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August 10, 1984

Director of Nuclear Reactor Regulation
Attention: Mr. Walter A. Paulson, Acting Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Responses to NRC Staff Questions
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Paulson:

Attached are responses to questions from the NRC staff concerning our Application for Amendment to Operating License dated April 2, 1984.

Very truly yours,

Roger W. Kober

Roger W. Kober

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Question 1. For each of the following operations - fuel shuffle, spent fuel storage rack removal, modification of fuel rack support base I beams in the fuel pool, decontamination and modification of fuel rack modules, and reinstallaton of modified fuel rack modules - provide the following information:

a. the number of workers, including divers, required for each phase of the operation;

b. the working area dose rates, including dose rates in the fuel pool;

c. the worker occupancy times for each dose rate;

d. the total person-rems to complete the operation.

Response: For each activity, the projected work force and man hours are described below.*

	Divers	Craft Labor	Supervision	HP	Riggers Gen Maint	Decon
Fuel Shuffle	0	0	0	0	2/160	0
Removal of Holddown Bolts	1/24 1/24	0	4/216	2/108	0	0
Decon & Mod of Racks	1/6 1/6	4/3000	4/3240	2/1720	3/180	2/60
Removal of Supports/ Install Shims	1 Diver/60 1 Tender/60	0	4/240	2/120	2/120	0
Reinstallation of Racks	1/6 1/6	0	4/240	2/120	3/180	0
Total Man Hours	96 Diver hrs 96 Tender hrs	3,000	3,240	2,068	640	120

*Work Force/total man hours for that work force and activity.

The following worker area dose rates are assumed.

Divers - in pool work - 50 mrem/hr
Diver Tender - 2 mrem/hr
Craft Labor - 20 mrem/hr
Supervision - 2 mrem/hr
HP - 2 mrem/hr
Riggers/Gen Maint - 2 mrem/hr
Decon - 5 mrem/hr

Therefore, projected total person rem = 77.5. This estimate may change as a result of dose rates measured during modification of the first rack.

Question 2. Regulatory Guide 8.8 states that "station personnel should have the benefit of preparations and plans that can ensure the exposures are ALARA while the personnel are performing the services." For each of the operations mentioned in 1. above, describe what ALARA measures (e.g., health physics surveillance) will be taken to ensure that personnel exposure will be kept as low as is reasonably achievable.

Response: All work conducted at the plant site during this project will be inside of a controlled access area where all normal plant health physics procedures will be followed. In addition the following special precautions will be taken to minimize exposures and the spread of a contamination.

a) The racks will be extensively decontaminated using high pressure water (~10,000 psi) to minimize radiation exposure to workers. The decontaminated racks will be surveyed to identify localized areas of high radiation and additional decontamination will focus on those areas.

b) Tents with air mover and HEPA filter system will be used over those work areas where the potential for generation of airborne activity exists to prevent the spread of contamination.

c) For the modification of the first rack, respirator equipment will be available along with air mover and HEPA filter system for tented areas to protect workers. Health physics personnel will evaluate the necessity of the use of respirator equipment for subsequent racks.

d) Special procedures for divers are outlined in question 3 below. Divers exiting the pool water will be rinsed off to prevent the spread of contamination. Prior to

diver entry into the pool, they will be briefed as to the work procedure and work area to include the location of stored spent fuel.

In general, the health physics staff will monitor all aspects of the work to insure that personnel exposures are maintained ALARA.

Question 3. In addition to your response to question 2, above, describe the ALARA measures which you will take to minimize doses to the divers during the spent fuel pool (SFP) modifications. Address the following topics in your response:

(a) Clean-up of SFP water prior to and during diver entry;

(b) Vacuuming of SFP floor prior to diver entry;

(c) Distribution of existing spent fuel in the SFP to minimize diver doses by providing for maximum water shielding;

(d) Preplanning of other work.

In addition, the licensee shall conduct comprehensive radiation surveys of the SFP following each fuel reconfiguration and map the SFP radiation profiles to identify any radiation hot spots along walls and fuel racks. Describe your plans to perform such SFP radiation surveys.

