2.0 System Based Design Description of ITAAC

2.1 Structures

2.1.1 Nuclear Island

1.0 Description

The Nuclear Island (NI) consists of all of the structures supported by the NI Common Basemat Structures foundation basemat. The NI includes the Reactor Building (RB), the Safeguard Buildings (SBs), the Fuel Building (FB), the main steam valve (MSV) and main feed valve (MFV) stations, the NI foundation basemat, the vent stack, and the stair towers. The physical arrangement of the NI structures is shown in Figure 2.1.1-1—Nuclear Island Structures. Dimensions on this and other figures in this section are for information only.

The RB consists of the Reactor Shield Building (RSB), the Reactor Containment Building (RCB) and the RB internal structures. The RSB is a heavily reinforced Seismic Category I safety-related cylindrical concrete structure, with an outside diameter of approximately 186 feet by approximately 230 feet high, which completely encloses the RCB. The RSB is surrounded by SBs 1, 2, 3, and 4 and by the FB, which are Seismic Category I safety-related structures. The primary function of the RSB is to protect the RCB from missiles and loadings resulting from design basis external events such as hurricanes and tornados, and certain beyond design basis events such as aircraft hazard and explosion pressure waves. The RCB is a Seismic Category I safety-related cylindrical concrete structure, with and outside diameter of approximately 162 feet by approximately 218 feet high; it has a 0.25 inch thick steel liner. The primary functions of the RCB are to protect the safety-related systems, structures, and components (SSCs) located within it, to prevent the release of radiation during plant operations, and to prevent the release of radiation and contamination in the event of accident conditions.

The Reactor Building Annulus (RBA) is the annular space between the RSB and the RCB. The annular space is approximately 5 feet 11 inches wide between the faces of the concrete walls of the two buildings. The primary function of the RBA is to serve as an access area to allow the passage of personnel, piping, ventilation ducts, electrical cables, and other equipment between the RSB and the RCB. A slight negative pressure is maintained in the RBA to facilitate the secondary function of the RSB, which is to provide a barrier to the release of contamination.

The SBs are reinforced Seismic Category I safety-related concrete structures located around the perimeter of the RSB. The SBs are arranged to accommodate four safeguard divisions. SB 4 and 1 are located adjacent to the RSB at 90 degrees and 270 degrees respectively as shown on Figure 2.1.1-1. SBs 2 and 3 are contained in a single structure separated by a common wall and are located adjacent to the RSB at 0 degrees as shown on Figure 2.1.1-1. As shown in Figures 2.1.1-4—Safeguard Buildings 2 and 3 Elevation +39 Feet and 2.1.1-8—Safeguard Buildings 2 and 3, SBs 2 and 3 are decoupled by a gap between the SBs external walls and their uppermost ceilings and the structure that houses these buildings. The SBs and the RSB share the reinforced concrete cylindrical shell from the basemat to elevation 0 feet 0 inches; above this elevation the structures are physically separated by a seismic gap. The SBs 2 and 3 structure has overall dimensions of approximately 92 feet out from the RSB wall by 180 feet long by 140 feet high. The SB 1 structure has overall dimensions of approximately 87 feet out from the RSB wall by

100 feet long by 115 feet high. The SB 4 structure has dimensions of approximately 87 feet out from the RSB wall by 100 feet long by 150 feet high. The primary function of the SBs is to provide physical separation between redundant divisions of safeguard equipment. The main control room (MCR) and technical support center (TSC) are located within SBs 2 and 3 as shown on Figure 2.1.1-5—Safeguard Buildings 2 and 3 Elevation +53 Feet. The remote shutdown station (RSS), which is separate from the MCR, is located within SB 3 as shown on Figure 2.1.1-4. Also located in the SBs are the reinforced concrete MSV and MFV stations. Stair towers are provided between the different SBs and the SBs and FB. Above elevation 0 feet 0 inches, flooding pits and flood relief panels provide for water flow to lower building levels or outside to prevent water ingress into adjacent divisions. Below elevation 0 feet 0 inches, rooms within divisions have flooding mitigation interconnections so that the maximum released water volume can be distributed and stored in the lower building levels of the affected division.

The FB is a reinforced Seismic Category I safety-related concrete structure. It extends approximately 58 feet out from the RSB wall and is approximately 160 feet long by 140 feet high. The FB is located adjacent to the RSB at 180 degrees as shown on Figure 2.1.1-1. As shown in Figure 2.1.1-6—Fuel Building - View 1, the FB is decoupled by a gap between the FB external wall and the structure that houses the FB. The primary function of the FB is to house new and spent fuel and provide radiation protection during normal operation by shielding areas of higher radiation from areas of lower radiation. The FB supports the vent stack, a steel structure approximately 12 feet 6 inches in diameter by 100 feet high located on top of the stair tower between the FB and SB 4. Stair towers are provided between the different SBs and the FB. These stair towers provide personnel access among the various elevations of the NI and tie together the buildings around the periphery of the RSB. Below elevation 0 feet 0 inches, rooms within divisions have flooding mitigation interconnections so that the maximum released water volume can be distributed and stored in the lower building levels of the affected division.

The RSB, the FB, and SBs 2 and 3 structures form an integrated contiguous surface barrier, as shown on Figure 2.1.1-1 and 2.1.1-2—Contiguous Barrier, designed to provide protection against external hazards including aircraft hazard and explosion pressure waves.

The NI foundation basemat is a heavily reinforced concrete slab, approximately 360 ft x 360 ft x 10 ft thick, which supports all NI structures including the RB, FB, and the SBs. The NI foundation basemat acts together with the RCB to maintain an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to maintain containment design conditions important to safety so that they are not exceeded for as long as postulated accident conditions require.

