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CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Forwards summary of changes to structural integrity criteria discussed in 830627 & 1110 meetings,results of structural stability assessment & answers to open items re SEP Topics II-2.A,III-2,III-4.A & III-7.B.

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July 13, 1984

Director of Nuclear Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Structural Upgrade Program
SEP Topics, II-2.A, III-2, III-4.A and III-7.B
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

On April 22, 1983, Rochester Gas and Electric Corporation supplied a summary report of the analyses performed to evaluate the structural integrity of Ginna Station. In that report, RG&E submitted a recommended set of design inputs and evaluation criteria. NRC approval was provided by the Integrated Plant Safety Analyses Report, (IPSAR), NUREG 0821, dated August 22, 1983. Review by the ACRS and a recommendation that RG&E continue with the program as planned was accomplished in meetings of April 4 and 5, 1984, as documented in a letter from Mr. Jesse Ebersole, ACRS, to the Honorable Nunzio Palladino, Chairman of the Commission, dated April 9, 1984. Prior to the start of the final design phase of the project, RG&E agreed to submit a letter report which summarizes the changes to the criteria discussed in meetings held between RG&E and the NRC staff on June 27 and November 10, 1983, plus the results of a structural stability assessment, and answers to all other open items pertaining to these topics. The attached report provides this information.

Upon receipt of NRC approval, the final design and installation of any required modifications will begin.

Very truly yours,

Roger W. Kober

Roger W. Kober

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I. INTRODUCTION

On April 22, 1983, Rochester Gas and Electric Corporation (RG&E) submitted a report entitled "Structural Reanalysis Program for the R. E. Ginna Nuclear Power Plant," (Reference 1) which summarized the results of the analyses conducted relative to the following SEP Topics for the R. E. Ginna Nuclear Power Plant structures:

- o II-2.A - Severe Weather Phenomena (Reference 2)
- o III-2 - Wind and Tornado Loadings (Reference 3)
- o III-4.A - Tornado Missiles (Reference 4)
- o III-7.B - Design Codes, Design Criteria and Load Combinations (Reference 5)

After NRC review of the report along with several meetings, the NRC Staff issued the Integrated Plant Safety Assessment Report (IPSAR) (Reference 6) for Ginna Station on August 22, 1983. In this report, the Staff found RG&E's commitments and approaches for resolution of these issues acceptable. Various technical issues identified in the IPSAR were still unresolved and RG&E further indicated that because of the large cost of the proposed program, additional criteria changes might be made if they were determined to be cost-beneficial and technically defendable. These items have been addressed in public meetings with the NRC, miscellaneous correspondence, and ACRS meetings. Concurrence with the general approach, design inputs and evaluation criteria was issued as a result of the recommendations of the Advisory Committee for

Reactor Safeguards (ACRS) in the April 9, 1984 letter to the Honorable Nunzio J. Palladino, Chairman of the USNRC. (Reference 7). The intent of this document is to reiterate the general approach of the Structural Upgrade Program (SUP) for Ginna Station and to formalize and document those items discussed with the NRC during the period between April 22, 1983 and the ACRS meetings of April 5 and 6, 1984. Specifically, this document discusses:

A. The original evaluation criteria that was presented in the April 22, 1983 report.

B. Changes to the criteria deemed appropriate during the course of the more detailed engineering analysis conducted for the RG&E recommended design tornado.

C. The criteria and judgments that were used to assess the capability of the upgraded structure to remain stable at tornado speeds above the RG&E recommended tornado.

D. The Design Criteria to be used to design the required modifications.

E. The Category III Open Items in the Technical Evaluation Report (Reference 8) dated August 2, 1983.

F. Any outstanding issues related to SEP Topic III-7.B.

G. Component/Missile Evaluations.

A. ORIGINAL EVALUATION CRITERIA

Evaluations of the primary members, connections, anchorages, secondary members (purlins and girts), siding systems and roof decking submitted in the April 22, 1983 Report (Reference 1) used the NRC Standard Review Plan (SRP 3.8.4) (Reference 9) acceptance criteria.