Response: Prior to and in conjunction with diver entry into the pool, various measures will be used to minimize diver exposure during the modification.

a. Purification of the pool water is accomplished by diverting approximately 10 percent of the cooling system flow through a demineralizer and filter. A separate skimmer pump is used to maintain clarity of the water surface.

b. Stored fuel will be reshuffled to provide zones around the diver work areas where no fuel will be stored. The more recently discharged fuel will be removed to the east end of the pool in those racks which will not be modified. At least four empty rows of storage cells will be between a working diver and stored spent fuel.

c. After the stored fuel has been shuffled and prior to diver entry, a radiation survey will be conducted to

map radiation profiles and locate hot spots on pool walls and racks. Based on this survey, there will be additional decontamination, vacuuming of pool walls and reshuffling of fuel as required.

d. After removal of a rack from the pool, a survey will be taken of the pool floor. A vacuum system will be available, and if required, will be used to remove loosely deposited contaminants from the pool floor.

e. All diver work, as well as other work in the modification process, will be incorporated into work procedures. These procedures will incorporate measures to maintain worker exposures ALARA. In addition, the divers are experienced in this type of work and the required radiation protection procedures.

Also, see responses to question 5.

Question 4. Section 19.12 of 10 CFR part 19 requires that all personnel working in restricted areas receive instruction on radiation protection, as well as in procedures to minimize exposure. Describe your plans for providing a comprehensive job specific training program to workers, including divers, who will be engaged in work in the spent fuel pool (SFP) area during the SFP rack modification. The training should cover all aspects of the SFP modification and should include all ALARA measures to be taken to minimize worker dose.

Response: All workers involved in this modification will be required to complete the Ginna Station radiation protection training program. This program provides general information on personal radiation protection measures and procedures for working in controlled access areas. In addition, training will be received by non-diver labor on the use of respirators. Prior to the beginning of any work, personnel will be briefed on the specific radiation hazard and precautions that must be taken. Also, constant monitoring by health physics personnel will insure compliance with Ginna Station procedures to maintain doses ALARA.

Question 5. Section C.3.b of Regulatory Guide 8.8 states that the licensee should provide adequate supervision and radiation protection surveillance to ensure that the appropriate procedures are followed and that any potential radiation hazards are addressed in a timely and appropriate manner. In order to minimize diver dose and maintain continuous health physics coverage of the divers performing SFP work, the following conditions should be met:

(a) Maintenance of constant voice contact between the divers and the workers above the surface who are monitoring the divers' movements in the SFP;

(b) Divers shall wear TLDs while working in the SFP;

(c) Workers on the surface shall monitor the stay-time of submerged divers.