The RCB design includes consideration for severe accident mitigation. Downward expansion of the lower head is limited by concrete support structures provided at the bottom of the reactor cavity. These structures preserve sufficient space for the outflow of melt and the later formation of a molten pool in the reactor cavity. Installed barriers prevent water ingress into the core spreading area prior to the arrival of core melt, which could lead to steam explosion. Installed barriers prevent core melt relocation to the upper containment, which could lead to direct containment heating.

2.0 Arrangement

2.1 The as-installed basic configuration of the NI structures is as described in Section 2.1.1, 1.0 Description, and as shown on Figures 2.1.1-1, 2.1.1-3—Reactor Building, 2.1.1-4, and 2.1.1-5.

3.0 Key Design Features

3.1 The basic configuration of the NI structures includes: (a) an integrated contiguous barrier (b) decoupling of SBs 2 and 3 and the FB from their respective structures at their exterior walls along the entire wall length and at the SBs 2 and 3 upper ceiling and (c) SBs 2 and 3 decoupling from the RSB above elevation 0 feet, 0 inches as described in Section 2.1.1, and as shown on Figures 2.1.1-1, 2.1.1-2, 2.1.1-4, 2.1.1-6, 2.1.1-8 and 2.1.1-10—Fuel Building - View 2.

3.2 Six rib support structures, provided at the bottom of the reactor cavity, as shown on Figure 2.1.1-13—Concrete Barriers and Rib Support Structures, limit lower reactor pressure vessel head deformation due to thermal expansion and creep during severe accident mitigation.

3.3 As described in Table 2.1.1-3—Spreading Area Water Ingression Barrier a flooding wall is provided to prevent ingress of water into the core melt spreading area. This wall includes a watertight door that provides entry to the venting shaft of the spreading area.

3.4 Core melt cannot relocate to the upper containment due to the existence of concrete barriers as shown on Figure 2.1.1-13.

4.0 Mechanical Design Features, Seismic 1E Classifications

4.1 The NI site grade level is located at elevation 0 feet, 0 inches as indicated on Figures 2.1.1-7—SB 1, 2.1.1-8, 2.1.1-9—SB 4, and 2.1.1-10.

4.2 The NI as-installed basic configuration structural supports, including critical sections, are seismic Category I and are constructed to withstand design basis loads without loss of structural integrity and safety-related functions. The design basis loads are those loads associated with:

- Normal plant operation (including dead loads, live loads, lateral earth pressure loads, equipment loads, hydrostatic, hydrodynamic, and temperature loads).
- External events (including rain, snow, flood, tornado, tornado-generated missiles, earthquake, aircraft hazard, and explosion pressure wave).

4.3 The RCB is designed to retain its pressure boundary integrity associated with the design pressure.

4.4 The as-installed basic configuration of the NI structures, as described in Section 2.1.1, 1.0 Description and as indicated in Table 2.1.1-1—Separation For Internal Hazards separates the four SBs so that the impact of internal hazards including fire, flooding, and high energy line break is contained within the SB of hazard origination.

4.5 The components of the NI structures that provide postaccident radiation barriers to support postaccident mitigating actions are as described in Table 2.1.1-2—Postaccident Radiation Barriers.

4.6 The RSB and the RCB are constructed of reinforced concrete and the RCB is pre-stressed.

4.7 The RBA is separated from the SBs and the FB by barriers, doors, dampers, and penetrations that have a minimum 3-hour fire rating.

4.8 The following are provided for water flow to the in-containment refueling water storage tank (IRWST):

- As shown on Figure 2.1.1-11—Trapezoidal Openings, Weirs, and Trash Racks, RCB rooms which are directly above the IRWST, contain trapezoidal-shaped openings in the floor to allow water flow into the IRWST. The floor openings are protected by weirs and trash racks to provide a barrier against material transport into the IRWST.

- As shown on Figure 2.1.1-12—Wall Openings to IRWST, RCB rooms which are adjacent to the IRWST contain wall openings slightly above the floor to allow water flow into the IRWST.

4.9 Essential SSCs in RCB rooms listed in Table 2.1.1-4—RCB Rooms With Pipe Whip Restraints are protected from the dynamic effects of pipe breaks.

4.10 Guard pipes are placed around high energy pipelines that pass through RBA penetrations so that consequential failures to other safeguard systems cannot occur. RBA penetrations containing high energy pipelines are described in Table 2.1.1-5—RBA Penetrations that Contain High Energy Pipelines.

4.11 Safety related SSCs in the RBA are located above the structural flood design elevation 0 feet 0 inches to protect them from the effects of flooding.

4.12 Above elevation 0 feet, 0 inches of the SBs, flooding pits and flood relief panels, as described in Table 2.1.1-6—SBs Flooding Pits and Relief Panels, provide for water flow to lower building levels or outside to prevent water ingress into adjacent divisions.

4.13 Rooms within the SBs and the FB below elevation 0 feet, 0 inches are provided with sufficient interconnections to keep the maximum released water volume stored within the affected division.

4.14 To provide adequate radiological protection, the Spent Fuel Storage Pool (SFSP) has a depth of 47 feet 3 inches as measured from the bottom of the SFSP to the fuel pool floor.

5.0 Interface Requirements

There are no interface requirements for the NI Structures.

6.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.1.1-7—Nuclear Island Inspections, Tests, Analyses, and Acceptance Criteria specifies the inspections, tests, analyses, and associated acceptance criteria for the NI.

