



Prairie Island Nuclear Generating Plant
1717 Wakonade Drive East
Welch, MN 55089

FEB 26 2013

L-PI-13-006
10 CFR 2.202

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

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

Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

References:

1. NRC Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (Accession No. ML12054A679).
2. NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, dated August 29, 2012 (Accession No. ML12221A339).
3. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, dated August 2012.
4. NSPM Letter to NRC L-PI-12-093, "Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated October 29, 2012 (Accession No. ML12305A313).

On March 12, 2012, the NRC staff issued Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," (Reference 1) to all NRC power reactor licensees and holders of construction permits in active or deferred status. Order EA-12-051 (Reference 1) was immediately effective and

directs Northern States Power Company (NSPM), a Minnesota corporation, d/b/a Xcel Energy, to have a reliable indication of the water level in the spent fuel storage pool for Prairie Island Nuclear Generating Plant (PINGP). Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 requires submission of an overall integrated plan by February 28, 2013. The NRC Interim Staff Guidance (ISG), JLD-ISG-2012-03, Revision 0, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," (Reference 2) was issued August 29, 2012. This ISG endorses, with exceptions and clarifications, the methodologies described in the industry guidance document, NEI 12-02, "Industry Guidance for Compliance with Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, dated August 24, 2012 (Reference 3). Reference 3 provides direction regarding the content of the overall integrated plan.

Reference 4 provided the NSPM initial status report regarding reliable spent fuel pool instrumentation, as required by Reference 1.

The purpose of this letter is to provide the overall integrated plan, pursuant to Section IV, Condition C.1 of Reference 1, including a description of how compliance with the requirements described in Attachment 2 will be achieved. The Enclosure to this letter provides the PINGP overall integrated plan with consideration of Reference 3. The Enclosure contains the current design information for the spent fuel pool level instrumentation as of the date of this letter, much of which is still preliminary. As the design details are finalized, additional information and revisions to the information contained in the Enclosure to this letter will be communicated to the NRC Staff in the six-month updates required by the Order.

Please contact Lynne Gunderson, Licensing Engineer, at 612-396-0173, if additional information or clarification is required.

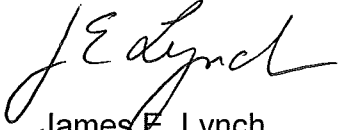
This letter makes no new commitments and no revisions to existing commitments.

Document Control Desk

Page 3

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

Executed on **FEB 26 2013**

A handwritten signature in cursive script, appearing to read "J E Lynch".

James E. Lynch

Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosure

cc: Administrator, Region III, USNRC
Director of Nuclear Reactor Regulation (NRR), USNRC
NRR Project Manager, PINGP, USNRC
Senior Resident Inspector, PINGP, USNRC

ENCLOSURE

**Prairie Island Nuclear Generating Plant
Units 1 and 2**

**Overall Integrated Plan For
Reliable Spent Fuel Pool Instrumentation**

(11 pages to follow)

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

1.0 Introduction

The Nuclear Regulatory Commission (NRC) issued Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," on March 12, 2012 (Reference 6.1). The Order requires licensees to have reliable indication of the water level in associated spent fuel pools capable of supporting identification of the following spent fuel pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred. The NRC Order also requires licensees to submit an overall integrated plan, including a description of how the requirements in Attachment 2 of the NRC Order will be achieved.

NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, (Reference 6.4) provides an approach for Complying with Order EA- 12-051. NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," (Reference 6.3) considers that the methodologies and guidance in conformance with the guidance provided in NEI 12-02, Revision 1, subject to the clarifications and exceptions specific to Section 3.4, Qualification, are an acceptable means of meeting the requirements of Order EA-12-051.

1.1 Applicability

This overall integrated plan applies to Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, for the Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2, Docket Nos. 50-282 and 50-306, respectively. This overall integrated plan is based on the current conceptual design information and may be revised as detailed design engineering proceeds. Consistent with the requirements of Order EA-12-051 and the guidance in NEI 12-02, six-month status reports will describe progress made, any proposed changes in compliance methods, schedule updates, and if needed, requests for relief and the bases for these requests.

