



DEC 13 2012

L-PI-12-110
10 CFR 50.90

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
Renewed License Nos. DPR-42 and DPR-60

License Amendment Request (LAR) to Revise Emergency Plan (EP) Emergency Action Levels (EALs): RA1.2 and Fuel Clad Barrier Loss Criteria

Pursuant to 10 CFR 50.90, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby requests changes to the Emergency Plan for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, to revise two EALs: RA1.2 and a Fuel Clad Barrier loss criterion. NSPM evaluated the proposed changes in accordance with 10 CFR 50.92 and concluded that they involve no significant hazards consideration.

NSPM identified two EALs that could provide inappropriate guidance for classification of emergencies. With the changes proposed in this LAR, these EALs will assure that emergencies are appropriately classified. These proposed changes meet the requirements of 10CFR 50.54(q)(4) for a license amendment and therefore NSPM requests NRC review and approval of the changes pursuant to 10CFR 50.90. With the implementation of the proposed changes, the NSPM EP will continue to meet the requirements in 10CFR 50.47(b) and 10CFR 50 Appendix E.

The enclosure to this letter, "Evaluation of the Proposed Changes" contains the licensee's evaluation of the proposed changes.

NSPM requests approval of this LAR within one calendar year of the submittal date. Upon NRC approval, NSPM requests 90 days to implement the associated changes. In accordance with 10 CFR 50.91, NSPM is notifying the State of Minnesota of this LAR by transmitting a copy of this letter and enclosure to the designated State Official.

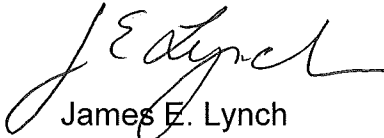
If there are any questions or if additional information is needed, please contact Mr. Dale Vincent, P.E., at 651-388-1121.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments

I declare under penalty of perjury that the foregoing is true and correct.

Executed on **DEC 13 2012**

A handwritten signature in black ink, appearing to read 'J. E. Lynch', written in a cursive style.

James E. Lynch
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (1)

cc: Administrator, Region III, USNRC
Project Manager, PINGP, USNRC
Resident Inspector, PINGP, USNRC
State of Minnesota

ENCLOSURE

Evaluation of the Proposed Changes

License Amendment Request (LAR) to Revise Emergency Plan (EP) Emergency Action Levels RA1.2 and Fuel Clad Barrier Loss Criteria

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1. Marked up Emergency Action Level pages
2. Final Emergency Action Level pages

1. SUMMARY DESCRIPTION

This evaluation supports a request to revise the EP for Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, respectively.

Pursuant to 10 CFR 50.90, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby requests changes to the Emergency Plan for PINGP, Units 1 and 2, to revise two Emergency Action Levels (EALs): RA1.2 and the Fuel Clad Barrier Loss Criteria.

2. DETAILED DESCRIPTION

2.1 Proposed Changes

A brief description of the associated proposed EAL changes is provided below along with a discussion of the justification for each change. The specific wording change to the Fission Product Barrier EAL is provided in Attachment 1 to this enclosure. The final proposed wording for both EALs is provided in Attachment 2 to this enclosure. (The explanation for this presentation difference for the two EAL changes is provided in the 2.2 Background discussion below)

RA1.2: The action level for escalation to emergency classification Alert level due to liquid releases is revised from 200 times the Offsite Dose Calculation Manual (ODCM) alarm setpoint value to 9×10^5 counts per minute (cpm) (60 times the ODCM alarm setpoint value) as indicated by radiation monitor R-18. The corresponding change to the Basis discussion has been made to describe the basis for this action. This change is acceptable because this indication is within the capability of the applicable instrumentation and, based on this proposed action level, the classification will be determined on a timely basis assuring the health and safety of the public is maintained.

