11.2 RADIATION PROTECTION AND MONITORING

11.2.1 DESIGN BASIS

Radiation protection design features, including radiation shielding, are provided to facilitate compliance with the personnel dose limits specified in 10 CFR Part 20 for normal operation. Additional shielding and other design features are provided to facilitate compliance with General Design Criterion 19, 10 CFR Part 50, Appendix A, as amplified in NUREG-0737, Item II.B.2. Specifically, the design dose for personnel in a vital area should not exceed 5 rem whole body, or its equivalent to any part of the body, for the duration of design basis accidents. In this case, vital areas are those areas of the plant requiring access or occupancy by an operator to aid in the mitigation or the recovery from an accident. These areas are not necessarily the same as the vital areas defined in 10 CFR 73.2 for security purposes, and would normally include the Control Room, the Technical Support Center, the post-accident sampling system, the sample analysis room, etc.

11.2.2 SHIELDING DESIGN AND EVALUATION

11.2.2.1 Primary Shielding

Primary shielding is provided to limit radiation emanating from the reactor vessel; the radiation consists of neutrons diffusing from the core, prompt fission gammas, fission product gammas, and gammas resulting from the slowing down and capture of neutrons.

The primary shielding is designed to:

a. Attenuate the neutron flux to prevent excessive activation of unit components and structures.

b. Reduce the contribution of radiation from the reactor to obtain a reasonable division of the shielding function between the primary and secondary shields.

c. Reduce residual radiation from the core to a level which does not limit access to the region between the primary and secondary shields at a reasonable time after shutdown.

The primary shield consists of 7'0" of reinforced concrete that surrounds the reactor vessel. The cavity between the primary shield and the reactor vessel is air cooled to prevent overheating and dehydration of the concrete primary shield wall. The primary shield arrangement and shield thickness are shown on Figures 11-3A through C.

In addition to the above concrete shield, an additional permanent neutron shield has been designed and installed over the Reactor Vessel cavity annulus to attenuate neutrons. The neutron shield consists of a 13-1/2"-thick ring of borated concrete poured into a carbon steel support assembly. The reactor vessel cavity neutron shield and the permanent cavity seal ring are shown in Figures 11-5 and 11-6.

The neutron shield is mounted on existing support beams and has been analyzed to meet Seismic Class II/I Category, although the neutron shield, itself, is classified as non-safety-related. The neutron shield is underneath the permanent cavity seal ring which forms a water-tight barrier to retain refueling water above the reactor vessel during refueling operations. Both the seal ring and the neutron shield have removable hatches located at various points that allow access to the annulus area below the ring and shield. These hatches allow maintenance on the nuclear instrumentation detectors and inspection of the cavity, as needed.

11.2.2.2 Secondary Shielding

Secondary shielding is provided to reduce the radiation from the RCS to levels which allow limited access to the containment during operation and to supplement primary shielding. Nitrogen-16 is the major source of radioactivity in the reactor coolant during operation, and establishes the thickness of the secondary shield. The secondary shielding consists of a minimum of 2'6" of reinforced concrete surrounding the reactor coolant piping, pumps, steam generators, and pressurizer. Secondary shielding is shown on Figures 11-3A through C. The original design basis N-16 activity concentration at the reactor vessel outlet nozzle was 3.63×10^6 dis/sec-cc.

11.2.2.3 Containment Shielding

The containment provides the shielding necessary to minimize the radiation level at the outside surface during full power operation (2737 MWt), and to ensure that radiation levels at the site boundary are below the recommended guideline values of 10 CFR 50.67 in the event of a maximum hypothetical accident (MHA). It consists of a reinforced, prestressed concrete and steel structure with 3'9"-thick cylindrical walls and a 3'3"-thick dome (Figure 5-1).

11.2.2.4 Fuel Handling Shielding

Fuel handling shielding is designed to facilitate the removal and transfer of spent fuel assemblies from the reactor vessel to the SFP. It is designed to protect personnel against the radiation emitted from the spent fuel and control rod assemblies.

