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10 CFR 50.48

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

Palisades Nuclear Plant  
Docket 50-255  
License No. DPR-20

Request for Extension of Discretion for the Interim Enforcement Policy for Fire Protection Issues on 10 CFR 50.48(c), National Fire Protection Association Standard NFPA 805 – Supplement

Dear Sir or Madam:

Entergy Operations, Inc. (Entergy) letter ENOC-08-00042, dated August 28, 2008, requested the period of the subject enforcement discretion be extended for several Entergy plants including Palisades Nuclear Plant (PNP). On November 12, 2008, Entergy Nuclear Operations, Inc., (ENO) provided a supplement describing progress on the PNP NFPA 805 transition activities. On November 19, 2008, in a teleconference with PNP management, the Nuclear Regulatory Commission (NRC) requested additional information regarding the schedule for completion of a licensed amendment request (LAR).

Enclosure 1 provides a detailed description of work completed to date. Enclosure 2 provides a schedule showing major tasks and subtasks along with planned completion dates.

ENO believes that there has been substantial progress made toward the NFPA transition. ENO is committed to provide adequate resources to ensure the LAR for PNP will be submitted within six months after the second pilot plant request is approved.

Summary of Commitments

This letter contains one new commitment and no revisions to existing commitments.

ENO will conduct a monthly teleconference with the NRC staff to discuss progress on the PNP NFPA 805 transition activities. The teleconferences will continue until ENO submits the LAR to support the NFPA transition or until the NRC determines they are no longer necessary.



Christopher J. Schwarz  
Site Vice President  
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Enclosures (2)

CC Administrator, Region III, USNRC  
Project Manager, Palisades, USNRC  
Resident Inspector, Palisades, USNRC

## ENCLOSURE 1 DETAILED DESCRIPTION OF WORK COMPLETED

Entergy Nuclear Operations, Inc., (ENO) believes that substantial progress has been made for the NFPA 805 transition. A status of tasks is provided below. ENO is also providing information to demonstrate the resources that have been committed to this project.

### Fire PRA (Palisades Probabilistic Risk Analysis)

The fire PRA represents the largest task of the transition process. For this reason, ENO has focused on the fire PRA to ensure the overall critical path of the project schedule is maintained. Detailed descriptions of status related to this task are provided, which demonstrates that substantial progress has been made.

### Multiple Spurious Operations (MSO) Expert Panel Review

The MSO panel convened. Most of the relevant issues have been identified, and a draft report has been written. Several action items included development of detailed logic models, such as containment isolation, letdown line isolation, control room HVAC, consequential loss-of-coolant accidents (LOCA's) (e.g., primary coolant pump seal LOCA's due to random loss of component cooling water/service water resulting from transient events, spurious power-operated relief valve (PORV) and block failures, spurious head vent failures) and additional flow diversion paths, such as the safety injection tanks. These additional logic models were not required for the internal events model; however, are now necessary to address additional MSO issues. In addition to the logic development, hydraulic analyses (discussed below) supporting flow diversion and various success criteria have been completed. Although presently in draft form, these models are currently being completed and integrated into the baseline internal events core damage and large early release frequency (LERF) model for integration into the NFPA 805 fire PRA logic model.

### Plant Partitioning

Walkdowns were completed for all accessible plant areas to establish the overall analysis boundaries and to identify discrete fire compartments. The walkdown findings were reconciled with the existing fire safe shutdown analysis to assure that, wherever possible, the fire compartments identified for the PRA correlated to fire areas already established in the fire safe shutdown program.

### Development of Fire Ignition Frequencies

The plant walkdowns also served to determine plant equipment populations for the purpose of partitioning generic fire frequency values. Subsequent to the walkdowns, an expert panel was convened to develop weighting factors for the calculation of transient

fire frequency values. Plant specific fire events were then reviewed to support Bayesian update of the generic industry fire frequency values, which has also been completed. These parameters were integrated and the individual fire compartment frequencies have been calculated.

