Department of Energy
Washington, D.C. 20545

Docket No. 50-537
HQ:S:82:032

MAY 14 1982

Mr. Paul S. Check, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Check:

RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION - AUXILIARY SYSTEMS

Reference: Letter, P. S. Check to J. R. Longenecker, "CRBRP Request for Additional Information," dated March 15, 1982

This letter formally responds to your request for additional information contained in the referenced letter.

Enclosed are responses to Questions CS 410.1, 4, 6, 7, 8, 11, 12, 13, 14, 15, 16, and 17 in the area of auxiliary systems. These responses will also be incorporated into the PSAR Amendment 69, scheduled for May 28.

Sincerely,

John R. Longenecker

John R. Longenecker, Manager
Licensing & Environmental
Coordination
Office of Nuclear Energy

Enclosure

cc: Service List
Standard Distribution
Licensing Distribution

D001
S1/1

Question CS410.1

Discuss whether failure of nonseismic Category I or non tornado protected water tanks and vessels due to the SSE or design tornado can result in flooding of essential structures, systems and components. If this possibility exists, provide the results of a failure modes and effects analysis that demonstrates that required safety functions, including safe shutdown, will not be compromised by the postulated failures.

Response

(a) Tanks Located Indoors:

With the exception of the tanks listed below, all water storage tanks located in Category I structures are designed as Seismic Category I components and are tornado protected.

Tank	Seismic Category	Location
Hot Water Heater (80 gal)	Non-Seismic Category I	Control Building
Normal Chilled Water Exp. Tank 23NCT003 (1200 gal)	Non-Seismic Category I	Steam Generater Bldg. (Intermediate Bay)
Normal Chilled Water Chemical Addition Tank 23NCT008 (70 gal)	Non-Seismic Category I	Steam Generator Bldg. (Intermediate Bay)

As can be determined from the above list, the tank capacities are very small. Rupture of these tanks results in a negligible buildup of water in these areas. Since all safety related equipment in the Nuclear Island Buildings are mounted on minimum 4" concrete pads, rupture of the above tanks will not result in flooding of essential structures, systems and components.

(b) Tanks Located Outdoors:

As described in PSAR Section 3.4, the Category I structures have been designed to withstand the effects of natural phenomena, including the worst case flooding conditions (which exceeds the rupture of any non-category I tanks in severity) without adverse effects: Therefore, flooding of essential structures, systems and components is prevented.

Question CS410.4 (9.1.4)

Describe the "emergency cooling" process instituted in case of power failure to the fuel transfer port cooling insert blower during core component pot (CCP) transfer (reference: Section 9.1.4.7.3).

Response

PSAR Section 9.1.4.7.3 has been revised to respond to this question.

9.1.4.7.3 Safety Evaluation

The transient dose rate from the highest powered spent fuel assembly is less than the criteria in Sections 12.1.1 and 12.1.2 at the surface of the adaptor body. This significant dose rate exists only during the short time (a few minutes) when a spent fuel assembly travels through the adaptor and floor valve into the EVTM. The closest location where personnel can be exposed to the radiation source is more than 10 ft. from the adaptor surface for normal operation, and more than 2 ft. from infrequent maintenance operations. Both locations are on the RCB operating floor, above the adaptor. Therefore, integrated exposures are low.

Cooling of spent core assemblies in the reactor or EVST fuel transfer port is adequate to maintain the assembly cladding temperature below the 1250°F limit for normal operations and anticipated events. During normal operations, the transit time of the core assembly through the port is short (a few minutes) so that there is no significant heatup. In the event that an assembly becomes immobilized in the port, design provisions to maintain the cladding temperature below 1250°F will be used. If immobilization of an assembly is the result of a mechanical failure of the EVTM grapple drive system, the backup cooling system for the port may be turned on to provide the necessary cooling. If immobilization is the result of a loss of power (which would also disable the backup cooling system), the EVTM grapple drive system may be operated manually to raise or lower the core assembly to a location (EVTM or sodium pool) where adequate passive cooling is provided to maintain the cladding temperature within the 1250°F limit. However, those operator actions are required only to maintain fuel temperatures within normal limits. In the unlikely event that a core assembly becomes immobilized in the port for a longer time by coincident drive system mechanical failure and loss of power or failure of the operator to respond to this condition the cladding temperature would exceed 1250°F but would remain below the 1500°F limit for unlikely and extremely unlikely events.