The components were evaluated for load combinations including normal wind plus normal snow, extreme snow, and wind pressures associated with various tornadoes including the effects of tornado induced differential pressure. The Auxiliary Building, Intermediate Building, Facade Structure, Turbine Building, Control Building, Diesel Generator Building and Screen House were included in the scope of this evaluation.

The results of the initial evaluation were transmitted to the NRC in the April 22, 1983 report (Reference 1). In that report, RG&E performed a value impact assessment and committed to upgrading the plant to resist the loads and load combinations associated with a 132 mph tornado, 75 mph normal wind plus 40 psf normal ground snow, and 100 psf extreme snow.

B. CRITERIA CHANGES

Additional reviews of the results of the initial evaluations were performed during the period from August,

1983 to February, 1984. The purpose of these additional reviews was to provide a more exact estimate of the type and location of the overstressed components. A two-stage approach was used for these reviews to better predict the actual components requiring modifications and the extent of overstress.

The first approach was to provide a more detailed engineering review of the results of the initial analysis. Primary members were reviewed on an individual basis to determine if the computer-predicted stresses for the overstressed members were correct or if these members could be shown to be acceptable using a more detailed engineering analysis. Connections and anchorages were reviewed for the purpose of defining specifically, where the overstresses occurred. The number of overstressed connections and anchorages initially reported were based on statistical samples which were found based on this evaluation to be overly conservative.

The following list summarizes the bases used in the first approach to reduce the quantities of overstressed components:

1. The Screen House was deleted from the scope since this structure is not required to achieve plant shutdown.

2. The computer model was reviewed for compatibility with the actual structure since the computer model tended to idealize the actual structure (by the use of simplifying conservative assumptions).
3. The Turbine Building operating floor maintenance live load was reduced from 1000 psf to 100 psf since the larger load is only present during turbine/generator maintenance when the plant is already in a shutdown mode.
4. The members with excessive kl/r ratios were evaluated to determine the actual load carrying capability of the members.
5. Modifications for those members whose failure would not damage required safety equipment were deleted.
6. Individual or groups of actual anchorages were evaluated instead of using a statistical projection.
7. Individual or groups of actual connections were evaluated instead of using a statistical projection.

The second approach modified the original evaluation criteria. Any components found overstressed after the first evaluation were re-evaluated considering three criteria changes.

1. Live Load Reductions

The criteria for all floors, other than the Turbine Building Operating floor, reduced the live loads to 25 percent of the loads shown on the construction drawings. This criteria change is consistent with live load reductions used for other extreme loading conditions and also is consistent with current industry practice.

2. Increased Yield Stress

The original evaluation criteria specified that the minimum specified yield stress (F_y) of the steel be used. The structural steel specifications for the Ginna plant require the use of A36 steel (F_y = 36 ksi). This criteria change will take advantage of normally higher yield stresses in the steel, and also account for the plastic versus elastic shape factors. The new criteria applied a factor of 1.2 to F_y.

3. Reduction or Elimination of Tornado Differential Pressure

The original evaluation criteria specified a tornado-induced differential pressure of 0.4 psi. This differential pressure would exist only for a completely sealed structure. The previous

evaluation took no credit for existing openings (doors, windows, HVAC vents, etc.) which would provide venting of the buildings and thereby reduce or eliminate the effective differential pressure. The new criteria will account for the existing areas. Where possible, additional vent area will be added to either reduce or eliminate the differential pressure loads.

The two approaches used in the reduction of the quantities of overstressed components and their results were presented to the NRC at a meeting in November, 1983. It was pointed out in that meeting that the quantity reductions being presented were, to a large extent, based upon engineering judgment and a minimum amount of calculations. Verification of the exact quantities (which could be larger or smaller) would be made in a confirming analytical phase of the upgrade program.

Following the NRC meeting in November, RG&E and the NRC Staff met with the ACRS to make a presentation of the overall program and proposed upgrade. In that meeting, the ACRS requested that RG&E provide a qualitative assessment of the capability of the upgraded structure to function at tornado windspeeds above 132 mph.