1.2 Schedule

PINGP maintains a common spent fuel pool for both Units 1 and 2. The schedule for installation of reliable instrumentation for the spent fuel pool (SFP) is based on Unit 2, which is the unit with the refueling schedule resulting in the earliest implementation schedule. The installation of reliable SFP level instrumentation for the SFP associated with PINGP Units 1 and 2 is scheduled for completion prior to startup from the 2R29 refueling outage. Refueling outage 2R29 is currently scheduled for the fall of 2015.

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

The following milestone schedule is provided. The dates are target dates and subject to change as design and implementation details are developed. Any changes to the following target dates will be reflected in subsequent six-month status reports.

Milestone	Target Date
Select Instrument Vendor	1 st Quarter 2013
Commence Engineering Design	3 rd Quarter 2013
Commence Installation	2 nd Quarter 2015
Reliable Spent Fuel Pool Instrumentation Operational	End of 2R29

1.3 Spent Fuel Pool Configuration

The spent fuel pool facility at PINGP is a shared pool comprised of two storage pools and a fuel transfer canal. These three compartments are separated by slots in the walls that can be isolated by use of pneumatically sealed gates. The bottom of these slots is located above the top of the active fuel in the fuel assemblies when stored in the racks. However, the bottoms of the slots are below the top of the storage racks. This configuration allows monitoring of pool level from Level 1 through Level 3 in any of the three compartments provided the gates are not in place. The SFP cooling system has a pump suction from both pools that is located approximately 4 feet below the normal water level (see Figure 1).