The refueling cavity above the reactor vessel is flooded to Elevation 67'0" to provide a temporary water shield above the components being withdrawn from the reactor vessel. The water height is thus approximately 23' above the reactor vessel flange. This height assures adequate water for shielding a withdrawn fuel assembly at its highest point of travel. Under these conditions, the dose rate from the spent fuel assembly is less than 7.0 mrem/hr at the water surface.

The permanent cavity seal ring installed around the reactor vessel cavity consists of a stainless steel ring that will hold refueling water above the reactor vessel. The seal ring has two L-shaped, stainless steel flexure seals that include an inner seal that absorbs radial expansion of the reactor vessel, and an outer seal that absorbs vertical movements of the vessel. Both seals, working together, accommodate the seismic lateral motions of the reactor vessel.

The seal ring is designed such that the flexible seal membranes which provide the sealing function are structurally supported by other components of the ring. That is, the top plate, the inner support ring, and the outer leveling screws of the seal ring provide the structural support for the weight and pressure loads.

The seal ring includes hatches with captured bolts; each hatch is fitted with a lifting ring. The hatches facilitate access to excore nuclear instrumentation, provide openings for air and steam flow during plant operation, and provide a path to the containment sump for containment spray. The small circular hatches which provide access to the neutron detector well latches are not required to be opened during plant operation. Prior to refueling, the hatches are closed to provide the sealing function of the refueling water. Each hatch incorporates two captured O-rings to provide seals for the refueling water. The inner O-ring provides a backup seal for each hatch and creates a sealed chamber to accommodate leak testing.

The seal ring provides a convenient working surface during refueling, allows visual inspection of all seal welds, and does not interfere with refueling operations.

All exposed metal parts of the seal ring are fabricated from Type 304 stainless steel. The hatch bolts are stainless steel. The O-ring seals used on the hatches are ethylene propylene elastomer.

Fuel is removed from the reactor vessel and moved to the SFP by the fuel transfer mechanism, via the fuel transfer tube. Concrete shielding is provided around the reactor internals storage pool and the steam generator for personnel protection during refueling. The SFP in the Auxiliary Building is permanently flooded to provide adequate water for shielding above a fuel assembly when being withdrawn from the fuel transfer tube and raised by the spent fuel handling machine prior to insertion in the spent fuel storage rack. The sides of the SFP are 6'0"-thick concrete to minimize the dose rate on the outer surface.

The areas adjacent to the SFP where personnel will be working are low radiation areas. In order to ensure that low dose rates are maintained, a filter and demineralizer processes part of the flow passing through the SFP cooling system to remove radioactive corrosion and fission products from the SFP water. The SFP filter and demineralizer are located within shielded rooms which protect operating personnel from excessive radiation.

11.2.2.5 Auxiliary Building Shielding

The function of the Auxiliary Building shielding is to protect personnel working near various system components, such as those in the CVCS, the Waste Processing Systems, and the Sampling System. Controlled access to the Auxiliary Building is allowed during reactor operation. Each equipment compartment is individually shielded so that compartments may be entered without having to shut down or decontaminate the entire system.

All ion exchangers and contaminated filters are located at the 27' level of the Auxiliary Building. Each ion exchanger or filter is enclosed in a separate, shielded compartment. The concrete thicknesses provided around the shielded compartments are sufficient to reduce the dose rate in normally accessible areas to less than 2.5 mrem/hr.

For the unlikely event of a massive fuel failure, additional concrete block and lead brick shield walls were constructed in the Auxiliary Building. These shield walls were installed in response to NUREG-0737, Item II.B.2 and are designed to allow for continuous occupancy of the Control Room during the entire course of a LOCA using Regulatory Guide 1.4 source term assumptions. This shielding also allows for access to the non-affected unit during a LOCA. Placement of these shield walls, as well as expected dose rates for this situation, are depicted in Figures 11-7 through 11-11.