C. STABILITY EVALUATION

In order to demonstrate to the ACRS that the ultimate plant capacity was actually greater than the level of the recommended design tornado, a stability evaluation was performed. This evaluation assumed that the structures were upgraded to withstand the tornado windspeed of 132 mph and the other extreme loads previously mentioned. The assessment was performed using the component's maximum strength and employing the following criteria:

1. Primary members were evaluated for stability by assessing the members for the actual loads associated with the 188 mph tornado windspeed and using the maximum strength that those members could develop. The allowable compressive load for column members was assumed to be equal to the theoretical buckling load. For bending elements, the allowable load was based on the theoretical lateral buckling stress.

   Allowable tension stress on the members was assumed to be equal to the minimum specified yield strength on their gross area or 80% of the ultimate strength on the effective net area.

All other allowable stresses not covered above were evaluated to a 1.6 S x 1.2 acceptance criteria where S is as defined in AISC.

The following criteria were also used in the overall stability assessment:

a. Column Research Council plastic design formulas were used to evaluate columns.

b. A diagional brace (in compression) in a cross-braced bay was considered to support its buckled load because the complimentary tension brace prevents excessive deflection.

c. Compression member lengths were evaluated using an effective length factor that was more representative of the actual details.

2. Connections and anchorages for the primary members evaluated for stability which did not meet the 1.6 S x 1.2 criteria specified in the SRP, were evaluated using the following criteria.

For connections:

a. The plastic bending capacity of double clip angles was used.

b. Higher bolt shear stresses for threads out of shear plane were used.

c. A compression diagonal brace is considered to support its buckled load because the complementary tension brace prevents excessive deflection thereby reducing the load on the tension brace connection.

d. For some bracing members containing numerous bolts, the fixity of that brace was assumed to be between a fixed end condition and a pinned end condition. An effective length factor of 0.65 was used which increased the compression capacity of the member, thereby reducing the load on the complementary tension member and its connections.

For anchorages:

a. The ultimate shear and tensile strengths for anchor bolts were used.

b. The plastic bending capacity of double clip angles was used.

c. The beam pockets in the Control Building were considered to be capable of restraining the beam after anchor bolt failure.

D. <u>DESIGN CRITERIA</u>

The design of modifications to the primary steel members, primary steel connections and primary anchorages which are identified as required in the evaluation phase of the SUP, will be done in accordance with the following criteria. Secondary members and their connections (purlins) which provide lateral support to the primary members will also be included. Local modifications to the concrete structures which provide embedment for the primary anchorages will also be considered as part of this program.

1. Load Conditions

The loads that are to be used in the design of the modifications for the various components have been developed in the evaluation phase of the SUP program. The content of these loads are described below:

Dead Load- D

Dead loads include the weight of the structure and the weight of permanently supported equipment (such as tanks, pumps and electrical cabinets) and systems components (such as piping, cable tray, conduit and ductworks), and thermal and pipe reactions as described below.

Live Load - L

The live loads will be 25% of the uniform live loads shown on the plant construction drawings. However, the live load applied to the Turbine Building operating floor will be 100 psf.

Crane live loads will not be considered in the design, consistent with procedural steps implemented at Ginna Station.

Thermal Effects - T_o

Based on engineering judgment, thermal effects and loads during normal operation or shutdown conditions will be assumed to be 2.5% of dead loads for this program and will be included in the independent loads as a part of the dead load.

Pipe Reactions - P_o

Major pipe reactions during normal operating or shutdown conditions from main steam and feedwater systems will be included in the evaluation. Based on engineering judgment, other pipe reactions during normal operating or shutdown conditions will be assumed to be 2.5% of dead load for this program, and will be included in the independent load cases as a part of the dead load.

Wind Load - W_n

The normal wind speed for Ginna Station will be based on the requirements of ANSI A58.1-1982 and have a magnitude of 75 mph. The only deviation from ANSI was in the manner by which the wind pressure was applied to the structure. This analysis did not vary the wind pressure with height, but instead applied the pressure uniformly over the entire windward side of the structure.

