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VISSING,G.S.

See Proposed Change to Tech Specs

SUBJECT: Forwards application for amend to license DPR-18,revising requirements associated w/SFP to reflect planned mod to storage racks & to temporarily address boraflex degradation within pool.

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ROBERT C. MECREDY
Vice President
Nuclear Operations

April 27, 1998

U.S. Nuclear Regulatory Commission
Document Control Desk
Attn: Guy S. Vissing
Project Directorate I-1
Washington, D.C. 20555

Subject: Application for Amendment to Facility Operating License, Revised Spent Fuel Pool Storage Requirements, Revision 1
Rochester Gas & Electric Corporation
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Reference: (a) Letter from R.C. Mecredy, RG&E, to G.S. Vissing, NRC, Subject: *Application for Amendment to Facility Operating License, Revised Spent Fuel Pool Storage Requirements*, dated March 31, 1997.

(b) Letter from R.C. Mecredy, RG&E, to G.S. Vissing, NRC, Subject: *Boraflex Degradation*, dated March 30, 1998.

Dear Mr. Vissing:

In Reference (a), RG&E submitted a License Amendment Request (LAR) which proposed to revise the Ginna Station Improved Technical Specifications (ITS) to reflect a planned modification to the spent fuel pool (SFP) storage racks. Revisions were proposed to specifications associated with SFP boron concentration, fuel assembly storage, and the maximum limit on the number of fuel assemblies which could be stored in the SFP. In addition, a criticality analysis of the proposed SFP modification was enclosed with the LAR, including an evaluation that the new SFP design would continue to meet Specification 4.3.1.1.b with respect to maintaining $k_{eff} \leq 0.95$ if flooded with unborated water.

In Reference (b), RG&E notified the NRC that recent testing of boraflex panels contained within Region 2 of the SFP indicated degradation such that certain portions of the criticality analysis provided in Reference (a) may no longer be conservative. This includes the ability of Region 2 to maintain a $k_{eff} \leq 0.95$ if flooded with unborated water. The letter described interim compensatory actions taken by RG&E and requested that the LAR continue to be processed since the SFP modifications would be part of the permanent solution with respect to boraflex degradation.

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Therefore, the purpose of this letter is to update Reference (a) to include necessary compensatory actions until Specification 4.3.1.1.b will be met with unborated water. Attachments I, II, and III to the original LAR are replaced in their entirety while Attachment IV remains unchanged. A new attachment is provided (V) which documents the basis for the interim boron concentration being proposed to address the boraflex degradation. Revision bars are shown in these attachments to indicate changes from the original submittal.

RG&E currently plans to have a permanent solution to the boraflex degradation concern implemented by December 31, 1999. This reflects the time needed to both evaluate, design, and implement necessary modifications. Since the rerack of SFP Region 1 will specifically address the boraflex issue by use of borated stainless steel, RG&E desires to complete this modification first prior to modifying Region 2. RG&E will then resubmit a LAR to remove the conservative boron concentration requirements as proposed in this letter.

In order to support a planned initiation of the SFP modification in June 1998, RG&E requests approval of this LAR as soon as possible since continued delays would affect the ability to receive new fuel for the spring 1999 refueling outage. We further request that upon NRC approval, the application should be considered effective immediately and implemented within 30 days thereafter.

Very truly yours,

Robert C. Mecredy

Attachments

xc: U.S. Nuclear Regulatory Commission
Mr. Guy S. Vissing (Mail Stop 14B2)
PWR Project Directorate I-1
Washington, DC 20555

U.S. Nuclear Regulatory Commission
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Ginna Senior Resident Inspector

Mr. F. William Valentine, President
New York State Energy, Research, and Development Authority
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Attachment I

R.E. Ginna Nuclear Power Plant

License Amendment Request
Revised Spent Fuel Storage Requirements

This amendment provides the description of the license amendment request (LAR) and the necessary justifications to support an increase in the allowed spent fuel pool storage capacity. This attachment is divided into six sections as follows. Section A summarizes all changes to the Ginna Station Improved Technical Specifications. Section B provides background and history associated with the changes being requested. Section C provides the justifications associated with the proposed changes. A no significant hazards consideration evaluation and environmental consideration of the requested changes to Ginna Station Improved Technical Specifications are provided in Sections D and E, respectively. Section F lists all references used in this attachment.

A. DESCRIPTION OF PROPOSED TECHNICAL SPECIFICATION CHANGES

This LAR proposes to revise the Ginna Station Improved Technical Specifications to reflect new spent fuel pool storage requirements. This change is summarized below and shown in Attachment II.