11.2.3 RADIATION MONITORING

11.2.3.1 General

The radiation monitoring system shown on Figure 11-4 consists of monitors, instrumentation and alarms that serve to warn plant personnel of increasing radiation/ radioactivity levels in various plant areas and effluents and provide early warning of a plant malfunction which may result in a health hazard.

The electronic circuitry is solid state except for photomultiplier-tubes and GM tubes. Circuits and their components are designed to operate with 0 to 100% relative humidity, where required, or with a humidity range appropriate for the environment where they are installed and will withstand temperatures from -20°F to 120°F outside and 50°F to 104°F inside. In addition, those components required to operate in a LOCA environment are designed for 100% relative humidity at 276°F. These monitors have also been evaluated for operation at the revised maximum vapor temperature in Section 14.20.

Detector ranges and sensitivities are chosen to enable monitoring within the requirements of 10 CFR Part 20 and the access control zoning. The area radiation monitoring system instruments and detectors have been chosen based on their proven reliability in other plants, and spare items and portable units are provided to permit operation during periods of prolonged maintenance.

Process/effluent and area monitoring systems have remote visual and audible alarms and visual meter indication at the detector location, plus control room alarm and meter indication. All process/effluent monitoring systems display trend recordings, and several provide signals to the plant computers.

Most radiation monitors are provided with solenoid-operated check sources which, when actuated from the Control Room, will cause a response on each instrument channel. Instrument channels are also provided with electronic test features which, together with the solenoid-operated check sources, provide the operator with a convenient means to routinely check instrument function and response. For those channels not equipped with a check source mechanism, the detector's crystal is doped with an isotope to act as a "keep alive" source. If the indicated count rate decreases below a pre-determined value, the channel's operate alarm actuates.

Calibration of all area and process radiation monitors will be accomplished at least once each refueling cycle. The calibration procedure will entail exposing the detector of each monitoring system to a known quantity of radiation in a constant and reproducible geometry. By using portable calibration equipment, it will be possible to calibrate the entire instrument channel from the detector to the Control Room recorder. Radioactive sources used in the portable calibration equipment are selected so that calibration points will be determined for at least two decades of instrument response.

The laboratory instrumentation at Calvert Cliffs is capable of detecting radioactivity levels normally encountered in environmental sampling programs. The equipment is, therefore, readily capable of detecting and measuring in-plant levels of radioactivity prior to dilution in the environment. Equipment is capable of monitoring specific radionuclides within the concentration ranges of the design objectives and expected levels. The ODCM includes requirements for radioactive effluent sampling and analysis, including detection sensitivities.

The radioactive effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous and liquid effluents during actual or potential effluent releases. The alarm/trip setpoints for these instruments shall be calculated and adjusted in accordance with the methodology and parameters in the ODCM. The alarm/trip for radioactive gaseous effluent monitoring instrumentation will occur prior to exceeding the ODCM limits, based on average annual χ/Q, and the alarm/trip for radioactive liquid effluent monitoring instrumentation will occur prior to exceeding 10 CFR Part 20 limits. The functionality and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

11.2.3.2 Digital Processing Radiation Monitors

The Unit 1 and 2 main steam line radiation monitoring system consists of a Geiger-Mueller tube detector, a local digital microprocessor, and Control Room indicator/controller. The equipment is qualified for the normal environment of the equipment locations. The configuration of the equipment provides sensitivity improvements and is capable of monitoring 10^{-2} μCi/cc of activity in the main steam lines.

The local microprocessors have local alarm indication on their interfaces. Any alarm condition at the local microprocessor is communicated to the Control Room for appropriate operator notification. The Control Room Microprocessors have alarm indication on their interfaces and are connected to the Control Room annunciator windows to indicate alarm conditions. The setpoints have been established to comply with Technical Requirements Manual leakage limits. In the event of experiencing an alarm, the initiating equipment must be manually reset when alarm conditions are corrected.

