UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOR OPERATION OF LOW-LEVEL RADIOACTIVE WASTE

VOLUME REDUCTION SUBSYSTEM

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS NOS. 1, 2 AND 3

DOCKETS NOS. 50-269, 50-270 AND 50-287

1.0 INTRODUCTION

In a letter dated June 10, 1985, Duke Power Company (the licensee) requested approval in accordance with 10 CFR Part 20, Section 20.305, and pursuant to 10 CFR Part 20, Section 20.302, to operate a low-level radioactive waste incinerator at their Oconee Nuclear Station. The submittal enclosed with the licensee's letter described the design and operation of the low-level radioactive waste Volume Reduction Subsystem (VRS) of which the incinerator is a major integral component. The submittal referenced the Oconee Final Safety Analysis Report and the VRS vendor, Aerojet Energy Conversion Company, Topical Report No. AECC-3-P(NP), for equipment details. The licensee's letter stated that the safety evaluation for the modifications of the design, construction and operation of other plant systems and components related to the use of the VRS were handled by the licensee pursuant to the requirements of 10 CFR Part 50, Section 50.59. Subsequently, the licensee sent additional information in their letters dated October 9 and December 13, 1985, and May 9, August 18 and September 11, 1986. In the letter dated December 13, 1985, the licensee revised the June 10, 1985 submittal.

The Nuclear Regulatory Commission's staff (the Commission or the staff) reviewed the Aerojet Energy Conversion Company Topical Report No. AECC-3-P(NP), "Radioactive Waste Volume Reduction System", referenced by the licensee to describe the Oconee Nuclear Station VRS, and prepared a Safety Evaluation (August 28, 1986) accepting it for referencing in license applications to the extent specified and under the limitations delineated in the report and the staff's Safety Evaluation.

2.0 EVALUATION

The Oconee Nuclear Station Radwaste Facility is designed to process liquid and solid radioactive waste. Liquid waste (radioactive equipment drains and floor drains, etc.) are processed by filters, demineralizers, and an evaporator in the Liquid Waste and Recycle System. The Radwaste Solidification System is composed of the Concentrated Waste Collection Subsystem, the VRS, and the Waste Packaging Subsystem. The VRS includes a fluid bed incinerator vessel to process combustible waste (low activity ion exchange resins, waste oil, and radioactive trash) and a fluid bed dryer vessel to process evaporator concentrates. The fluid bed incinerator shares a common off-gas cleanup system with the fluid bed dryer. Exhaust from each is directed to a gas/solids separator from which the removed larger particles are transferred to the solidification equipment in the Waste Packaging Subsystem. Finer particles

from both exhausts are removed from the gases in the wet scrubber/preconcentrator loop. This loop provides a steady feed to the fluid bed dryer, receives waste fed from the Concentrated Waste Collection Subsystem, and can return liquid to the Liquid Waste and Recycle System. Remaining gases and particles from the scrubber/preconcentrator are directed through a secondary scrubber, an off-gas condenser, and then discharged through the off-gas filters and the Radwaste Facility ventilation exhaust to the environment.

In its Safety Evaluation of Topical Report No. AECC-3-P(NP), the staff stated the following:

The report AECC-3-P(NP), its amendments and other supplemental information submitted by AECC, including AECC's response to NRC questions, give an acceptable basis for the following staff position:

1. The system evaluated by Topical Report No. AECC-3-P(NP) (the AECC-3-P(NP) system) can safely process evaporator bottoms, contaminated oil, dry active wastes and low-activity (less than about 1.8 microcurie per cubic centimeter) spent ion exchange resins and sludges generated at commercial boiling water reactors (BWR) and pressurized water reactors (PWR). The capability of the system is dependent on the design of the liquid radwaste system, the concentration and volumes of feed solutions to the system. These factors will be evaluated for individual license applications.

2. The design, construction, and quality group classification of the AECC-3-P(NP) system are acceptable in consideration of the guidance stated in Regulatory Guide 1.143 as noted in Section 2.2.1 of the Topical Report.