9.1.4.8 Spent Fuel Shipping Cask

The integrity of the SFSC design will ensure sufficient margins to meet all requirements stipulated in the applicable regulations, especially 10 CFR 71. The shipping cask is discussed in this section only to the extent that conditions to which it is subjected inside the RSB are potentially more severe than those design conditions specified in 10 CFR 71.

Regulation 10 CFR 71, paragraph 71.36, states that the cask design shall withstand a hypothetical accident characterized by a 30-ft drop onto a flat, essentially unyielding, horizontal surface without exceeding a specified reduction in shielding and containment of radioactive material. The LMFBR spent fuel shipping cask will be designed to withstand, with no release of radioactivity, a maximum deceleration of 123 g if dropped 30 ft onto an unyielding surface. The largest height for a potential SFSC drop in the CRBRP is the 72-ft vertical distance of the SFSC handling shaft.

9.1.4.8.1 Design Basis

The free fall impact energy of the 72 ft SFSC drop to the bottom of the cask handling shaft shall be limited to an amount less than that experienced in a hypothetical cask accident specified in 10 CFR 71.

9.1.4.8.2 Design Description

The SFSC is handled within the RSB and lowered and raised in the cask shaft by the double reeved RSB bridge crane using rigging specially designed and tested for the SFSC. Preliminary analysis indicates that a

Question CS410.6 (9.6.1)

The kitchen and toilet exhaust fans are non-safety related. Verify that ducts leading to these fans are at least seismic Category III. It appears from Figure 9.6-1 that these fans exhaust air from other spaces in addition to the kitchen and toilets. Discuss the consequences of loss of these fans.

Response

The kitchen and toilet exhaust fans, along with their associated ductwork and accessories are Seismic Category III. In addition to exhausting the toilets (Cells 425, 426, 435) the toilet exhaust fan also exhausts air from janitor closets (Cells 437A, 439) and the chart storage room (Cell 437). The kitchen exhaust fan exhausts air from the kitchen (Cell 427) and the halon tank storage (Cell 421A). The loss of the kitchen and/or toilet exhaust fans would have no effect upon the operation of the safety related control room HVAC system.

Question CS410.7 (9.6.1)

On a signal of high levels of toxic chemicals or smoke in the control room HVAC intake ducts, the path for outside air supply to the control room will be routed through filter units. Provide the capability of these filters to remove toxic chemicals and products of combustion.

