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Docket File

Docket No. 50-286

Richard DeYoung, Assistant Director for Pressurized Water Reactors, L

REVISED SAFETY EVALUATION REPORT FOR INDIAN POINT, UNIT 3

Plant Name: Indian Point, Unit 3
Licensing Stage: OL
Docket Number: 50-286
Responsible Branch: PWR #1
Project Leader: H. Spector
Requested Completion Dated: Not applicable
Description of Response: Revised Safety Evaluation Report for Indian Point, Unit 3

Based on additional information from Consolidated Edison Company concerning the operation of the waste management and effluent monitoring systems we have revised the radioactive waste management, Processing monitoring and radiation protection sections of the Safety Evaluation Report for Indian Point, Unit 3. This additional information is contained in a letter to G. Knighton from W. Cahill dated August 21, 1973. The enclosed revision replaces our original writeup forwarded to you in my memorandum of May 21, 1973.

We conclude that the liquid, gaseous and solid radioactive waste treatment systems are acceptable. Our conclusion is based on the applicant's statement that the steam generator blowdown purification system installed in Unit 1 will be designed to treat blowdown simultaneously from Units 1, 2, and 3 and his commitment to divert blowdown from Unit 3 when the radioactivity exceeds a predetermined level regardless of the operability of Unit 1.

The effluent monitoring system does not meet the requirements of General Design Criterion 64 which requires that releases of radioactivity to the environs be monitored and therefore is not acceptable. Normally the blowdown flash tank will be vented to the Unit 1 turbine condenser which in turn will be vented to the atmosphere through the Unit 1 stack which is continuously monitored for gross radioactivity,

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particulates and radioiodine. However, when Unit 1 is shutdown, the blowdown flash tank will be vented to the atmosphere through an unmonitored system will be required to measure direct releases from the blowdown flash tank.

/s/

Robert Tedesco, Assistant Directora
for Containment Safety
Directorate of Licensing

~~XXX~~
Enclosure:
As stated

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SAFETY EVALUATION REPORT
INDIAN POINT, UNIT 3

11.0 RADIOACTIVE WASTE MANAGEMENT

11.1 Design Objective and Criteria

The radioactive waste management systems for Indian Point, Unit 3 are designed to provide for the controlled handling and treatment of radioactive liquid, gaseous and solid wastes. The applicant's design objective for these systems is to restrict the amount of radioactivity released from normal plant operation to unrestricted areas to within the limits set forth in 10 CFR Part 20.

The technical specifications issued as part of the operating license will require the applicant to maintain and use existing plant equipment to achieve the lowest practicable releases of radioactive materials to the environment in accordance with the requirements of 10 CFR Part 20 and 10 CFR Part 50. The applicant will also be required to maintain radiation exposures to inplant personnel and the general public "as low as practicable" in conformance with the requirements of 10 CFR Part 20.

Our evaluation of the design and expected performance of the waste management systems for Indian Point, Unit 3, is based on the following design objectives:

Liquids

(1) Provision to treat liquid radioactive waste to control the expected releases of radioactive materials in liquid effluents

to the environment to less than 5 Ci/yr/unit, excluding tritium and dissolved noble gases.

(2) The calculated annual average radiation exposure to the whole body or any organ of an individual at or beyond the site boundary not to exceed 5 mrem.

(3) Concentration of radioactive materials in liquid effluents prior to dilution in the environment not to exceed the limits in 10 CFR Part 20, Appendix B, Table II, Column 2.

Gaseous

(1) Provisions to treat gaseous radioactive waste to limit the expected release of radioactive material in gaseous effluent from principal release points so that the annual average radiation exposure to the whole body or any organ of an individual at or beyond the site boundary not to exceed 5 mrem.

(2) Provisions to treat radioiodine released in gaseous effluent from principal release points so that the annual average thyroid dose to a child through the pasture-cow-milk pathway be less than 15 mrem. For Indian Point, Unit 3, the estimated thyroid dose is evaluated at the location of the nearest actual cow, approximately seven miles south of the site.

Solid

(1) Provisions to solidify all liquid waste from normal operation including anticipated operational occurrences prior to shipment to a licensed burial ground.

(2) Containers and method of packaging to meet the requirements of 10 CFR Part 71 and applicable Department of Transportation regulations. The following sections present our evaluation of the liquid, gaseous and solid waste treatment systems; the design codes and quality assurance criteria; and the radiation monitoring of process effluents and of inplant areas. Our evaluation also considered radioactive effluent releases for combined operation of Indian Point, Units 1, 2, and 3. Each unit is provided with separate waste treatment systems except for the steam generator blowdown and laundry treatment systems located at Unit 1 and shared by Units 1, 2, and 3.