Fission Product Barrier, Fuel Clad Barrier EALs LOSS Column, 6. Other Indications: Replace "RCS letdown line radiation monitor 1(2)R-9 10 R/hr or Greater" with "Not Applicable". The determination of fuel clad barrier loss will be based on five indications and Emergency Director judgment; indication from a sixth indicator, radiation monitor R-9, will be removed. The corresponding Basis discussion will be removed. This change is acceptable because there is adequate indication for determination of fuel clad barrier loss without use of R-9. Classification without use of R-9 will be determined on a timely basis assuring the health and safety of the public is maintained.

In summary these changes are acceptable because the PINGP Emergency Plan, as revised by these proposed changes, will continue to meet the requirements of 10CFR Part 50 Appendix E and the planning standards of 10 CFR 50.47(b).

2.2 Background

The current PINGP EALs were approved by NRC safety evaluation on November 18, 2005 (ADAMS Accession Number ML053080024). Subsequent to implementation of these EALs, the PINGP staff determined that the indicating range for installed radiation monitor R-18, Waste Effluent Liquid Monitor, would not support the intended threshold value of 200 times (200X) the ODCM alarm setpoint value. This condition was documented in the corrective action program for resolution. Since 2005, this issue has been identified at other plants (in particular at Kewaunee) as the subject of findings. Resolutions were implemented at PINGP under the provisions of 10 CFR 50.54(q) without prior NRC review and approval.

Subsequent to implementing the revised EALs, industry experience and a detailed EAL review determined changes were required to maintain compliance with the intent of the scheme as provided in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels", Revision 4, January 2003 (ADAMS Accession Number ML041470131), the licensing basis for the current PINGP EALs. NSPM, using the evaluation criteria provided in Regulatory Guide (RG) 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors" (ADAMS Accession Number ML102510560), determined that the changes to resolve this issue would require prior NRC approval. On August 29, 2012, NSPM conducted a pre-submittal conference call with the NRC as recommended by RG 1.219 pertaining to the changes. Subsequent to that call, NSPM concluded the two changes proposed in this LAR, modification of EAL RA1.2 and removal of radiation monitor R-9 as a criterion for determining Fuel Clad Barrier Loss, require NRC prior review and approval.

Note that the proposed change to EAL RA1.2 for which this LAR requests NRC review and approval has already (incorrectly as an interim compensatory measure) been incorporated into the PINGP EP as discussed with the NRC on the August 29, 2012 conference call. Thus a markup of changes to the current EAL RA1.2 are not provided since the current EAL RA1.2 is already in the final proposed form in the PINGP EP. This LAR seeks to bring the change process for EAL RA1.2 into compliance with regulatory requirements.

3. TECHNICAL EVALUATION

PINGP is a two unit plant located on the right bank of the Mississippi River approximately six miles northwest of the city of Red Wing, Minnesota. The facility is owned and operated by Northern States Power Company, a Minnesota corporation (NSPM). Each unit at PINGP employs a two-loop pressurized water reactor designed and supplied by Westinghouse Electric Corporation. The initial PINGP application for a Construction Permit and Operating License was submitted to the Atomic Energy Commission (AEC) in April 1967. The Final Safety Analysis Report (FSAR) was submitted for application of an Operating License in January 1971. Unit 1 began

commercial operation in December 1973 and Unit 2 began commercial operation in December 1974.

The PINGP was designed and constructed to comply with the licensee's understanding of the intent of the AEC General Design Criteria (GDC) for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967. PINGP was not licensed to NUREG-0800, "Standard Review Plan (SRP)."

Current EAL Requirements, Basis and Limitations

The current licensing basis for PINGP EAL was established in 2005. By letter dated October 22, 2004 (ADAMS Accession Number ML043080252), the Nuclear Management Company, LLC (the licensee for PINGP at that time) submitted EAL changes based on the guidance provided in NEI 99-01, Revision 4. NRC RG 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors" (ADAMS Accession Number ML032020276), endorses NEI 99-01, Revision 4 as an acceptable EAL scheme for compliance with the EP requirements of 10 CFR 50.47(b)(4). The NRC reviewed and approved NEI 99-01, Revision 4, as the licensing basis for the PINGP EAL scheme by Safety Evaluation dated November 18, 2005 (ML053080024).