3. The design, construction, and testing of the offgas filter system are acceptable in consideration of the guidance stated in Regulatory Guide 1.140 as noted in Section 2.2.1.

4. The overall system decontamination factors (DFs) are 100 for radioiodine and 100 for radionuclides in particulate form.

5. The AECC-3-P(NP) system can operate but must meet the in-plant ALARA criteria of Regulatory Guide 8.8.

6. The AECC-3-P(NP) system can operate without jeopardizing the operation of the remainder of the plant or the safety of the general public.

7. Report AECC-3-P(NP) is an acceptable nonproprietary summary of proprietary report AECC-3-P.

8. The AECC-3-P(NP) system can operate within the fire protection criteria of Branch Technical Position CMEB 9.5.1. However, detailed compliance will be addressed on a plant-specific basis.

9. Plant-specific aspects of conformance with the following must be judged on an individual plant basis: 10 CFR 20.101; 10 CFR 20.103; 10 CFR 20.105; 10 CFR 20.106; 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 61 and 64; 10 CFR Part 50, Appendix I; 10 CFR Part 61; 10 CFR Part 71; 10 CFR

Part 100; and Regulatory Guides 1.140, 1.143 and 8.8.; and disposal site license conditions.

10. Halogenated plastics and chloride in the feed to the fluid bed incinerator should be limited to 1 percent by weight and 5,000 parts per million, respectively.

11. Additional factors that will be evaluated on a plant-specific basis are identified and discussed in Section 2.1.1.

The licensee has proposed certain station-specific exceptions to Topical Report No. AECC-3-P(NP), as follows:

1. The waste source term, decontamination factors, and expected effluent releases in the Topical Report do not apply at Oconee and are presented separately.

2. 575 VAC is used in place of 480 VAC.

3. The general arrangement of equipment in the Topical Report is not used at Oconee but there are recognizable similarities.

4. The components T1, P1, F3, and CP5 were not provided by AECC for Oconee, but similar equipment is used to fulfill these functions.

5. The interface of VRS product to the Solidification System is accomplished by the Dry Product Storage and Transfer System built by Stock Equipment Company. Therefore, Oconee has no H1 or R4.

6. Taps test each filter assembly in place but not each element individually.

7. The SS-1 skid was dismantled and rearranged to enhance ALARA considerations.

The acceptability of these exceptions is addressed in Section 2.12 of this Safety Evaluation.

2.1 ADEQUACY OF VRS CAPABILITY

Based on the processing rates and times in the staff Safety Evaluation of Topical Report No. AECC-3-P(NP) and the Oconee Nuclear Station waste generation data summary provided by the licensee, the VRS capability has been determined to be adequate for service at the Oconee Nuclear Station.

2.2 COMPLIANCE WITH 10 CFR PART 50, APPENDIX A, GDC 61 AND 64

GDC 61 requires that radioactive waste management systems and other systems which may contain radioactivity be designed to assure adequate safety under normal operating conditions and postulated accident conditions. The staff Safety Evaluation of Topical Report No. AECC-3-P(NP) stated that the isolation of mechanical devices such as pumps and blowers must be verified, on a plant specific basis, so periodic inspection and maintenance can be conducted with a minimum radiation exposure to operating personnel. The staff evaluation

of this aspect of the design and operation of the Oconee VRS is addressed in Section 2.5 of this Safety Evaluation.

GDC 64 requires that means be provided for monitoring effluent discharge paths for radioactivity releases from normal operations, including anticipated operational occurrences, and from postulated accidents. The licensee has stated in their submittal that the process exhaust from the VRS is mixed with radwaste facility heat, ventilation and air conditioning (HVAC) exhaust before release. An isokinetic sampling system would obtain representative exhaust duct air samples for radiological monitoring and analyses. A continuous noble gas activity monitor and sample cartridge for continuous collection of iodine and particulate samples are provided. These cartridges will be collected and analyzed weekly for principal gamma emitters, including radioiodines. The staff has reviewed the information submitted by the licensee regarding GDC 64 and concludes that the applicable requirements are satisfied. Technical Specification changes incorporating limiting conditions for operation and surveillance requirements for radiation monitors for the VRS release point will be required to ensure adequate control of releases from the system.