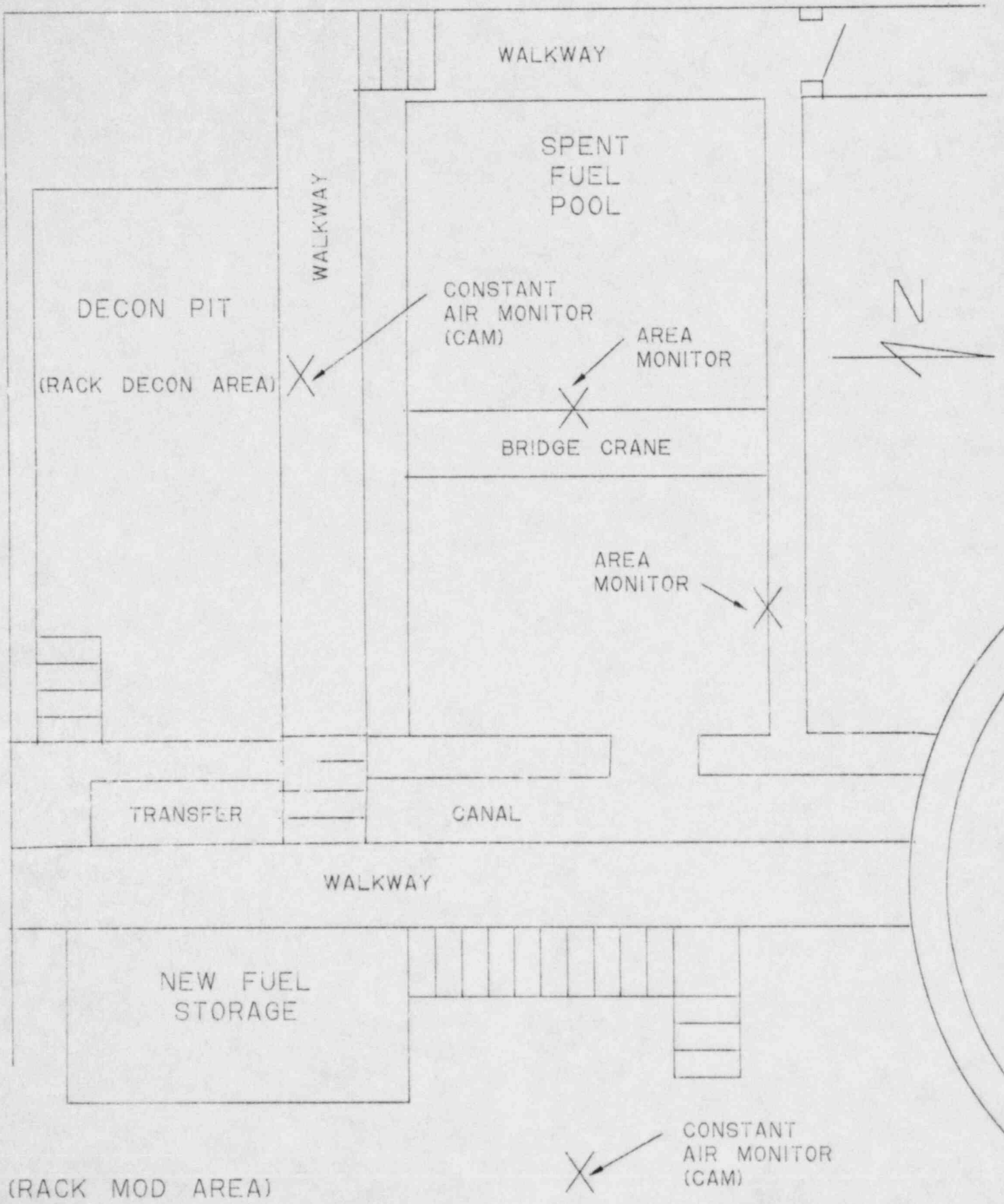
State how you plan to provide the health physics coverage described above.

Response: The modification work procedures for the divers will incorporate the provisions of a) through c) above. Prior to entry, divers will be briefed on their travel limits and, while in the pool, will be constantly monitored. Dose rates will also be monitored through the use of remote readout dosimetry. These provisions, along with those discussed in question 3 above, will insure diver exposures are maintained ALARA.

Question 6. Section C.2.9 of Regulatory Guide 8.8 states that the use of radiation monitoring systems to measure dose rate and airborne radioactivity levels in selected plant areas can reduce the exposure of station personnel in these areas. Describe your plans for providing area radiation and airborne radioactivity monitoring in the spent fuel pool area during the spent fuel pool storage rack modification. Provide a layout drawing of the spent fuel pool area showing the location of all area monitors and air samplers.

Response: Area radiation and airborne radioactivity monitoring will be performed in the spent fuel pool area during the rack modification. Radiation area monitors will be provided on the fuel handling crane bridge and on the north wall of the SFP area. In addition, items removed from the SFP will be surveyed by portable survey instruments. The racks will be removed from the pool and placed in the Decon Pit where they will be decontaminated in an enclosed area. The enclosure will be exhausted by an air mover with HEPA filters. A constant air monitor (CAM) will be used to monitor for airborne radioactivity outside the enclosure. Breathing zone samplers will be worn by personnel inside the enclosure. After decontamination, the rack will be moved to another enclosure on the auxiliary building operating floor. Air monitoring will be provided in a similar fashion as described for the decon pit area. Grab samples will be taken for airborne radioactivity as required by conditions or to provide additional information.

AUXILIARY BUILDING
SFP AREA



Question 7. On page 36 you list the major radionuclides measured in the SFP prior to the fuel rack modification. Describe what affect the increased storage of fuel after the SFP modification will have on the level of fission products in the SFP and how this will affect the dose rates at the fuel pool surface.

Response: Redesign of the SFP racks increases only the storage capacity of the pool and not the frequency or the amount of the core to be replaced each cycle. Thus, the amount of corrosion product activity released to the pool during any year will be about the same. Expansion of SFP capacity does increase the potential for increasing the release of fission products to the pool from fuel rod clad defects. Based on Ginna's fuel experience since the previous SFP expansion in 1976, the percentage of leaking fuel rods is very small, and only trace amounts of fission products have been detected in the pool. Dose rates at the surface of the pool have not increased since 1976, although 240 additional assemblies have been placed in storage. The purification system is capable of removing an increase in radioactivity so as to maintain acceptable radiation levels at the pool surface. The system consists of a demineralizer and filter for the pool water and a skimmer system to remove surface dust and debris.