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
SB 1	1UJH01 002	2UJH01 001 2UJH01 004		X		-31' 6" to 55' 1 ½"
	1 UJH10 002	2UJH10 001 2UJH10 004	X			0' 0"
	1UJK22 024	2UJK22 004	X			39' 4 ½"
	1UJE26 001	2UJK26 004 2UJK26 042 2UJK26 043 2UJK26 044		X		55' 1 ½" to 68' 10 ¾"
	1UJH01 002 1UJH01 005 1UJH01 006 1UJH01 008 1UJH01 010	RSB wall exterior surface		X X X X X		-31' 6" to 93' 6"
	UJB05 004	RSB wall interior surface		X		-14' 1 ¼" to 93' 6"
	1UJH01 010	UFA01 002 UFA01 004		X		-31' 6" to 93' 6"
	1UJH01 011	UFA01 002	X			-31' 6"
	1UJH05 013	UFA05 003	X			-16' 4 ¾"
	1UJH10 013	UFA10 002	X			0' 0"
	2UJE34 003	Room adjacent to 2UJK31 009		X		68' 10 ¾" to 93' 6"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
SB 2	2UJH01 003 2UJH01 040 2UJH01 023 2UJH01 038 2UJH01 020 2UJH01 024	Decoupling Gap		X		-28' 2 ½" to top of SB 2 uppermost ceiling
	2UJH01 004	2UJH01 003		X		-28' 2 ½" to 88' 7 1/8"
	2UJH01 004	Outside		X		-28' 2 ½" to 94' 6"
	2UJH01 001 2UJH01 007 2UJH01 008 2UJH01 009	RSB wall exterior surface		X		-28' 2 ½" to 88' 7 1/8"
	UJB05 005	RSB wall interior surface		X		-14' 1 ¼" to 88' 7 1/8"
	2UJH01 024	3UJH01 024		X		-28' 2 ½" to 39' 4 ¼"
	2UJH01 011	3UJH01 011		X		-39' 4 ¼" to 0' 0"
	2UJH01 009	3UJH01 009		X		-31' 6" to 0' 0"
	2UJH10 006	3UJH10 025		X		0' 0" to 16' 10 ¾"
	2UJH10 006	3UJH10 006		X		0' 0" to 16' 10 ¾"
	2UJH10 010	3UJH10 012		X		0' 0" to 16' 10 ¾"
	2UJH10 006	3UJH10 006	X			0' 0"
	2UJH10 005	UJB05 005	X			0' 0"
	2UJK14 002	3UJK14 002		X		16' 10 ¾" to 53' 5 ¾"
	2UJK22 024	2UJK22 024			X	Floor: 39' 4 ½" Ceiling: 53' 5 ¾"
SB 2 (cont'd)	2UJK26 019	3UJK26 019		X		53' 5 ¾" to 94' 6"
	2UJK26 020	3UJK26 019		X		53' 5 ¾" to 94' 6"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	2UJK26 020	3UJK26 020		X		53' 5 ¾" to 94' 6"
	2UJK26 032	3UJK26 020		X		53' 5 ¾" to 94' 6"
	2UJK26 032	3UJK26 005		X		53' 5 ¾" to 94' 6"
	2UJK22 024	3UJK14 025		X		53' 5 ¾" to 94' 6"
	2UJK26 020	3UJK26 019	X			53' 5 ¾"
	2UJK26 020	3UJK26 020	X			53' 5 ¾"
	2UJK26 032	3UJK26 020	X			53' 5 ¾"
	2UJK26 032	3UJK26 005	X			53' 5 ¾"
	2UJK26 020	2UJK26 020			X	Floor: 53' 5 ¾" Ceiling: 68' 11"
	2UJK26 032	2UJK26 032			X	Floor: 53' 5 ¾" Ceiling: 68' 11"
	2UJK22 024	2UJK22 024			X	Floor: 53' 5 ¾" Ceiling: 68' 11"
	2UJK31 035 2UJK31 019 Peripheral Supply Air Shaft	Decoupling Gap		X		68' 11" to 88'
SB 3	3UJH01 024 3UJH01 020 3UJH01 038 3UJH01 023 3UJH01 040 3UJH01 003	Decoupling Gap		X		-28' 2 ½" to top of SB 2 uppermost ceiling
	3UJH01 004	3UJH01 003		X		-28' 2 ½" to 88' 7 1/8"
	3UJH01 004	Outside		X		-28' 2 ½" to 94' 6"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
SB 3 (cont'd)	3UJH01 009 3UJH01 008 3UJH01 007 3UJH01 001	RSB wall exterior surface		X		-28' 2 ½" to 88' 7 1/8"
	UJB05 001	RSB wall interior surface		X		-14" 1 ¼" to 88' 7 1/8"
	3UJH10 005	UJB05 001	X			0' 0"
	3UJK22 005 3UJK22 007	Decoupling Gap		X		43' 10 ½" to 53' 5 ¾"
	3UJK22 006	Decoupling Gap		X		39' 4 ½" to 53' 5 ¾"
	3UJK22 001 3UJK22 032 3UJK22 030	3UJK22 020		X		39' 4 ½" to 53' 5 ¾"
	3UJK22 020	3UJK22 040		X		39' 4 ½" to 53' 5 ¾"
	3UJK22 020	3UJK22 029		X		39' 4 ½" to 53' 5 ¾"
	Hall between 3UJK22 029 and 3UJK22 031	3UJK22 029		X		39' 4 ½" to 53' 5 ¾"
	3UJK22 031 3UJK22 020	3UJK22 028		X		39' 4 ½" to 53' 5 ¾"
	3UJK22 028	2UJK22 024		X		39' 4 ½" to 53' 5 ¾"
	3UJK14 025	2UJK22 024		X		39' 4 ½" to 53' 5 ¾"
	3UJK14 025	2UJK14 025		X		39' 4 ½" to 68' 11"
	3UJK14 026	2UJK14 026		X		39' 4 ½" to 68' 11"
	3UJK22 027	2UJK22 027		X		39' 4 ½" to 68' 11"
SB 3 (cont'd)	3UJK22 020	3UJK22 001	X			39' 4 ½"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	3UJK22 020	3UJK22 032	X			39' 4 ½"
	3UJK22 020	3UJK22 030	X			39' 4 ½"
	3UJK22 020	3UJK22 040	X			39' 4 ½"
	3UJK22 020	3UJK22 029	X			39' 4 ½"
	Hall between 3UJK22 029 and 3UJK22 031	3UJK22 028	X			39' 4 ½"
	3UJK22 020	3UJK22 028	X			39' 4 ½"
	3UJK22 031	3UJK22 031			X	39' 4 ½" (floor) 53' 5 ¾" (ceiling)
	3UJK22 020	3UJK22 020			X	39' 4 ½" (floor) 53' 5 ¾" (ceiling)
	3UJK26 036 3UJK26 037	3UJK26 005		X		53' 5 ¾" to 68' 11"
	3UJK26 036	3UJK26 036			X	Floor: 53' 5 ¾" Ceiling: 68' 11"
	3UJK26 037	3UJK26 037			X	Floor: 53' 5 ¾" Ceiling: 68' 11"
	3UJK31 035	3UJK31 019 Central Supply Air Shaft		X		68' 11" to 88'
	3UJK31 035 3UJK31 019 Peripheral Supply Air Shaft	Decoupling Gap		X		68' 11" to 88'
	3JUK31 034	3UJK31 019 Central Supply Air Shaft		X		68' 11" to 88'
	3UJK31 032	3UJK31 019		X		68' 11" to 88'
	3UJK31 032	2UJK31 026	X			68' 11"
SB 3 (cont'd)	3UJK14 025	2UJK14 025		X		68' 11" to 79'
	3UJK14 025	3UJK22 027		X		68' 11" to 79'
	3UJK31 031	3UJK22 027		X		68' 11" to 88'