Snow Loads - S_n

The snow load which will be used in the upgrade of the Ginna Station structures will be based on ANSI A58.1-1982. For these structures a design ground snow load of 40 psf used.

Extreme Snow Loads - S'_n

The extreme environmental snow load used for Ginna Station will be 100 psf.

Tornado Wind Loads - W_t

A tornado windspeed of 132 mph with a core radius of 150 feet to the point of maximum velocity will be used as the design base tornado. A differential pressure drop of 0.4 psi will be used.

For the main structural framework, the horizontal tornado pressure profile is positioned on the plant so as to achieve the maximum average pressure over each side. This pressure has been assumed to not vary with height.

2. Load Combinations

The following load combinations shall be used as the basis for the design of component modifications.

a. $D + L + W_n + S_n$

Severe Load Condition - This load represents the combination of dead load, live load, design snow load and design wind load. The combination of a 100-year recurrence wind and 100-year recurrence snow represents an event having an annual probability of occurrence in the range of 10^{-4}.

b. $D + L + S'_n$

Extreme Snow Load - This load description represents the combination of dead load, live load, and the extreme snow load.

c. $D + L + W_t$

Tornado Load - This load represents the combination dead load, live loads and tornado created loads.

3. Stress Limits

Based on the low probabilities of occurrence associated with the extreme loads developed in the SUP, modifications will be designed to the stress limits shown in the following table:

Load Condition	Load Combination	Stress Limit
Severe	$D + L + W_n + S_n$	1.6 S
Extreme Snow	$D + L + S'_n$	1.6 S
Tornado	$D + L + W_t$	1.6 S

S - The required section strength based on the elastic design method and the allowable stresses defined in AISC.

Only those secondary members that are required to provide lateral support to the primary framework and have been found to be overstressed will be upgraded using the same criteria used for primary components.

Siding and decking will not be upgraded for these loading conditions. In fact, localized failures of the siding and decking actually reduce the effective loads on the primary structures.

Modification to the concrete structures, as required for this program, will generally be designed to satisfy the requirements of the American Concrete Institute (ACI) "Code Requirements for Nuclear Safety Related Structures," ACI 349-80 (Reference 14).

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E. ANSWERS TO THE TECHNICAL EVALUATION REPORT CATEGORY III OPEN ITEMS

The following discussions are presented in response to the issues raised in the NRC Technical Evaluation Report dated August 2, 1983. These issues pertain to:

- o Effective Tornado Loadings
- o Structural Loadings
- o Structural Acceptance Criteria
- o Structural Systems

Effective Tornado Loadings

1. Atmospheric Pressure Change

"RG&E made a commitment to reexamine the calculation for atmospheric pressure changes and will apply the appropriate value in the structural loadings."

The atmospheric pressure drop used in the SRP evaluation for a 132 mph tornado was 0.4 psi. FRC calculated a pressure drop of 0.46 psi using the minimum translation speed of 5 mph noted in Regulatory Guide 1.76. The translational speed corresponding to a 0.4 psi pressure drop is 12.8 mph. The Regulatory Guide only provides guidance that the minimum translational speed be used in regard to the ultimate heat sink calculations for the plant. Use of the minimum speed for structural design considerations is not specified by the Regulatory Guide. The 12.8 mph translational speed was originally judged reasonable and it is thus considered that the 0.4 psi pressure drop is acceptable.

2. Wind-borne Missiles

"RG&E has made a commitment to reexamine the effects of tornado-induced missile impacts on the primary structural members throughout the Ginna facility in its final analysis."

RG&E commissioned a study, "Utility Pole Tornado Missile Trajectory Analysis" by Dr. Larry Twisdale of Applied Research Associates (Reference 1, Appendix A). In that study, it was concluded that windspeeds lower than approximately 150 mph could not provide the necessary aerodynamic lift required for a utility pole to become an airborne missile. Thus, at a windspeed of 132 mph, it was determined that there would be no adverse effect on the primary framing of Ginna structures due to a utility pole missile. At higher windspeeds approaching 200 mph, it was considered credible that a utility pole missile could become airborne for short distances. However, the probability of a utility pole missile damaging the primary Ginna structures at higher windspeeds becomes increasingly small, since the

probability of a higher windspeed (10^{-5} at 132 to 10^{-6} at 188 mph) must be coupled with the probability of actually hitting a primary structural element (this was estimated to be about 25% in the study, based on an area ratio to effective missile length distribution function). Thus, it is estimated that the probability of actually hitting and damaging a primary member is less than 10^{-6}, and thus is not of concern with respect to tornado protection design efforts.

