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10 CFR 50.90

December 7, 2001
2130-01-20246

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

Subject: Response to Request for Additional Information – Technical Specification Change Request No. 281, Heavy Loads Over Irradiated Fuel

Oyster Creek Generating Station
Facility Operating License No. DPR-16
NRC Docket No. 50-219

The enclosure to this letter provides additional information in response to NRC staff requests discussed on December 4, 2001. The enclosure provides an itemized response format to address each of the technical issues discussed.

If you have any questions or require additional information, please do not hesitate to contact us.

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

Very truly yours,

12-07-2001
Executed On

Michael P. Gallagher
Director, Licensing & Regulatory Affairs
Mid-Atlantic Regional Operating Group

Enclosure: Response to Request for Additional Information

cc: H. J. Miller, USNRC, Administrator, Region I
H. N. Pastis, USNRC, Senior Project Manager, Oyster Creek
L. A. Dudes, USNRC, Senior Resident Inspector, Oyster Creek
File No. 01037

A001

Enclosure

Oyster Creek Generating Station

Response to Request for Additional Information

Technical Specification Change Request No. 281

1. NRC Request

Provide the basis for the factors used in assessing the BOCA Code in determining the snow load if the BOCA Code was to be used.

Response

The codes of record for the Oyster Creek Reactor Building are the Uniform Building Code (UBC), and American National Standard, ANSI A58.1. The BOCA Code (1996), which was discussed with the NRC staff on December 4, 2001, contains the same information on the subject discussed in the above two documents. The bases for the factors obtained from ANSI A58.1 are discussed in the response to Item 2.

2. NRC Request

Provide justification for the choice of code for the snow loads and why it is not the most limiting live load.

Response

As stated in AmerGen letter to the NRC dated November 30, 2001, Enclosure 1, response to the NRC Question No. 1, a further static analysis was performed of the reactor building roof structure to account for a total of 12 psf design live load or snow load. The basis for the 12 psf load was the AISC Manual of Steel Construction, 7th Edition, Revised on 6/73, Section 3.8, recommendation of a design live load of 12 psf. This value bounds the snow load requirements of the Oyster Creek Codes of Record for the reactor building as described below.

The Oyster Creek Updated Final Safety Analysis Report Section 3.8.4.2 lists the Uniform Building Code (UBC-1964), as the Code of Record for the design of the Reactor Building. Section 2305 of UBC-1964 designates that the minimum roof live loads for a flat roof shall be 12 psf for structural members with tributary areas greater than 600 square feet. The Oyster Creek main roof trusses all have tributary areas greater than 600 square feet. Therefore, the minimum roof design live load is 12 psf. The UBC directs that the snow load shall be considered in place of the live load if such loading will result in larger members or connections.

NRC letter dated April 30, 1982, "Systematic Evaluation Program Topic III-7-B, Design Codes, Design Criteria, and Loading Combinations, Oyster Creek," transmitted an evaluation that was based on a technical evaluation prepared by the Franklin Research Center in conjunction with the NRC staff. Attachment 1 to that letter contains the Technical Evaluation Report, "Design Codes, Design Criteria and Loading Combinations", tracked by NRC TAC No. 41498. In that Technical Evaluation Report on page 43 it states:

> "Snow load coefficients in accordance with ANSI A58.1 may be used, or provisions of UBC Section 2311(j) invoked."

The ANSI A58.1-1982 document, approved on March 10, 1982, is the applicable standard based on the date of the NRC letter referenced above. Using this document, the snow load is computed to be 10.08 pounds per square foot as follows:

Roof snow load $P_f = 0.7\ C_e\ C_t\ I\ P_g$

Exposure factor, C_e	=	0.8	from Table 18, page 33
Thermal factor, C_t	=	1.0	from Table 19, page 33
Importance Factor, I	=	1.2	from Table 20, page 33
Ground snow load, P_g	=	15	from Figure 7, page 45

(In pounds per square foot)

P_f = $0.7 \times 0.8 \times 1.0 \times 1.2 \times 15 = 10.08$ psf.