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

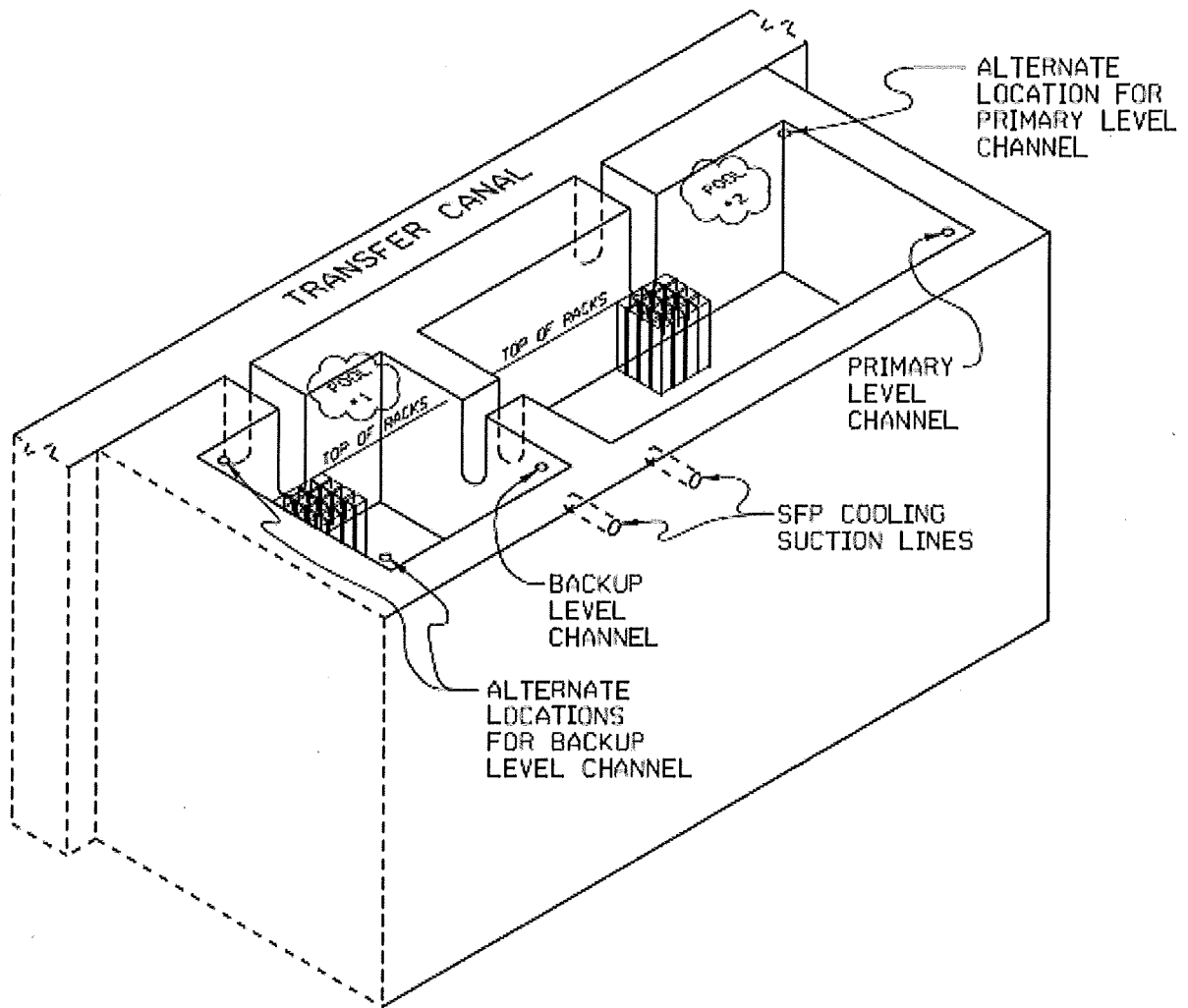


Figure 1 – Spent Fuel Pool General Layout (Not to Scale)

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

2.0 Identification of Spent Fuel Pool Water Levels

Key spent fuel pool water levels were determined using the guidance in Section 2.3 of NEI 12-02. The spent fuel pool water Levels 1, 2 and 3 for PINGP will be as identified in the sections below. The levels are also depicted on Figure 2, "Simplified Elevation Sketch of Levels," located at the end of Section 2.0. The figure is not to scale.

2.1 Level 1- Support Operation of the Normal Fuel Pool Cooling System

Level 1 is the level that is adequate to support operation of the normal fuel pool cooling system. This level will be based on the top of the cooling system suction pipe location, which is about four feet below the normal pool water level. The minimum level is 21 feet and 1 $\frac{3}{4}$ inches above the top of the racks (36 feet and 3 $\frac{3}{4}$ inches from the bottom of the pool). This level will be adequate to assure the normal fuel pool cooling system is available for cooling the spent fuel pool (See Figure 2) and will be used for Level I. Allowance for instrumentation accuracy will be applied to the setpoint for this level.

2.2 Level 2 - Provide Substantial Radiation Shielding for a Person Standing on the Spent Fuel Pool Operating Deck

Level 2 represents the range of water level where any necessary operations in the vicinity of the spent fuel pool can be completed without significant dose consequences from direct gamma radiation from the stored spent fuel. Based on the guidance in Section 2.3 of NEI 12-02, Level 2 is 10 feet (+/- 1 foot) above the top of the spent fuel rack, which corresponds to 25 feet and 8 inches from the bottom of the PINGP spent fuel pool. Therefore, Level 2 will be 25 feet and 8 inches from the bottom of the spent fuel storage pool. Allowance for instrumentation accuracy will be applied to the setpoint for this level.

2.3 Level 3 - Fuel Remains Covered and Actions to Implement Make-up Water Addition Should No Longer be Deferred

Level 3 is the level where the fuel remains covered and actions to implement make-up water addition should no longer be deferred. Level 3 will be greater than six inches above the top of the racks or 15 feet and 8 inches above the pool bottom. This level will be adequate to ensure the fuel remains covered (see Figure 2). This level is based on the guidance provided by NEI 12-02 (i.e., +/- one foot of the highest point of the fuel racks in the spent fuel pool). The final setpoint will be established upon installation and will be within one foot of the top of the racks as recommended by NEI 12-02. Allowance for instrumentation accuracy will be applied to the setpoint for this level.