LCO 3.7.12

1. The requirement for the minimum boron concentration in the spent fuel pool is increased from 300 to 2300 ppm and the Mode of Applicability is changed to "whenever any fuel assembly is stored in the spent fuel pool".

2. The Frequency for SR 3.7.12.1 is changed from 31 days to 7 days.

LCO 3.7.13

1. The requirements for storage of spent fuel in Region 1 of the storage racks is revised to include restrictions on initial enrichment and accumulated burnup as identified in new Figure 3.7.13-1.

2. The REQUIRED ACTION for not satisfying the storage requirements is revised to allow movement of the noncomplying fuel assembly to any acceptable storage location regardless of storage region.

3. Figure 3.7.13-1 is added to provide the initial enrichment and burnup restrictions for storage in specified locations in Region 1.

4. Previous Figure 3.7.13-1 is renumbered to 3.7.13-2 and revised to provide additional restrictions on acceptable storage locations for Region 2.

5. SR 3.7.13.1 is revised to remove the NOTE providing an exemption to the SR when moving a fuel assembly from Region 2 to Region 1.

6. SR 3.7.13.1 is revised to verify the additional restriction on burnup and accumulated burnup is satisfied prior to storing a fuel assembly in Region 1.

7. Figure 3.7.13-1 is renumbered to 3.7.13-2 in SR 3.7.13.2 reflecting the addition of the figure for Region 1.

DESIGN FEATURES 4.3

1. Specification 4.3.1.1(c)is changed to remove the statement concerning RGAF2 fuel storage canister not satisfying the requirements for initial enrichment and burnup of LCO 3.7.13.

2. The specification of the spent fuel pool storage capacity is changed to reflect the maximum number of fuel assemblies and storage locations.

3. Specification 4.3.1.1 (b) is revised to add a note stating that the SFP shall be maintained with a boron concentration ≥ 2300 ppm until December 31, 1999.

B. BACKGROUND

The original spent fuel storage racks for Ginna Station had a storage capacity of 210 fuel assemblies. In 1977 these racks were removed and replaced with racks manufactured by US Tool and Die consisting of nine rack modules utilizing a checkerboard pattern alternating storage locations with water cells. This increased storage capacity to 595 storage locations. In 1985 six of the nine racks were removed from the storage pool and modified. This modification removed the lead-in funnels over the water box locations and added boraflex inserts to all locations to effectively double the storage capacity for the modified modules. This increased overall pool storage capacity to 1016 fuel assemblies and divided the storage racks into two regions. Region 1 consisted of three checkerboard pattern rack modules capable of storing all (fresh or recently discharged) fuel assemblies. Region 2 consisted of the six modified rack modules with higher density fuel storage and restrictions based on initial enrichment, minimum accumulated burnup, and minimum decay time after shutdown.

The proposed modification will replace the three Region 1 rack modules with seven new rack modules scheduled for implementation in 1998. Six new peripheral modules can be added at some time in the future. Two of the seven new modules planned to be installed in 1998 will be designated as part of Region 2 with similar restrictions on burnup versus initial enrichment (i.e., the Region 2 area will be effectively increased). The other five modules will compose Region 1. Higher density fuel storage in the new racks will be possible with the use of borated stainless steel and, for Region 1, the use of a checkerboard pattern alternating fresh fuel with burned fuel satisfying minimum burnup levels based on initial enrichment.

In 1998, RG&E identified boraflex degradation in Region 2 as a result of testing (Reference 4). To compensate for this degradation, RG&E is also proposing that the spent fuel pool boron concentration be maintained ≥ 2300 ppm at all times until a permanent resolution can be implemented.

C. JUSTIFICATION OF CHANGES

This section provides the justification for all changes described in Section A above and shown in Attachment II. The justifications are organized based on whether the change is: more restrictive (M), less restrictive (L), administrative (A), or the requirement is relocated (R). The justifications listed below are also referenced in the technical specifications which are affected (see Attachment II).

Reference 1 (enclosed as Attachment IV to Reference 5) provides a detailed analysis of the design and licensing basis of the proposed modification. This analysis is based upon the guidance established in Reference 2 and addresses the major areas of structural, criticality, thermal hydraulics and radiological. This analysis is summarized below to the extent necessary to provide justification for the specific proposed changes to the Technical Specifications. In addition, Attachment V provides the justification for the interim changes being proposed with respect to the boraflex degradation concern.