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	3UJK31 019	3UJK31 019			X	Floor: 68' 11" Ceiling: 88'
	3UJK31 032	3UJK31 032			X	Floor: 68' 11" Ceiling: 88'
	Room above 3UJK14 025	Room above 3UJK31 031 Room above 3UJK31 029		X		68' 10 ¾" to 88'
	Room above 3UJK14 025	Room adjacent to 2UJK22 024		X		68' 10 ¾" to 88'
SB 4	4UJH01 002	3UJH01 001 3UJH01 004		X		-31' 6" to 55' 1 ½"
	4UJH10 002	3UJH10 001 3UJH10 004	X			0' 0"
	4UJK22 024	3UJK22 004	X			39' 4 ½"
	3UJE26 001	3UJK26 004 3UJK26 041 3UJK26 043 3UJK26 044		X		55' to 93' 6"
	4UJH01 002 4UJH01 005 4UJH01 006 4UJH01 008 4UJH01 010	RSB wall exterior surface		X		-31' 6" to 93' 6"
	UJB05 002	RSB wall interior surface		X		-14' 1 ½" to 93' 6"
SB 4 (cont'd)	4UJH01 010	UFA01 051 UJA01 054		X		-31' 6" to 93' 6"
	4UJH01 011	UFA01 051	X			-31' 6"
	4UJH01 009	UFA05 051	X			-16' 4 ¾"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	4UJH10 013	UFA10 052	X			0' 0"
FB	UFA01 049	UFA01 099		X		-36' 5" to 12' 1 ¾"
	UFA01 085	UFA01 057	X			-31' 6"
	UFA01 083	UFA01 057		X		-31' 6" to 12' 1 ¾"
	UFA01 083	UFA01 088		X		-31' 6" to 12' 1 ¾"
	UFA01 085	UFA01 088		X		-31' 6" to 12' 1 ¾"
	UFA01 038	UFA01 088		X		-31' 6" to 12' 1 ¾"
	UFA01 025	UFA01 089		X		-31' 6" to 12' 1 ¾"
	UFA01 054	RSB wall exterior surface		X		-31' 6" to 105' 7 ¾"
	UFA01 004	RSB wall exterior surface		X		-31' 6" to 105' 7 ¾"
	UFA01 099	RSB wall exterior surface		X		-36' 5" to
	Room adjacent to UFA01 048	RSB wall exterior surface		X		-36' 5" to 105' 7 ¾"
	Room adjacent to UFA01 098	RSB wall exterior surface		X		-36' 5" to 105' 7 ¾"
	UFA01 049	RSB wall exterior surface		X		-31' 6" to 105' 7 ¾"
	UFA01 095	RSB wall exterior surface		X		-31' 6" to 105' 7 ¾"
	UJB003	RSB wall interior surface		X		-31' 6" to 105' 7 ¾"
	UFA06 057	UFA06 085	X			-11' 1 ¾"
FB (cont'd)	UFA10 095	UFA10 045	X			4' 11"
	UFA10 007	UFA10 007	X			0' 0"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	UFA01 024 UFA01 026 UFA01 017 UFA01 025 UFA01 089 UFA01 079 UFA01 078 UFA01 077 UFA01 076 UFA01 073 UFA01 072 UFA01 056	Decoupling Gap		X		-31' 6" to 63' 1 ¾"
	UFA29 015 UFA01 078 UFA29 092 UFA29 090 UFA29 063 UFA29 062	Decoupling Gap		X		63' 1 ¾" to 105' 7 ¾"
	UFA29 092	UFA29 090		X		
	UFA29 090	UFA29 090	X			63' 11 ¾"
	UFA21 053	UJB05 003	X			36' 5"
	UFA34 002	UJB05 003	X			79' 4 ½"
FB (cont'd)	UFA01 041 UFA01 010 UFA01 001 UFA01 002	Outside		X		-31' 6" to 105' 7 ¾"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	UFA01 056 UFA01 051	Outside		X		-31' 6" to 105' 7 ¾"
	UFA10 057	UKA10 034	X			0' 0"
	UFA16 023	UFA15 096		X		12' 1 ¾" to 48' 6 ¾"
	UFA16 023	UFA13 084		X		12' 1 ¾" to 48' 6 ¾"
	UFA16 023	UFA13 083		X		12' 1 ¾" to 48' 6 ¾"
	UFA15 022	UFA13 083		X		12' 1 ¾" to 48' 6 ¾"
	UFA15 022	UFA13 057		X		12' 1 ¾" to 48' 6 ¾"
	UFA13 089	UFA13 079		X		12' 1 ¾" to 48' 6 ¾"
	UFA16 023	UFA15 096	X			12' 1 ¾"
	UFA13 089	UFA13 079	X			12' 1 ¾"
	UFA17 025	UFA17 079	X			24' 3 ¼"
	UFA21 045	UFA21 095	X			36' 5"
	UFA21 025	UFA21 079	X			36' 5"
	UFA24 045	UFA24 095		X		48' 6 ¾" to 63' 11 ¾"
	UFA16 023	UFA24 081		X		48' 6 ¾" to 63' 11 ¾"
	UFA24 081	UFA24 086		X		48' 6 ¾" to 63' 11 ¾"
	UFA24 082	UFA24 057		X		48' 6 ¾" to 63' 11 ¾"
	UFA24 057	UFA15 022		X		48' 6 ¾" to 63' 11 ¾"
FB (cont'd)	UFA24 025	UFA24 079		X		48' 6 ¾" to 63' 11 ¾"
	UFA24 086	UFA24 057	X			48' 6 ¾"
	UFA24 025	UFA24 079	X			48' 6 ¾"
	UFA29 090	Room adjacent to UFA29 006		X		63' 11 ¾" to 105' 7 ¾"