2.3 CONFORMANCE WITH REGULATORY GUIDE 1.140

Regulatory Guide (R.G.) 1.140 describes design, testing, and maintenance criteria for normal ventilation exhaust system air filtration and absorption units of nuclear power plants. Although R.G. 1.140 is not specifically applicable to the VRS off-gas filter system, it was used by AECC as guidance for the design of the off-gas filters. Likewise, the staff has used R.G. 1.140 as guidance in the evaluation of the off-gas filter system. It is the responsibility of the licensee to assure that the off-gas filter system will be operated, maintained and tested in accordance with the intent of R.G. 1.140. As stated in the staff Safety Evaluation of Topical Report No. AECC-3-P(NP), it is the responsibility of the licensee to 1) assure that the HEPA filters are procured and qualification tested in accordance with the provisions of MIL-F-51068 and MIL-STD-282; 2) assure that the charcoal adsorbent meets the results summarized in Table 1 of R.G. 1.140; 3) assure that visual inspection is conducted before installing any new or replacing cartridge assembly; and 4) accomplish periodic complete adsorbent and filter replacement in lieu of employing laboratory testing on the aged adsorbent at 18-month intervals. Our review of the licensee's submittal indicates that they will be in compliance with the intent of the R.G. 1.40 guidelines. R.G. 1.140 suggests in-place testing of the filters, but AECC stated in Topical Report AECC-3-P(NP) that this testing cannot be done because of the design of the off-gas filter system. The licensee has stated that off-gas filters will be operated and tested according to a plan which includes initial acceptance tests of the system involving in-place leak tests of the HEPA filters and carbon adsorber bed, periodic testing of samples of used carbon adsorber, daily monitoring of the pressure drop across the filter system, and a daily review of the release as indicated by the radwaste vent stack monitor to assure that the off-gas filter system removal of radioactive contaminants is acceptable and releases are being maintained below Technical Specification limits. The staff finds this deviation to be acceptable. The staff has reviewed the information submitted by the licensee regarding R.G. 1.140 and concludes that the applicable guidelines are satisfied.

2.4 CONFORMANCE WITH REGULATORY GUIDE 1.143

R.G. 1.143 gives design guidance for radioactive waste management systems, structures and components installed in nuclear power plants. The Commission's Safety Evaluation of Topical Report No. AECC-3-P(NP) states that regulatory positions 1.1.3, 1.1.1 through 1.2.4, 4.1, 5.2 and 6.2 of R.G. 1.143 should be evaluated on a plant-specific basis. These regulatory positions involve seismic design criteria for foundations and walls of structures that house the VRS tanks containing liquid radwaste; monitoring and alarming of liquid tank levels and curbing of indoor tanks; routing drains, overflows, and sample lines to the liquid radwaste system; provisions for prevention of contamination of unmonitored or non-radioactive systems or ductwork; seismic design criteria for the building housing the radwaste systems; and quality assurance requirements. The staff has reviewed the information submitted by the licensee regarding R.G. 1.143 and concludes that the applicable guidelines are satisfied.

2.5 CONFORMANCE WITH REGULATORY GUIDE 8.8

The Radiation Protection design for the VRS for Oconee Nuclear Station is intended to minimize radiation exposure to onsite personnel and is consistent with the guidelines of R.G. 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be as Low as is Reasonably Achievable". The design features of the incinerator at Oconee are intended to assure that occupational radiation exposures to personnel operating and maintaining the facility are kept as low as is reasonably achievable. The VRS components will be housed in separate shielded cubicles to reduce the dose rates during normal operation to acceptable levels and also reduce the radiation exposure received by workers during maintenance.

The VRS will be operated remotely from the radwaste control room which is located in a low-level radiation area. All local readouts for instrumentation will be located in similar areas. Pumps and blowers are located in areas separated from the VRS components which are likely to contain significant radioactivity during operation. This allows individual mechanical components to be decontaminated and maintained without the need to decontaminate the entire system. The Oconee radwaste area HVAC system is designed so that the air flow is from areas of lesser potential radioactive contamination to areas of greater potential contamination.