Structural Loadings

1. Effective Structural Pressures

"RG&E has made a commitment to examine the local effects of peak pressures on primary members in the final analysis."

RG&E has committed to upgrade the structure to withstand the effects of a 132 mph tornado on a stress basis. In addition, a commitment has been made to assure stability of the structures to the 188 mph windspeed. Since the average pressure associated with the 188 mph tornado is approximately the same as the peak pressure associated with the 132 mph tornado, assuring stability (and thus, assuring all safety functions are met) at the average pressure for the 188 mph tornado is in effect the same as designing for the peak pressure associated with the 132 mph tornado.

Structural Acceptance Criteria

1. Roof Deck

"RG&E has stated that the roof decks will be reexamined for potential buckling under extreme environmental loadings. The capacities of the roof decks will be modified accordingly."

The evaluation of the roof decking done in the SUP considered that the allowable stresses associated with the steel roof decking, found at Ginna Station, would be increased by 1.6 in accordance with the SRP for extreme load cases. Based on information found in the Americal Iron and Steel Institute (AISI), "Specifications for the Design of Cold-Formed Steel Structural Members," (Reference 21), a theoretical buckling stress for the roof decking has been estimated to be greater than the actual yield stress of the material. Stress levels found in the roof decking as a result of the extreme snow load are, in nearly all cases, less than the allowable stress of

the steel decking multiplied by the 1.6 allowable overstress. For the remaining areas where the stress levels were found to be greater than the SRP allowable stresses, the actual stress was still found to be less than the yield stress of the material. It is RG&E's conclusion that since all the stresses associated with the extreme snow load were found to be less than the yield stress of the material (and concurrently less than the theoretical yield stress of the material), local buckling of compression areas of the decking will not occur.

Structural Systems

1. Control Building

"RG&E has made a commitment to reexamine the Control Building east wall for the structural upgrade."

The connections to the east wall (security wall) of the control room will be reexamined and upgraded as necessary to withstand the differential pressure effects of the RG&E recommended design tornado for Ginna Station.

2. Diesel Generator Building

"RG&E has made a commitment to reexamine the reinforced concrete structures of the diesel generator building in the final analysis."

The reinforced concrete structures will be examined for the RG&E recommended design tornado effects (wind forces and the effects of differential pressure). No further analysis is required for tornado missiles, since these walls have already been found to be able to acceptably withstand the SEP missile spectrum.

During the review of the concrete code changes, it was also determined that further analysis or upgrade will be required for the shear walls to meet the Ginna seismic response spectra within applicable acceptance criteria. This analysis will be performed in conjunction with the tornado analysis.

F. <u>SEP Topic III-7.B, Loads, Load Combinations and Design Criteria</u>

RG&E's initial submittal, dated May 27, 1983, (Reference 11) defined all applicable loads and load combinations considered limiting for the concrete and steel safety-related structures at Ginna Station. In the NRC's Safety Evaluation Report of August 22, 1983 (Reference 6), it was determined that the proper load combinations had been used in the structural re-evaluation of Ginna structures.

A related issue was a comparison of the steel and concrete codes used in the original Ginna design, versus current codes. The following comparison were made:

1) AISC 1980 (Reference 12) vs. AISC 1963 (Reference 13).

2) ACI 349-80 (Reference 14) vs. ACI 318-63 (Reference 15).

