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Director
Office of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Additional Information Provided in Support of
May 20, 1982 Request for Relief from the Specified
Schedule for Completion of 10 CFR Part 50, Appendix
R, Section III.J, Emergency Lighting Modifications

In our letter dated May 20, 1982 we requested additional schedule relief from the requirements of 10 CFR Part 50, Section 50.48(c), for the installation of emergency lighting required by Section III.J of Appendix R. An extension until January 1, 1983 was requested for both units. In a letter dated July 29, 1982 from Mr Robert A Clark, Chief, Operating Reactors Branch #3, Division of Licensing, we were informed that the requested extension could not be granted because an inadequate explanation was offered for "... why it was not determined much earlier in the process that plant shutdown would not be required to complete this requirement for emergency lighting". We were asked to submit a complete and detailed chronology of our efforts to implement Section III.J, commencing with the publication of the Fire Protection Rule on November 17, 1980 to the present, and justify, in detail, the schedule requested in our May 20, 1982 letter. The purpose of this letter is to provide additional information in support of our exemption request, including a detailed chronology of our efforts to implement Section III.J of Appendix R.

Appendix R Rulemaking

The Commission published on November 19, 1980 a revised Section 50.48 and a new Appendix R to 10 CFR Part 50 pertaining to fire protection requirements at operating nuclear generating plants. Two categories of requirements were contained in the new regulation. One category dealt with requirements that were applicable only if the NRC Staff had not previously reviewed and found acceptable the action taken by a licensee to meet established fire protection positions. The other category dealt with three requirements that were to be backfit by all licensees, regardless of whether or not alternative plant features were in place and found acceptable by the NRC Staff. Appendix R, Section III.J,

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Emergency Lighting, was in the category of requirements to be backfit by all licensees. Appendix R, Sections III.G, Fire Protection of Safe Shutdown Capability, and Section III.O, Oil Collection System for Reactor Coolant Pump, were the other requirements to be backfit.

At Prairie Island the NRC Staff had reviewed and found acceptable all plant fire protection measures and planned modifications necessary to meet their established positions, with the exception of the safe shutdown analysis and alternate shutdown capability. New requirements contained in Appendix R, Section III.G, supersede these requirements (Reference 1). This shows an early appreciation at Prairie Island for an effective fire protection program and a willingness to cooperate fully with the NRC Staff in implementing necessary improvements.

Requirements of Section III.J

As noted above, the requirements of Appendix R, Section III.J, Emergency Lighting, were backfit to all licensees regardless of any other provisions included in the original plant design or added later to meet the requirements of the NRC Staff.

Section III.J of Appendix R requires:

Emergency lighting units with at least an eight-hour battery power supply shall be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

The backfit provisions contained in the final rule for items previously found acceptable by the NRC Staff were completely unexpected by Northern States Power Company and other licensees. No notice was given of the intention of the Commission to include this feature in the regulation and no opportunity was provided to offer comments on this action.

During their review of the lighting systems provided at Prairie Island, the NRC Staff had found that "...the existing lighting system, when augmented by the portable handlights to be provided in the centralized fire equipment storage locker, satisfies the objectives identified in Section 2.2 of this report, and is therefore, acceptable" (Reference 2). In addition to normal plant lighting, an emergency lighting system was provided in the original plant design to light major areas of the plant except for the control room. This emergency lighting system is supplied from 120/208-volt minimum interruptible bus with automatic transfer to one of the 125-volt batteries upon failure of the AC supply. Batteries are maintained fully charged by the diesel generators and can supply emergency lighting for an indefinite period. Separate battery powered lighting was provided in the control room as well as AC lighting supplied by the diesel generators.

Action Taken Following Publication of Appendix R

For several months following the publication of Appendix R, we believed the existing emergency lighting system, with minor modifications, would satisfy the requirements of Section III.J. As noted above, the existing emergency lighting is automatically transferred to the plant DC system. The diesel generators, via the battery chargers, provide well in excess of the required eight-hour capability.

In a letter dated March 19, 1981 (Reference 3) we stated:

The existing system will be evaluated and modifications made to provide each area needed for operation of safe shutdown equipment, including access and egress routes, with DC lighting. For each light, the DC source will either be the station battery and its associated battery charger (which can supply essential lighting indefinitely) or another eight-hour battery source. The auxiliary building special ventilation zone airlocks are small (four to ten feet in length and four feet wide). They do not constitute an access or egress route within the meaning of Section III.J.

On April 9, 1981 a review by the plant electrical group concluded that the installed emergency lighting system met the requirements of Appendix R, Section III.J, as interpreted by the group.

In a letter dated July 13, 1981 (Reference 4) we received additional information related to the NRC Staff's interpretation of the requirements of Section III.J. In responding to an exemption request submitted for our Monticello Plant (Monticello has a limited DC lighting system and an essential AC lighting system, all ultimately supplied from the diesel generators), the NRC Staff stated that such a system was not acceptable unless it could be shown that "a postulated fire in one area of the plant could not cause the loss of lighting in another area which would aid access to or permit operation of equipment and components necessary to effect safe plant shutdown". This interpretation of the Section III.J requirements makes it impractical for any permanently wired emergency lighting system to meet the requirements of the regulation.