The detectors are equipped with check sources, which when actuated, will cause activity indication at the local Microprocessor and Control Room indicator/controller. Additional electronic operation checks can be performed by implementing internal test programs. These capabilities provide the operator with a convenient means to verify equipment operation.

All equipment will be checked for calibration at least once each refueling cycle. The calibration procedure will entail exposing the detector of each monitoring system to known quantity of radiation and simulated reactor power level to assure correct and accurate operation is maintained.

11.2.3.3 Process and Effluent Radiation Monitoring

Process radiation monitors are provided in the following areas to monitor radioactivity in systems and to ensure that plant effluents are released in accordance with ODCM limitations. Table 11-10 lists the locations, calibration ranges, and minimum detectable concentration (MDC) of these monitors.

11.2.3.3.1 Plant Vent Monitors and Samplers

The plant vent effluent monitoring and sampling system consists of a gas monitor (1/2-RE-5415) and a pair of particulate, iodine, and tritium samplers on skids (1/2-RE-5320A, and 1/2-RE-5320B).

The plant vent effluent is continuously sampled through an isokinetic nozzle. The motive force for this sampling is the sample pump associated with the gas monitor and the sample pump for the fixed operating sampler skid. The sample flow is divided into two flow paths. A portion of the sample flows through the noble gas sample chamber, where its activity is monitored by a GM tube. The second sample flow path is the fixed particulate, iodine, and tritium filters located on the redundant sampler skids. This sample is pulled through the operating sampler skid by a sample pump with a flow rate of approximately

1 SCFM. Each of these samples is exhausted back to the main vent exhaust plenum.

The filters used for the iodine and particulate sampling are removable cartridges that are replaced weekly. Tritium samples are collected at least once per month. To collect the samples, it is necessary to have a person enter the Main Vent Exhaust Equipment Room and remove the cartridges for laboratory analysis. The noble gas monitor is audibly and visually alarmed in the Control Room.

11.2.3.3.2 Waste Gas Discharge Monitor

This detector monitors gases discharged from the waste gas decay tanks after they have passed through an absolute filter prior to their release from the plant vent. A high activity alarm on the monitor automatically shuts redundant isolation valves to prevent release of radioactive gas in excess of 10 CFR Part 20 concentration limits. Although the monitor has an automatic trip function, it consists of only a single detector. Requirements to ensure the functional capability of the waste gas discharge monitor are provided in the ODCM. The intermittent mode of waste release provides ample opportunity between waste releases for necessary maintenance and operational checks to assure proper operation of the monitor. In addition, grab samples are analyzed before each release to ensure that the monitor is functioning properly.

11.2.3.3.3 Liquid Waste Processing Discharge Monitor

A monitor is installed in the common discharge header from the RCWPS and MWPS. The monitor provides an alarm signal on high activity to shut redundant, downstream isolation valves. Closure of these isolation valves prevents release of radioactive effluents which exceed 10 CFR Part 20 concentration limits for unrestricted areas. The monitor utilizes only one detector as does the waste gas discharge monitor.

11.2.3.3.4 Condenser Air Removal Discharge Monitor

Noncondensable gases are continuously removed from the condensers by the Condenser Air Removal and Priming System. Vacuum pumps within this system take suction on the condenser and discharge to the plant vent. In the event of a reactor-coolant-to-secondary leak through the steam generator tubes, the gas removed from the condenser could be radioactive. Therefore, a monitor is installed in each vacuum pump suction line upstream of the plant vent, to warn plant operations personnel of such an occurrence.

11.2.3.3.5 Steam Generator Blowdown Tank Discharge Monitor

A single detector monitor is installed in the discharge from the blowdown tank to detect possible leakage of reactor coolant through steam generator tubes. A high activity alarm on this monitor automatically shuts the blowdown valves from the steam generator. In addition, depending on the valve line-up in the steam generator blowdown recovery system, either this monitor or the recovery system discharge radiation monitor will shut the recovery system discharge lines to the circulating water channel and the condenser, and open the valve to the MWPS.

