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October 26, 1979

Director of Nuclear Reactor Regulation
Attention: Mr. L. S. Rubinstein, Chief
Light Water Reactors Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Perkins Nuclear Station
Docket Nos.: 50-488, 489, 490
TMI-2 Related Commitments
Duke File: PK-1412.06

Dear Mr. Rubinstein:

Mr. D. B. Vassallo's October 10, 1979 letter requested that Duke Power Company commit to implement certain TMI-2 related recommendations identified in his letter with respect to Perkins Nuclear Station. Attached is Duke's response which addresses Duke's specific commitments to the items identified by Mr. Vassallo.

Duke is participating in the activities of the Combustion Engineering Owners Group on Post-TMI efforts. This group is also studying the "Installation of Remotely Operated High Point Vents in the Reactor Coolant System" discussed in Enclosure 4 to Harold Denton's August 20, 1979 memo to the NRC Commissioners. This group is working with Combustion Engineering to develop the specific details for implementing these items in an expeditious manner. Additionally, Duke will make any changes during the construction phase that are required to provide substantial, additional protection for the public health and safety.

On the basis of the additional information provided in this letter and its attachment, we respectfully request your expeditious actions to enable issuance of a Construction Permit.

Very truly yours,

L. C. Dail, Vice-President
Design Engineering

JEB/sr

Attachment

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Part 1

Perkins Nuclear Station Units 1, 2, and 3

Duke Power Company

Docket Nos. 50-488, 489, 490

The following additional information provides the NRC with the necessary assurance that Perkins Nuclear Station will meet the intent of NUREG-0578, "TMI-2 LESSONS LEARNED TASK FORCE REPORT AND SHORT-TERM RECOMMENDATIONS," July 19, 1979. While the commitments to each applicable position are addressed below, the implementation details will be described more fully in the FSAR.

Item 2.1.1 Emergency Power Supply Requirements for the Pressurizer Heaters, Power-Operated Relief and BlockValves, and Pressurizer Level Indicators in PWR's

Recommendation:

Provide redundant emergency power for the minimum number of pressurizer heaters required to maintain natural circulation conditions in the event of loss of offsite power. Also provide emergency power to the control and motive power systems for the power-operated relief valves and associated block valves and to the pressurizer level indication instrument channels.

Response:

Redundant emergency power supplies will be provided for necessary pressurizer heaters. Emergency power will be provided to the pressurizer level indication instruments. This item is under active study by the CE Owners Group. The Perkins design does not employ power operated relief valves and associated block valves.

Item 2.1.2 Performance Testing for BWR and PWR Relief and Safety Valves

Recommendation:

Commit to provide performance verification by full scale prototypical testing for all relief and safety valves. Test conditions shall include two-phase slug flow and subcooled liquid flow calculated to occur for design basis transients and accidents.

Response:

Industry efforts to provide performance verification by full scale prototypical testing for all relief and safety valves will be supported. The verification for Perkins Nuclear Station will comply with resolution of the testing requirements between the NRC and the industry.

Item 2.1.3 Information to Aid Operators in Accident Diagnosis and Control

a. Direct Indication of Power-Operated Relief Valve and Safety Valve Position for PWR's and BWR's

Recommendation:

Provide in the control room either a reliable, direct position indication for the valves or a reliable flow indication device downstream of the valves.

Response:

A reliable position indication for the valves, a reliable flow indication device downstream of the valves, or an equivalent alternate method will be used to provide indication in the control room. This item is under active study by the CE Owners Group.

b. Instrumentation for Detection of Inadequate Core Cooling PWR's and BWR's

Recommendation:

Perform analyses and implement procedures and training for prompt recognition of low reactor coolant level and inadequate core cooling using existing reactor instrumentation (flow, temperature, power, etc.) or short-term modifications of existing instruments. Describe further measures and provide supporting analyses that will yield more direct indication of low reactor coolant level and inadequate core cooling such as reactor vessel water level instrumentation.

Response:

Necessary instrumentation, analysis procedures and training will be provided. This item is under active study by the CE Owners Group.

Item 2.1.4 Containment Isolation Provisions for PWR's and BWR's

Recommendation:

Provide containment isolation on diverse signals in conformance with Section 6.2.4 of the Standard Review Plan, review isolation provisions for non-essential systems and revise as necessary, and modify containment isolation designs as necessary to eliminate the potential for inadvertent reopening upon reset of the isolation signal.

Response:

Containment isolation will be initiated by diverse signals. Isolation provisions for non-essential systems will be reviewed and revised as necessary. The Perkins design will eliminate the potential for inadvertent valve reopening upon reset of the isolation signal. The CE Owners Group has initiated an effort to develop revised containment isolation criteria.