C.1 <u>More Restrictive</u>

1. LCO 3.7.12 specifies the minimum boron concentration required for the spent fuel pool during fuel movement. The proposed revision increases this minimum concentration to 2300 ppm from 300 ppm.

   The criteria for the criticality design of both Region 1 and 2 of the spent fuel pool is based upon maintaining the $k_{eff} \leq .95$. NRC guidelines specify that due to the postulated accident condition where all soluble boron is lost, no credit for boron can be taken under normal conditions. However, RG&E has identified that boraflex degradation is occurring within Region 2 of the spent fuel pool such that boron must be temporarily credited to meet this limit until a permanent solution is implemented (Reference 4). A minimum value of 2300 ppm was selected since: (1) this is the concentration required by LCO 3.9.1 for the hydraulically coupled reactor coolant system and spent fuel pool during MODE 6; (2) the value is substantially greater than that required to maintain the spent fuel $k_{eff} \leq 0.95$ assuming no credit is taken for the boraflex originally installed (see Attachment V); and (3) the value is equivalent to the minimum RWST boron concentration required by LCO 3.5.4. In addition, the Frequency for SR 3.7.12.1 will be increased from 31 days to 7 days to highlight the need to maintain sufficient boron while the Mode of Applicability is changed to "whenever any fuel assembly is stored in the spent fuel pool". Since the Mode of Applicability is changed, Required Action A.2.2 is no longer an acceptable alternative (i.e., the only means on exiting the Mode of Applicability is to remove all fuel assemblies from the spent fuel pool).

A note will also be added to Specification 4.3.1.1 (b) to state that a boron concentration of ≥ 2300 ppm will be temporarily credited in the spent fuel pool. A permanent resolution to the boraflex degradation concern will occur by December 31, 1999 allowing time for evaluation, design, and implementation.

The spent fuel pool is normally maintained with high boron concentrations; consequently, crediting soluble boron to compensate for boraflex degradation will have limited or no impact on direct Ginna Station operation. However, a boron dilution event within the spent fuel pool could have different consequences. RG&E has evaluated the spent fuel pool configuration and concluded that a boron dilution event is not credible for the following reasons:

(1) The spent fuel pool inventory is very large (approximately 230,000 gallons). In order to take the spent fuel pool from 2300 ppm to 1450 ppm ($k_{eff} > 0.95$) requires over 105,000 gallons of unborated water. The only tank with this capacity that can be procedurally connected to spent fuel pool is the refueling water storage tank which is required to have the same minimum boron concentration as that being proposed for the spent fuel pool in MODES 1 through 4. Below MODE 4, the RWST boron concentration is not expected to be reduced since the reactor coolant system is required to be at 2300 ppm soluble boron in MODE 6.

(2) The spent fuel pool boron concentration could be diluted in one of two ways: an overfill of the pool, or a controlled feed and bleed process with unborated water. For the overfill case, there are numerous alarms available within the control room to alert the operators including high spent fuel pool water level and sump pump actuations within the residual heat removal pump pit (lowest location in the Auxiliary Building). Auxiliary operators also tour the Auxiliary Building periodically as part of their shift duties. Depending on the source of water for the overfill condition, there would likely be significant time available to stop the event. Per station procedures, the largest pump used to fill the spent fuel pool is only 60 gpm (monitor and reactor makeup water pumps) which would require over 29 hours of unmonitored injection into the spent fuel pool to reach 105,000 gallons. This is considered very unlikely given the alarms and lack of unborated water source. For the controlled feed and bleed process, there is no tank available to store the required 105,000 gallons either as a "feed" source or as a "bleed" destination.

(3) A walkdown of the spent fuel pool indicates that there is no direct source of unborated water located above the pool. While there are several lines which could potentially spray water into the pool depending on the angle of the break, these sources are of limited size (i.e., much less than 105,000 gallons) and/or provide direct indication in the control room (e.g., fire water pump actuation) in order to allow isolation of the break before reducing the spent fuel pool boron concentration below that required to maintain $k_{eff} \leq 0.95$. Assuming full flow from fire pump into the pool (2000 gpm) would provide almost one hour to terminate the event.

