

7.0 SPECIAL REVIEWS

The scope of this procedure does not include activities that require a 50.59 review per Palisades Administrative Procedure 10.41, "Procedure Initiation and Revision." Therefore, changes to this procedure do not require a 50.59 review.

The scope of this procedure includes activities that require a PRC review per Palisades Administrative Procedure 10.41, "Procedure Initiation and Revision." Therefore, changes to this procedure require a PRC review.

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FUEL FAILURE BASED ON RADIATION MONITOR DATA

Start of Accident or Shutdown: Date _____ Time _____

SECTION I. CONTAINMENT HIGH RANGE MONITORS

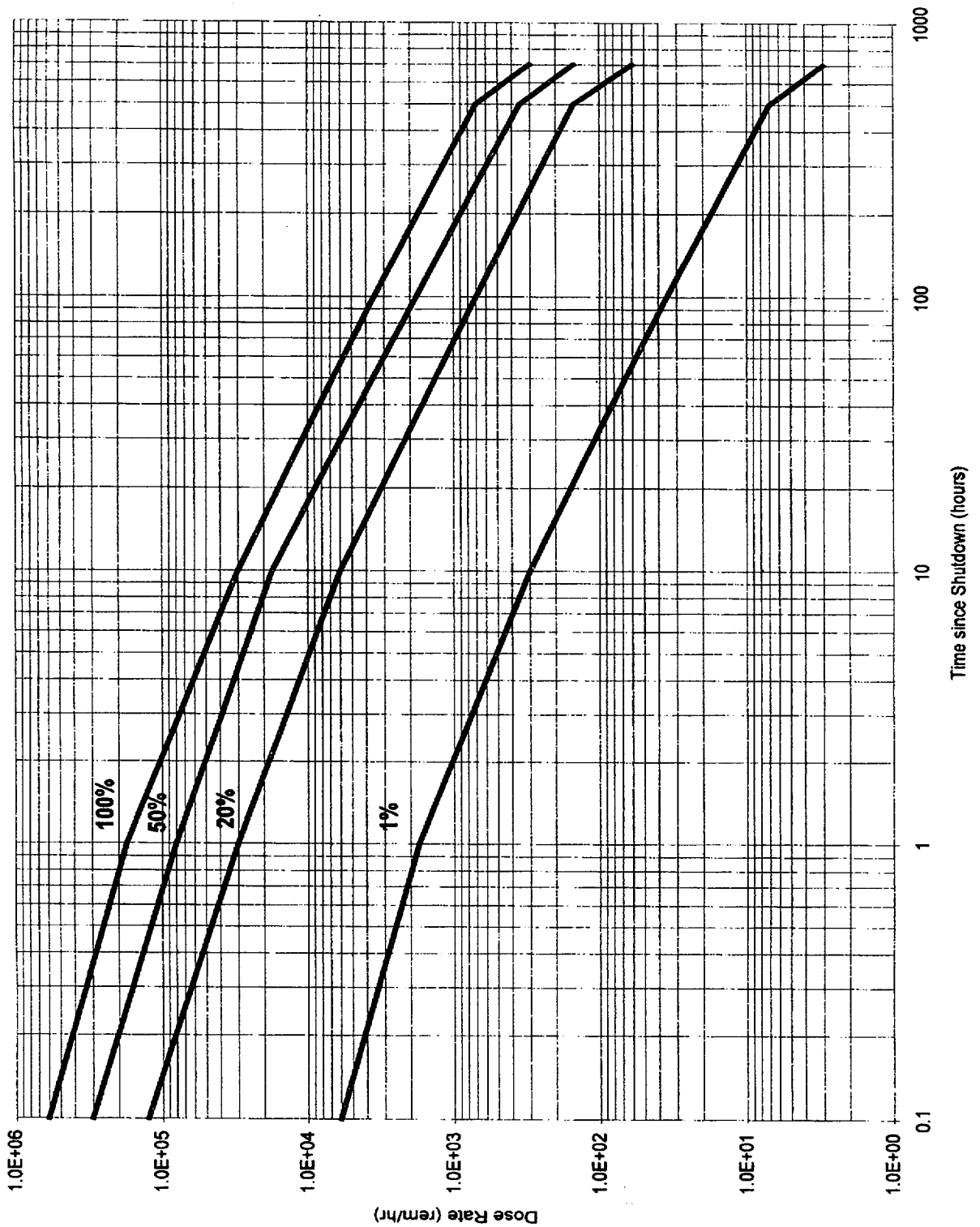
Date	Time	RIA-2321 Reading (R/hr)	Back ground (R/hr)	Absolute (R/hr)	Elapsed Time (hours)	Failed Fuel (%)	Data By	Reviewed By

Date	Time	RIA-2322 Reading (R/hr)	Back ground (R/hr)	Absolute (R/hr)	Elapsed Time (hours)	Failed Fuel (%)	Data By	Reviewed By

SECTION II. AREA RADIATION MONITOR

Date	Time	RIA-2315 Reading (mrem/hr)	Back ground (mR/hr)	Absolute (mR/hr)	Elapsed Time (hours)	Failed Fuel (%)	Data By	Reviewed By

PERCENT FUEL FAILURE BASED ON RIA-2321 AND RIA-2322 DATA



PERCENT FUEL FAILURE BASED ON RIA-2315 DATA