Table 2.1.1-1—Separation For Internal Hazards[1] (10 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Slab[2]	Elevation(s)
	UFA29 015	UFA29 090		X		63' 11 ¾" to 105' 7 ¾"
	UFA29 015	UFA01 078		X		63' 11 ¾" to 105' 7 ¾"
	UFA29 006	UFA29 090	X			63' 11 ¾"
	UFA29 015	UFA29 090	X			63' 11 ¾"
	UFA29 015	UFA29 090	X			63' 11 ¾"
	UFA01 049	UFA01 085		X		-36' 6" to 0' 0"
	UFA01 035	UFA01 085		X		-36' 6" to 0' 0"

1) All wall and slab penetrations are sealed appropriately.
2) This includes floor and ceiling slabs for the room. Ceiling slabs are the floor slabs for the next higher level and floor slabs are ceiling slabs for the next lower level, thus ceiling slabs and floor slabs share an integrated space. This is true for all slabs delineated in this table.

Table 2.1.1-2—Postaccident Radiation Barriers (4 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) KKS]	Door [1]	Wall	Slab	Elevation(s)	Minimum Thickness (feet)
SB 1	1UJH01 007	1UJH01 027		X		-31' 6" to -16' 4 ¾"	1.5
	1UJH01 001	1UJH01 025		X		-31' 6" to -16' 4 ¾"	1.5
	1UJH01 001	1UJH01 025		X		-31' 6" to -14 9 ¼"	1.5
	1UJH01 001	1UJH01 021		X		-31' 6" to -14 9 ¼"	1.5
	1UJH01 010 1UJH01 011	UFA01 002		X		-31' 6" to 0' 0"	1.0
	1UJH01 001	1UJH01 021	X			-28' 2 ½"	NA
	1JUH05 001	1JUH05 021	X			-14' 9 ¼"	NA
	1JUH01 011	UFA01 002	X			-31' 6"	NA
	1UJH05 013	UFA05 003	X			-16' 4 ¾"	NA
	1UJH05 013 1UJH05 008	1UJH01 026		X		-16' 4 ¾" to 0' 0"	1.5
	1UJH05 005	1UJH05 025		X		-14' 9 ¼" to 0' 0"	1.5
	1UJH05 005	1UJH05 021		X		-14' 9 ¼" to 0' 0"	1.5
	1UJH10 001	1UJH10 001			X	0' 0"	1.5
	1UJH10 004	1UJH10 004			X	0' 0"	1.5
SB 2	2UJH01 005	2UJH01 020		X		-28' 2 ½" to -16' 4 ¾"	1.0
	2UJH01 003	2UJH01 040		X		-28' 2 ½" to -16' 4 ¾"	1.0
	2UJH01 010	2UJH01 020 2UJH01 024		X		-28' 2 ½" to -16' 4 ¾"	1.0
SB 2	2UJH01 011	2UJH01 024		X		-28' 2 ½" to -16' 4 ¾"	1.8
	2UJH01 003	2UJH01 040	X			-28' 2 ½"	NA

Table 2.1.1-2—Postaccident Radiation Barriers (4 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) KKS]	Door [1]	Wall	Slab	Elevation(s)	Minimum Thickness (feet)
(cont'd)	2UJH05 005	2UJH05 040		X		-16' 4 ¾" to 0' 0"	1.0
	2UJH05 006	2UJH05 040 2UJH05 020		X		-16' 4 ¾" to 0' 0"	1.5
	2UJH05 010	2UJH05 025		X		-16' 4 ¾" to 0' 0"	1.0
	2UJH10 002	2UJH10 002			X	0' 0"	1.5
	2UJH10 005	2UJH10 005			X	0' 0"	1.5
	2UJH10 006	2UJH10 006			X	0' 0"	1.5
	2UJH10 007	2UJH10 007			X	0' 0"	1.5
	2UJH10 010	2UJH10 010			X	0' 0"	1.5
	2UJH10 012	2UJH10 012			X	0' 0"	1.5
	2UJK26 002	2UJK26 002			X[2]	68' 11"	1.64
	2UJK26 001	2UJK26 001			X[2]	68' 11"	1.64
	2UJK26 015	2UJK26 015			X[2]	68' 11"	1.64
	2UJK26 016	2UJK26 016			X[2]	68' 11"	1.64
	2UJK26 020	2UJK26 020			X[2]	68' 11"	1.64
	2UJK26 029	2UJK26 029			X[2]	68' 11"	1.64
	2UJK26 030	2UJK26 030			X[2]	68' 11"	1.64
	2UJK26 031	2UJK26 031			X[2]	68' 11"	1.64
	2UJK26 032	2UJK26 032			X[2]	68' 11"	1.64
SB 2	2UJK26 046	2UJK26 046			X[2]	68' 11"	1.64
	2UJK26 019	2UJK26 019			X[2]	68' 11"	1.64