Question 8. On page 38 of Appendix B to your spent fuel pool modification request, you provided a table listing the calculated principal airborne radionuclides in the spent fuel pool area. State whether these concentrations represent maximum or average expected airborne radioactivity concentrations in the SFP area following rack modification. Describe how these values compare with present measured airborne concentrations in the SFP area (prior to rack modification).

Response: The measured principal airborne radionuclides on page 36 of Appendix B represent average concentrations except for tritium which is close to a maximum value. Typically the isotopes, other than tritium, do not exceed 1/100 of their Maximum Permissible Concentrations. The tritium was measured in the pool ventilation exhaust stream close to the pool surface which gives a maximum value and is not representative of the average concentration in the SFP area. The airborne concentrations are not expected to change after rack modification and have not increased since 1976 although 240 assemblies have been added. The operation of the pool purification system and the building ventilation system will not change and the pool temperature limitations will still apply.

Question 9. On page 40 you state that the dose associated with changing the spent fuel pool filter cartridges and demineralizer resins (for the existing 302 stored fuel assemblies) represents less than 0.1 percent of Ginna's total annual person-rem burden. Provide the actual person-rem figures for these operations. Also provide the average annual person-rem for all SFP related operations at Ginna (described on page 41 to represent less than one percent of the total plant person-rem).

Response: The annual doses associated with changes of the spent fuel pool filters, resin and fuel handling operations are as follows:

Task	Man-Rem
SFP filter change	0.21
SFP resin change	0.03
Skimmer filter change	0.03
SFP Fuel Handling during Refueling	0.13
TOTALS	0.40

Question 10. Discuss how the increase in SFP storage capacity will affect the direct radiation doses to accessible areas adjacent to the SFP walls which are at the same elevation as the SFP racks.

Response: The increase in the SFP storage capacity will not affect the direct radiation doses in accessible areas adjacent to the SFP walls. Only the east and north walls are accessible. The three storage racks near the east end of the pool will not be modified so dose rates at the east wall will not change. The north wall is accessible in an area that has a very low occupancy factor. Only background radiation levels are observed on this wall at the same elevation as the SFP racks. Fuel assemblies are presently stored in every other slot in rack locations closest to the north wall. Storing fuel assemblies in every slot is not expected to change the dose rate from the present background level.

Question 11. Show that the method chosen for disposal of the waste material generated by the SFP modification will be cost effective with respect to ALARA exposure criteria and adequacy of burial space.

Response: The waste material generated will be primarily SS-304 components removed from the rack during the modification (approximately 10,000 lbs). We anticipated that this material will be able to be decontaminated using, for example, electro-polishing or liquid abrasive processes. This decontaminated material will then be disposed of as normal industrial waste. The remainder of the material that would not be able to be decontaminated in this manner would be compacted and disposed of as dry activitated waste.

Because the decontamination of the SS-304 waste will minimize the volume of low level waste, it is an efficient option in terms of ALARA concerns and the impact on burial space requirements.

Question 12. On page 28 of Appendix B to the letter of April 2, 1984 are listed 11 nuclear power units that use Boraflex in the spent fuel storage pools. Identify which of these units have instituted surveillance programs and indicate the method by which Rochester Gas and Electric Corporation will monitor the results of particular surveillance programs and make use of them to ensure the integrity of the materials in the Ginna spent fuel pool.

Response: Rochester Gas and Electric will cooperate with Wisconsin Electric to monitor their surveillance program for BORAFLEX neutron absorber material. Point Beach Units 1 and 2 use BORAFLEX in their spent fuel storage racks, and the next scheduled removal and examination of material is March 1985.

In addition, it should be noted that Brand Industrial Services, the manufacturer of BORAFLEX, has the requirement to notify all users of any defects under 10 CFR 21.

Should a defect become evident from the results of the various surveillance programs that is applicable to the material used at Ginna, an examination program will be undertaken to test the neutron attenuation capabilities using the currently available methods.