11.2.3.3.6 Steam Generator Blowdown Recovery Monitor

This monitor measures radioactivity in the combined discharge from the steam generator blowdown and recovery system ion exchangers. The alarm sounds locally and in the Control Room to warn operators of high radioactivity levels in the discharge. At the same time, the trip signal closes discharge valves to the condenser and circulating water system and diverts the flow to the MWPS. This trip prevents the release of radioactivity to the plant secondary system and subsequently to the environment.

11.2.3.3.7 Containment Atmosphere Monitor

The containment atmosphere monitor and associated equipment are mounted on a common base and their function is to detect RCS leakage in the containment. The monitor consists of a moving filter particulate detector, a gaseous radioactivity detector, piping, valves, and pumping system. The pump draws a representative sample from the containment cooling fans exhaust plenums or the containment purge exhaust fan inlet header. The sample is tested and exhausted to the main vent.

11.2.3.3.8 Atmosphere Monitors

These monitors detect particulate and gaseous activity within the plant atmosphere and alarm individually in the Control Room upon high activity.

a. Control Room Ventilation Supply
b. Fuel Handling Area Ventilation Exhaust
c. Access Control Ventilation Exhaust
d. Waste Processing Ventilation Exhaust
e. Emergency Core Cooling System (ECCS) Pump Room Ventilation Exhaust

11.2.3.3.9 Component Cooling System Monitor

The Component Cooling System monitor is installed in piping which extends from the discharge side to the suction side of the component cooling pumps to detect possible in-leakage of radioactive liquid through tube leaks in certain heat exchangers. Normal flow through the monitor is produced by the differential pressure across the component cooling pumps. The alarm is annunciated locally and in the Control Room to alert operators to the presence of radioactivity.

11.2.3.3.10 Service Water System Monitor

The SRW system monitor is installed in the SRW return headers of the SFP coolers to detect possible tube leakage in the coolers. Flow through the monitor is produced by the SRW monitor pump which continuously draws a sample flow from the SRW return header and discharges back to the same header. The alarm is annunciated both locally and in the Control Room.

11.2.3.3.11 Main Steam Header Monitor

The Unit 1 and 2 monitors measure potential fission product releases to the environment in the event of a steam generator tube failure which would allow leakage of primary coolant to the secondary steam. The monitors have digital processing circuitry for self-checking and activity alarm communication. The detectors of the monitoring system are mounted adjacent to the main steam lines upstream of the isolation valves and safety relief valves. Setpoints are established in accordance with plant procedures.

11.2.3.3.12 Wide Range Effluent Monitor

These monitors are used to measure the release of radioactivity from the unit vents in the event of an accident. The ranges of these monitors are considerably greater than those of the original plant vent monitors. However, the original plant vent monitors are still maintained for normal operation and to provide redundant monitoring at the low end of the concentration range. The wide-range effluent monitors have three detectors with overlapping ranges for measuring noble gases. A high flow rate sample is measured by the low-range detector. A separate low flow rate sample is filtered for particulates and iodine and is then measured by the intermediate- and high-range noble gas radioactivity detectors. The filtration serves two purposes: to keep particulate and iodine plateout from contaminating the noble gas detection chamber and to collect grab samples for laboratory analyses, especially for I-131. Lead shielding is provided for the grab sample cartridges. Readouts and alarms are provided in the Control Room.

11.2.3.4 Area Radiation Monitoring

Monitoring Program

The area radiation monitoring system reads out and records gamma radiation levels in selected areas throughout the station and alarms (audibly and visually) if these levels exceed a preset value or if the detector malfunctions. Each detector reads out and alarms in the Control Room and at its station location. They can be checked with a test source to verify proper operation.

The alarm setpoint of each area monitor is variable, and is set at a level sufficiently above the normal background radiation level in the respective area to minimize the occurrence of spurious alarms.

Table 11-11 lists the locations of the installed in-plant area radiation monitors, including the range and sensitivities of these instruments.

