

SUPPLEMENTAL SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
FOR SYSTEMATIC EVALUATION PROGRAM/STRUCTURAL UPGRADE PROGRAM
R. E. GINNA NUCLEAR POWER PLANT
DOCKET NO. 50-244

1.0 INTRODUCTION

On March 24, 1987, the NRC issued to RG&E a Safety Evaluation (SE) on the Structural Upgrade Program (SUP). In that report the NRC staff concluded that subject to the plant modifications which RG&E had committed to install, the implementation of the Structural Upgrade Program would provide reasonable assurance that Ginna Station could safely shut down following specified environmental events. The staff also stated that these conclusions were subject to satisfactory resolution of nine open items. On May 24, 1987, RG&E responded with the necessary information requested by the staff, as well as its comments on the staff's earlier review findings. The staff met with RG&E on December 14, 1988 to discuss the outstanding items. The meeting resulted in the staff request for additional information which RG&E submitted to the staff for its review on January 25, 1989. The staff conducted an audit of the calculations at RG&E engineering office on August 3, 1989, and visited the plant to inspect various SEP modifications on August 4, 1989. The audit and plant visit resulted in RG&E's submittal for further analysis and confirmatory information on August 31, 1989.

2.0 EVALUATION

The following provides our evaluation and resolution of the open items as well as the technical basis for closure of R. E. Ginna Structural Upgrade Programs.

With respect to the issue of using actual thermal loads in load combinations for areas of the plant known to have high operating temperatures (e.g. concrete surrounding the reactor), the licensee performed a worst-case condition analysis and the results were found to be acceptable. Furthermore, the licensee has stated based on recorded data that the concrete temperature at reactor vessel supports (hot spots) ranged from 80°F to 110°F which is less than the 150°F maximum allowable temperature in concrete, therefore, the issue is considered resolved.

Regarding the straight line wind load distribution used in the design, the licensee has demonstrated that for Ginna structures use of stepped wind loads per ANSI A58.1-1982 would result only in minor total wind load variation and would not affect the results of the overall structural analysis. At the audit, the staff reviewed the licensee's drawings and calculation for wind and tornado loads and confirmed that the use of straight line distribution was acceptable. This issue is resolved.

Regarding the issue of adequately accounting for any loads imparted by the siding or decking to the steel frame, the staff verified that the licensee conservatively assumed its calculations of wind and tornado loads that the siding and decking will remain intact and thus, transfer the full magnitude of these loads to the structure. This conservative approach is acceptable and the issue is resolved.

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On the issue related to design adequacy of roof decking failure due to snow loading, the licensee stated that all structural roofs of Ginna Station except that of the diesel generator building have load carrying capacities greater than their applied loads. The diesel generator building roof will be upgraded in the Ginna's Structural Upgrade Program to assure no failure due to snow loads. At the audit of August 3, 1989, the staff reviewed RG&E's pertinent internal structural documents and calculations and inspected the ongoing diesel generator building upgrade work and concluded that the licensee's approach is acceptable for resolving the issue.

With respect to the issue of potential buckling of the roof decks used in Ginna structures, the licensee stated that the metal roof decking used at the Ginna is a "multiple stiffened element" per the definition of the Cold-Formed Steel Design Manual of the American Iron and Steel Institute Standards. Because of the shape and the width-to-thickness ratios of the compression zones of the deck, the licensee claims that the full bending capacity of the shape can be developed without buckling. The staff accepts the licensee's justification and the issue is considered resolved.

Previously, the licensee committed to examine the east wall of the control building and portion of the diesel generator building for tornado winds and missiles. The east wall of the control building has been modified and the diesel generated building is being modified to withstand wind and tornado loads including missiles. The design criteria for these modifications were found acceptable by the staff. During the August 4, 1989 plant visit, the staff inspected areas affected by these modifications. The staff concludes that the modifications are acceptable.

On the issue of assuring that previous conclusions reached regarding seismic capability of Ginna structures remain valid considering seismic loads in combination with other loads, the licensee performed additional analyses including a complete seismic analysis of an area of the plant that was judged to be most critical for overall structural stability of the plant. This "slice methodology" consisted of analyzing the common wall between the turbine and intermediate buildings. The results of the analysis were presented to the staff at the December 14, 1988 meeting and confirmed the licensee position that the structures are adequately designed for a combination of seismic and other loads. The staff did examine some of the calculations at the August 3, 1989 audit meeting and found that the design documentation was in order and acceptable. The staff concludes that this issue is resolved.

On the issue of evaluation of the effects of masonry wall failure on main steam and feed water lines and associated valves and to prevent the walls from entering the spent fuel pool, the licensee completed the modifications to prevent damage to the required steam and feed water line and valves in 1988. The modification to prevent damage to the spent fuel due to failure of the block wall on the north side of the spent fuel pool was also completed. Calculations indicated that the effect of failure of the west side wall will not cause damage to the spent fuel pool, thus, no modifications are proposed by the licensee. The staff has inspected these masonry walls and the modifications installed and found them to be satisfactory. The issue is considered resolved.

3.0 CONCLUSION

Based on the NRC evaluation of a series of licensee submittals, design documentation audits, inspection of the implementation of the SUP at the plant, and the technical bases described in the above resolution of specific issues, the NRC concludes that all structural issues related to Ginna Station SUP are resolved. This evaluation also provides closure to the Ginna Station SEP.

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Dated:

Dr. Robert C. Mercredy

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November 15, 1989

Our Supplemental Safety Evaluation is provided in Enclosure 1. We consider our efforts on TAC No. 54364 complete. We understand that full implementation of SUP modifications is targeted for September 1990.

Sincerely,

/s/

Allen Johnson, Project Manager
Project Directorate I-3
Division of Reactors Projects I/II
Office of Nuclear Reactor Regulation

Enclosure:
Supplemental Safety Evaluation

cc: See next page

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