### Fire PRA Component and Cable Selection

The scope of plant equipment to be credited in the fire PRA has been established. A rigorous review was performed to disposition the basic events in the internal events PRA model, and to reconcile these basic events with the fire safe shutdown equipment list. The review was completed and resulted in the identification of additional components for which cable data is required. These components were identified in phases and considerable progress has been made in the cable identification and raceway location efforts.

### Fire PRA Model

As a part of component selection, additional sequences were identified that merited inclusion in the fire PRA model. These resulted from a review of initiating events previously screened from the internal events PRA model. Sequences not treated in the plant PRA may become significant when considered in combination with fire-induced failures and sequences resulting from multiple spurious operations. These additional sequences and the associated model changes are being incorporated directly into the plant internal events model, which will be used for the fire PRA.

In summary, based on the above substantial progress has been made in the fire PRA development.

### Internal Events PRA

#### Independent Review of AC and DC Logic

An independent review of both ac and dc electrical logic modeling has been completed with identified issues being resolved. Other model updates supporting NFPA 805 include incorporation of battery depletion effects and use of instrument ac supplied station power as a backup to a preferred ac supply.

#### Plant Specific Data

The review of about 7000 work orders (WO's) in support of the component failure probability data update have been completed. These data are currently being correlated to maintenance rule driven corrective actions, condition reports and maintenance rule evaluations.

In addition to the work order review, valve repositioning (open / close / throttle) for over one hundred valves and pump start data were collected for more than thirty pumps over the previous six years of plant operation. This task is complete.

#### Pre-initiator Human Error Probability (HEP) Development

The process for completing an update of pre-initiator development was completed. This effort involved reviewing many procedures, included an update of existing pre-initiators and the development of a screening process to identify actions requiring detailed analysis. The identified operator actions are in review and will be added to the model shortly.

Post-initiator updates of documentation and conversion to a new process have been ongoing. Some forty human failure events will have been updated by the end of 2008. In addition the associated HEP instrumentation and controls (I&C) logic (diagnostic instrument modeling) is nearly complete and will soon be integrated into the overall core damage model used to support the NFPA 805 logic model.

#### Modular Accident Analysis Program Updates (MAAP)

The Palisades version of the MAAP3.0B code, called CPMAAP, was developed to allow the evaluation of the integrated effect of the plant-specific features on overall containment performance and fission product release. Over twenty additional subroutines were developed that included hard coding the Larsen and Miller creep rupture model for different primary coolant system (PCS) pipe segments, as well as steam generator tubes, to explicit modeling of debris transport to the auxiliary building. Given that the industry version has caught up with the 1993 Palisades individual plant evaluation (IPE) developed plant specific model, the MAAP4.0.6 parameter file is complete with only the quality assurance paperwork waiting disposition. Moreover, a GOTHIC subdivided containment model that duplicates the MAAP4.0.6 subdivided control volume representation has been built and is currently being used to benchmark MAAP containment response results. It should be noted that the Palisades CPMAAP containment model was requested by the Nuclear Energy Institute to support the Nuclear Regulatory Commission's (NRC's) current state-of-the-art reactor consequence analyses (SOAR CA).

#### Other Hydraulic Analysis: Pipe-Flo ESS Model Upgrade and Benchmarking

This task involved a complete revalidation and benchmarking of the integrated containment spray, low-pressure injection, and high-pressure injection hydraulic model. This required review of over one hundred drawings, vendor manuals, and calculations to ensure input to the model was current with respect to as-built design. Each of these steps required revalidation of inputs and benchmarking runs. Over twenty benchmarking cases were performed on the final model, each of which had to be evaluated for accuracy and impact to the current plant design. This task provides the

basis for reducing the many conservatisms in the current internal events core damage model that is being modified for NFPA 805. Currently, this task is in the final comment resolution stage.