3) ASME Section III, Div. 2, 1983 (Reference 16) vs. ACI 318-63 (Reference 15)

These comparisons were documented in the NRC's SER of January 4, 1983 (FRC Report TER-C5257-322) (Reference 17). RG&E responded to this TER in letters dated April 22, 1983 (steel structures) (Reference 1) and May 27, 1983 (concrete structures) (Reference 11). The comparison showed that, for tornado-related loadings, all required safety-related structures were either able to meet currently-required factors of safety, were shown to meet margin-to-failure criteria through detailed calculations, or were to be provided with additional reinforcement as part of the Structural Upgrade Program. For seismic loadings, it was determined that all concrete code changes were acceptable, except for the shear walls in the diesel generator buildings. These walls were to be further evaluated in conjunction with RG&E's Structural Upgrade Program.

Seismic loadings for steel structures were not specifically analyzed by RG&E. As noted in our August 19, 1983 letter, (Reference 18), RG&E considers that the main structural elements were determined suitable, by virtue of the overall Lawrence Livermore Laboratory analysis, documented in NUREG/CR-1821 (Reference 18), which was approved by the NRC. The steel code changes concerning coped beams, moment connections and steel embedments will be evaluated relative to the extreme seismic loads and load combinations, in conjunction with the overall Structural Upgrade Program.

Scuppers will be installed in accordance with RG&E's May 27, 1983 (Reference 11) submittal to the NRC.

G. COMPONENT/MISSILE EVALUATIONS

The structures, systems, and components required to be tornado-missile protected are those required to achieve and maintain a safe shutdown condition. Also, other systems considered for protection are the surface of the spent fuel pool, such that missiles and other large items would be prevented from causing unacceptable damage to the fuel assemblies; the reactor coolant pressure boundary and maintain steam and feedwater lines, to prevent major primary and secondary system breaks; and items whose failure could cause unacceptable inadvertent operation or failure of safety-related equipment.

RG&E's resolution of these items is detailed below:

1. Refueling Water Storage Tank

An analysis of missile effects (utility pole and steel rod), and wind pressure effects due to a 188 mph tornado, was performed for the RWST. It was determined that a minimum safety factor for any of these load combinations is 1.18. For the RWST perforation analysis, the perforation formula contained in EPRI report NP-769 (Reference 10), which accounts for the energy absorption due to deformation of the relatively soft utility pole missile, was used. For the steel rod, the "Ohte Formula" from "the Strength of Steel Plates Subjected to Missile Impact", paper J7/10, 6th. Smirt Conference, 1981 (Reference 10) was used.

2. Electrical Buses 14, 17 and 18

Bus 14 is located on the operating floor of the Auxiliary Building and could be subject to damage from tornado missiles. However, safety-related bus 16, located on the intermediate level of the Auxiliary Building, is protected from tornado missiles, and would be available in the event of a tornado.

Buses 17 and 18 are located in the screen house. The operating floor of the screen house is not protected from the effects of tornadoes, including missiles. However, RG&E has made modifications which will eliminate dependence on the Service Water System to achieve and maintain safe plant shutdown. Thus, no protection for buses 17 and 18 is required.

RG&E has also investigated the potential for damage to buses 17 or 18 causing failure of required electrical equipment, such as a diesel generator. In order to eliminate the potential damage from fault currents, RG&E is planning to install a protective breaker for diesel generator 1B, to be located in a tornado missile protected area.

3. Main Steam Lines A and B, and Main Feedwater Lines A and B

An analysis of the effects of tornado wind loadings and tornado missiles on the steam lines, feedwater lines, supports, and attached piping and valves has been completed, for a tornado windspeed of 188 mph. Based on the results of the analysis, the Ginna Station main steam line and main feedwater line will not be perforated from either the utility pole or the steel rod tornado missile.

The results confirmed both piping systems will withstand the effects of tornado wind and missile loads combined with normal operating loads within the acceptance criteria of Service Level D of ASME NC 3600 for Class 2 piping. In performing this analysis, it was conservatively assumed that snubber restraints were ineffective in resisting the tornado wind. It was also conservatively assumed that any snubber restraint impacted by the utility pole missile would fail. Both piping systems can withstand the effects of the steel rod missile impact without permanent deformation. It was determined that there would be some permanent, but not unacceptable, deformation of both piping systems if impacted by the utility pole missile.