11.2 Liquid Waste

The liquid waste system is divided into three main subsystems: the reactor coolant treatment, which includes the chemical and volume control system (CVCS) and the boron recycle system, liquid waste disposal system and the steam generator blowdown treatment system. These systems serve only Unit 3. When the steam generator blowdown contains radioactivity above a predetermined value, it will be processed at Unit 1 along with the blowdown from Units 1 and 2. The laundry and hot shower wastes are also processed at Unit 1. The collection rates and system capacities are presented in Table 11-1. Prior to the release of any processed liquid wastes, samples will be analyzed to determine the type and amount of radioactivity in a batch. The liquid effluents will be continuously monitored before discharging through the circulating water duct to the Hudson River. If the radioactivity exceeds a predetermined value, the discharge will be automatically ~~stopped~~ terminated by a valve on the discharge line.

11.2.1 Reactor Coolant Treatment System

The reactor coolant treatment system (RCTS) will collect and process deaerated liquids from shim bleed, equipment leaks and excess letdown flows. During normal operation the reactor coolant will be let down continuously and processed at a nominal rate of 75 gpm in the chemical and volume control system (CVCS) to maintain coolant quality. Th~~is~~e letdown stream will be processed through redundant deep-mixed-bed demineralizers to remove corrosion and fission products and return to the reactor coolant system. Part of this stream, the shim bleed, will be processed through the boron recycle system. The excess letdown and the containment equipment leaks will also be processed through the boron recycle system. These streams will be collected in the reactor coolant drain tank and the CVCS holdup tank. They will be batch processed through redundant cation demineraliz~~ation~~ers, gas stripp~~ing~~er, and an evaporat~~ion~~ors ~~equipment~~. The evaporator condensate will be processed through an anion demineralizer to remove principally iodine and routed to one of two monitor tanks for sampling and analysis. Condensate will either be sent to the primary water tank for reuse in the reactor or released to the environment. The condensate can also be processed in the liquid waste disposal system. The boric acid concentrate from the evaporator will be filtered and ~~then~~ collected in the concentrate holding tank for sampling and analysis. The concentrate will either be sent to the boric acid tanks for reuse, or sent to the solid waste system for offsite disposal.

In our evaluation we estimated that approximately 15,000 gallons per day of shim bleed, excess letdown and equipment leaks will be ~~collected. These wastes will~~ be processed through the boric acid demineralizers and evaporators and result in an estimated release of 0.035 Ci/yr of radioactivity, excluding tritium and dissolved gases. The applicant did not estimate the radioactivity released from this source. The processing capacity will be 43,000 gallons per day when using both evaporators. Our estimate assumed one-day holdup for decay and 10% release of the processed effluent to the environment. The liquid effluent will be continuously monitored during its release to the environment. We conclude that the design of the RCTS is capable of providing effluents which can be considered as low as practicable in accordance with 10 CFR Part 50.

11.2.2 Liquid Waste Disposal System

The liquid radioactive waste disposal system will collect and batch process aerated wastes from equipment, floor and chemical drains. The system equipment includes collection and monitoring tanks, a filter, and a two-gpm evaporator. These wastes will be collected in the waste holdup and chemcal drain tanks, ~~then~~ filtered, and evaporated. The evaporator condensate will be collected in one of two monitor tanks, sampled and analyzed. The condensate ~~that meets specification~~ will be returned to the reactor water storage tank for reuse or discharged to the Hudson River. Condensate not meeting the required water quality will be recycled to the waste holdup tank for further treatment. The evaporator concentrate and spent filters will be sent to the solid waste system.

In our evaluation we estimated that approximately 140 gallons per day of equipment drain effluent and 330 gallons per day of floor and chemical drain effluents will be processed by the two-gpm waste evaporator. We assumed one-day holdup for decay, 10% release from equipment drain effluents, and 100% release of the condensate from the floor and chemical drain effluents. Our calculations ~~showed~~ indicate that approximately 2 Ci/yr of radioactivity, excluding tritium and dissolved gases, will be released. The applicant estimated that approximately 2 Ci/yr of radioactivity, excluding tritium, ~~would~~ will be released from this system.