Item 2.1.5 Post-Accident Hydrogen Control Systems for PWR and BWR

a. Dedicated Penetrations for External Recombiner or Post-Accident External Purge System

Recommendation:

For plants that have external recombiners or purge systems, provide dedicated penetrations and isolation systems that meet the redundancy and single failure requirements of the Commission regulations. Modify design as necessary so that these systems are not connected to, or are branch lines of, the large containment purge penetrations.

Response:

Perkins Nuclear Station will provide dedicated penetrations and isolation systems for post-accident hydrogen control.

b. Inerting BWR Containments

Recommendation:

Provide inerting for all Mark 1 and Mark 11 BWR containments. This would require changes at Vermont Yankee and Hatch Unit 2 (operating plants), as well as pending OL applications for Mark 1 and 11 BWR's.

Response:

This recommendation is not applicable to Perkins Nuclear Station.

c. Capability to Install Hydrogen Recombiner at Each Light Water Nuclear Power Plant

Recommendation:

A minority of the Task Force recommends that all operating reactors, which do not already have the capability, be required to provide the capability to add, within a few days after an accident, a hydrogen recombiner system for post-accident hydrogen control.

Response:

The Perkins Nuclear Station design will provide permanently installed external recombiners.

Item 2.1.6 Post-Accident Control of Radiation in Systems Outside Containment of PWR's and BWR's

a. Integrity of Systems Outside Containment Likely to Contain Radioactive Materials (Engineered Safety Systems and Auxiliary Systems)

Recommendation:

Perform leakage rate tests on systems outside containment that process primary coolant and could contain high level radioactive materials. Develop and implement periodic testing programs and preventive maintenance programs.

Response:

Efforts will be made to eliminate or reduce leakage from systems outside containment that process primary coolant and could contain high level radioactive materials. Testing and preventative maintenance programs will be provided.

b. Design Review of Plant Shielding of Spaces for Post Accident Operations

Recommendation:

Perform a design review of the shielding of systems processing primary coolant outside of containment. Determine any areas or equipment that are vital for post-accident occupancy or operation and assure that access and performance will not be unduly impaired due to radiation from these systems.

Response:

The necessary review will be performed and required modifications made to assure that access will not be unduly impaired.

Item 2.1.7 Improved Auxiliary Feedwater System Reliability

a. Automatic Initiation of the Auxiliary Feedwater System

Recommendation:

Provide automatic initiation of all auxiliary feedwater systems. The initiation signals and circuits shall be designed in such a manner that a single failure will not result in the loss of auxiliary feedwater system function. Testability of the initiating signals and circuits shall be a feature of the design. The initiating signals and circuits shall be powered from the emergency buses. Manual capability to initiate the auxiliary feedwater system from the control room must be retained and must be implemented in such a manner that a single failure in the manual circuits will not result in the loss of system function. The a-c motor-driven pumps and valves in the auxiliary feedwater system

must be included in the automatic actuation (simultaneous or sequential) of the loads to the emergency buses. The design of the automatic initiating signals and circuits must be such that their failure will not result in the loss of manual capability to initiate the auxiliary feedwater system from the control room.

Response:

This recommendation will be incorporated into the design of Perkins Nuclear Station Units 1, 2 and 3. The CE Owners Group has initiated an effort to develop functional requirements and design of an automatic actuation system.

b. Auxiliary Feedwater Flow Indication to Steam Generators

Recommendation:

Provide safety-grade indication in the control room of auxiliary feedwater flow for each steam generator. The flow instrument channels shall be powered from the emergency buses, consistent with satisfying the power diversity requirements for auxiliary feedwater systems.

Response:

Perkins Nuclear Station design will comply with this recommendation. The CE Owners Group has initiated an effort to develop functional requirements and a conceptual design for Auxiliary Feedwater Flow Indication.

Item 2.1.8 Instrumentation to Follow the Course of an Accident

a. Improved Post-Accident Sampling Capability

Recommendation:

Review and upgrade the capability to obtain samples from the reactor coolant system and containment atmosphere under high radioactivity conditions. Provide the capability for chemical and spectrum analysis of high-level samples on site.

Response:

Perkins Nuclear Station design will incorporate this recommendation.

b. Increased Range of Radiation Monitors

Recommendation:

Provide high range radiation monitors for noble gases in plant effluent lines and redundant high-range radiation monitors in the containment. Provide

instrumentation for monitoring effluent release lines capable of measuring and identifying radioiodine and particulate radioactive effluents under accident conditions.

Response:

Duke will support the industry efforts to provide: a) high-range radiation monitors for noble gases in plant effluent lines, b) redundant high-range radiation monitors in the containment, and c) instrumentation for monitoring effluent release lines capable of measuring and identifying radioiodine and particulate radioactive effluents under accident conditions. The instrumentation for Perkins Nuclear Station will comply with the final resolution between the NRC and the industry based on state-of-the-art capability.

c. Improved In-Plant Iodine Instrumentation

Recommendation:

Provide instrumentation for accurately determining in-plant air-borne radioiodine concentrations to minimize the need for unnecessary use of respiratory protection equipment.

