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LTR 1 ENCL 40
SUBJECT:
FURNISHING RESPONSE TO NRC LTR DTD 05/17/78, CONSISTING OF INFO PERTAINING TO THE CONTROL OF HEAVY LOADS NEAR SPENT FUEL OF SUBJECT FACILITY...W/ATT. [redacted] REFERENCES.

PLANT NAME: MONTICELLO
REVIEWER INITIAL: XJM
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cp

NSP

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

July 21, 1978

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

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Control of Heavy Loads Near Spent Fuel

Your May 17, 1978 generic letter to licensees of power reactors asked nine questions pertaining to the control of heavy loads near spent fuel. This issue was discussed and documented extensively on the Monticello docket from early 1974 through mid-1977 culminating in NRC review and acceptance of substantial modifications to the reactor building crane. The Staff Safety Evaluation of this backfit program concludes, "We find that NSP's proposed modifications to the reactor building crane have incorporated all the provisions of draft Regulatory Guide 1.104 that are practical for the Monticello design." Because of the attention already given this issue, we have frequently referred to the 18 docketed information references included as an attachment to this letter. The requests for information of your May 17 letter are repeated below followed by our response.

NRC REQUEST 1

Provide a diagram which illustrates the physical relation between the reactor core, the fuel transfer canal, the spent fuel storage pool and the set down, receiving or storage areas for any heavy loads moved on the refueling floor.

NSP Response:

These diagrams can be found in References 1 and 7.

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NRC REQUEST 2

Provide a list of all objects that are required to be moved over the reactor core (during refueling), or the spent fuel storage pool. For each object listed, provide its approximate weight and size, a diagram of the movement path utilized (including carrying height) and the frequency of movement.

NSP Response:

Loads required to be carried over the core during refueling consist of those too large to enter the reactor vessel but which could impart damage if dropped, those small enough to enter the reactor vessel and those moved only over the spent fuel pool. The drop of a fuel assembly from its maximum height has been considered in reference 1 and shown to have acceptable consequences. Therefore, loads having less weight and potential drop height than a fuel assembly are not included here.

Heavy loads which are larger than the vessel diameter include:

Upper Shield Plugs - There are two concrete plugs over the reactor cavity which must be lifted a maximum of 2.5 feet and moved to temporary storage positions on the refueling floor each fueling outage. They are half circular cylinders, approximately 2 feet high by 35 feet in diameter, weighing 76 tons each.

Lower Shield Plugs - There are four concrete plugs over the reactor cavity which must be lifted a maximum of 4 feet and moved to temporary storage positions on the refueling floor each refueling outage. They are half circular cylinders, approximately 2 feet high by 34 feet in diameter, weighing 64 tons each.

Drywell Head - This is a 27 foot diameter by 13 foot high dome weighing 46 tons. It must be lifted 24 feet and moved to a temporary storage position on the refueling floor each refueling outage.

Vessel Head Insulation - This is a 20 foot diameter by 10 foot high cylindrical component weighing 5 tons. It must be lifted 24 feet and moved to a temporary storage position on the refueling foor each refueling outage.

Vessel Head - This is a 19 foot diameter by 9 foot high dome weighing 45 tons. It must be lifted 24 feet and moved to a temporary storage location on the refueling foor each refueling outage.

Heavy loads small enough to enter the vessel include:

Steam Dryer - This is a 16 foot diameter by 14 foot high cylindrical component, weighing 22 tons. It must be lifted 18 feet and moved into a storage pool to the west of the reactor cavity each refueling outage.

Steam Separator - This is a 16 foot diameter by 14 foot high cylindrical component weighing 33 tons. It must be lifted 25 feet and moved into a storage pool to the west of the reactor cavity each refueling outage.

Heavy loads handled only over the spent fuel pool include:

Shipping casks - A variety of casks may be set down onto a special pad in the spent fuel pool designated for that purpose. These casks are used to ship irradiated fuel or other irradiated components. The largest cask analyzed for use in the spent fuel pool is the 70 ton IF-300. This is dicussed extensively in References 13 and 16.

NRC REQUEST 3

What are the dimensions and weights of the spent fuel casks that are or will be used at your facility?

NSP Response:

The largest cask we plan to use is the IF-300 which is described in References 13 and 16. Various small casks may be used, two examples being the NAC-1 and NSF-4 as described in References 7, 9 and 11.

NRC REQUEST 4

Identify any heavy load or cask drop analyses performed to date for your facility. Provide a copy of all such analyses not previously submitted to the NRC Staff.

NSP RESPONSE:

References 1 through 18 comprise a chronology of studies performed on this subject.

NRC REQUESTS 5 & 6

Identify any heavy loads that are carried over equipment required for safe shutdown of a plant that is operating at the time the load is moved. Identify what equipment could be affected in the event of a heavy load handling accident (piping, cabling, pumps, etc.) and discuss the feasibility of such an accident affecting this equipment. Describe the basis for your conclusion.

If heavy loads are required to be carried over the spent fuel storage pool or fuel transfer canal at your facility, discuss the feasibility of a handling accident which could result in water leakage severe enough to uncover the spent fuel. Describe the basis for your conclusions.