Two EALs have been identified for revision:

1. The current guidance for EAL RA1.2 provided in NEI 99-01, Revision 4, requires escalating a liquid release event to an Alert emergency classification when radiation monitor R-18 indicates 200 times the ODCM alarm setpoint value for 15 minutes or longer. However, R-18 will not provide a reading at that radiation level, that is, it would be off-scale and not provide a basis for escalating the event classification.
2. The current EAL for Fission Product Barrier, Fuel Clad Loss Threshold Value under the "Other Indications" uses an indication from radiation monitor R-9 of 10R/hr as a criterion for determining loss of fuel cladding integrity. Other indications of loss of fuel cladding integrity are equivalent to reactor coolant activity for Dose Equivalent Iodine at 300 uCi/gm. At radiation monitor R-9, this activity level would be equivalent to approximately 734 R/hr. The R-9 value chosen for this loss of barrier criterion was based on the maximum scale of the instrument of 10 R/hr. Thus classification of Fuel Clad Barrier Loss using the R-9 value would therefore result in the determination of the loss of the barrier at a value approximately 1 percentage of the other criteria which is not consistent with the intent of the NEI 99-01, Revision 4, EAL scheme.

Proposed Changes

As shown in Attachment 2 to this Enclosure, this LAR proposes to revise EAL RA1.2 to require escalating the event classification to Alert when the Radiation Monitor R-18 indicates 60 times the ODCM alarm setpoint value for 15 minutes or longer.

As shown in Attachments 1 and 2 to this Enclosure, this LAR proposes to remove radiation monitor R-9 as a criterion for determining Fuel Clad Barrier Loss.

Technical Basis for Changes

This LAR proposes changes to two EALs: RA1.2 and the Fuel Clad Barrier Loss Criteria.

Basis for Changes to RA1.2:

This LAR proposes to revise EAL RA1.2 to classify an Alert at 60 times the ODCM alarm setpoint value to ensure the classification can be performed within the current range of the installed equipment. A reading of 60 times the ODCM alarm setpoint value is 900,000 cpm which is within the capability of R-18.

This proposed EAL change reduces the classification of a liquid effluent release via this pathway to approximately 60 times the ODCM limit from the current approved licensing basis of 200 times the limit. No other monitor is available to assess the liquid effluent release condition from this pathway at the 200 times value. Use of R-18 at 60 times the ODCM alarm setpoint value maintains a clear delineation and escalation for classification of an Unusual Event and an Alert. Classification of an Alert at 60 times the ODCM alarm setpoint value remains the most effective means of classifying an abnormal liquid release.

Basis for Changes to the Fuel Product Barrier Loss Criteria:

This LAR proposes to remove radiation monitor R-9 as a criterion for determining Fuel Clad Barrier Loss to ensure consistent classification. The licensing basis for the PINGP EALs is NEI 99-01, Revision 4. The NEI 99-01 Basis Information for Table 5-F-4, PWR Emergency Action Level, Fission Product Barrier Reference Table, states:

6. Other (Site-Specific) Indications

This EAL is to cover other (site-specific) indications that may indicate loss or potential loss of the Fuel Clad barrier, including indications from containment air monitors or any other (site-specific) instrumentation.

The intent of the "Other Indications" was to determine if any other site specific indicators not already credited in the Fission Product Barrier classification would provide an equivalent relative indication with the other criteria. The first indicator in the Fuel Clad Barrier LOSS column is the reactor coolant system activity for Dose Equivalent Iodine set at 300 uCi/gm, which is the threshold established in NEI 99-01. NSPM calculations determined that the radiation level at the R-9 monitor equivalent to the Dose Equivalent Iodine threshold value would be 734.4 R/hr which far exceeds the capability of this instrument. Since the current R-9 indication would result in

classification at 10 R/hr, removal of R-9 from the Fission Product Barrier loss criteria eliminates the possibility of an over classification from this indication.