11.2.3 Steam Generator Blowdown

The secondary coolant will be blown down from the steam generator at 10 gpm to maintain chemical purity. ~~As shown in Figure 11-1~~, The blowdown from the Unit 3 steam generators can be directed to the treatment system installed at Unit 1 or can be directed to the steam generator blowdown flash tank installed at Unit 3. The steam generator blowdown flash tank at Unit 3 is intended to process ~~only low-level activity~~ liquid wastes below a predetermined level. Wastes discharged from this tank ~~would enter~~ (will be released to) the environment without treatment. A continuous beta-gamma monitor will measure the radioactivity of the secondary coolant to the blowdown flash tank. When the radioactivity in the secondary coolant exceeds a predetermined value, the monitor will activate an alarm and automatically close isolation valves on the blowdown and sampling lines. The blowdown stream from Indian Point 3 will be routed manually to the Unit 1 blowdown treatment system.

~~A~~ Composite samples of the liquid releases from the blowdown flash tank will be ~~taken daily and~~ analyzed for isotopic composition.

The steam generator blowdown purification system will be designed to handle blowdown simultaneously from all three units. Blowdown from Unit 3 will be diverted to Unit 1 treatment system regardless of the operability of Unit 1. The blowdown treatment system at Unit 1 will consist of redundant filters and deep-mixed-bed demineralizers, with a total capacity of 132 gpm. The effluent from the demineralizer will be discharged to the Hudson River. If the radioactivity in the demineralizer effluent exceeds a predetermined ~~preset~~ value, it will activate an alarm requiring appropriate action. Composite samples of the demineralizer effluent will be ~~are taken daily and~~ analyzed for isotopic composition.

Based on our evaluation, approximately 10 gpm blowdown from Unit 3 will be processed in the Unit 1 treatment system, resulting in an estimated release of 1.7 Ci/yr of radioactive material, excluding tritium and dissolved gases. With a 50-gpm blowdown rate, the applicant estimated the release rate to be 7.5 Ci/yr. The 132 gpm capacity of the Unit 1 system will therefore be adequate to process 50 gpm blowdown rates from Units 1, 2, and 3. We conclude that this system has adequate capability and ~~is acceptable~~ will produce effluents which meet our as low as practicable guidelines and therefore is acceptable.

11.2.4 Liquid Waste Summary

The total radioactivity in the liquid effluent released from Unit 3 to the environment was estimated by the applicant to be 9.6 Ci/yr, excluding tritium, 610 Ci/yr of tritium. Based on our evaluation, we calculate an annual release of radioactive material in the liquid effluent will be approximately 3.8 Ci/yr excluding tritium and dissolved gases and 350 Ci/yr of tritium.

In our evaluation we calculate the radiation doses to an individual in unrestricted areas from the aquatic food chain and swimming ~~would~~ will be less than 5 mrem to the whole body and less than 5 mrem to the thyroid. Our radiation dose calculations considered the combined operations of Units 1, 2 and 3 at the Indian Point site. All ~~radioactive~~ liquid radioactive wastes will be continuously monitored before discharge. Assuming a circulating water flow rate at Unit 1 of 320,000 gpm and at Units 2 and 3 of 870,000 gpm the radioactivity concentration released to the Hudson River will be less than 1% of the limits specified in 10 CFR Part 20.

The liquid waste treatment system will be ~~has been~~ designed to collect, process, and store waste from operation with the equivalent of 1 percent fission product inventory releases from failed fuel rods to the primary coolant. We conclude that the liquid waste treatment systems will be capable of producing liquid effluents which we considered "as low as practicable" and therefore are acceptable.

11.3 Gaseous Wastes

The gaseous wastes treatment systems for Unit 3 include the waste gas processing, the condenser air ejector and the steam generator blowdown vent systems along with the containment purge, and the fuel storage, turbine and auxiliary building ventilation systems. These systems for Unit 3 are independent of Units 1 and 2, except for the steam generator blowdown system. Steam generator blowdown containing radioactivity above a predetermined level will be processed at Unit 1. The gaseous releases from all systems will be monitored except ventilation air released from the turbine building. The gases released from the waste gas processing system, the containment purge, the condenser air ejector and the auxiliary building ventilation will be discharged through the plant vent. Ventilation air from the turbine building will be discharged from the turbine building roof.

11.3.1 Waste Gas Processing

The waste gas processing system will collect and treat radioactive gases from the reactor coolant treatment system. These sources include the shim bleed gas stripper, holdup tank, cover gases, equipment vents, and gases generated from sampling. The primary source of radioactivity will be ~~is~~ from degassing the shim bleed in the boron recovery system.