(4) In addition to the overfill of the spent fuel pool while using station procedures as discussed in item (2) above, there is also the potential for a tube break in the service water (SW) supplied spent fuel pool heat exchanger. While SW pressure is normally lower than that in the spent fuel pool pump discharge line, it could be postulated that SW pressure would be higher and proceed to fill the spent fuel pool with unborated water. Conservatively assuming that the entire SW flow to one spent fuel pool heat exchanger was diverted to the pool (approximately 1600 gpm per UFSAR Table 9.1-3), this allows over 1 hour to detect and isolate the affected heat exchanger before injecting 105,000 gallons. It is noted that a rupture of only one tube is required to be considered and not a break of all tubes. Thus, this analysis is very conservative.

Upon a permanent resolution of the boraflex degradation issue, the double contingency principle discussed in ANSI N16.1-1975 (Reference 3) and Reference 2 allows credit for boron under accident or abnormal conditions since only a single accident need be considered at one time. The limiting accident condition, as discussed in Section 4 of Reference 1, is an incorrectly placed assembly in Region 2. The analysis shows that the criticality criterion for this, and any other abnormal event, is satisfied by a minimum boron concentration of 450 ppm during fuel movement which is also less than the temporarily proposed 2300 ppm.

2. LCO 3.7.13 specifies the requirements for storage of fuel assemblies in Regions 1 and 2 of the spent fuel pool to maintain $k_{eff} \leq .95$. With the proposed modification the storage configuration for fuel in Region 1 changes to a checkerboard pattern alternating between storage locations for fresh or low burnup fuel, and locations for higher burnup fuel. The fresh/low burnup fuel locations are identified on the racks by using lead-in funnels for those locations only. The proposed change to the Technical Specification adds the reference to the new Figure 3.7.13-1 which provides the criteria for determining the acceptability of fuel assembly storage in either of two locations based upon the initial enrichment and accumulated burnup. The analysis providing the basis for this configuration is in Section 4 of Reference 1.

   With the addition of new Figure 3.7.13-1 for Region 1, the figure for Region 2 is renumbered to 3.7.13-2. This new figure contains four possible locations for fuel storage within Region 2 (versus the previous two). With the proposed modification Region 2 is expanded from the original six Boraflex lined rack modules to include two new borated stainless steel rack modules. The acceptability for storage of fuel assemblies in Region 2 is expanded to include any fuel assembly provided specified initial enrichment, burnup, and storage configuration requirements are satisfied. These requirements are based upon maintaining the criticality criteria of $k_{eff} \leq .95$ and include an assumed amount of boraflex degradation/shrinkage. Based on the initial enrichment and accumulated burnup the fuel assembly is determined to fall within one of four burnup domains. Each domain has specific restrictions for the storage of fuel assemblies in adjacent storage locations to satisfy the basis for the criticality analysis. The analysis that demonstrates that fuel assemblies stored in conformance with this figure satisfy the criteria of $k_{eff} \leq .95$ is in Section 4 of Reference 1.

3. SR 3.7.13.1 specifies the surveillance required prior to placing a fuel assembly into a storage location in Region 1. Consistent with the proposed change to LCO 3.7.13, the proposed change to this SR adds the reference to the initial enrichment and accumulated burnup criteria identified on Figure 3.7.13-1. Prior to the proposed modification any fuel assembly acceptable for storage in Region 2 could be stored in any location of Region 1. After the proposed modification and revisions to new Figure 3.7.13-2, the criteria should be verified prior to movement of any assembly regardless of its initial storage location. With the proposed change, the note exempting this surveillance when moving a fuel assembly from Region 2 is no longer appropriate.

C.2 <u>Less Restrictive</u>

1. REQUIRED ACTION A.1 for LCO 3.7.13 specifies the action to be taken given a fuel assembly is identified in a location that is not in compliance with the requirements of the LCO. With the addition of requirements for storage of fuel assemblies within each region as identified on Figures 3.7.13-1 and 3.7.13-2, the action for non-compliance must allow movement of fuel within a region to an acceptable location. That is, it is now acceptable to allow movement of the noncomplying fuel assembly to a different location within the same spent fuel pool region and still meet the LCO requirements.

2. Design Feature 4.3.1.1(c) contains a statement noting that a fuel canister containing rods from a region RGAF2 fuel assembly would not satisfy the initial enrichment and burnup specifications for the storage region. With the criticality analysis documented in Section 4 of Reference 1, the subject fuel canister will satisfy the modified requirements of LCO 3.7.13 and the statement is no longer required.