#### Other Hydraulic Analysis: Pipe-Flo AFW Model Upgrade and Benchmarking

The hydraulic model upgrade of the auxiliary feedwater (AFW) system required review of more than eighty drawings, vendor manuals, and calculations. A complete revalidation of all model piping segments was performed and additional pipe segments added to represent cross-tie piping to the service water and fire protection systems. Similar to the integrated emergency safeguards systems (ESS) hydraulic model task, the AFW model required numerous benchmarking calculations each of which had to be evaluated for accuracy and impact on current plant design. Upon completion of benchmarking, the model was updated with current AFW, service water, and fire protection pump curves and benchmarked to test flow rate data. These models provide the basis that demonstrates a single fire pump can deliver sufficient makeup to the steam generators when considering specific AFW failures. This task is currently in the technical review stage.

#### Other Hydraulic Analysis: Pipe-Flo SIT and Quench Tank Flow Diversion Analysis

The ESS Pipe-Flo model was upgraded to expand the system boundaries to include the safety injection tanks (SIT), quench tank, and the SIT fill and drain piping. This required review of over fifty drawings, vendor manuals, and other sources of information to develop forty additional model pipelines and all of the associated valves, components, and pressure boundaries. Upon completion of the model upgrade, over one hundred sensitivity analyses were performed to establish at which primary system pressures a flow diversion would result in failure to inject the required minimum flow rates. The sensitivity cases have been completed and preliminary results are available. This effort supports the reconciliation of specific MSO issues. This task is currently in the documentation phase.

#### Other Hydraulic Analysis: Development of new HPSI / LPSI and Containment Spray Injection Curves

This task involved running over 175 parametric hydraulics case to develop current realistic performance curves for the high pressure safety injection (HPSI) and low pressure safety injection (LPSI) as a function of PCS pressure and containment spray as a function of containment pressure. The sensitivity cases have been completed and preliminary results are available. This effort supports the reduction of conservatisms in the current internal events core damage model that serves as the backbone to the NFPA 805 logic model. This task is in the formal documentation phase.

#### Other Hydraulic Analysis: GOTHIC model of Condensate Storage Tank Flow Diversion to the Hotwell

A GOTHIC model was developed to calculate various parametrics of valve failures that result in a flow diversion from the condensate storage tank to the main condenser hotwell. This task required development of functions to emulate various flow rate demands from condensate storage tank depending on decay heat demands and air operated valve failure states. It also required creation of a GOTHIC flow network based on plant isometric drawings and vendor data for components. The GOTHIC model is complete and preliminary results are available. This effort supports the reconciliation of specific MSO issues. Formal documentation is required to complete this task.

In summary:

- Substantial progress has been made in developing the success criteria basis that will be employed in the NFPA 805 logic models.
- Given the independent reviews, it is considered that substantial progress has been made in ensuring that sufficient detail has been incorporated into the electrical logic models to address MSO's.
- The current status of characterizing the plant failure history demonstrates that substantial progress has been made in ensuring that the NFPA 805 analyses will reflect the current as built plant configuration.
- Both the pre- and post-initiator and I&C logic work demonstrate substantial human error modeling progress, and
- MAAP, GOTHIC and hydraulic calculations demonstrate substantial progress in the development of the thermal-hydraulic codes used to support the NFPA 805 success criteria has occurred.

### Non-PRA Related Tasks

ENO has developed a comprehensive integrated schedule based on NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)." This schedule contains main tasks and sub-tasks, a portion of which is summarized below:

NEI 04-02, "Nuclear Safety Performance Criteria," includes table B.2 which provides the corporate level tasks, including the procedure for performing the nuclear safety capability assessment methodology review and fire area-by-fire area transition. It also includes the overview activities of project management, scheduling, and budget. Substantial progress has been made on the development of the B-2 table.

NEI 04-02, "Fundamental Fire Protection Program (FPP) and Design Elements," includes the fire area and non-fire area specific element review with a completed NEI

04-02 transition worksheet, table B-1. This also completes the NFPA code compliance evaluations, and the completed/ revised fire protection equivalency evaluations. Substantial progress has been made on this task with the preparation of the fire and non-fire area specific element reviews, which constitute a major portion of the B-1 table.