The gas processing system includes redundant compressors and four 525 ft^3 and six 40 ft^3 storage tanks. The waste gases will be pumped to one of the four storage tanks and recycled to the CVCS holdup tanks to provide cover gas during emptying operations. A second tank will be available as backup. When 110 psig pressure is reached in the inservice tank, the feed will be automatically switched to the backup tank. Prior to cold shutdown of the reactor, the reactor coolant will be degassed and the gas will be distributed among the six 40 ft^3 storage tanks.

Some hydrogen will ~~is~~ also be present in the gas released from the CVCS system. To prevent hydrogen-oxygen explosions, the process equipment vent system will operate~~s~~ at positive pressure so as to minimize inleakage of air. In addition, no air or aerated liquids will be present in equipment that vents to this system. The storage tank gas will be automatically sampled and analyzed for hydrogen and oxygen. An alarm will alert the operator when the hydrogen concentration exceeds 2%.

The waste gas storage tanks have sufficient capacity to holdup gases for 45 days for radioactivity decay. Before releasing to the environment the gas will be sampled and analyzed. During discharge at a controlled rate through the plant vent, the gas will be continuously monitored. Radioactivity releases above a predetermined value will automatically close a valve on the discharge line. Based on a holdup time of 45 days, the applicant estimated releases of 2000 Ci/yr of noble gases. Based on our evaluation assuming 45 days holdup, we calculate an average annual release rate of 1500 Ci/yr of noble gases and negligible release of iodine-131.

11.3.2 Containment Purge

The containment purge system will process radioactive gases that build up in the containment atmosphere as a result of leaks from the primary system. In our evaluation we considered that the containment atmosphere will be purged four times per year. The equipment used for containment purging will include prefilters, HEPA filters and charcoal adsorbers. The filters and the exhaust fan will be shared with the primary auxiliary building ventilation system. Prior to ~~Before~~ purging, we assumed that the air in the containment will be recirculated for 16 hours through an internal cleanup system consisting of HEPA filters and charcoal adsorbers. The containment air will then be purged through the HEPA filters, charcoal adsorbers and released through the plant vent. The applicant has estimated the radioactivity released from four purges per year to be 88 Ci/yr of noble gases and 0.00014 Ci/yr of iodine-131.

Based on our evaluation, assuming four purges/yr and 16 hours internal recirculation before purging, we calculate a release of 88 Ci/yr of noble gases and 0.027 Ci/yr of iodine-131. This shared system is acceptable since, during normal operations the exhaust fans provide a negative pressure in the exhaust plenum. This will prevent the cross flow between the containment and the primary auxiliary building. If the exhaust fan fails, the associated supply fan will automatically be shut down to prevent cross ventilation flow between these buildings.

11.3.3 Condenser Air Ejector

Gaseous radioactivity, along with noncondensable gases in the secondary coolant, will be removed from the turbine condenser by the air ejectors. Leakage in the steam generator from the primary to the secondary system will result in some radioactivity in the secondary system coolant. The off gases from the condenser air ejectors ~~will pass through the steam jet ejectors,~~ will be monitored, and ~~then~~ released through the plant vent. The applicant has calculated ~~that~~ the activity released from the condenser air ejectors will be 1300 Ci/yr of noble gases and 0.065 Ci/yr of iodine-131.

Based on our evaluation we calculate the radioactivity released will be approximately 580 Ci/yr of noble gases and 0.13 Ci/yr of iodine-131 from this source.

11.3.4 Steam Generator Blowdown

The secondary coolant will be blown down from the steam generators flash tank at a rate of 10 gpm. The steam vapor From the flash tank ~~the steam vapor~~ will be released without monitoring from a rooftop vent. When the radioactivity in the secondary coolant is above a predetermined value the blowdown will be automatically stopped and manually diverted to the steam generator blowdown purification system ~~flash tank~~ at Unit 1. The blowdown system ~~at Unit 1~~ will also receive the blowdowns from Units 1 and 2. The vent from Unit 1 flash tank will be vented to the Unit 1 turbine condenser. The radioactivity released from Unit 1 condenser will be monitored and discharged through the Unit 1 stack. When the Unit 1 condenser is shut down the vapor will be released from the Unit 1 flash tank through an unmonitored rooftop vent. The applicant considered 6 weeks/year for this direct release and estimated a release of 0.13 Ci/yr of iodine-131 from this source.