Response

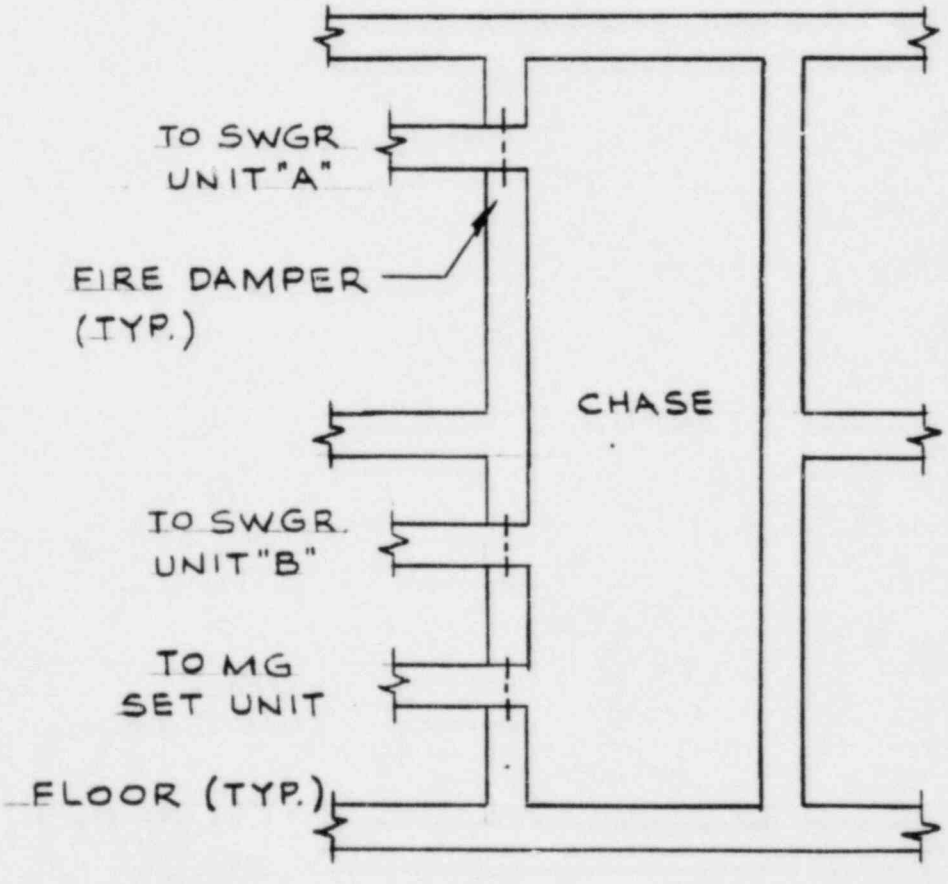
As stated in Sections 9.6.1.2.1 and 6.3.1.6.2, upon detection of toxic chemicals or smoke at either control room intake, the isolation valves for the intake will automatically close and will not be routed through the filter units. Therefore, the capability to remove toxic chemcials and products of combustion is not required for the filter units.

Question 410.8 (9.6.1)

On Figure 9.6.3 indicate the interface between the safety-related switchgear room HVAC air intake ducting and the non-safety-related MG set HVAC subsystem air intake ducting.

Response

The outside air intake shown on Figure 9.6-3 is a schematic representation of a 3 hour fire-rated chase. This intake and chase is shown on Figures 1.2-70 and 1.2-71. Individual intake ducting is provided for each HVAC unit and is connected to the intake chase. Each opening into the intake chase is protected by a 3 hour rated fire damper. The interface between safety-related switchgear room HVAC intake ducting and non-safety related MG set HVAC intake ducting is the chase as shown below.



Question CS410.11 (9.6.2)

Manual valves are provided in the RAPS cells HVAC exhaust ducts. These valves are the only means of isolating a contaminated RAPS cell from the remainder of the HVAC exhaust system. Justify the lack of remotely-operating valves for this isolation function. Discuss the adverse consequences of high radiation levels preventing operation of a manual RAPS cell isolation valve when required by a release of radioactivity to the RAPS cell.

Response

As described in Section 9.6.2.2.5 and shown on Figure 9.6-9, the manual valves are not the only means to isolate the RAPS cells from the remainder of the HVAC exhaust system. A radiation monitor and an automatic valve are located in the RAPS cells exhaust header. Upon detection of high radioactivity, the valve will automatically close, thereby isolating all the RAPS cells from the remainder of the HVAC exhaust system. The leaking cell will then be isolated from the remaining RAPS cells by closing the manual valve serving the leaking cell. The manual valves are located outside the RAPS cells for valve accessibility, and as such, the plant operator will not be exposed to the released radioactivity to the RAPS cells.

Question CS410.12 (9.6.2, 9.6.3)

Describe the protection afforded redundant, safety-related components of the reactor containment building HVAC system, annulus filtration system, and reactor service building HVAC system to prevent common mode failures of the components.

Response

All redundant safety-related components of the HVAC System are Seismic Category I, located in separate fire zones, provided with independent IE control systems, connected to separate divisions of Class 1E power supplies, and connected to separato loops of the emergency chilled water system as appropriate to prevent common mode failures of the components. For detailed description and safety evaluation of these systems refer to Sections 9.6.2.2, 9.6.2.3, 9.6.3.2, 9.6.3.3 and 6.2.6.