The bases for using the above equation and factors are as follows:

- The equation used is for a flat roof. This is acceptable since the Oyster Creek Reactor Building Roof has a slope of 3/8" to 1 foot which is less than 1" to 1 foot that defines a flat roof.
- $C_e = 0.8$: since the roof is in a windy area and is exposed on all sides and there are no high structures nearby.
- $C_t = 1.0$: since the Reactor Building operating floor is always significantly above freezing and is a heated structure.
- $I = 1.2$: the Reactor Building is a Category III structure as defined in Table 1 of ANSI A58.1 (i.e., Power Stations required in an emergency). The 1.2 factor is the largest importance factor value.

Therefore, as described in the response to NRC Question No. 1 in AmerGen letter to the NRC dated November 30, 2001, the appropriate live load to be applied to the roof structure is 12 psf, as this bounds the calculated snow load for Oyster Creek.

3. NRC Request

Provide a statement which provides an assessment of the distribution of loads in the E-W members as opposed to the N-S members recognizing that some small increment may go to the N-S members of the reactor building superstructure.

Response

The primary load carrying members for the vertical roof loads are the E-W trusses. The E-W trusses span the short direction of the roof. The roof beams span in the N-S direction between the E-W trusses. The roof beams distribute the roof load to the panel points of the E-W trusses.

The roof was designed so that the E-W trusses carry the roof vertical loads. The N-S trusses are designed as lateral frame bracing. The N-S lateral frame bracing trusses are designed to provide stability and to resist horizontal seismic loading. The E-W trusses are shorter and stiffer than the N-S bracing trusses. The individual members of the E-W trusses are larger than the N-S truss members. The panel points of the E-W trusses are located on 8'-11" centers, compared with 22' and 23'-3" centers for the N-S trusses. The E-W trusses are more heavily braced than the N-S trusses. This design assures that vertical loads will be carried predominantly by the E-W trusses.

The analysis which considers the additional 5 psf vertical roof load, described on Page G6 of AmerGen's letter to the NRC dated November 30, 2001 (2130-01-20244), distributes the load to the E-W trusses only. It is recognized that a minor portion of the vertical load will be distributed to the N-S truss members. This increase in vertical loading is not significant, and will not compromise the ability of the superstructure to resist the seismic loadings.

4. NRC Request

State why wind loads were not considered/reanalyzed for the reactor building superstructure when the crane was modified to single failure proof.

Response

Wind loads were not considered/re-analyzed for the reactor building superstructure since the loads delivered by the crane to the reactor building did not change from the original design loads. The design weight for the old reactor building crane trolley was 86,000 pounds. The weight of the new trolley is less than 74,000 pounds. The difference in weight is approximately 12,000 pounds. The old trolley was rated for 100 tons, and the new trolley is rated for 105 tons.

The difference between the trolley ratings (5 tons or 10,000 pounds) is made up for by the difference between the old trolley design weight and the new trolley weight (12,000 pounds). The net change to the reactor building is a decrease in design weight (dead + live load). For the dead + live + wind load combination, there is no change to the wind load since there is no change to the exposed structure. Since the dead + live load has decreased slightly (approx. 2,000 pounds), the new configuration is bounded by the previous analysis for dead + live + wind load. Therefore, reanalysis of the reactor building is not required for wind loading.

5. NRC Request

With regard to the wheel truck connecting member, provide a statement which provides a conclusion relative to the member capability when buckling is of concern.

Response

The End Truck (Bridge) connector members located at each end of the crane bridge girders have been checked for buckling conditions. Pinned end conditions coupled with a maximum span taken as the horizontal distance between centerlines of bridge girders conservatively minimizes the allowable buckling load calculated using both the CMAA 70 and AISC Codes for these members. Maximum calculated axial stresses from the seismic analyses are far below these allowable axial stresses. Therefore, it is concluded that these members are capable of performing their intended function of maintaining a constant horizontal separation distance between the end trucks.