The containment area monitors provide a signal for securing the containment purge system, should a fuel handling incident occur during refueling. The setpoints for these monitors are far below the dose rates resulting from a postulated fuel handling incident so these monitors can also fulfill the normal functions of area monitors. Four of the area monitors located in the Containment Structure provide control signals in addition to indication and alarms. Upon alarm on high activity, their output is used in a two-out-of-four logic matrix to stop the containment purge fans and close the containment isolation valves (Section 7.3.2.2).

11.2.3.5 Radiological Environmental Monitoring

The radiological environmental monitoring program required by the ODCM provides representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides resulting from the plant operation that lead to the highest potential radiation exposures to members of the public. This monitoring program implements 10 CFR Part 50, Appendix I, Section IV.B.2 and thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways. Guidance for this monitoring program is provided by the Radiological Assessment Branch Technical Position on Environmental Monitoring. Program changes may be initiated based on operational experience.

The required detection capabilities for environmental sample analyses are tabulated in terms of the lower limits of detection. The lower limits of detection required by the ODCM are considered optimum for routine environmental measurements in industrial laboratories. It should be recognized that the lower limits of detection is defined as a limit representing the capability of a measurement system (a priori, or before the fact) and not as a limit for a particular measurement (a posteriori, or after the fact).

Land Use Census

To satisfy the requirements of 10 CFR Part 50, Appendix I, Section IV.B.3, the ODCM requires an annual land use census to ensure that changes in the use of areas at and beyond the site boundary are identified and that modifications to the radiological environmental monitoring program are made if required. The best information from the door-to-door survey, aerial survey or consulting with local agricultural authorities shall be used. Restricting the census to gardens of greater than 50 m^2 provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26 kg/year) of leafy vegetables assumed in Regulatory Guide 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were made: 1) 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and 2) a vegetation yield of 2 kg/m^2.

Interlaboratory Comparison Program

The ODCM requirement for participation in an approved Interlaboratory Comparison Program is provided to ensure that independent checks on the precision and accuracy of the measurements of radioactive material in environmental sample matrices are performed as a part of the quality assurance program for environmental monitoring in order to demonstrate that the results are valid for the purposes of 10 CFR Part 50, Appendix I, Section IV.B.2.

TABLE 11-11

AREA RADIATION MONITORS

LOCATION	RANGE	SENSITIVITY
Containment – Area Monitors (RI-5316 A,B,C, & D)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Auxiliary Building – SFP Platform (RI-7025)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Sample Rooms 413, 424 (RI-7006)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Penetration Rooms 211, 221 (RI-7011)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
SFP Heat Exchanger Room 320 (RI-7020)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Drum Storage Area Room 418 (RI-7021)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Chemistry Lab 14 (RI-7023)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Liquid Waste Evaporator Room 420 (RI-7022)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
ECCS Pump Rooms (East, West) (RI-7004, RI-7005)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Miscellaneous Waste Pump Area Room 110 (RI-7017)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Miscellaneous Waste Rec. Tank Room 113 (RI-7016)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Conc. Boric Acid Storage Tank Rooms 215, 217 (RI-7010)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Waste Gas Equipment Room 208 (RI-7018)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Decontamination Room 210 (RI-7019)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
SFP Area Room 414 (RI-7024A)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV

TABLE 11-11

AREA RADIATION MONITORS

LOCATION	RANGE	SENSITIVITY
SFP Area Room 414 High Range (RI-7024B)	1 to 10^4 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Blowdown Tank Areas (RI-7012)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
New Fuel Storage Area (RI-7026)	.1 mr/hr to 10 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Containment High Range (RI-5317A, RI-5317B)	1 to 10^8 R/hr	Energy dependence of ± 20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV
Gas Analyzer Equipment Room (RI-7027)	.1 mr/hr to 10 R/hr	Energy dependence of ±20% of the actual radiation intensity over an energy response from 80 keV to 3 MeV