3. Design Feature 4.3.3 currently specifies the spent fuel pool storage capacity in terms of the number of fuel assemblies. With the use of consolidated fuel canisters, fuel rods from multiple fuel assemblies (typically 2 assemblies or less) can be stored in one canister which occupies one storage location. With the proposed modification, the design and licensing basis will support the storage of up to 1879 fuel assemblies in 1369 storage locations. Therefore, this specification was revised to specify that no more than 1879 fuel assemblies be stored in no more than 1369 storage locations consistent with the analysis in Reference 1.

D. SIGNIFICANT HAZARDS CONSIDERATIONS EVALUATION

The proposed changes to Ginna Station Improved Technical Specifications as identified in Section A and justified in Section C have been evaluated with respect to 10CFR 50.92(c) and shown to not involve a significant hazards consideration as described below.

(1) Operation of Ginna Station in accordance with the proposed changes does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The design basis events considered for the spent fuel pool include both external events and postulated accidents in the pool. The external events considered are tornado missiles and seismic events. The evaluation of the postulated impact of a tornado missile is detailed in Sections 3, 4, and 6 of Reference 1. The structural evaluation indicates that there are no gross distortions of the racks or any adverse effects upon plant structures or equipment. The radiological consequences of this event indicate that offsite doses are "well within" the 10CFR100 limits.

The structural evaluation is detailed in Section 3 of Reference 1. Current state of the art methods are used in the structural analysis. The evaluation of the storage racks is based on a conservative interpretation of the ASME Boiler and Pressure Vessel Code. The evaluation of the spent fuel pool is based on a conservative interpretation of requirements set forth in the American Concrete Institute, Code Requirements for Nuclear Safety Related Concrete Structures, and American Institute of Steel Construction, Specification for Structural Steel Buildings. The spent fuel storage system was designed to meet all applicable structural criteria for normal (Level A), upset (Level B), and faulted (Level D) conditions as defined in NUREG-0900, SRP 3.8.4, Appendix D. The following loadings were considered: dead weight, seismic, thermal, stuck fuel assembly, drop of a fuel assembly, and tornado missile impact. Load combinations were performed in accordance with SRP 3.8.4, Appendix D. Given the evaluated seismic events, the changes in the final position of the racks are small as compared to the initial position prior to the seismic event. The maximum closure of gaps is such that no significant changes in gaps results during any single seismic event. Furthermore, the combined gap closures resulting from a combination of 5 OBEs and 1 SSE show that there are no rack-to-rack or rack-to-wall impacts. These evaluations conclude that under these postulated events, the stored fuel assemblies are maintained in a stable, coolable geometry, and a subcritical configuration.

As described in the bases for LCO 3.7.12 and 3.7.13, the postulated accidents in the spent fuel pool are divided into two categories. The first are those involving a loss of cooling in the spent fuel pool. The thermal-hydraulic analysis for the maximum expected decay heat loads is described in Section 5 of Reference 1. The proposed modification does not change the configuration of the available spent fuel cooling systems, the limiting design conditions for maximum decay heat load which occurs during a full core offload, or the existing requirement to maintain pool temperature below 150°F. Utilizing the three available spent fuel cooling systems, Ginna Station maintains full redundancy during high heat load conditions. The decay heat load to the spent fuel pool is maintained within the capacity of the operating cooling system by appropriately delaying fuel offload from the reactor. Should a failure occur on the operating cooling system, the resulting heat rates allow sufficient time to place a standby cooling system in service before the pool design limit temperature is exceeded. Increases in spent fuel pool temperature, with the corresponding decrease in water density and void formation from boiling, will result in an decrease in reactivity due to the decrease in moderation effects. In addition, the analysis demonstrates that the storage rack geometry and required fuel storage configurations result in a $k_{eff} \leq .95$ assuming no soluble boron allowing for the potential of makeup to the pool with unborated water if credit is taken in Region 2 for minimal availability of boraflex panels installed on the storage rack. (Note that concerns with boraflex degradation are discussed later in this evaluation).