Enclosure
 Prairie Island Nuclear Generating Plant Units 1 and 2
 NRC Order EA-12-051
 Overall Integrated Plan

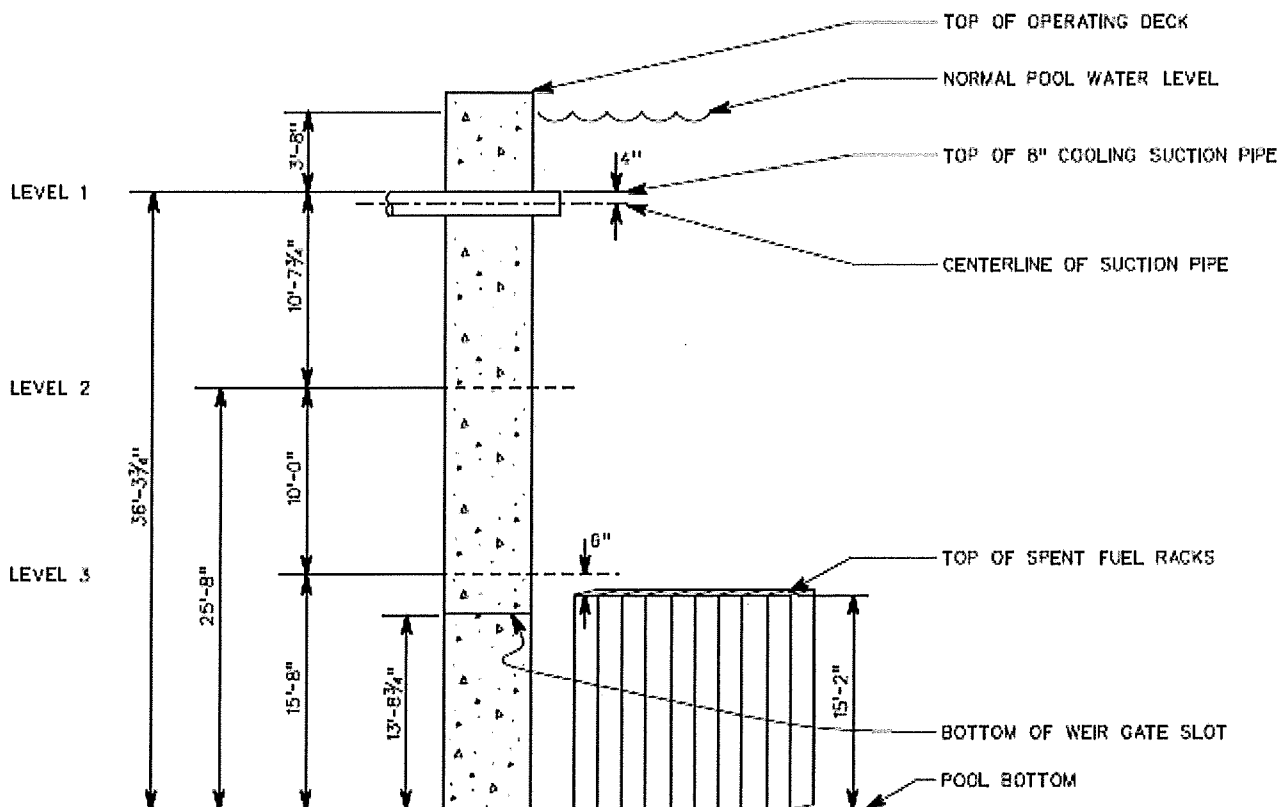


Figure 2 – Simplified Elevation Sketch of Levels (Not to Scale)

3.0 Instrument Design Features

3.1 Instruments

The design of the instruments will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02. Specifically, the channels will be designed as discussed in the following sections:

3.1.1 Primary Instrument Channel

The primary instrument channel level sensing component will be a new fixed system. The channel location is described in Section 3.2 of this Enclosure. The new fixed system will be a guided wave radar device. The device will be a level monitoring system capable of measuring the range of levels discussed in Section 2.0. To measure the water level the device sends a test signal that propagates

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

down the cable through the probe. The device records the backscatter to determine the water level. The probe will be mounted on the edge of the spent fuel pool and the probe will extend down into spent fuel pool directly measuring the water level. The primary instrument channel will be capable of displaying level from Level 1 to Level 3. The primary instrument channel will not use any wireless communication technology.

3.1.2 Backup Instrument Channel

The backup instrument channel is identical to and independent from the primary instrument channel. The backup instrument channel probe will be mounted on the edge of the spent fuel pool and will be capable of displaying level from Level 1 to Level 3. The backup instrument channel will not use any wireless communication technology.