Table 2.1.1-2—Postaccident Radiation Barriers (4 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) KKS]	Door [1]	Wall	Slab	Elevation(s)	Minimum Thickness (feet)
	2UJK26 039	2UJK26 039			X[2]	68' 11"	1.64
SB 3	3UJH01 003	3UJH01 040		X		-28' 2 ½" to -16' 4 ¾"	1.0
	3UJH01 005	3UJH01 020		X		-28' 2 ½" to -16' 4 ¾"	1.0
	3UJH01 010	3UJH01 020 3UJH01 024		X		-28' 2 ½" to -16' 4 ¾"	1.0
	3UJH01 011	3UJH01 024		X		-28' 2 ½" to -16' 4 ¾"	1.8
	3UJH01 003	3UJH01 040	X			-28' 2 ½"	NA
	3UJH05 005	3UJH05 040		X		-16' 4 ¾" to 0' 0"	1.0
	3UJH05 006	3UJH05 040 3UJH05 020		X		-16' 4 ¾" to 0' 0"	1.5
	3UJH05 010	3UJH05 025		X		-16' 4 ¾" to 0' 0"	1.0
	3UJH10 002	3UJH10 002			X	0' 0"	1.5
	3UJH10 005	3UJH10 005			X	0' 0"	1.5
	3UJH10 006	3UJH10 006			X	0' 0"	1.5
	3UJH10 007	3UJH10 007			X	0' 0"	1.5
	3UJK26 002	3UJK26 002			X[2]	68' 11"	1.64
	3UJK26 001	3UJK26 001			X[2]	68' 11"	1.64
	3UJK26 005	3UJK26 005			X[2]	68' 11"	1.64
SB 3 (cont'd)	3UJK26 020	3UJK26 020			X[2]	68' 11"	1.64
	3UJK26 025	3UJK26 025			X[2]	68' 11"	1.64
	3UJK26 036	3UJK26 036			X[2]	68' 11"	1.64
	3UJK26 037	3UJK26 037			X[2]	68' 11"	1.64

Table 2.1.1-2—Postaccident Radiation Barriers (4 Sheets)

NI Structure	From Room(s) [KKS]	To Room(s) KKS]	Door [1]	Wall	Slab	Elevation(s)	Minimum Thickness (feet)
	3UJK26 019	3UJK26 019			X[2]	68' 11"	1.64
	3UJK26 039	3UJK26 039			X[2]	68' 11"	1.64
SB 4	4UJH01 007	4UJH01 025		X		-31' 6" to -16 4 ¾"	1.5
	4UJH01 001	4UJH01 025		X		-31' 6" to -16 4 ¾"	1.5
	4UJH01 001	4UJH01 025		X		-31' 6" to -16 4 ¾"	1.5
	4UJH01 001	4UJH01 021		X		-31' 6" to -16 4 ¾"	1.5
	4UJH01 010 4UJH01 011	UFA01 051 UFA01 054		X		-31' 6" to 0' 0"	1.0
	4UJH01 001	4UJH01 021	X			-28' 2 ½"	NA
	4UJH01 011	UFA01 051	X			-31' 6"	NA
	4UJH05 013	UFA05 051	X			-16' 4 ¾"	NA
	4UJH05 006	4UJH05 026		X		-16' 4 ¾" to 0' 0"	1.5
	4UJH05 005	4UJH05 025		X		-16' 4 ¾" to 0' 0"	1.5
	4UJH05 005	4UJH05 021		X		-16' 4 ¾" to 0' 0"	1.5
	4UJH10 001	4UJH10 001			X	0' 0"	1.5
	4UJH10 004	4UJH10 004			X	0' 0"	1.5
FB	UFA17 057	UFA17 084		X		24' 3 ¼" to 48' 6 ¾"	0.8
RCB	NA[3]	RBA		X		-14' 1 ¼" to 162' 1¾ "	3.0

1) Doors have the same radiation attenuation ability as the walls in which they are placed.
2) These are ceiling slabs; all other slabs are floor slabs.
3) This barrier is the entire RCB peripheral wall, which is adjacent to the RBA.

Table 2.1.1-3—Spreading Area Water Ingression Barrier

NI Structure	From Room(s) [KKS]	To Room(s) [KKS]	Door	Wall	Elevation(s)
RCB	UJA07 029	UJA07 017		X	-7' 6 ½" to 16' 10 ¼"
	UJA07 028	UJA07 017		X	-7' 6 ½" to 16' 10 ¼"
	UJA07 020	UJA07 017		X	-7' 6 ½" to 16' 10 ¼"
	UJA07 026	UJA07 017		X	-7' 6 ½" to 16' 10 ¼"
	UJA07 020	UJA07 017	X		-7' 6 ½"

Table 2.1.1-4—RCB Rooms With Pipe Whip Restraints

UJA07 018
UJA11 024
UJA15 002
UJA15 005
UJA15 006
UJA15 009
UJA15 013
UJA15 014
UJA15 015
UJA15 016
UJA29 003
UJA29 004
UJA29 007
UJA29 008

Table 2.1.1-5—RBA Penetrations that Contain High Energy Pipelines (2 Sheets)