Based on the past operating experience of Unit 1, we estimated that the blowdown vapor from Unit 3 would be directly released to the atmosphere for approximately 17 weeks per year. We calculated that this would release 0.16 Ci/yr of iodine-131. The applicant has been advised that capability for continuous monitoring of the blowdown effluent is required.

11.3.5 <u>Primary Auxiliary Building Ventilation</u>

The atmopshere in the primary auxiliary building will contain radioactivity from equipment leaks. The ventilation exhaust system for this building will include pre-filters, HEPA filters and charcoal adsorbers. The filters and exhaust systems will be shared with the containment purge system. The building ventilation system ~~is~~ will be designed to flow from clean to potentially more contaminated areas. The applicant estimated that the radioactivity released will be approximately 1300 Ci/yr of noble gases and less than 0.001 Ci/yr of iodine-131. Based on our evaluation we estimate 580 Ci/yr of noble gases and 0.05 Ci/yr of iodine-131 will be released from this source.

11.3.6 Turbine Building Ventilation

Steam leaks from the secondary coolant system will release some radioactivity into the turbine building atmosphere. This will be discharged without monitoring to the environment through 11 roof-mounted exhaust fans. The applicant has estimated that the radioactivity released from this source will be 0.01 Ci/yr of iodine-131. Based on our evaluation, we estimate a release of approximately 0.04 Ci/yr of iodine-131.

11.3.7 Fuel Storage Building Ventilation

The Fuel Storage Building Ventilation System will include HEPA filters and charcoal adsorbers. Normally exhaust air will be processed through HEPA filters and discharged through the monitored plant vent. However, when the radioactivity is above a predetermined value, the ventilation exhaust air will be automatically diverted through the charcoal adsorbers prior to being released.

The applicant did not estimate the radioactivity release through the ventilation system under normal conditions. In our evaluation we determined that the radioactivity released from this building under normal conditions will be negligible. An analysis of radioactivity releases due to a fuel handling accident is given in Section 15 of this report.

11.3.8 Gaseous Waste Summary

The applicant has estimated the radioactivity in the gaseous effluents released from Unit 3 will be 5500 Ci/yr of noble gases and 0.16 Ci/yr of iodine-131. For the combined operation of Units 1, 2 and 3, the applicant's estimated releases are 11,000 Ci/yr of noble gases and 0.32 Ci/yr of iodine-131. The applicant also estimated that radiation doses to an individual at or beyond the site boundary from the combined operation will be 2.4 mrem/yr to the whole body and 1.4 mrem/yr to the thyroid from inhalation.

Based on our evaluation of the gaseous waste systems, we calculated that the radioactivity released from Unit 3 during normal operation will be 2700 Ci/yr of noble gases and 0.41 Ci/yr of iodine-131. For the combined operation of Units 1, 2, and 3 we calculated the radioactivity release will be 6600 Ci/yr of noble gases and 0.88 Ci/yr of iodine-131. Based on the combined operation of Units 1, 2 and 3 we calculated the annual average radiation doses at the site boundary will be less than 5 mrem to the whole body and less then 5 mrem to the thyroid from inhalation. We calculated the radiation dose to a child's thyroid will be less than 15 mrem based on the grass-cow-milk pathway for radioiodine at the nearest actual cow, seven miles south of the site. The dose calculations were based on a maximum annual average relative concentration of 2.4×10^{-7} sec/m^3 for Unit 2 and 3.

11.4 Solid Wastes

The sources of solid radioactive wastes will include spent demineralizer resins, evaporator concentrates, filters, and miscellaneous items such as contaminated clothing, gloves, shoe covers, glassware and paper. The solid waste disposal system ~~is~~ will be design to package all solid wastes in 55-gallon drums. A facility will be provided for loading spent resin and evaporator concentrates. A hydraulic baler will be used for the miscellaneous wastes. The filled drums will be stored in a shielded area of the drumming room. The spent demineralizer resins ~~after approximately six months storage~~ will be slurried into shielded filter units within 55-gallon drums. The filtrate will be returned to the waste holdup tank. The evaporator concentrates will be pumped into 55-gallon drums containing vermiculite and cement for solidification. The miscellaneous solid waste, clothing, paper and glassware will be compressed in 55-gallon drums. The applicant has estimated that approximately 150 drums of spent resins and evaporator concentrate waste will be packaged and shipped each year. Based on the experience of operating reactors, we estimate that approximately 1000 drums containing 4900 Ci of radioactivity will be shipped from Unit 3. All solid wastes will be packaged and shipped to a licensed burial ground in accordance with AEC and Department of Transportation regulations. We conclude that the solid waste system will be similar to those previously reviewed and found to meet our criteria ~~have adequate capacity~~ and is acceptable.