Removal of radiation monitor R-9 as a criterion for Fuel Clad Barrier Loss ensures that the determination of the specific Fission Product Barrier, Fuel Clad Loss and the intended progression of classifications based on barrier loss are maintained. Five other criteria, in addition to Emergency Director judgment, for determining Fission Product Barrier, Fuel Clad Loss are retained providing sufficient redundancy to ensure accurate classification.

Conclusions

This LAR proposes to change EALs RA1.2 and the Fission Product Barrier, Fuel Clad loss criteria which will assure that the Emergency Plan is implemented in an effective and consistent manner. The RA1.2 alarm setpoint value for classifying a liquid effluent release will be established at a value within the indication capability of radiation monitor R-18. Use of R-18 at the proposed value will provide for escalation of an event at the appropriate level of liquid releases. Radiation monitor R-9 will be removed as a criterion for classifying fuel clad loss. Due to the limited range of this radiation monitor, its use for classification of fuel clad loss is inconsistent with other indicators of fuel clad loss and continued use may result in an inappropriate classification or event escalation. Other viable indicators will continued to be used for fuel clad loss classification. Operation of the Prairie Island Nuclear Generating Plant with the proposed Emergency Plan revisions will continue to protect the health and safety of the public. The Emergency Plan, as revised by these proposed changes will continue to meet the requirements of 10 CFR Part 50 Appendix E and the planning standards of 10 CFR 50.47(b).

4. REGULATORY SAFETY ANALYSIS

4.1 Applicable Regulatory Requirements/Criteria

Title 10 Code of Federal Regulations 50.47(b):

(b) The onsite and, except as provided in paragraph (d) of this section, offsite emergency response plans for nuclear power reactors must meet the following standards:

(4) A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

The PINGP Emergency Plan includes a standard emergency classification and action level scheme based on the industry standard NEI 99-01, Revision 4. This LAR

proposes to modify two action levels to specifically base the scheme on the plant system and effluent parameters. EAL RA1.2 will be modified to base liquid effluent event actions on radiation monitor R-18 indications at 60 times the ODCM alarm setpoint value. The EAL for classification of fuel clad barrier loss will be modified to be based on five criteria related to installed plant equipment in addition to Emergency Director judgment without reliance on radiation monitor R-9. With these changes, the Emergency Plan will continue to invoke a standard emergency classification and action level scheme which is based on plant systems and effluent parameters. Thus with the changes proposed in this license amendment request, the requirements of Title 10 CFR 50.47(b) continue to be met.

Title 10 Code of Federal Regulations Part 50 Appendix E

IV. Content of Emergency Plans

1. The applicant's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, *i.e.*, organization for coping with radiological emergencies, assessment actions ...

B. Assessment Actions

1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring.

The PINGP Emergency Plan includes means for determining the magnitude of, and for continually assessing the impact of the release of radioactive materials, including emergency actions levels that provide the criteria for determining the need for notification and participation of governmental agencies and protective measures. This LAR proposes to modify two emergency action levels to specifically base the actions on in-plant conditions and instrumentation. EAL RA1.2 will be modified to base liquid effluent event actions on in-plant radiation monitor R-18 indications at 60 times the ODCM alarm setpoint value. The EAL for classification of fuel clad barrier loss will be modified to be based on five criteria related to in-plant conditions, instrumentation and onsite monitoring in addition to Emergency Director judgment without reliance on radiation monitor R-9. With these changes, the Emergency Plan will continue to provide the means for determining the magnitude of the release of radioactive material and include emergency actions levels that provide criteria for notification of governmental agencies and determining protective measures. These emergency action

levels continue to be based on in-plant conditions, instrumentation and onsite monitoring. Thus with the changes proposed in this license amendment request, the requirements of Title 10 CFR Part 50 Appendix E continue to be met.