For equivalency evaluations required per Generic Letter 86-10, "Implementation of Fire Protection Requirements" the review of existing equivalency evaluations is substantially complete.

NEI 04-02, "Nuclear Safety Analysis Transition," includes completing the B-3 transition table, resolving use of risk-informed performance-based techniques, which input to task eight, transient analysis review including cable selection for both offsite and non-offsite power (over 2700 cables) to support recovery actions, updated recovery action feasibility evaluations, and updated post-fire safe shutdown procedures. Substantial progress has been made on this task for the identification of cable selection and cable locations.

For operator manual actions (OMA) substantial progress has been made for the review of OMA's.

The non-power operation modes transition includes additional components and circuit analyses entered into the safe shutdown database, including revision to the existing shutdown calculations, completing the NEI 04-02 Table F-1 for the transition report, and suggested revisions to shutdown risk management procedures. Substantial progress has been made in the identification of additional components to be analyzed.

### Palisades Committed Resources

Currently, there are seven Palisades plant personnel supporting NFPA 805. A new employee will be added within the next two weeks. In addition, two contractors provide onsite support in the areas of project management and scheduling. Offsite contractor support is provided by ERIN Engineering and Research, Applied Reliability Engineering Inc., Nexus Engineering Inc., and Engineering Planning and Management Inc. ENO is committed to provide adequate resources to ensure the license amendment request (LAR) for Palisades will be submitted within six months after the second pilot plant request is approved.

In order to demonstrate to the NRC that ENO is continuing to make substantial progress for NFPA 805 transition activities at Palisades, ENO will conduct a monthly teleconference with the NRC staff to discuss the status. The teleconferences will continue until ENO submits the LAR to support the NFPA transition or until the NRC determines they are no longer necessary.

**ENCLOSURE 2  
PALISADES NFPA 805 PROJECT MILESTONES**

<b>NEI Task No.</b>	<b>Title</b>	<b>Milestone Date<sup>1</sup></b>
Task 1:	Transition of Nuclear Safety Performance Criteria (NEI 04-02 Table B-2)	03/04/09
Task 2:	Fundamental Fire Protection Program & Design Elements (NEI 04-02 Table B-1)	07/13/09
Task 3:	Radioactive Release Transition	04/06/09
Task 4:	Nuclear Safety Analysis Transition (NEI 04-02 Table B-3)	09/30/09
ST 4.1.1	Off-Site Power Cable Selection and Analysis	02/15/09
ST 4.1.2	Other Cable Selection and Analysis	03/15/09
Task 5:	Non-Power Operational Modes Transition (NEI 04-02 Table F-1)	05/26/09
Task 6:	Internal Events PRA	02/17/10
ST 6.2.1	Prepare LERF Model	07/31/09
ST 6.2.2	Update Flooding Analysis	07/31/09
ST 6.3	Thermal Hydraulic Analysis for MSO/HRA	03/15/09
Task 7:	Fire PRA	12/22/09
ST 7.6.4	R3 Internal Events Model	04/01/09
ST 7.7	Quantification Risk Screening	05/15/09
ST 7.8	Scoping for Fire Modeling	07/15/09
ST 7.9/10	Circuit Failure Mode Likelyhood Analysis	07/15/09
ST 7.12	Post Fire HRA	07/15/09
ST 7.13	Siesmic Fire Interaction Assessment	07/31/09
ST 7.14	Fire Risk Quantification	09/15/09
ST 7.15	Uncertainty and Sensitivity Analysis	09/15/09
Task 8:	NFPA 805 Change Evaluations	02/01/10
ST 8.1	Change Evaluations	12/01/09
ST 8.2	Non-Compliance Risk Evaluations	12/01/09
Task 9:	Palisades Mapping of Post Transition Procedures & Document Revisions	01/08/10
Task 10:	Transition Report	03/18/10
Task 11:	License Amendment Request (LAR)	03/19/10

<sup>1</sup>Milestone dates per the current schedule (PLP 805 S1-3 WIFC Schedule 12NOV08) and are subject to change