Response:

Instrumentation will be provided for determining in-plant airborne radioiodine concentrations to minimize the need for unnecessary use of respiratory protection equipment. Accuracy will be based on state-of-the-art capability.

Item 2.1.9 Analysis of Design and Off-Normal Transients and Accidents

a. Recommendation:

Provide the analysis, emergency procedures, and training to substantially improve operator performance during a small break loss-of-coolant accident.

Response:

Appropriate analysis, procedures and training will be provided. The CE Owners Group has initiated efforts to perform appropriate analyses, revise procedures, and provide additional training.

b. Recommendation:

Provide the analysis, emergency procedures, and training needed to assure that the reactor operator can recognize and respond to conditions of inadequate core cooling.

Response:

Appropriate analysis procedures and training will be provided. The CE

Owners Group has initiated an effort to prepare analyses of inadequate core cooling to produce a basis for increased operator understanding of plant response during an accident.

c. Recommendation:

Provide the analysis, emergency procedures, and training to substantially improve operator performance during transients and accidents, including events that are caused or worsened by inappropriate operator actions.

Response:

Appropriate analysis, procedures and training will be provided. The CE Owners Group has initiated efforts to perform appropriate analyses, revise procedures, and provide additional training.

Item 2.2 Operations

Item 2.2.1 Improved Reactor Operations Command Function

a. Shift Supervisor Responsibilities

Recommendation:

Review plant administrative and management procedures. Revise as necessary to assure that reactor operations command and control responsibilities and authority are properly defined. Corporate management shall revise and promptly issue an operations policy directive that emphasizes the duties, responsibilities, and authority and lines of command of the control room operators, the shift technical advisor, and the person responsible for reactor operations command in the control room (i.e., the senior reactor operator).

Response:

Duke will utilize the experience gained in operating earlier nuclear units and will provide adequate administrative and management procedures.

b. Shift Technical Advisor

Recommendation:

Provide on shift at each nuclear power plant a qualified person (the shift technical advisor) with a bachelor's degree or equivalent in a science or engineering discipline and with specific training in the plant response to off-normal events and in accident analysis of the plant. Shift technical advisors shall serve in an advisory capacity to shift supervisors. The licensee shall assign normal duties to the shift technical advisor that pertain to the engineering aspects of assuring safe operations of the plant, including the review and evaluation of operating experience.

Response:

Duke will utilize the experience gained in operating earlier nuclear units and will provide adequate staffing for Perkins Nuclear Station at the time of operating license issuance.

c. Shift and Relief Turnover Procedures

Recommendation:

Review and revise plant procedures as necessary to assure that a shift turnover checklist is provided and required to be completed and signed by the on-coming and off-going individuals responsible for command of operations in the control room. Supplementary checklists and shift logs should be developed for the entire operations organization, including instrument technicians, auxiliary operators, and maintenance personnel.

Response:

Duke will utilize the experience gained in operating earlier nuclear units and will provide adequate shift and relief turnover procedures for Perkins Nuclear Station.

Item 2.2.2 Improved In-Plant Emergency Procedures and Preparations

a. Control Room Access

Recommendation:

Review plant emergency procedures, and revise as necessary to assure that access to the control room under normal and accident conditions is limited to those persons necessary to the safe command and control or operations.

Response:

Duke will utilize the experience gained in operating earlier nuclear units and will provide adequate controls for control room access for Perkins Nuclear Station.

b. Onsite Technical Support Center

Recommendation:

A separate technical support center shall be provided for use by plant management, technical, and engineering support personnel. In an emergency, this center shall be used for assessment of plant status and potential offsite impact in support of the control room command and control function. The center should also be used in conjunction with implementation of onsite and offiste emergency plans, including communications with an offsite emergency response center. Provide at the onsite technical support center the as-built drawings of general plant arrangements and piping, instrumentation and electrical

systems. Photographs of as-built system layouts and locations may be an acceptable method of satisfying some of these needs.

Response:

Perkins Nuclear Station Units 1, 2 and 3 will provide an onsite technical support center.

c. Onsite Operational Support Center

Recommendation:

Each operating nuclear power plant should establish and maintain a separate onsite operational support center outside the control room. In the event of an emergency, shift support personnel (e.g., auxiliary operators and technicians) other than those required and allowed in the control room shall report to this center for further orders and assignment.

Response:

Perkins Nuclear Station Units 1, 2 and 3 will provide an Onsite Operational Support Center outside the control room.

Vassallo Letter Item (d)

Provide instrumentation to monitor containment conditions during the course of an accident.

Response:

Duke has initiated design efforts to address this recommendation. This item is also under study by the CE Owners Group.

Vassallo Letter Item (e)

Provide remotely operated high point vents in the Reactor Coolant System.

Response:

Duke has initiated design efforts to address this recommendation. This item is also under study by the CE Owners Group.