4.2 Precedent

NSPM is aware of two LARs which propose EAL changes. On April 27, 2012, Omaha Public Power District submitted an LAR for Fort Calhoun Station, Unit 1 (ADAMS Accession No. ML12121A565) which proposed to revise emergency action levels for flooding. On April 30, 2012, NextEra Energy Seabrook, LLC, submitted an LAR for Seabrook Station, Unit 1 (ADAMS Accession No. ML12124A341) which proposed to revise EALs for classifications based on instrumentation failures. Since the requirement to request EAL changes as an LAR was established less than one year ago, NSPM is not aware of any such LARs that have been reviewed and approved by the NRC.

4.3 Significant Hazards Consideration

Northern States Power Company, a Minnesota corporation (NSPM) evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

This license amendment request proposes to revise Emergency Plan emergency action levels for classification of liquid effluent releases and determining fuel clad barrier loss. These changes propose to use installed plant radiation monitors differently but do not involve any physical plant changes.

The Emergency Plan emergency action levels and installed plant radiation monitors are not accident initiators and therefore the proposed changes do not involve an increase in the probability of an accident.

The proposed emergency action level changes do not affect the capability of any structures, system or components to mitigate a design basis accident. Thus the proposed changes do not involve a significant increase in the consequences of an accident.

Therefore, the proposed Emergency Plan emergency action level changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

This license amendment request proposes to revise Emergency Plan emergency action levels for classification of liquid effluent releases and determining fuel clad barrier loss. These changes propose to use installed plant radiation monitors differently but do not involve any physical plant changes.

The proposed Emergency Plan emergency action level changes do not change any system operations or maintenance activities. The changes do not involve physical alteration of the plant, that is, no new or different type of equipment will be installed. The changes do not alter assumptions made in the safety analyses but ensures that the plant Emergency Plan is effectively and consistently implemented. These changes do not create new failure modes or mechanisms which are not identifiable during testing and no new accident precursors are generated.

Therefore, the proposed Emergency Plan emergency action level changes do not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

This license amendment request proposes to revise Emergency Plan emergency action levels for classification of liquid effluent releases and determining fuel clad barrier loss. These changes propose to use installed plant radiation monitors differently but do not involve any physical plant changes.

Margin of safety is provided by the ability of accident mitigation structures systems or components to perform at their analyzed capability. The changes proposed in this license amendment request do not affect the capability of any equipment to perform its accident mitigation function. Thus, no margin of safety is reduced as part of this change.

Therefore, the proposed Emergency Plan emergency action level changes do not involve a significant reduction in a margin of safety.

Based on the above, Northern States Power Company, a Minnesota corporation (NSPM), concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed in above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5. ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6. REFERENCES

None

ENCLOSURE, ATTACHMENT 1

Emergency Plan, Emergency Action Level Page (Markup)

F3-2.1, page 6-F-6
F3-2.1, page 6-F-8

2 pages follow

TABLE F-1
PINGP Emergency Action Level
Fission Product Barrier Reference Table
Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the Loss or Potential Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

<u>Fuel Clad Barrier EALS</u>		<u>RCS Barrier EALS</u>		<u>Containment Barrier EALS</u>	
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS
OR		OR		OR	
<u>6. Other Indications</u>		<u>5. Other) Indications</u>		<u>7. Other Indications</u>	
RCS shutdown line radiation monitor 1(2)R-9-10 R/hr or Greater	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
OR	<div style="border: 1px solid black; padding: 2px; display: inline-block;">No longer applicable</div>	OR		OR	
<u>7. Emergency Director Judgment</u>		<u>6. Emergency Director Judgment</u>		<u>8. Emergency Director Judgment</u>	
Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the RCS Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment Barrier	

3. Core Exit Thermocouple Readings

Core Exit Thermocouple Readings are included in addition to the Critical Safety Functions to include conditions when the CSFs may not be in use (initiation after SI is blocked).