The areas around the incinerator and subsystem components are subdivided into radiation zones. The licensee defined maximum zone dose rates for each zone, depending on anticipated occupancy and access control. The licensee also presented a dose assessment showing the maximum expected dose rates and 30-year integrated doses for areas around the VRS. The licensee estimated the annual exposure (person-rem) associated with scheduled maintenance, inspection, and normal operations; and predicted the radiation fields associated with all cubicles of the VRS where personnel may require access during operations.

The shielding is designed to maintain radiation exposure to onsite employees within the limits of 10 CFR Part 20. The licensee presented tables showing shielded wall thickness, maximum dose rates and zone designations for the incinerator and subsystem components. The arrangement of components in

individually shielded cubicles reduces the need for entire system decontamination before performing maintenance on individual components. Shielded cubicle walls separate the fluid bed incinerator/scrubber/preconcentrator, exhaust gas condenser, gas solid separator, etc., from the fluid bed incinerator hopper. Dose rates from incinerator operation outside the shielding of these cubicles is less than 2.0 mr/hr. Access is restricted to all areas where dose rates exceed 100 mr/hr. Health Physicists will monitor any access to these areas. Area monitors are located in areas where normal radiation levels are low but may have high radiation levels during abnormal operation. Local alarms and radwaste facility control room alarms alert personnel to high dose rates in these areas. The staff has reviewed the information submitted by the licensee regarding R.G. 8.8 and concludes that the applicable guidelines are satisfied.

2.6 TRAINING OF OPERATING AND MAINTENANCE PERSONNEL

The staff Safety Evaluation of Topical Report No. AECC-3-P(NP) stated that the purchaser of the VRS should ensure that the operators of the VRS and the maintenance personnel are sufficiently trained. The licensee has stated that to incorporate the VRS, training has been expanded to include a five-week course on the facility. A start-up team was established to review the design of the facility, develop a training program, develop startup and operating procedures for the systems, and perform start-up testing. The start-up team includes technicians and supervisors who will test and operate the equipment. By the time the systems are all operational, the entire dedicated organization that will operate and maintain the new systems will have completed the training and will have obtained six months to one year of experience on the equipment. The staff has reviewed the information submitted by the licensee regarding training and finds it acceptable.

2.7 CALCULATION OF RADIOACTIVE MATERIALS IN LIQUID AND AIRBORNE EFFLUENTS

The staff's Safety Evaluation of Topical Report No. AECC-3-P(NP) stated that the calculation of radioactive materials in liquid and airborne effluents should be a part of the evaluation of each plant application since the results would depend on the highly plant-specific nature of the quantity of the radioactive materials that would normally be processed directly by the solid waste management system but which are instead fed to the VRS for processing. Other important plant-specific factors affecting the radioactive materials in effluents from the VRS operation are the filtration provided by the plant ventilation exhaust filter system, and type of treatment of VRS recycled condensate by the plant liquid radwaste treatment system.

The licensee submitted calculations of radioactive materials in liquid and airborne effluents for operation of the VRS of the Oconee Nuclear Station. In support of this calculation, the licensee submitted information on the expected annual station volumetric production and maximum expected activity feed rates of waste to be input to the VRS, and specific activities by radionuclide, for each of the input streams. This information is based on Oconee Nuclear Station

operating experience and on studies reported in the U.S. Department of Energy Report, "Waste Inventory Report for Reactor and Fuel-Fabrication Facility Wastes," ONWI-20-NUS-3314, March 1979, and the U.S. Nuclear Regulatory Commission Report, "Draft Environmental Impact Statement on 10 CFR Part 61," NUREG-0782, September 1981. To support the DFs used in the calculations which differ from those stated in the staff position of the Safety Evaluation on Topical Report No. AECC-3-P(NP), information was provided regarding tests conducted to determine DFs for particulates and iodine for the various modes of VRS operation. The licensee's calculated expected effluent releases were based on the waste source term and DFs supported by this information.