NSP Response:

In the studies discussed in the previous item, it was recognized very early that the drop of certain heavy loads would have unacceptable consequences. Rather than performing an extensive analysis for the damage incured and any safety equipment that might be affected by such a potential event, efforts were directed toward precluding such an event by adding redundant features to the reactor building crane such that it could incur a single failure without loss of function. This matter is discussed at length in the references, especially the modified crane design report (Reference 13), the response to an NRC request for additional information on that report (Reference 16), and the Staff safety evaluation accepting the modification (Reference 17).

NRC REQUEST 7

Describe any design features of your facility which affect the potential for a heavy load handling accident involving spent fuel, e.g., utilization of a single failure proof crane.

NSP Response:

This matter is addressed in Reference 13.

NRC REQUEST 8

Provide copies of all procedures currently in effect at your facility for the movement of heavy loads over the reactor core during refueling, the spent fuel storage pool, or equipment required for safe shutdown of a plant that is operating at the time the move occurs.

NSP Response:

Northern States Power has consistently maintained the position that operating procedures are inappropriate documents for docketing purposes. There are numerous reasons for this position. Operating procedures are written for use by operators and not as licensing documents. They are often bulky, use terminology not readily understood by those outside the plant, and make reference to non-docketed information. Procedures are reviewed and

revised frequently as required by the technical specifications. Distribution is controlled and restricted to avoid the existence of out-of-date and possibly incorrect information. We believe three acceptable alternatives to the NRC request, stated in the order of increased preference, are as follows. First, knowledgeable members of your staff could meet in our offices to review and discuss the operating procedures. Second, the Region III Office of Inspection and Enforcement personnel, who have a working knowledge of our operations and procedures, might be consulted. Third, your interest will most likely be satisfied by reviewing our operating practices (References 13, 16, & 17) rather than our detailed procedures.

In reviewing the operating practices discussed in the references, please note the distinction between the submittals justifying interim use of small casks and the submittals describing the long term modifications to the reactor building crane. The interim use of the small casks involved requirements on procedures that would have made a cask drop accident tolerable. Since the drop of heavier loads could not be tolerated, these procedural requirements were supplanted by design features of the crane. Unfortunately, the Staff safety evaluation carried over some extraneous procedural requirements which had no basis relative to the modified crane.

NRC REQUEST 9

Discuss the degree to which your facility complies with the eight (8) regulatory positions delineated in Regulatory Guide 1.13 (Revision 1, December, 1975) regarding Spent Fuel Storage Facility Design Basis.

NSP Response:

The Monticello Plant conforms with the requirements of this guide with one exception. There are no interlocks provided to prevent cranes from passing over stored fuel when fuel handling is not in progress. Such interlocks are considered unnecessary for three reasons. First, it is a good and commonly known operating practice that heavy loads not be taken over critical areas; this practice is implemented administratively. Second, the travel path of heavy loads is such that they would not normally

be carried over spent fuel; traveling over spent fuel would increase the travel path. Third, the redundant features of the modified crane as discussed in References 13 and 16 are such that the drop of any heavy load is highly improbable. Additional information on how the remaining seven regulatory positions of Regulatory Guide 1.13 are met can be found in References 1, 13, & 16.

Yours very truly,

L. O. Mayer

L O Mayer, PE
Manager of Nuclear Support Services

LOM/deh

Attachment

cc: J G Keppler
G Charnoff

REFERENCES

1. Monticello Final Safety Analysis Report

2. February 4, 1974, NRC Request for Analysis and Other Information Needed to Determine Possible Damage in the Event of a Cask Drop caused by a System Failure, D J Skovholt to L O Mayer

3. October 1, 1974, Submittal of Analysis of the Spent Fuel Shipping Cask Drop Accident, L O Mayer to K R Goller

4. January 31, 1975, NRC Request for Additional Information on Structural Analysis for the Cask Drop Accident, D L Ziemann to L O Mayer

5. February 17, 1975, Response to Request for Additional Information on the Cask Drop Accident Analysis, L O Mayer to D L Ziemann

6. May 30, 1975, Status Report on Plans for Offsite Shipment of Spent Fuel, L O Mayer to D L Ziemann

7. January 22, 1976, Offsite Shipment of Spent Fuel, L O Mayer to V Stello

8. February 12, 1976, NRC Request for Comments on Value Impact Statement on Regulatory Guide 1.104, " Overhead Crane Handling Systems for Nuclear Power Plants", G A Arlotto to A V Dienhart

9. February 13, 1976, Offsite Shipment of Spent Fuel, L O Mayer to V Stello

10. April 12, 1976, Comments on Value Impact Statement on Regulatory Guide 1.104, A V Dienhart to G A Arlotto

11. June 16, 1976, Offsite Shipment of Spent Fuel, L O Mayer to V Stello

12. October 27, 1976, Offsite Shipment of Spent Fuel, L O Mayer to V Stello

REFERENCES (continued)

13. November 22, 1976, Design Report for Redundant Reactor Building Crane, L O Mayer to V Stello

14. January 25, 1977, NRC Approval of the Use of NFS-4 and NAC-1 Fuel Shipping Casks, K R Goller to L O Mayer

15. February 11, 1977, NRC Request for Additional Information on The Redundant Reactor Building Crane Design Report, D L Ziemann to L O Mayer

16. February 28, 1977, Additional Information on Redundant Reactor Building Crane, L O Mayer to D L Ziemann

17. May 19, 1977, NRC Acceptance of Reactor Building Crane Modification, D K Davis to L O Mayer

18. June 24, 1977, Reactor Building Redundant Crane, L O Mayer to D K Davis