The "Loss" EAL 1200 degrees F reading corresponds to significant superheating of the coolant. This value corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier EAL #1 which is 1200 degrees F. [Ref. 1]

The "Potential Loss" EAL 700 degrees F reading corresponds to loss of subcooling. This value corresponds to the temperature reading that indicates core cooling - ORANGE in Fuel Clad Barrier EAL #1 which is 700 degrees F. [Ref.1]

4. Reactor Vessel Water Level

There is no "Loss" EAL corresponding to this item because it is better covered by the other Fuel Clad Barrier "Loss" EALs.

The RVLIS values for the "Potential Loss" EAL corresponds to the top of the active fuel under various RCP configurations (2 RCPs running, 1 RCP running, or no RCPs running).

The "Potential Loss" EAL is defined by the Core Cooling - ORANGE path. [Ref.1, 2]

5. Containment Radiation Monitoring

The 200 R/hr reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. [Ref. 9] The reading is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 $\mu\text{Ci/gm}$ dose equivalent I-131 into the containment atmosphere. [Ref. 4, 5] Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage. This value is higher than that specified for RCS barrier Loss EAL #4. Thus, this EAL indicates a loss of both the fuel clad barrier and a loss of RCS barrier.

There is no "Potential Loss" EAL associated with this item.

6. Other Indications

Not Applicable

~~The RCS Letdown Line Radiation Monitor (R-9) provides indication for this Fuel Cladding loss threshold. An R-9 reading of 10 R/hr or greater indicates damage to the Fuel Cladding barrier. [Ref. 13, 14, 15]~~

7. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

ENCLOSURE, ATTACHMENT 2

**Emergency Plan, Emergency Action Level Pages
(Final)**

F3-2.1, page 6-F-6

F3-2.1, page 6-F-8

F3-2.1, page 6-R-8

F3-2.1, page 6-R-9

4 pages follow

TABLE F-1
PINGP Emergency Action Level
Fission Product Barrier Reference Table
Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the Loss or Potential Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

<u>Fuel Clad Barrier EALS</u>		<u>RCS Barrier EALS</u>		<u>Containment Barrier EALS</u>	
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS
OR		OR		OR	
<u>6. Other Indications</u>		<u>5. Other Indications</u>		<u>7. Other Indications</u>	
Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
OR		OR		OR	
<u>7. Emergency Director Judgment</u>		<u>6. Emergency Director Judgment</u>		<u>8. Emergency Director Judgment</u>	
Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the RCS Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment Barrier	

3. Core Exit Thermocouple Readings

Core Exit Thermocouple Readings are included in addition to the Critical Safety Functions to include conditions when the CSFs may not be in use (initiation after SI is blocked).

The "Loss" EAL 1200 degrees F reading corresponds to significant superheating of the coolant. This value corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier EAL #1 which is 1200 degrees F. [Ref. 1]

The "Potential Loss" EAL 700 degrees F reading corresponds to loss of subcooling. This value corresponds to the temperature reading that indicates core cooling - ORANGE in Fuel Clad Barrier EAL #1 which is 700 degrees F. [Ref.1]

4. Reactor Vessel Water Level

There is no "Loss" EAL corresponding to this item because it is better covered by the other Fuel Clad Barrier "Loss" EALs.

The RVLIS values for the "Potential Loss" EAL corresponds to the top of the active fuel under various RCP configurations (2 RCPs running, 1 RCP running, or no RCPs running).

The "Potential Loss" EAL is defined by the Core Cooling - ORANGE path. [Ref.1, 2]

5. Containment Radiation Monitoring

The 200 R/hr reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. [Ref. 9] The reading is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 $\mu\text{Ci/gm}$ dose equivalent I-131 into the containment atmosphere. [Ref. 4, 5] Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage. This value is higher than that specified for RCS barrier Loss EAL #4. Thus, this EAL indicates a loss of both the fuel clad barrier and a loss of RCS barrier.

