GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose, CA 95125

July 16, 1993

Docket No. STN 52-001

Chet Poslusny, Senior Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of the Nuclear Reactor Regulation

Subject: Submittal Supporting Accelerated ABWR Schedule - **Clarification of Subsections 9.3.3, 9.3.8 and 11.2**

Dear Chet:

Enclosed is a SSAR markup clarifying the boundaries of the Non-Radioactive Drain System (Subsection 9.3.3), Radioactive Drain Transfer System (Subsection 9.3.8), and the Liquid Radwaste System (Section 11.2). This submittal supplements the discussions during our July 14, 1993 conference call. These changes will be included in Amendment 32 scheduled to be transmitted on August 31, 1993.

Please provide a copy of this transmittal to Butch Burton.

Sincerely,

Jack Fox

Jack Fox
Advanced Reactor Programs

cc: Alan Beard (GE)
Norman Fletcher (DOE)
Gail Miller (GE)

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~~9.3.3 Equipment and Floor Drainage System~~

~~The system which collects and transfers all radioactive liquid wastes is discussed~~ in ~~Subsection 9.3.8. The non-radioactive drains are discussed in this subsection~~. The non-radioactive drains consist of equipment inside the standard plant buildings and COL interface requirements for that portion outside the buildings. The drains release effluent to the site specific discharge structure. The potable and sanitary water systems (Subsection 9.2.4) includes the non-radioactive drains.

9.3.3.1 Non-Radioactive Drains

9.3.3.1.1 Safety Design Bases

(1) There shall be no interconnection between any portion of the radioactive drain transfer system and any non-radioactive waste system.

(2) Effluent from non-radioactive systems shall be sampled prior to discharge to assure that there are no unacceptable discharges.

(3) Non-radioactive drains piping shall be non-nuclear safety class and quality group D and shall not have any effect on the operation of safety-related equipment.

(4) The floor drain piping system shall be arranged with a separate piping system for each quadrant. The piping shall be arranged so that flooding or backflow in one quadrant cannot adversely affect the other quadrants.

(5) Any valves that are relied upon to prevent backflow shall be inspectable and testable and withstand SSE.

9.3.3.1.2 Power Generation Design Bases

(1) The drains shall be designed to collect and remove effluent from their point of origin to the site discharge structure.

(2) The sump level switches shall serve as leakage monitors for equipment or systems served by each sump. Leakage detection is also discussed in Subsection 5.2.5.

(3) Open drainage lines from areas that are required to maintain an air pressure differential are provided with a water seal.

(4) All drainage lines into each sump shall be turned down and terminated below the lowest fluid level to which the sump pump can draw.

9.3.3.1.3 System Description

The non-radioactive drain system is designed to assure that waste liquids, valve and pump leakoffs and component drains and vents are directed to the proper area for processing. The process portion of the systems consists of sump pumps, valves and instrumentation. Sumps are provided as shown in the arrangement drawings in Section 1.2.

All drainage systems are essentially passive systems down to the sumps or yard pipe connections. This is, flow is by gravity with no valves, pumps, and the like in the lines such that failure could cause a system not to drain. All exposed drainage piping is seismically analyzed to remain intact following an SSE, and thus will drain the area as required. See Subsection 3.4.1 for further details.

Unacceptable flooding consequences are precluded by the capacity of the drain and the placement of safety-related equipment on raised pads or grating. Also, check valves in sump pump discharge lines prevent reverse flow from other sumps that have piping to common collection tanks.

The design of the drain system precludes release to the environs of radioactive liquid. As a backup, however, all non-radioactive drain systems are sampled for radiation prior to release to the environs.

9.3.3.1.4 System Operation and Component Description

The drain system in similar in operation and component descriptions as discussed in Subsections 9.3.8.2.2 and 9.3.8.2.3 excepting radiation effects and the interfacing discharge process in lieu of discharge to radwaste.

(A) 9.3.3 Non-Radioactive Drain System

9.3.8 Radioactive Drain Transfer System

9.3.8.1 Design Bases

(B) → ~~The radioactive drains are part of the radwaste system in Subsection 11.2.~~

9.3.8.1.1 Safety Design Bases

(1) The drain transfer system drains equipment and floor areas where required for structural loading reasons and to protect systems required for a safe shutdown.

(2) All potentially radioactive drains are pipe directly to the radwaste system and shall not affect safety-related equipment operation.

(3) Containment and drywell penetrations shall be designed and fabricated in accordance with the ASME Code, Section III, Class 2. Secondary Containment penetrations shall be in accordance with the ASME Code, Section III, Class 3.

(4) Effluent from the radioactive drains shall be monitored prior to discharge to assure that there are no unacceptable discharges.