11.5 Design

The radioactive waste treatment systems will be designed and constructed ~~fabricated~~ in accordance with acceptable codes and standards. The reactor coolant drain tank, waste filter, the spent resin storage tank and the gas decay tanks will be designed to ASME III, Class C. The piping code will be USAS-B31.1. The equipment will be located in a Category I (seismic) structure. We ~~have~~ concluded that the equipment and piping designs of the radwaste systems are acceptable.

11.6 Process and Area Radiation Monitoring Systems

The process radiation monitoring systems will be designed to provide information regarding radioactivity levels in effluents released to the environment. In addition, these systems will automatically terminate releases to unrestricted areas when the radioactivity in the effluents exceeds predetermined values.

The liquid effluents in the discharge line from the waste condensate tanks will be monitored continuously. The monitor will automatically terminate the discharge if the radioactivity concentration exceeds predetermined values. A similar system will monitor the secondary coolant activity in the steam generators that will automatically stop the blowdown when the activity exceeds a predetermined value. The component coolant loop of the auxiliary coolant system, the essential service water system, will be monitored for any primary coolant leakage into these systems. The circulating water discharge will be continuously sampled and analyzed.

The gaseous effluent in the plant vent will be continuously monitored for gross radioactivity, particulates, and radioiodine. The plant vent provides the discharge path for the gas decay tanks, the containment purge, the condenser air ejector and the ventilation systems for the primary auxiliary building and the fuel storage building. Radiation levels above a predetermined value will automatically stop the discharge from the gas decay tanks and activate the auxiliary dilution air supply to the plant vent. A similar monitoring system will serve the containment to control the purge and entry operations. Radiation levels in the containment above a predetermined value will automatically stop the purge.

A continuous monitor will measure the gross radioactivity in the effluent from the turbine condenser air ejector. Radioactivity in the gas decay tanks will be measured during the filling operation, and will alarm when the inventory limit is reached.

The air exhausted from the 11 roof-mounted exhaust fans on the turbine building will not be monitored for radioactivity since the building is not tight and therefore gases are exhausted from many places.

The area radiation monitoring system will be designed to provide information on radiation fields in the various areas of the plant for personnel protection. Monitor locations will include the control room, containment, in-core instrumentation area, spent fuel building, sampling room, changing pump room, and drumming station. If a radiation level rises above a predetermined value, an alarm will be sounded locally and in the control room.

Monitoring systems will detect, indicate, annunciate and/or record the levels of radioactivity to verify compliance with existing regulations to keep radiation levels within the plant and in unrestricted areas "as low as practicable."

11.7 Personnel Protection

The personnel protection programs will be established to maintain exposure to plant personnel to levels as low as practicable. These programs include radiation shielding, area access control, area and personnel monitoring and protective clothing. The applicant's design objective for radiation shielding for normal operation is to maintain whole body dose rates for all controlled access areas of the plant to less than 1.25 rem per calendar year, assuming continuous occupancy and the equivalent of 1 percent fission product inventory releases from failed fuel rods into the primary coolant. The plant will be zoned into six radiation areas for personnel occupancy control. These range from continuous access at less than 0.1 mrem/hr maximum radiation to controlled access at greater than 15 mrem/hr.

Personnel monitoring equipment will be provided for all personnel at the plant. Records showing radiation exposures of all personnel at the plant will be maintained by the applicant. The records will contain at least a monthly tabulation of readings from beta-gamma-neutron film badges or their equivalent. Protective clothing and respiratory protective equipment will be available for the protection of personnel, when required.

We conclude that the personnel protection systems satisfy the requirements of existing regulations as pertains to exposure of individuals to radiation, and are acceptable.

11.8 Conclusions

Based on our evaluation, we concluded that the radioactive waste management systems will satisfy the "as low as practicable" guidelines of 10 CFR Part 20; that the system will be designed in accordance with acceptable codes and standards and that the area monitoring will be similar to other systems previously accepted.

We conclude that the steam generator flash tank vent monitoring equipment will not satisfy the guidelines of Regulatory Guide 1.21 and the General Design Criterion 64 and is not acceptable. The applicant has been informed that a monitoring system will be required to measure direct releases from the blowdown flash tank.