RG&E has also committed to evaluate the possible damaging effects on the steam and feedwater lines, due to failure of block walls. The block walls are located at the entire level in the intermediate building where the steam and feedwater lines are located. Based on the tornado missile evaluation, RG&E does not expect the majority of the systems to require protection;

however, some local protection, such as for the main steam isolation valve solenoid valves, and the auxiliary feedwater system connections up to the check valve, may be required.

4. Surface of the Spent Fuel Pool

An analysis has been performed for RG&E by Pickard, Lowe, and Garrick, Inc. entitled "Criticality Analysis for the Spent Fuel Storage Racks" (Reference 1, Appendix B). It has been calculated that, even if the utility pole caused displacement of a fuel storage box, such that several fuel storage boxes were adjacent, a K_{eff} of less than 0.8894 would result with borated water of 2000 ppm in the pool (such is the case). RG&E considers the criticality issue resolved. RG&E has also performed an analysis to determine the effects of a utility pole missile on the spent fuel assemblies. As provided in RG&E's proposed amendment to the Ginna Technical Specifications submitted by letter dated January 18, 1984 (Reference 19), it has been determined that the worst case utility pole strike would not result in offsite radiological consequences greater than the guideline exposures of 10 CFR Part 100 (Reference 20). Thus, this issue has been resolved.

RG&E has also committed to prevent the block walls in the vicinity of the spent fuel pool from adversely affecting the spent fuel assemblies.

5. Diesel Generators and Their Fuel Supply

RG&E has determined that additional protection is required for the doors and roof of one diesel generator room. Based on that analysis, RG&E plans to provide protection from tornado missiles for the "B" diesel generator, and its required auxiliaries. The muffler for the diesel generator is also not protected from damage as a result of a tornado missile impact. RG&E plans to prepare and implement a procedure to negate the possible adverse effects on DG operability due to any anticipated damage of the muffler system from tornado missiles.

6. Control Building

The east wall of the relay room is steel siding and some block wall. Although it is anticipated that the relay room wall could withstand tornado wind speeds, it is not anticipated that it could withstand the rod or the utility pole. RG&E thus plans to provide missile protection for that wall.

7. Standby Auxiliary Feedwater System

Although the Standby Auxiliary Feedwater System is protected by the SAFW Building, the discharge piping is routed through the Auxiliary Building. All of the discharge piping for the "C" pump, associated with bus 14, is located in the intermediate level of the Auxiliary Building, and thus protected from tornado missiles, except for a small elbow section. This small section of piping is protected by concrete walls on the south and east sides, and by the RMWT on the north and west. Since the "C" pump is associated with the power supply and distribution equipment not tornado-protected, RG&E plans to make the necessary changes to exchange the power supply and distribution for the "C" pump and associated valves, from bus 14 to bus 16, and for the "D" pump and associated valves from bus 16 to bus 14, or modify the discharge piping arrangement. Thus, both the power supply and piping associated with one auxiliary feedwater pump will be missile protected.

8. Instrumentation

RG&E anticipates that some primary and secondary instrumentation may require rerouting from non-protected areas in the Intermediate Building to the intermediate floor of the Auxiliary Building. Sufficient instrumentation will be provided for the operator to monitor safe shutdown conditions.

9. Diesel Generator Component Operability

During the ACRS presentation, questions were raised concerning operability of diesel generator components (such as the day tank) due to the tornado differential pressure of 0.4 psi. Although it is not anticipated that this pressure would be of concern, RG&E will conduct an evaluation to ensure no operability restrictions exist.

SCHEDULE

On April 22, 1983, a tentative work schedule was submitted with the Structural Reanalysis Program Report to the NRC. This schedule anticipated that the final design of the modifications work take 18 to 24 months, and final installation 24 to 30 months after completion of the design phase.

Recent meetings with the NRC and ACRS have delayed the submittal of these reports. However, RG&E feels confident that the original schedule is still valid. Therefore, based on approval of these reports, final design of the modifications should be completed in January, 1986, and final installation to be completed in late 1988 to mid 1989.

Work will still be scheduled so that the most critical components and structures will be addressed first.