KKS	Penetration	Description
JEW	JMK10BQ001	Chemical & Volume Control System - Seal return
JEW	JMK10BQ004	Chemical & Volume Control System - Seal injection
JMQ	JMK43BQ116	Containment Heat Removal System - Screen flushing line
JMQ	JMK41BQ104	Containment Heat Removal System - Spray line
JMQ	JMK42BQ105	Containment Heat Removal System - Basemat cooling line
JNA	JMK10BQ103	LHSI/RHR suction line/RHR train 1
JNA	JMK20BQ203	LHSI/RHR suction line/RHR train 2
JNA	JMK30BQ308	LHSI/RHR suction line/RHR train 3
JNA	JMK40BQ403	LHSI/RHR suction line/RHR train 4
JNG	JMK10BQ101	LHSI/RHR
JNG	JMK20BQ201	LHSI/RHR
JNG	JMK30BQ301	LHSI/RHR
JNG	JMK40BQ401	LHSI/RHR
KBA	JMK10BQ002	CVCS - Charging
KBA	JMK10BQ003	CVCS - Letdown
KPL	JMK60BQ005	Gaseous Waste Processing System
KPL	JMK60BQ006	Gaseous Waste Processing System
KTA10	JMK10BQ007	Nuclear Island Drain & Vent System - PZR Degassing Line
LAB	JMK60BQ109	Feedwater to SG1
LAB	JMK70BQ207	Feedwater to SG2
LAB	JMK80BQ306	Feedwater to SG3
LAB	JMK90BQ409	Feedwater to SG4
LBA	JMK10BQ110	Main Steam Piping System - Main Steam 1
LBA	JMK20BQ208	Main Steam Piping System - Main Steam 2
LBA	JMK30BQ307	Main Steam Piping System - Main Steam 3
LBA	JMK40BQ410	Main Steam Piping System - Main Steam 4
LCA90	JMK10BQ304	Main Condensate Piping System - Condensate to Blowdown Coolers
LCA90	JMK10BQ305	Main Condensate Piping System - Condensate from Blowdown Coolers

Table 2.1.1-5—RBA Penetrations that Contain High Energy Pipelines (2 Sheets)

KKS	Penetration	Description
LCQ	JMK60BQ019	Steam Generator Blowdown System
LCQ	JMK60BQ205	Steam Generator Blowdown System

Table 2.1.1-6—SBs Flooding Pits and Relief Panels

NI Structure	From Room [KKS]	To Room [KKS]	Description	Elevation
SB 1	1UJH10 001	1UJH10 001	Flooding Pit	0' 0"
	1UJK26 028	1UJK26 041	Relief Panel	55' 1½"
SB 2	2UJH10 003	2UJH10 003	Flooding Pit	0' 0"
SB 3	3UJH10 003	3UJH10 003	Flooding Pit	0' 0"
SB 4	4UJH10 001	4UJH10 001	Flooding Pit	0' 0"
	4UJK26 028	4UJK26 038	Relief Panel	55' 1½"

Table 2.1.1-7—Nuclear Island Inspections, Tests, Analyses, and Acceptance Criteria (5 Sheets)

	Commitment Wording	Inspection, Analysis, or Test	Acceptance Criteria
2.1	The as-installed basic configuration of the NI structures is as described in Section, 2.1.1, and as shown on Figures 2.1.1-1, 2.1.1-3, 2.1.1.4, and 2.1.1.5	(a) An inspection of the as-installed basic configuration of the NI structures will be performed.	(a) The as-installed basic configuration of the NI structures is as follows: • The RCB peripheral wall and dome is within the RSB as shown on Figure 2.1.1-3. • SBs 4 and 1 are adjacent to the RSB at 90 and 270 degrees respectively as shown on Figure 2.1.1-1. • SBs 2 and 3 are adjacent to the RSB at 0 degrees as shown on Figure 2.1.1-1. • The FB is adjacent to the RSB at 180 degrees as shown on Figure 2.1.1-1. • The RSB cylindrical wall is thicker above the point where this wall meets the FB and SB structures roofs as shown on Figure 2.1.1-3. • The vent stack is located on top of the FB stair tower as shown on Figure 2.1.1-1. • The MFV and MSV stations are located in SBs 1 and 4 as shown on Figure 2.1.1-1. • The MCR, RSS, and TSC are located in the SBs 2 and 3, with the MCR and RSS separated, as shown on Figures 2.1.1-4 and 2.1.1-5.
		(b) An analysis will be performed	(b) Minimum containment free volume of 2.755×10^6 ft^3
3.1	The basic configuration of the NI structures includes: (a) an integrated contiguous barrier (b) decoupling of the SBs and the FB from their respective structures at their exterior walls	An inspection of the as-installed basic configuration of the NI structures will be performed.	The basic configuration of the NI structures has the following features: (a) The RSB, SBs 2 and 3, and the FB share a common boundary exterior surface at the SBs and FB structures roofs

Table 2.1.1-7—Nuclear Island Inspections, Tests, Analyses, and Acceptance Criteria (5 Sheets)

	Commitment Wording	Inspection, Analysis, or Test	Acceptance Criteria
	along the entire wall length and (c) SBs 2 and 3 decoupling from the RSB above elevation 0' 0" as described in this section, 2.1.1, and as shown on Figures 2.1.1-1, 2.1.1-2, 2.1.1-4, 2.1.1-6, 2.1.1-8, and 2.1.1-10.		and walls to form an integrated contiguous external surface for the RSB and SBs and FB structures as shown on Figures 2.1.1-1 and 2.1.1.-2. (b) SBs 2 and 3 and the FB are decoupled from their respective structures at the external SBs and FB walls along their entire length and SBs 2 and 3 from the RSB above the 0' 0" elevation as shown on Figures 2.1.1-4, 2.1.1-6 and 2.1.1-10. (c) SBs 2 and 3 are decoupled from their structure at the upper most ceilings as shown on Figure 2.1.1-8.
3.2	Six rib support structures are provided at the bottom of the reactor cavity as shown on Figure 2.1.1-13.	Inspection of the reactor vessel cavity will be performed.	Six rib support structures are provided at the bottom of the reactor cavity as shown on Figure 2.1.1-13.
3.3	A flooding wall, including a water tight door, is provided to prevent ingress of water into the core melt spreading area as described in Table 2.1.1-3.	Inspection of the RCB will be performed.	The RCB provides a flooding wall, including a water-tight door as described in Table 2.1.1-3.
3.4	Core melt cannot relocate to upper containment due to the existence of concrete barriers as shown on Figure 2.1.1-13.	Inspection of the RCB will be performed.	Concrete barriers are located within the RCB as shown on Figure 2.1.1-13.