In the Safety Evaluation of Topical Report No. AECC-3-P(NP), the staff estimated that the contribution from the VRS to the radioactive materials discharge to the environment in liquid effluents at a PWR plant would be negligible. The staff performed an independent calculation of radioactive materials in airborne effluents from the Oconee Nuclear Station from VRS operation. The staff employed the parameters, models and bases given in U.S. Nuclear Regulatory Commission Report, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Pressurized Water Reactors," NUREG-0017, April 1976, the NRC staff-developed PWR-GALE code, and Oconee plant-specific characteristics to calculate the annual VRS input of radionuclides from evaporator concentrates. Calculational values for radioactivity levels from dry active waste and spent resins were based on data summarized in Topical Report AECC-3-P(NP), Amendment 1 based on the AECC Report "Ion Exchange Resin Disposal Evaluation," January 1980, ONWI-20-NUS-3314, NUREG-0782, and the U.S. Nuclear Regulatory Commission Working Paper "LWR Solid Waste Generation," Revision 2, June 1981. Calculational values for radioactivity levels in contaminated oil were based on the licensee submittal and were negligible. In its calculation of radioactive materials in effluents from the VRS, the staff used the conservative overall VRS DFs stated in the staff's Safety Evaluation of the Topical Report, i.e., 100 for radioiodine and 100 for radionuclides in particulate form. The results of these dose calculations are discussed in Section 2.9 of this Safety Evaluation.

2.8 CONSEQUENCES OF ACCIDENTS

The staff's Safety Evaluation of Topical Report No. AECC-3-P(NP) stated that the consequences of potential accidents related to the use of the VRS are a function of the activity of the feed stream to the VRS and, therefore, must be analyzed on a plant-specific basis. Plant layout and meteorological characteristics further affect the consequences of potential VRS accidents. The staff's evaluation of the consequences of potential accidents is addressed in Section 2.9.2.

2.9 COMPLIANCE WITH 10 CFR PART 20, SECTIONS 20.101, 20.103, 20.105 AND 20.106; 10 CFR PART 50, APPENDIX I; 10 CFR PART 100; AND 40 CFR PART 190

2.9.1 ROUTINE RELEASES

The use of the VRS will only be allowed under operating conditions which will limit releases of radioactivity to the environment. These releases will be controlled by Technical Specification limits on the release of radioactive material in gaseous and liquid effluents from the station. As stated in Section 2.7, there are estimated to be no significant increases in the releases of radioactive materials in liquid effluents from the operation of the VRS; therefore, there is expected to be no significant increase in offsite concentrations or doses from the releases in liquid effluents.

Based on the calculated airborne effluents discussed in Section 2.7, the staff utilized the methods of R.Gs. 1.109 and 1.111 to estimate the doses to the maximally exposed member of the public, as well as the population as a whole surrounding the Oconee site out to a distance of 50 miles. The annual external doses from gaseous effluents from VRS operation to any individual in unrestricted areas are expected to be negligible. The staff calculated doses to the total body and thyroid from exposure to airborne releases of radioactive iodine and radioactive material in particulate form from the VRS for the ground shine, inhalation, and food ingestion pathways. Doses to the maximally exposed individual were estimated for an individual at the site boundary, one mile south of the VRS release point. A ground level, continuous release was assumed. An average annual atmospheric dispersion factor of 9.2×10^{-6} sec/m^3 and average annual deposition factor of 2.1×10^{-8} per square meter were used to estimate doses at a distance of one mile south of the facility.