Efforts to comply with Section III.J were redirected to procuring and installing satisfactory local battery powered lighting units.

Installation of Lighting Units and Request for Schedule Relief

On August 10, 1981 the plant engineer, assigned the responsibility of installing the lighting units required by Section III.J, contacted the local representative of Teledyne Company to determine the availability of equipment meeting the eight-hour requirement. A catalog was received on August 17, 1981 and followup contacts with the vendor were made. Discussions

centered on the requirement for seismic qualification of the units. On September 11, 1981 a copy of a Wyle Laboratories seismic simulation test was received for Teledyne lighting units which appeared to meet our requirements. In September, an appropriation request was submitted for Capital Budget Review Committee approval to complete the installation of Section III.J and other Appendix R backfit modifications.

Work continued through September, October, and November on the Section III.G evaluation to identify equipment and cables needed for safe shutdown in the event of fire in any area of the plant. A review of the routing of emergency lighting cables at this time confirmed our earlier belief that the system was vulnerable to damage from fire in certain plant areas.

On November 16, 1981 (Reference 5 and 6) Northern States Power Company informed the NRC that the plans outlined in our March 19, 1981 letter for using the installed emergency lighting system to meet the requirements of Section III.J were being abandoned. It was stated that "...we will proceed with the purchase and installation of eight-hour battery powered lighting units to satisfy the requirements of Appendix R, Section III.J". An exemption request was included in this submittal to extend the time allowed to complete this work until the 1982 refueling outage of each unit.

When we prepared our November 16, 1981 exemption request, the safe shutdown analysis had not progressed to the point where all locations for operation of safe shutdown equipment (in accordance with the new requirements of Appendix R, Section III.G) had been finalized. It was felt that several areas requiring emergency lighting would be in parts of the plant where radiation levels or the presence of critical plant equipment made it imprudent to perform modification work during plant operation.

On December 18, 1981 NSP submitted the Section III.G safe shutdown analysis for Prairie Island (Reference 7). In January, 1982 we were informed through utility group contacts and discussions with our Project Manager in the Division of Licensing that recurring deficiencies in safe shutdown submittals were being noted by the NRC Staff. Several such deficiencies in the Prairie Island report were identified during a telephone conference call with members of the NRC Staff. On February 5, 1982 (Reference 8) we requested additional schedule relief for the purpose of re-submitting the Section III.G safe shutdown report to permit these deficiencies to be corrected. It should be noted that, strictly speaking, locations for emergency lighting units cannot be finalized until the Section III.G analysis has been completed and found acceptable by the NRC Staff.

On February 24, 1982 representatives from Teledyne toured the plant and, based on criteria available at that time, concluded that 43 lighting units were needed in the main portion of the plant and five units were needed in the screen house.

Work continued through February, March, April, and May on the revised Section III.G safe shutdown report (actually the fourth such report prepared and submitted to the NRC to address evolving requirements). On April 28, 1982 funding for Prairie Island Appendix R modification projects, including emergency lighting, was approved by the Board of Directors. Total modification costs were expected to be several million dollars.

In April, 1982 in discussions with our Project Manager in the Division of Licensing we learned that the NRC Staff would soon approve the schedule exemptions we had requested to complete modifications required by Sections III.G and III.J. It was clear at this point that the original schedule we proposed for completing Section III.J modifications in unit 2 (1982 refueling outage) could not be met. This information was conveyed to our Project Manager. Through further discussions we were told that the Appendix R schedule exemption approval would be issued as written (requiring Unit 2 Section III.J modifications to be completed during the June, 1982 refueling outage) and that Northern States Power Company could request additional schedule relief following receipt of the exemption request approval. The Appendix R schedule exemption approval was issued by the commission on May 4, 1982 (Reference 8). Accompanying the May 4, 1982 approval was the most definitive guidance received to date for performing the safe shutdown analysis required by Section III.G.

On May 20, 1982 (Reference 9) Northern States Power Company submitted a second schedule exemption request for completing the Section III.J Emergency Lighting Modifications. At this time the Section III.G Safe Shutdown Analysis was nearing completion and areas of the plant needing emergency lighting were well defined. The plant staff determined that all of these areas could be worked in during plant operation with acceptable risk of disruption of critical plant equipment and acceptable radiation exposures. The May 20, 1982 exemption request asked for an extension in the time allowed for completing Section III.J modifications to January 1, 1983 in accordance with Section 50.48(c)(3) in both units. There was no longer a need to coordinate the completion schedule with a refueling outage.

Early in May we had discussions with the lighting equipment vendor related to difficulties with obtaining seismic batteries for the lights. The foreign supplier of batteries used in the seismically qualified units was no longer a reliable source. The decision was made at this time to purchase standard lead-acid batteries with the option to later replace them with seismically qualified batteries. The rest of the unit would be seismically qualified (i.e. it would not fall off its mounting during a seismic event and possibly damage safety-related equipment located below it). Fully qualified seismic lighting units, while desirable, were not required by Section III.J.

