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Richard DeYoung, Assistant Director for Pressurized Water Reactors, L  
RAB INPUT FOR SECTIONS 2.1.3, 11.6, 12.1, 12.2, AND 12.3, VOGTLE SER

Plant name: Vogtle 1, 2, 3, and 4  
Licensing stage: CP  
Docket number: 50-424, 425, 426, and 427  
Responsible branch: PWR-1  
Project Manager: L. Crocker  
Date request received by RA-L: Per Blue Book  
Requested completion date: 12/7/73  
Description of response: SER Sections 2.1.3, 11.6, 12.1, 12.2, and 12.3  
Review status: Complete

RAB has reviewed the subject sections of the Vogtle Nuclear Plant PSAR, as well as related sections describing the inplant radiation sources and the radwaste system. As a result of this review, the attached proposed input to the Safety Evaluation Report has been generated. In summary, the Georgia Power Company has proposed a reasonably complete offsite radiological monitoring program and has developed a thorough and effective plan and design for inplant radiation protection.

This review and input was carried out by M. Milligan, RA-L.

Original signed by

H. R. Denton

Harold R. Denton, Assistant Director  
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Enclosure:  
As stated

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OFFICE	L:RA <i>subm</i>	L:RA <i>JK</i>	L:SS <i>HD</i>			<i>Meas</i>
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DATE	12/5/73	12/5/73	12/6/73			

## VOGTLE SER RAB

### 2.1.4 Uses of Adjacent Lands and Waters

Major land use around the Vogtle Nuclear Plant consists in agriculture; woodlands occupy 60% of the land, with crops such as soybeans, corn, cotton, and peanuts utilizing minor land areas. Most of the area on the South Carolina side of the Savannah River which lies within a ten-mile radius of the plant is included in the Savannah River Plant reservation.

The nearest location for dairying is 6.5 miles south-southwest of the plant; the nearest residence is about 2 miles west-northwest of the nearest containment structure.

There are no formal recreational facilities in the immediate site region, but the Savannah River is normally used for such recreational purposes as boating and fishing. Commercial river traffic on the Savannah River in the site region consists in tug-drawn barges working the river between Savannah and Augusta.

Based on the appraisal of land and water uses in the vicinity of the Vogtle Nuclear Plant, the staff concludes that land and water uses have been adequately considered and are not critical with respect to the normal operation of the plant.

### 11.6 Offsite Radiological Monitoring Program

The Georgia Power Company radiological monitoring program for the Vogtle Nuclear Plant offsite environs has been developed for the purpose of providing surveillance and backup support to detailed effluent monitoring. Both programs should permit evaluation of individual and population exposures resulting from controlled releases of low-level gaseous and liquid radioactive wastes. The offsite program also has the potential for detecting radioactivity that may escape from the plant without being detected by the effluent monitors, and it should cover each pathway by which man can receive measurable exposures to radiation.

The Vogtle program emphasizes air and water sampling. Water from wells and the Savannah River is sampled at ten separate locations either quarterly or monthly. Air particulate samplers are placed at fifteen locations; in addition, twenty five external radiation monitors (film badge or TLD) are located around the environs of the plant. Other specific sampling will be done for river bottom sediment, terrestrial and aquatic vegetation, aquatic organisms, and milk. Preoperational monitoring will begin two years prior to start-up for those samples for which seasonal variations should be established (aquatic and terrestrial vegetation and aquatic organisms) and one year prior to start-up for the remainder. We have examined the proposed program, including expected background, expected dose via the various pathways, sampling frequency and locations, and analytical sensitivity.

The details of the program will be finalized in the FSAR and will be incorporated in the technical specifications for plant operation. We conclude that the applicant's program will be adequate for monitoring the radiological impact of plant operation on the environs and for verifying the adequacy of in-plant monitoring and control of radioactivity with regard to the health and safety aspects of the release of radionuclides to the environment from the proposed operation of the plant.

## 12.0 Radiation Protection

### 12.1 Shielding

The staff has evaluated the proposed radiation protection program as presented in the PSAR, and as discussed with members of the applicant's staff. The shielding has been designed to achieve specific radiation levels in particular areas according to the need to occupy those areas and to keep exposures to personnel in both restricted and nonrestricted areas below the limits specified in 10 CFR 20. The applicant has carried out shielding analysis using accepted computer codes. Consideration has been given to location of components to minimize exposures from adjacent components. The use of remote valving, remote readout of instrumentation, and remote handling of radwaste drums has been planned. Traffic patterns need for access to particular areas, and the operations that have to be carried out in radiation areas have been considered and factored into the shielding design.

We conclude that adequate consideration has been given to shielding design to keep exposures within applicable limits and to reduce unnecessary exposures during normal operation of the plant. The effectiveness of the shielding provided will be evaluated by means of radiation surveys of the plant during initial low power reactor operation and during full power operation.

#### 12.1.4 Area Monitoring

The area radiation monitoring system is designed to indicate radiation levels that may exist at various locations throughout the plant where personnel are most likely to be exposed. Fifteen separate stations with gamma detectors are planned in the present system design. In addition, thirteen stations for airborne radioactivity monitoring have been included as part of the ventilating system described in section 12.2. The combination of these monitors is considered adequate.

### 12.2 Ventilation

The ventilation systems are designed to maintain a suitable environment for personnel and equipment. The containment structure ventilation systems are

designed to preclude an excessive buildup of airborne contaminants during normal operation and a purge system is provided to remove potentially contaminated air from the containment prior to personnel entry. The systems are designed to prevent the spread of airborne radioactive material. Air flow will be from uncontaminated areas to potentially contaminated areas.

The design criteria of the systems, the system descriptions and the planned operation of the systems provided in the PSAR give reasonable assurance that adequate consideration has been given to ventilation design for the protection of personnel from airborne radioactivity hazards.

### 12.3 Health Physics Program

Personnel protection will be accomplished through administrative controls and procedures, through the use of protective equipment and verified by personnel monitoring. The applicant has stated in the PSAR that it is his policy to keep radiation exposures as low as practicable and it will be the responsibility of each individual to observe established rules and keep his exposure as low as possible consistent with discharging his duties.

Areas of the plant which contain radioactive materials and where radiation is present will be designated as radiation control areas. Access to these areas will be limited to those persons authorized entry by plant supervisors and health physics and entry/exit will be through designated access control points only. Appropriate security measures will be employed to prevent unauthorized entry to high radiation areas and entrance will require issuance of radiation work permit. When appropriate, protective clothing will be required for entry to controlled areas. Health physics personnel will evaluate the radiological conditions and specify the required items of protective clothing to be worn.

Personnel monitoring will be accomplished by beta-gamma film badges. Neutron sensitive film packets will be issued whenever a significant neutron exposure is possible. Self-reading dosimeters will be issued to film badged individuals whose work conditions make a day-to-day indication of exposure desirable. Dosimeter records will furnish the exposure data for the administrative control of radiation exposure.

The applicant has described a health physics program of sufficient scope to enable his compliance with 10 CFR Part 20. Based on this program and the radiation protection criteria factored into the design of the plant, the staff concludes that the applicant will provide plant personnel with adequate protection against the radiation hazards associated with the normal operation of the plant. The health physics program and plant design provide reasonable assurance that in-plant exposures will be within applicable limits.

Bibliography  
RAB - Vogtle Units 1, 2, 3, and 4

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