(5) The radioactive drain transfer collection piping shall be provided with the following features:

(a) The COL applicant will provide equipment and floor drain piping P&IDs as a part of the radioactive drain transfer system. See Subsection 9.3.12.1 for COL license information requirements)

(b) These piping systems shall be non-nuclear safety class and quality group D with the exception of the containment penetrations and piping within the drywell which shall be seismic category I and quality group B. Additional exceptions are the back flow check valves in the ECCS equipment room sumps which shall be seismic category I and quality group C.

(c) The floor drain piping system shall be arranged with a separate piping system for each quadrant. The piping shall be arranged so that flooding or backflow in one quadrant cannot adversely affect the other quadrants.

(d) There shall be no interconnection between any portion of the radioactive drain transfer system and any non-radioactive waste system.

(e) Any valves that are relied upon to prevent backflow shall be inspectable and testable and withstand SSE.

9.3.8.1.2 Power Generation Design Bases

(1) The drain transfer system shall be designed to collect and remove waste liquids from their point of origin to the radwaste system for further processing.

(2) The sump level switches shall serve as leakage monitors for equipment or systems served by each sump. Leakage detection is also discussed in Subsection 5.2.5.

(3) Open drainage lines from areas that are required to maintain an air pressure differential, but drain to a radioactive sump, are provided with a water seal.

(4) All drainage lines into each sump shall be turned down and terminated below the lowest fluid level to which the sump pump can draw.

9.3.8.2 System Description

The system P&ID showing the sumps with their pumps, piping, instruments and controls are provided in Section 11.2.

9.3.8.2.1 General Description

The drain transfer system is designed to assure that waste liquids, valve and pump leakoffs and component drains and vents and system are directed to the proper area for processing. The process portion of the systems consists of sump pumps, sump coolers (if necessary) tanks, valves and instrumentation. Sumps are provided as shown in the arrangement drawings in Section 1.2.

The following ECCS loops are located in separate watertight areas:

(1) RHR A, RCIC

(2) RHR B and HPCF B

(3) RHR C and HPCF C

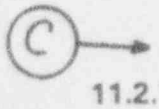
(B) This subsection describes the equipment and floor drain system which consists of collection fixtures and drainage piping from points of collection to sumps within the Reactor, Turbine and Radwaste buildings. This subsection also discusses the sumps, sump pumps, sump coolers, piping, valves, instruments and controls used to transfer liquid wastes to the radwaste building collection tanks. This equipment is a part of the liquid waste management system (see Subsection 11.2).

11.2 Liquid Waste Management

11.2.1 Design Basis

11.2.1.1 Design Objective

The Liquid Radwaste System is designed to segregate, collect, store, and process potentially radioactive liquids generated during various modes of typical plant operation: startup, normal operation, hot standby, shutdown, and refueling. The system is designed such that it may be operated to maximize the recycling of water within the plant, which would minimize the releases of liquid to the environment. Maximizing recycling serves to minimize the potential for exposure of persons in unrestricted areas from the liquid release pathway.



11.2.1.2 Design Criteria

The criteria considered in the design of this system include (1) minimization of solid waste shipped for burial, (2) reduction in personnel exposure, (3) minimization of offsite releases, and (4) maximizing the quality of water returned to the primary system.

Per General Design Criterion 60 of 10CFR50 Appendix A, the Radwaste System design includes means to suitably control the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences. These operational occurrences include condenser leakage, maintenance activities, and process equipment downtime. The Liquid Radwaste System provides one discharge line to the canal for the release of liquid waste, with the flow rate of this effluent stream controlled by a flow control valve together with the necessary flow instrumentation. Radiation monitoring equipment is placed on this line to measure the activity discharged and to assure that specified limits are not exceeded. A high radiation signal from this monitor will close the discharge valve. The single discharge line is fed by the hot shower drain (HSD) sample tanks (a very low level radioactivity source) or one of the two sample tanks which usually contain condensate quality water. These two sources may not discharge simultaneously because of interlocks on the two valves leading to the discharge line.

In addition to providing a means for a controlled (i.e., batch) discharge, the sample tanks also function as surge tanks to minimize or delay the offsite discharge of liquid volume for which there is no immediate room available in condensate storage. By administrative control, the discharge from this single discharge line to the canal is adjusted so that it can be shown that the discharge will meet the requirements of 10CFR20 on concentration limit and Appendix I of 10CFR50.

Per General Design Criterion 64, means are provided for monitoring effluent discharge paths that may be released from normal operations, including anticipated operational occurrences and from postulated accidents. The monitoring of liquid release as

The sumps, sump pumps, sump coolers, piping, valves, instruments and controls used to transfer liquid wastes to the radwaste building collection tanks are described in Subsection 9.3.8. The remainder of the liquid waste management system is described below.