The second category is related to the movement of fuel assemblies and other loads above the spent fuel pool. The limiting accident with respect to reactivity is the fuel handling accident which is analyzed in Section 4 of Reference 1. For both the incorrectly transferred fuel assembly (placed in an unauthorized location) or a dropped fuel assembly, the positive reactivity effects resulting are offset by the negative reactivity from the required minimum soluble boron concentration. The resulting k_{eff} is shown to be less than 0.95 if credit is taken in Region 2 for minimal availability of boraflex panels installed on the storage racks. The radiological consequences of a fuel assembly drop remain as described in Section 15.7.3 of the UFSAR and as discussed in Section 6 of Reference 1. Loads in excess of a fuel assembly and its handling tool are administratively prohibited from being carried over spent fuel. There are no changes anticipated for either the fuel handling equipment of the auxiliary building overhead crane due to the proposed modification to the fuel storage racks. The modification is scheduled for the Year 1998 to be performed while Ginna Station is operating. Movement of heavy loads around the spent fuel pool are controlled by the requirements of NUREG-0612 and the regulatory guidelines set forth in NRC Bulletin 96-02 (see Section 3 of Reference 1). Spent fuel casks and storage racks (during removal and installation) will be moved using the auxiliary building crane and lifting attachments satisfying the single failure proof criteria of NUREG-0554, obviating the need to determine the consequences for this accident.

Due to boraflex degradation within the spent fuel pool, credit must be temporarily taken for soluble boron to maintain $k_{eff} \leq 0.95$. There is no increase in the probability of a loss of spent fuel pool cooling or fuel handling accident as a result of crediting soluble boron. The spent fuel pool is normally maintained at a boron concentration level greater than that proposed, including during fuel movement. Therefore, there is no effect on plant systems or spent fuel pool activites than which are currently in effect. The proposed boron concentration level is also equivalent to that required by LCO 3.9.1 during MODE 6 such that no boron dilution event is expected to occur within the pool during refueling operations when the reactor coolant system and spent fuel pool are hydraulically coupled.

Crediting soluble boron does not increase the consequences of an accident. As described in the bases for LCO 3.7.12, increases in spent fuel pool temperature, with the corresponding decrease in water density and void formation from boiling, will generally result in an decrease in reactivity due to the decrease in moderation effects. The only exception are temperature bands where positive reactivity is added as a result of the high boron concentration. This effect is bounded by the reactivity added as a result of a misloaded fuel assembly. With respect to the more limiting dropped fuel assembly accidents, boraflex nuetron absorber panels were originally assumed in the criticality analysis. Requiring a high concentration of soluble boron in place of boraflex panels ensures that the spent fuel pool remains subcritical with $k_{eff} \leq 0.95$ for these accidents. Fuel assembly movement will continue to be controlled in accordance with plant procedures and LCO 3.7.13 which specifies limits on fuel assembly storage locations. Periodic surveillances of boron concentration will be required every 7 days with level verified every 7 days during fuel movement per LCO 3.7.11. Due to the large inventory within the spent fuel pool, dilution of the soluble boron within the pool is very unlikely without being detected by operations personnel during auxiliary operator rounds or available level detection systems. There is also a large margin between the required boron concentration to maintain the pool subcritical $k_{eff} \leq 0.95$ and the proposed value (approximately 900 ppm).

Based on the above, it is concluded that the proposed changes do not significantly increase the probability or consequences of any accident previously analyzed.

2. Operation in accordance with the proposed changes does not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed modification does not alter the function of any system associated with spent fuel handling, cooling or storage. The proposed changes do not involve a different type of equipment or changes in methods governing normal plant operation. The additional restrictions placed on the acceptable storage locations for spent fuel are consistent with the type of restriction that previously existed. The potential violation of these restrictions (incorrectly transferred fuel assembly) are analyzed as discussed above. The rerack design, analysis, fabrication, and installation meet all the appropriate NRC regulatory requirements, and appropriate industry codes and standards.

Crediting soluble boron within the spent fuel pool in place of boraflex neutron absorber panels does not create the possibility of a new or different kind of accident since the spent fuel pool is normally maintained with high boron concentrations. Assuming a boron dilution event to the level required to reach $k_{eff} \leq 0.95$ conditions within the spent fuel pool would require either overfill of the pool or a controlled feed and bleed process with unborated water. In both cases, greater 105,000 gallons of unborated water would be required to reach $k_{eff} > 0.95$. There is no source of unborated water of this size available to reach the spent fuel pool under procedural control or via a pipe break other than a fire water system pipe break or SW leak through the spent fuel pool heat exchangers. However, there are numerous alarms available within the control room to indicate this condition including high spent fuel pool water level and sump pump actuations within the residual heat removal pump pit (lowest location in the Auxiliary Building). Auxiliary operators also perform regularly scheduled tours within the Auxiliary Building. This provides sufficient time to terminate the event such that there is no credible spent fuel pool dilution accident.

Based on the above, the change does not create the possibility of a new or different kind of accident from any previously analyzed.

3. Operation of Ginna Station in accordance with the proposed changes does not involve a significant reduction in the margin of safety.