The staff estimates the highest annual dose to the total body (critical organ) and thyroid of the maximally exposed individual from radioactive iodine and radioactive material in particulate form to be approximately 12 and 8 mrem/yr, respectively, from exposure to the routine radioactive effluent releases from the Oconee VRS. The calculated annual doses from other effluents from the operation of the Oconee Nuclear Station were based on the doses given in the Final Environmental Statement, issued in March 1972, and on data obtained during operation of the Station. It is estimated that for all airborne releases from operation of the Oconee Nuclear Station, the annual dose from radioactive iodine and radioactive material in particulate form will be 12 mrem to the total body and 13 mrem to the thyroid (critical organ) of the maximally exposed individual in unrestricted areas. These annual dose estimates are less than the ALARA guides for design objectives set forth in Appendix I to 10 CFR Part 50 (45 mrem for the three reactor Oconee Nuclear Station). The calculated annual doses are also less than the standards of 40 CFR Part 190 (25 mrem to

the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ). The annual total body dose to the population within 50 miles of the Oconee Nuclear Station from exposure to radioactive material in effluents from the VRS is estimated by the Commission to be 18 person-rems. The population dose from all radioactive releases from the Oconee Nuclear Station is estimated to be 28 person-rems. It was determined by a cost-benefit analysis that additional radwaste systems and equipment would not, for a favorable cost-benefit ratio, reduce the calculated population doses from the operation of the VRS. The values of $1000 per total body person-rem and $1000 per person-thyroid-rem were used in the cost-benefit analysis. The estimated annual dose to the maximally exposed individual and the estimated annual population dose are small fractions of the doses from natural background radiation (144 mrems for the general areas of the site and 73,000 person-rems within 50 miles of the plant, respectively).

The licensee and the staff have also estimated the potential doses to reactor operational personnel in the Oconee control room from radioactive iodine and radioactive material in particulate form in normal gaseous effluent releases from the Oconee VRS. The staff estimates annual total body and thyroid doses in the control room of 5 and 56 mrem, respectively. These doses are well below the allowable occupational dose levels of 10 CFR Part 20.

Based on the above, we conclude that the routine releases from operation of the Station with the VRS meet the requirements of 10 CFR Part 20.101, 20.103, 20.105, 20.106 Part 50 Appendix I, and 40 CFR Part 190.

2.9.2 ACCIDENTAL RELEASES

The licensee has conservatively analyzed the radiological consequences of a variety of postulated VRS accidents. The licensee estimates that the peak off-site total body and critical organ (thyroid) doses that could result from any of the postulated accidents would be from radioactive iodine and radioactive material in particulate form and would be 104 and 1260 mrem, respectively. The staff has reviewed the licensee's analyses and agrees that the assumptions are adequately conservative and that the conservatively estimated doses are well below the guidelines of 10 CFR Part 100 and below the regulatory equivalency values used by the staff for the 10 CFR Part 20 normal operational annual limits and are, therefore, acceptable.

The licensee has conservatively estimated the potential dose consequences to reactor operational personnel that could result from the same potential VRS accidents discussed above. The resulting worst total body and thyroid doses from any of these accidents in the control room are 0.08 and 9.7 rem, respectively. These calculated control room accident dose levels are well below the allowable 5 and 30 rem whole body and thyroid doses respectively specified in the requirements of GDC 19, and are, therefore, acceptable.

2.10 COMPLIANCE WITH 10 CFR PARTS 61 AND 71

10 CFR Part 61 establishes performance objectives for land disposal of radioactive waste, technical requirements for the waste characteristics that waste generators must meet for the land disposal of waste, and for the classification of waste. The VRS will interface with a waste solidification system. In the

staff's Safety Evaluation of Topical Report No. AECC-3-P(NP), it was stated that conformance to 10 CFR Part 61 requirements must be addressed on a plant-specific basis.

The user utility is responsible for the plant-specific process control program to assure solidification, the waste classification program in accordance with Section 61.55 of 10 CFR Part 61, the waste product compliance program to meet the requirements set forth in Section 61.56 of 10 CFR Part 61, and meeting the licensed waste burial site requirements. 10 CFR Part 71 establishes requirements for packaging, preparation for shipment, and transportation of licensed material. The licensee has stated that solid wastes generated by operation of the VRS will be packaged to meet U.S. Department of Transportation, NRC, and burial site license requirements and shipped for disposal at a shallow land burial site. The staff finds this commitment acceptable.