Table 2.1.1-7—Nuclear Island Inspections, Tests, Analyses, and Acceptance Criteria (5 Sheets)

	Commitment Wording	Inspection, Analysis, or Test	Acceptance Criteria
4.2	The NI structures are seismic Category I and are constructed to withstand design basis loads as specified in Section 2.1.1, without loss of structural integrity.	A verification inspection of the NI structures design analysis versus construction records will be performed.	NI structures conform to the approved design and will withstand the design basis loads specified in Section 2.1.1, without loss of structural integrity.
4.3	The RCB as described in Section 2.1.1, and its penetrations as described in Section 3.5, Containment Isolation, retain their pressure boundary integrity associated with the RCB design pressure	A hydrostatic or pressure test will be performed on the components required by the ASME Code Section III to be tested.	Components identified in Table 3.5.1-1 as ASME Code Section III, conform with the requirements of the ASME Code Section III, Division 2, Section CC-6410.
4.4	The as-installed basic configuration of the NI structures, as described in Section 2.1.1 and Table 2.1.1-1, separates the four SBs so that the impact of internal hazards is contained in the SB of hazard origination.	An inspection of the as-installed basic configuration of the NI structures will be performed.	The as-installed basic configuration of the NI structures provides separation as described in Table 2.1.1-1.
4.5	The NI structures include barriers for postaccident radiation shielding, as described in Section 2.1.1 and in Table 2.1.1-2.	An inspection of the as-installed NI accident radiation barriers will be performed.	The as-installed NI structures barriers that provide postaccident radiation shielding are as described in Table 2.1.1-2.
4.6	As described in Section, 2.1.1, the RSB and RCB are constructed of reinforced concrete and the RCB is pre-stressed.	Inspection of the RSB and RCB construction records will be performed.	The RSB and RCB are constructed of reinforced concrete and the RCB is pre-stressed.

Table 2.1.1-7—Nuclear Island Inspections, Tests, Analyses, and Acceptance Criteria (5 Sheets)

	Commitment Wording	Inspection, Analysis, or Test	Acceptance Criteria
4.7	As described in Section 2.1.1, the RBA is separated from the SBs and the FB by barriers, doors, dampers and penetrations that have a minimum 3-hour fire rating.	(a) An analysis will be performed. (b) Inspection of barriers, doors, dampers and penetrations that separate the RBA from the SBs and FB will be performed.	(a) Completion of analysis that indicates barriers, doors, dampers, and penetrations that separate the RBA from the SBs and FB have a minimum 3-hour fire rating (b) The as-built configuration of barriers, doors, dampers and penetrations that separate the RBA from the SBs and FB agrees with construction drawings.
4.8	As described in Section 2.1.1, and shown on Figures 2.1.1-11 and 2.1.1-12, provisions are provided for water flow to the IRWST.	Inspection of the RCB will be performed.	The as-installed RCB configuration includes the following provisions: • As shown on Figure 2.1.1-11 rooms UJA11 002, UJA11 005, UJA11 006, and UJA11 009 contain trapezoidal-shaped openings in the floor and are provided with weirs and trash racks. • As shown on Figure 2.1.1-12, Rooms UJA07 014 and UJA07 015 contain wall openings slightly above the floor to allow water flow into the IRWST.
4.9	Essential SSCs in RCB rooms listed in Table 2.1.1-4 are protected from the dynamic effects of pipe breaks.	An analysis will be performed that indicates essential SSCs in RCB rooms listed in Table 2.1.1-4 are protected from the dynamic effects of pipe breaks.	Essential SSCs in RCB rooms listed in Table 2.1.1-4 are protected from the dynamic effects of pipe breaks.

Table 2.1.1-7—Nuclear Island Inspections, Tests, Analyses, and Acceptance Criteria (5 Sheets)

	Commitment Wording	Inspection, Analysis, or Test	Acceptance Criteria
4.10	As described in Section 2.1.1, RBA penetrations that contain high energy pipelines have guard pipes, as described in Table 2.1.1-5.	Inspection of the RBA will be performed.	RBA penetrations that contain high energy pipelines have guard pipes, as described in Table 2.1.1-5.
4.11	As described in Section 2.1.1, safety-related SSCs in the RBA are located above the structural design flooding level elevation.	Inspection of the RBA will be performed.	Safety-related SSCs in the RBA are located above elevation 0' 0".
4.12	As described in Section 2.1.1, above elevation 0' 0" of the SBs, flooding pits and flood relief panels provide for water flow to lower building levels or outside.	Inspection of the SBs will be performed.	The as-installed SBs configuration includes flooding pits and flood relief panels as described in Table 2.1.1-6.
4.13	As described in Section 2.1.1, rooms within the SBs and the FB below elevation 0' 0" are provided with sufficient interconnections to keep the maximum released water volume stored within the affected division.	(a) An analysis will be performed.	(a) Completion of analysis that indicates rooms within the SBs and the FB below elevation 0' 0" are provided with sufficient interconnections to keep the maximum released water volume stored within the affected division.
		(b) An inspection of the SBs and FB will be performed.	(b) The as-built configuration of SBs and FB interconnections, to keep the maximum released water volume stored below elevation 0' 0", agrees with construction drawings.
4.14	As described in Section 2.1.1, the SFSP has a depth of 47' 3".	An inspection of the SFP will be performed.	The as-built SFSP has a depth of 47' 3" as measured from the bottom of the SFSP to the fuel pool floor.