The Licensing Report enclosed as Reference 1 addresses the following considerations: nuclear criticality, thermal-hydraulic, and mechanical, material, and structural. Results of these evaluations demonstrate that the changes associated with the spent fuel reracking does not involve a significant reduction in the margin of safety as summarized below:

<u>Nuclear Criticality</u>

The established regulatory acceptance criterion is that k_{eff} be less than or equal to 0.95, including all uncertainties at the 95/95 probability/confidence level, under normal and abnormal conditions. The methodology used in the evaluation meets NRC requirements, and applicable industry codes, standards, and specifications with credit taken in Region 2 for the previously installed boraflex panels. In addition, the methodology has been reviewed and approved by the NRC in recent nuclear criticality evaluations. Specific conditions which were evaluated include misloading of a fuel assembly, drop of a fuel assembly (shallow, deep drops, and side drops), pool water temperature effects, and movement of racks due to seismic events. Results described in Section 4 of Reference 1 document that the criticality acceptance criterion is met for all normal and abnormal conditions.

Thermal-Hydraulic

Conservative methods and assumptions have been used to calculate the maximum temperature of the fuel and the increase of the bulk pool water temperature in the spent fuel pool under normal and abnormal conditions. The methodology for performing the thermal-hydraulic evaluation meets NRC regulatory requirements. Results from the thermal-hydraulic evaluation show that the maximum temperature at the hottest fuel assembly, intact or consolidated canister, is less than the temperature for nucleate boiling condition. The effects of cell blockage on the maximum temperature of intact fuel and consolidated canisters were evaluated. Results described in Section 5 of Reference 1 show that adequate cooling of the intact or consolidated fuel is assured. In all cases, the existing spent fuel pool cooling system will maintain the bulk pool temperature at or below 150°F by delaying core offload from the reactor.

Mechanical, Material, and Structural

The primary safety function of the spent fuel pool and the racks is to maintain the spent fuel assemblies in a safe configuration through all normal and abnormal loads. Abnormal loadings which have been considered in the evaluation are: seismic events, the drop of a fuel assembly, the impact of a tornado missile, a stuck assembly, and the drop of a heavy load. The mechanical, material, and structural design of the new spent fuel racks is in accordance with NRC regulatory requirements (including the NRC OT Position dated April 14, 1978, and addendum dated January 18, 1979), and applicable industry standards. The rack materials are compatible with the spent fuel pool environment and fuel assemblies. The material used as a neutron absorber (borated stainless steel) has been approved by the American Society for Testing and Materials (ASTM), and licensed previously by the NRC for use as a neutron absorber at Indian Point 3, Indian Point 2, and Millstone 2. The structural evaluation presented in Section 3 of Reference 1 documents that the tipping or sliding of the free-standing racks will not result in rack-to-rack or rack-to-wall impacts during seismic events. The spent fuel assemblies will remain intact and the criticality criterion of k_{eff} less than or equal to 0.95 is met if credit is taken in Region 2 for previously installed boraflex panels.

Soluble boron within the spent fuel pool provides a significant negative reactivity such that k_{eff} is maintained ≤ 0.95. The proposed surveillance frequency will ensure that the necessary boron concentration is maintained. A boron dilution event which would remove the soluble boron from the pool has been shown to not be credible.

Based upon the above information, it has been determined that the proposed changes to the Ginna Improved Technical Specifications do not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of a new or different kind of accident previously evaluated, and does not involve a significant reduction in the margin of safety. Therefore, it is concluded that the proposed changes meet the requirements of 10CFR 50.92(c) and do not involve a significant hazards consideration.

E. ENVIRONMENTAL CONSIDERATION

RG&E has evaluated the proposed changes and determined that:

1. The changes do not involve a significant safety hazards consideration as documented in Section D above;

2. The changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, since:

   a. the consequences following a fuel handling accident or tornado missile event remain within accepted limits (Section 6 of Reference 1),

   b. it is not expected that the waste generated from demineralizer resin replacement will significantly increase (Section 6 of Reference 1),

   c. anticipated waste generated from the rack replacement will be substantially decreased through decontamination prior to disposal (Section 6 of Reference 1), and

   d. it is not expected that a significant activity will be released to receiving waters or the atmosphere as a result of the reracking (Section 6 of Reference 1).