The Oconee Nuclear Station Technical Specifications apply to the processing and packaging of radioactive solid waste before shipment from the site. The Technical Specifications require that the Solid Radwaste System shall be used in accordance with a Process Control Program (PCP) for the solidification of radioactive wastes; and that before shipment of containers of radioactive wastes from the site, radioactive wastes shall be processed and packaged to ensure meeting the requirements of 10 CFR Part 20, 10 CFR Part 71, and Federal and State regulations governing the disposal of radioactive wastes.

The PCP is defined in the Technical Specifications and is a procedure that contains the sampling, analysis, and formulation determination by which solidification of radioactive waste is assured. The licensee has stated that the changes to the NRC-approved Oconee PCP resulting from the design of the Radwaste Solidification System will be formally incorporated by the licensee into the PCP through the normal NRC-approved internal review process at Duke Power Company. The staff finds this commitment acceptable.

2.11 SAFE OPERATION OF THE STATION

The licensee has submitted information regarding their analysis of Oconee Control Room radiological exposure impacts resulting from postulated accidents and design basis routine operation of the VRS. This evaluation is one aspect of the evaluation of the acceptability of potential consequences of accidents and the evaluation of the acceptability of radiation doses (10 CFR Part 20, Section 20.101) and exposures of individuals to concentrations of radioactive materials in restricted areas (10 CFR Part 20, Section 20.103) as deemed required on a plant-specific basis by the staff Safety Evaluation of Topical Report No. AECC-3-P(NP). See Section 2.9. Calculated doses to Control Room personnel from normal and accidental releases were determined to be within acceptable limits. Calculated control room airborne radionuclide concentrations potentially resulting from VRS operation were also determined to be within acceptable limits.

The licensee's submittal also addressed limits to be maintained for controlling the quantities of feed materials that could potentially result in detrimental non-radiological impacts as well as VRS design features which inhibit toxic compound formation and release. The staff's Safety Evaluation of Topical Report No. AECC-3-P(NP) stated that halogenated plastics and chloride in the feed to the fluid bed incinerator should be limited to 1 percent by weight and 5,000 parts per million, respectively. The staff finds the limits of feed materials proposed by the licensee to be acceptable for controlling potentially detrimental non-radiological impacts of VRS operation. Additionally, there are no toxic or hazardous gas (e.g., chlorine and propane) storage or transport requirements resulting from VRS operation which could increase onsite gas accidental release hazards.

The staff Safety Evaluation of Topical Report AECC-3-P(NP) also stated that detailed compliance with the fire protection criteria of Branch Technical Position CMEB 9.5.1. should be addressed on a plant-specific basis. Fire protection programs ensure that the licensee can shut down the reactor, maintain it in a safe shutdown condition and minimize radioactive releases to the environment in the event of a fire. The staff has reviewed the information submitted by the licensee regarding fire protection and finds it acceptable.

2.12 EXCEPTIONS TO TOPICAL REPORT NO. AECC-3-P(NP)

As listed earlier, the licensee has proposed certain station-specific exceptions to Topical Report No. AECC-3-P(NP). The licensee stated that the waste source term, decontamination factors, and expected effluent releases in the Topical Report do not apply to Oconee and are presented separately. The licensee submitted information to support this exception to the Topical Report. The waste source term, decontamination factors, and expected effluent releases determined by the staff are discussed in Section 2.7. The other exceptions proposed by the licensee concern minor VRS design modifications and have been evaluated and determined by the staff to be acceptable.

3.0 CONCLUSION

On the basis of the foregoing evaluation, the staff concludes that the operation of the VRS will not present an undue hazard with respect to either safe operation of Oconee Nuclear Station, Units Nos. 1, 2 and 3, or the public health and safety. Therefore, the staff finds the licensee's request to operate the VRS at Oconee pursuant to 10 CFR Part 20, Section 20.305, to be acceptable. In addition, the staff concludes that the VRS meets the applicable requirements of GDC 64 and Appendix I to 10 CFR Part 50. Technical Specification changes incorporating limiting conditions for operation and surveillance requirements for radiation monitors for the VRS release points will be required to ensure adequate control of releases from the system.

Dated: October 30, 1986

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