3.1.3 Reliability

Reliability of the primary and backup instrument channels will be assured by conformance with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02. The instrument channel reliability will be established through the use of an augmented quality assurance process, which is described in Section 3.4. The instrument channel reliability will be demonstrated through an appropriate combination of design, analyses, operating experience, and/or testing of channel components.

3.1.4 Time Duration

The time duration required for the primary and backup instrument channels to be functional will be designed to coordinate with the strategy developed in response to Order EA-12-049 (Reference 6.2) and NEI 12-06 (Reference 6.5).

3.2 Arrangement

3.2.1 Probes

The two level instruments will be installed in separate pools as shown in Figure 1. The probes will be located approximately 45 feet apart. This distance meets the minimum separation requirement from NEI 12-02, as the shortest length of one pool side is 18 feet and 3 inches. These locations will assure that damage due to missiles is minimized since each instrument is located in a separate pool and is also protected in a pool corner by two walls. In addition, the entire spent fuel pool at PINGP is enclosed in a Class 1 structure designed to protect the pool from tornado generated missiles.

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

3.2.2 Cable Routing

All cabling routing for the primary and backup instrument channels will be protected from external events to meet the requirements of NRC JLD-ISG-2012-03 and NEI 12-02. No cabling will be installed outside structures or in areas subject to external event submergence. The conduit and cable routing will be determined during the design process.

3.3 Mounting

Both the primary and backup system mounting will be installed as Seismic Category I to meet the NRC JLD-ISG-2012-03 and NEI 12-02 guidance requirements. An evaluation of other hardware stored in the SFP will be conducted as part of the detailed design to ensure it will not create adverse interaction with the fixed instrument locations.

3.4 Qualification

The primary and backup channels will be qualified through the use of an augmented quality assurance process that meets the requirements of NRC JLD ISG-2012-03 and NEI 12-02. The following sections describe the conditions and details of the qualification.

3.4.1 Conditions

The primary and backup instrumentation channel equipment installed in the spent fuel pool enclosure and vicinity will be qualified for reliable operation at conditions expected in the spent fuel pool enclosure as described by Section 3.4 of NEI 12-02. This includes consideration of the spent fuel pool boiling at saturated conditions and the presence of high levels of boric acid in the vicinity of the pool. The equipment installed will also be qualified for reliable operation at radiation levels representative of a normal core offload of freshly discharged fuel as allowed by existing refueling procedures with the spent fuel pool water at Level 3. The sensors and cables located in the vicinity of the SFP will be qualified to withstand these conditions for an extended period consistent with strategies developed in response to NRC Order EA-12-049 and NEI 12-06.

3.4.2 Shock and Vibration

The applicable components of the primary and backup instrumentation channel required after an event will be rated for anticipated shock and vibration per the recommendations of NRC JLD-ISG-2012-03 and NEI 12-02.

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

3.4.3 Seismic

The primary and backup instrument channel components required after a potential seismic event will be qualified for reliable operation following such an event. The methods used to qualify components will be consistent with the guidance of NEI 12-02, including the clarifications and exceptions to that guidance provided by the NRC Staff in NRC JLD-ISG-2012-03. Mounting of components for reliable operation following a seismic event is addressed in Section 3.3 of this Enclosure.

3.5 Independence

The primary channel will be independent of the backup channel. Both channels will have their own probes located in separate corners of the spent fuel pool, separate cable routes, and separate electronics. In the vicinity of the spent fuel pool, existing embedded conduit will be used for entry and exit of cables from the spent fuel pool structure. Once outside the pool structure, the primary and backup channel cabling will be routed in separate conduit or cable trays to achieve independence. Power supply independence is addressed in Section 3.6 of this Enclosure.

3.6 Power Supplies

The instrument channels will each have an independent power supply meeting the recommendations of NRC JLD-ISG-2012-03 and NEI 12-02. Any onsite generators used as an alternate power source and replaceable batteries used for instrument channel function will have sufficient capacity to maintain level indication function until offsite resource availability is reasonably assured. Any portable power supplies used will be stored consistent with the requirements of NRC Order EA-12-049 and NEI 12-06. The design process will determine the normal power source, battery power supply, and any additional power sources required for the instrument channels.