3. The changes do not involve a significant increase in individual or cumulative occupational radiation exposure. The occupational exposure limits are limited by 10CFR20 and controlled to as low as reasonably achievable by plant procedures and practices. Expected dose rates in accessible spaces adjacent to the spent fuel pool are calculated and documented in Section 6 of Reference 1. Increased storage capacity of the spent fuel pool is not expected to result in any significant increase in the radiation dose levels at the pool surface or other locations of accessibility.

   Doses to the workers will be constantly monitored during the reracking. The use of electronic dosimetry, in-pool radiation area monitors, as well as the presence of radiation protection staff will provide a high degree of assurance that does to workers will be minimized in accordance with ALARA principles. The Radiation Protection Staff will be an integral part of this operation, and therefore will be available to support emerging requirements. The estimated total exposure for this operation will be between 8 and 12 Person-Rem. Reviews of the rerack will be conducted formally as part of the ALARA process, and documented as part of the project work scope. Additional radiological considerations are detailed in Section 6 of Reference 1.

Accordingly, the proposed changes meet the eligibility criteria of categorical exclusion set forth in 10CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed changes is not required.

F. REFERENCES

1. Framatome Technologies, Inc., "R.E. Ginna Nuclear Power Plant, Spent Fuel Storage Pool Reracking Licensing Report", February 1997.

2. Letter from B. K. Grimes, NRC to All Reactor Licenses, Subject: "OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications," dated April 14, 1978 and modified January 18, 1979.

3. ANSI N16.1-1975, "American National Standard for Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors."

4. Letter from R.C. Mecredy, RG&E, to G.S. Vissing, NRC, Subject: *Boraflex Degradation*, dated March 30, 1998.

5. Letter from R.C. Mecredy, RG&E, to G.S. Vissing, NRC, Subject: *Application for Amendment to Facility Operating License, Revised Spent Fuel Pool Storage Requirements*, dated March 31, 1997.

TABLE 1
PROPOSED CHANGES TO T.S.

CHANGES TO T.S.	FRAMATOME LICENSING REPORT	DESCRIPTION	CURRENT	PROPOSED
Sections 4.3.3 and B 3.7.13 Figure B 3.7.13-1	Sections 1, 2, 3, 4, 5, 6, and 8	O CAPACITY	1016 FUEL ASSEMBLIES	1879 FUEL ASSEMBLIES IN 1369 STORAGE LOCATIONS (ASSUMES CONSOLIDATION)
Not described	Section	O NUMBER OF RACKS AND TYPE OF POISON MATERIAL	REGION 1 (176 LOCATIONS) 3 S.S. WITH NO POISONS REGION 2 (840 LOCATIONS) 6 S.S. WITH BORAFLEX	REGION 1 (294 LOCATIONS) 5 S.S. WITH BORATED STAINLESS STEEL REGION 2 (1075 LOCATIONS) 2 S.S. WITH BORATED STAINLESS STEEL 6 WITH BORAFLEX 6 S.S. WITH BORATED STAINLESS STEEL
Sections 3.7.13 and B 3.7.13 Figure 3.7.13-1	Section 4	O LOADING REQUIREMENTS	REGION 1 NO ENRICHMENT/BURNUP REQUIREMENTS REGION 2 ENRICHMENT/BURNUP REQUIREMENTS (TWO DOMAINS) TRANSFER OF NON-COMPLYING ASSEMBLIES FROM REGION 2 REGION 1	REGION 1 ENRICHMENT/BURNUP (TWO DOMAINS) AND STORAGE CONFIGURATIONS REGION 2 ENRICHMENT/BURNUP (FOUR DOMAINS) AND STORAGE CONFIGURATIONS TRANSFER OF NON-COMPLYING FUEL ASSEMBLIES TO AN ACCEPTABLE LOCATION IN EITHER REGION
Sections 4.3 and B 3.7.13	Section 4	O CONSOLIDATED ROD STORAGE CANISTERS	NUMBER OF RODS IN CONSOLIDATED STORAGE CANISTER SHALL BE ≤ 144 RODS OR ≥ 256 RODS	NO RESTRICTIONS ON THE NUMBER OF RODS IN CONSOLIDATED ROD STORAGE CANISTER
Sections 3.7.12, 4.3.1.1, and B 3.7.12	Section 4	O BORON CONCENTRATION O MODE OF APPLICIABILITY O SR 3.7.12.1 FREQUENCY	300 PPM BETWEEN SFP VERIFICATIONS 31 DAYS	2300 PPM WHENEVER FUEL IN SPENT FUEL POOL 7 DAYS