Question CS410.13 (9.6.3)

As shown on Figures 9.6-7 and 9.6-7a, several lengths of reactor service building HVAC system ducting in the "fuel handling accident mode" flow path are not Seismic Category I. Justify the lack of a Seismic Category I rating for this ducting.

Response

All ductwork associated with the RSB clean-up filter unit, including the "Fuel Handling Accident Mode" flow path is Seismic Category I as described in Sections 9.6.3.3 and 6.2.6. Figures 9.6-7 and 9.6-7a will be revised to clearly indicate this.

Question CS410.14 (9.6.2 (9.6.3)

The RAPS and CAPS cells HVAC exhaust system could potentially vent airborne radioactivity from these cells. Justify the lack of a Seismic Category I classification for these exhaust ducts and a safety classification of Quality Group C for the exhaust ducts.

Response

The RAPS and CAPS cells which could potentially contain the highest amounts of radioactivity are the CAPS Cold Box Cell 378, the RAPS Cold Box Cell 105 BH, and the noble gas storage vessel Cell 105 BI. These cells have ASME III/3, Seismic Category I HVAC exhaust ducts up to and including the automatic isolation valve. The next highest potential amounts of radioactivity are contained by the recycle vessels cell 105 BC, the RAPS surge vessel cell 105 BF, and the CAPS surge vessel cell 371. The HVAC exhaust ducts from these cells are designed to remain intact following a SSE, up to and including the automatic isolation valve. Since a failure of the HVAC exhaust ducts for cells 105 BC, 105 BF or 371 will result in conservatively calculated radiation doses at the site boundary of less than 0.5 rem to the whole body; using Regulatory Guide 1.26 Section C.2.d as guidance; less than Group C quality standards (ASME III/3, Seismic Category I) are acceptable.

The RAPS and CAPS exhaust systems are undergoing redesign and this response is consistant with the new design. PSAR Sections 9.6.2.2.5 and 9.6.3.2-3 and Figure 9.6-9 will be revised in the future to reflect the redesign.

Question CS410.15 (9.6.3)

Radiation monitors are provided in the exhaust ducts of the reactor service building-radwaste area HVAC system. If abnormal radioactivity is detected, the exhaust air is directed to the system's exhaust filter unit and exhausted by an exhaust filter fan to the exhaust vent. Justify the lack of a Seismic Category 1, Quality Group C classification for the exhaust isolation dampers and the downstream exhaust filtration piping and filter units.

Response

As described in Section 15.7.2.5, there are no adverse consequences of a failure of the liquid radwaste system. The reactor service building - radwaste area is a non-safety related, Seismic Category III building as described in Section 3.8.4.4.3.2. Accordingly, the reactor service building - radwaste HVAC system, including the exhaust isolation dampers and the downstream exhaust filtration piping and filter unit, is also designed to Seismic Category III.

Question CS410.16 (9.6.4)

The turbine generator building HVAC system is provided with a radiation monitoring system to sample and analyze tritium in the exhaust air released from the building to meet the requirements of 10 CFR 20. Justify the lack of seismic Category I, Quality Group C isolation dampers to contain an excessive release of radioactivity.

Response

The tritium levels are described in Section 11.3.6.2 and are inconsequential. These levels, at best, can only be measured by sampling and laboratory analysis. The need for "isolation dampers to contain an excessive release of radioactivity" is not justified.

Question CS410.17 (9.6.6)

The primary sodium tank cell unit cooler is not safety grade. Describe the consequences of the loss of this unit cooler.

Response

As described in Section 9.3.2.2.2, the Ex-Containment Primary Sodium Storage Tanks are used only during plant shutdown for initial fill or planned maintenance involving drainage of primary sodium. These tanks are normally empty and do not perform a safety function. If the unit cooler is lost while these tanks contain sodium, it is not expected that the cell temperature rise will affect the structural integrity of the cells and equipment within. To verify that the expected cell temperature rise is not detrimental to the cell and the equipment within and sufficient time is available for corrective action, a thermal transient analysis will be performed and the result of this analysis will be presented in the PSAR. In addition, alarms are provided to alert operator of the loss of cell cooling and administrative procedures will be used to re-establish cooling to the cell.