There is no "Potential Loss" EAL associated with this item.

6. Other Indications

Not Applicable

7. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

RA1

Initiating Condition -- ALERT

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Offsite Dose Calculation Manual Specification for 15 Minutes or Longer.

Operating Mode Applicability: All

Emergency Action Levels: (RA1.1 or RA1.2 or RA1.3)

RA1.1. VALID reading on any effluent monitor that exceeds 200 Times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer
OR
VALID reading on effluent monitor R-18 that exceeds 900,000 cpm for 15 minutes or longer.

RA1.2. VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds				
Monitor	GE	SAE	Alert	UE
			CPM	CPM
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	43000 mR/hr	4300 mR/hr	N/A	N/A
1 R-22* Shield Building Vent Rad Monitor	N/A	N/A	160,000*/ 1.6 E5	1600*/ 1.6 E3
2 R-22* Shield Building Vent Rad Monitor	N/A	N/A	100,000*/ 1 E5	1000*/ 1 E3
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	100,000*/ 1 E5	1000*/ 1 E3
2R-30* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	100,000*/ 1 E5	1000*/ 1 E3
2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	120,000*/ 1.2 E5	1200*/ 1.2 E3
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	100,000*/ 1 E5	1000*/ 1 E3
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	800,000*/ 8 E5	8000*/ 8 E3
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	900, 000*/ 9 E5	30,000*/ 3 E4
1R-19*SG Blowdown Radiation Monitor	N/A	N/A	100,000*/ 1 E5	1,000*/ 1 E3
2R-19*SG Blowdown Radiation Monitor	N/A	N/A	60,000*/ 6 E4	600*/ 6 E2
R-21 Circ Water Discharge Monitor	N/A	N/A	800,000/ 8 E5	8000/ 8 E3

Notes:

1. ERCS EAL Alarms indicate an EAL threshold MAY have been exceeded. Further evaluation of the radiation monitor reading is required to determine if the EAL threshold is exceeded.
2. *Applies when Effluent discharge not isolated.

RA1.3. Confirmed sample analysis for gaseous or liquid release indicates concentrations or release rates, with a release duration of 15 minutes or longer, in excess of 200 Times ODCM specification.

Basis:

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. PINGP incorporates features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM) [Ref. 3, 5]. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of degradation in these features and/or controls.

The ODCM specification multiples are specified in ICs RU1 and RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an offsite dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate. Releases should not be prorated or averaged.

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 15 minutes. RA1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared. This EAL addresses radioactivity releases that for whatever reason cause effluent radiation monitor readings exceed 900,000 cpm for R-18 or 200 Times alarm setpoint for all other applicable radiation monitors established by the radioactivity discharge permit for greater than 15 minutes. These alarm setpoints are associated with a planned batch release, or a continuous release path. In either case, the setpoint is established by the ODCM to warn of a release that is not in compliance with the ODCM specification. Indexing the EAL threshold to the ODCM setpoints in this manner insures that the EAL threshold will never be less than the setpoint established by a specific discharge permit.

RA1.2 is similar to RA1.1, but is intended to address effluent or accident radiation monitors on non-routine release pathways (i.e., for which a discharge permit would not normally be prepared). The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. These monitor reading EALs have been determined using this methodology. The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 900,000 cpm for R-18 or 200 Times the alarm setpoint values for all other applicable radiation monitors.

RA1.3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

RA1.1 and RA1.2 directly correlate with the IC since annual average meteorology is required to be used in showing compliance with the ODCM specifications and is used in calculating the alarm setpoints. The fundamental basis of this IC is NOT a dose or dose rate, but rather the degradation in the level of safety of the plant implied by the uncontrolled release.