On June 1, 1982 the final location and mounting of each of the lighting units was established by the plant technical staff. An order was placed with the vendor on June 8, 1982. Earliest possible delivery was requested. On June 29, 1982 the vendor's representatives, again, toured the plant and finalized installation specifications. The first shipment of mounting brackets was received on July 14, 1982. On July 22, 1982 markup drawings were prepared for installation activities. Several changes were required due to mounting interferences. On July 23, 1982 batteries and the second shipment of mounting brackets were received and nine additional lighting units ordered that were determined necessary from detailed review of mounting areas. Final work on the design change package is now in progress. This package should be completed, reviewed, and approved by the Operations Committee by the end of the month. Depending on manpower availability, installation work could begin in Unit 2 as early as the first week in September.

Additional workers will be available during the Unit 1 outage later this year and all battery-powered lighting units in both units will be installed and tested by January 1, 1983.

Summary

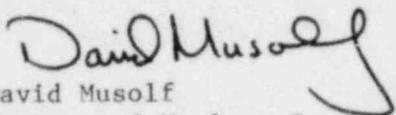
In summary, we believe Northern States Power Company has made a good faith effort to comply with all of the backfit requirements of Appendix R to 10 CFR Part 50, including Section III.J, Emergency Lighting. Our requested schedule exemption request for completion of Section III.J modifications by January 1, 1983 is a reasonable and necessary request and should be granted by the Commission. As noted above, the primary reasons why an extension in completion schedule is justified are:

- a. The backfit provisions of Appendix R were totally unexpected, and many portions of the regulation were difficult to understand and subject to differing interpretation. For several months we believed our installed DC emergency lighting system, previously found acceptable by the NRC Staff, satisfied the requirements of Section III.J.
- b. The safe shutdown analysis performed to meet the requirements of Section III.G of Appendix R was continually delayed by problems in interpreting the requirements of the regulation. Definitive guidance from the NRC Staff evolved over an 18-month period. Locations and numbers of lighting units could not be established until the Section III.G analysis was nearing completion.
- c. Difficulties in defining qualification requirements were experienced with the lighting unit vendor.

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Actions are now underway to complete the modifications required by Section III.J by January 1, 1983 in accordance with our May 20, 1982 exemption request.

Please contact us if you require further information related to the information we have provided.


David Musolf
Manager of Nuclear Support Services

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cc Secretary of the Commission
Regional Administrator - III, NRC
NRC Resident Inspector
NRR Project Manager, NRC
G Charnoff

References

1. Letter dated November 24, 1980 from Darrel G Eisenhut, Director, Division of Licensing, to All Power Reactor Licensees with Plants Licensed Prior to January 1, 1979.
2. Letter dated September 6, 1979 from A Schwencer, Chief, Operating Reactors Branch #1, Division of Operating Reactors, to L O Mayer, Northern States Power Company, (Amendment 39 to DPR-42 and Amendment 33 to DPR-60); Fire Protection Safety Evaluation Report.
3. Letter dated March 19, 1981 from L O Mayer, Northern States Power Company, to Director of Nuclear Reactor Regulation, USNRC, "Plans and Schedules for Meeting the Provisions of Paragraphs 50.48(c)(2), (c)(3), and (c)(5) of 10 CFR Part 50; Fire Protection Modifications".
4. Letter dated July 13, 1981 from Thomas M Novak, Assistant Director for Operating Reactors, Division of Licensing, Office of Nuclear Reactor Regulation, USNRC, to L O Mayer, Northern States Power Company.
5. Letter dated November 16, 1981 from L O Mayer, Northern States Power Company, to Director of Nuclear Reactor Regulation, USNRC, "Request for Relief from the Requirements of 10 CFR Part 50, Sections 50.48(c)(2), (c)(3), and (c)(5); Schedule for Completion of Appendix R, Section III.J, Emergency Lighting Modifications".
6. Letter dated December 1, 1981 from L O Mayer, Northern States Power Company, to Director of Nuclear Reactor Regulation, USNRC, "Correction to Request for Relief dated November 16, 1981".
7. Letter dated December 18, 1981 from L O Mayer, Northern States Power Company, to Director, Office of Nuclear Reactor Regulation, USNRC, "Fire Protection Safe Shutdown Analysis and Compliance with Section III.G of 10 CFR Part 50, Appendix R, Including Requests for Relief".
8. Letter dated May 4, 1982 from Dominic C Di Ianni, Project Manager, Operating Reactors Branch #3, USNRC, to L O Mayer, Northern States Power Company, "Exemption Request - Fire Protection Rule Scheduler Requirements of 10 CFR 50.48(c) - Prairie Island Nuclear Generating Plant, Units 1 and 2.
9. Letter dated May 20, 1982 from L O Mayer, Northern States Power Company, to Director, Office of Nuclear Reactor Regulation, USNRC, "Request for Relief from the Requirements of 10 CFR Part 50, Section 50.48(c)(3), Schedule for Completion of Appendix R Section III.J, Emergency Lighting Modifications.