Both the primary and the backup instrument channels will maintain their design accuracy without recalibration following a power interruption or change in the power source, as required by NRC Order EA-12-051.

3.7 Accuracy

The accuracy of both the primary and backup instrument channel will be consistent with the requirements of NRC JLD-ISG-2012-03 and NEI 12-02. The primary and backup instrument channels will maintain their design instrument accuracy without requiring recalibration following power interruptions or changes in power source, as required by NRC Order EA-12-051. The total loop accuracy of both instrument channels will be determined for the entire span (Level 1 to 3) during the design process with consideration of the conditions described in Section 3.4.

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

3.8 Testing

The instrument channel design will provide for routine testing and calibration. The entire primary and backup instrumentation channel will be capable of in-situ testing and calibration per the requirements of NRC JLD-ISG-2012-03 and NEI 12-02. Testing and calibration procedures will be developed and are addressed further in Section 4.2.

3.9 Display

The primary and backup instrumentation displays will be installed per the requirements of NRC JLD-ISG-2012-03 and NEI 12-02. The primary and backup instrument channel will be capable of displaying an on-demand or continuous display of spent fuel pool level from Level 1 to Level 3. The primary and backup display will be located in an area which meets the four characteristics defined in NEI 12-02, Section 3.9. The location will be finalized in the design process.

4.0 Instrument Channel Program Features

The program features for the instrument channels will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02. These features include training, procedures, and testing and calibration.

4.1 Training

Training on the new instrumentation will be provided to the necessary personnel, as determined by plant processes and procedures. NSPM's Systematic Approach to Training (SAT) will be used to identify the population to be trained, and the initial and continuing elements of the required training.

4.2 Procedures

Procedures will be developed for both the primary and backup instrument channels consistent with the requirements of NRC JLD-ISG-2012-03 and NEI 12-02, Section 4.2. This will include procedures for the maintenance, operation, testing, calibration and normal/abnormal response of the primary and backup instrument channels. As described in Section 3.1.4, the time duration required for both the primary and backup instrument channels to be functional will be coordinated with the strategies developed for NRC Order EA-12-049 and NEI 12-06.

4.3 Testing and Calibration

Testing and calibration of the primary and backup instrument channels will be established and implemented by existing PINGP processes, and will be scheduled in

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

intervals such that the design accuracy of the instruments is maintained. Surveillance or testing intervals will be established per the recommendations of NEI 12-02, Section 4.3.

If instrumentation is out of service for any reason, including testing, maintenance or calibration, the guidance in NEI 12-02, Section 4.3 will be implemented. This includes a 90-day limitation on use of pool divider gates that isolate the common pool into pools 1 and 2 (refer to Figure 1). When the pools are isolated by the divider gates and an instrument in one of the pools containing fuel discharged within the past five years is declared out of service, actions will be initiated within 24 hours to either restore the equipment, un-isolate the pools, or take other appropriate compensatory measures within 72 hours. Allowed out of service times, as identified in NEI 12-02, will be incorporated consistent with the programmatic process used for compliance with NRC Order EA-12-49.

5.0 Need for Relief Basis

NSPM is not requesting relief from the requirements of NRC Order EA-12-051 or the guidance in NRC JLD-ISG-2012-03 at this time.

Consistent with the requirements of NRC Order EA-12-051 and the guidance in NEI 12-02, the six-month status reports will delineate progress made, any proposed changes in our compliance methods, updates to the schedule, and if needed, requests for relief and the bases for these requests.

6.0 References

- 6.1 NRC Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012, Accession No. ML12054A679.
- 6.2 NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis-External Events," dated March 12, 2012, Accession No. ML12054A736.
- 6.3 NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, dated August 29, 2012, Accession No. ML12221A339.
- 6.4 NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, dated August 2012.

Enclosure
Prairie Island Nuclear Generating Plant Units 1 and 2
NRC Order EA-12-051
Overall Integrated Plan

- 6.5 NEI 12-06, "Diverse and Flexible Coping Strategies (Flex) Implementation Guide," Revision 0, dated August 2012.