
REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 141-8098
SRP Section: 12.03-12.04 - Radiation Protection Design Features
Application Section: 12.3
Date of RAI Issue: 08/07/2015

Question No. 12.03-8

REQUIREMENT

10 CFR 52.47(a)(5) requires that the FSAR contain the kinds and quantities of radioactive materials expected to be produced in the operation and the means for controlling and limiting radioactive effluents and radiation exposures within the limits set forth in 10 CFR 20.

INFORMATION NEEDED

SRP 12.3-12.4 indicates that the shielding should be specified for each of the radiation sources identified in Chapter 11 and Section 12.2, and other applicable sections. Staff has identified the following shielding information that is missing or incorrect.

1. While FSAR Table 12.3-4 identifies design basis radiation shield thicknesses for plant rooms for which shielding is necessary, there are several rooms containing significant sources, or significant dose rates (some of them potentially greater than 100 Rad/hour), for which no shielding thicknesses are provided. Please provide the minimum required shield thicknesses for the following rooms in FSAR Table 12.3-4 or justify why they are not needed (if an area is inaccessible then minimum shielding thicknesses are not needed):
 - a. Room 089-C01 (Core Debris Chamber, Figure 12.3-3)
 - b. Room 086-A01A (Filter Area, Figure 12.3-3)
 - c. Room 063-P38 (Solidification and Drum Conveyor Room, Figure 12.3-10)
 - d. Room 085-P32 (Primary Sampling Sink Room, Figure 12.3-12)
 - e. Room 085-P45 (Drum Removal Chase, Figures 12.3-11 through 12.3-12)

- f. Room 100-P02 (GRS Equipment Removal Area, Figure 12.3-13)
 - g. Room 100-P10 (Spent Filter Drum Storage Area, Figure 12.3-13)
 - h. Room 120-P01 (Gaseous Radwaste Sample Control Panel Room, Figure 12.3-14)
 - i. Room 120-P02 (Gaseous Radwaste Sample Valve Rack Room, Figure 12.3-14)
2. In FSAR Table 12.3-4 Room 063-005 is labeled "Future Use" and Room 063-P06 is labeled "Spent Resin Long-term Storage Tank Room" however, in FSAR Figure 12.3-12 Room 063-005 is labeled "Spent Resin Long-Term Storage Tank Room" and Room 063-P06 is labeled "Future Use." Please correct this discrepancy.
3. While the FSAR indicates that there are four gaseous radwaste system delay beds, it is unclear which rooms each delay bed is located. FSAR Table 12.3-4 indicates that Rooms 096-P01 and 096-P02 are delay bed rooms. Please specify in the FSAR which rooms each of the delay beds (1, 2, 3, and 4) are located.

Response – (Rev. 1)

1. The minimum required shield thicknesses for the above rooms except for Core Debris Chamber and Filter Area is provided in DCD Table 12.3-4.

Core Debris Chamber (089-C01) is designed to minimize the direct containment heating as a severe accident mitigation feature and personnel access to this area is not allowed during normal operation. Since this area is surrounded by massive concrete structure with more than 6 feet, it is not necessary to provide additional shielding requirement.

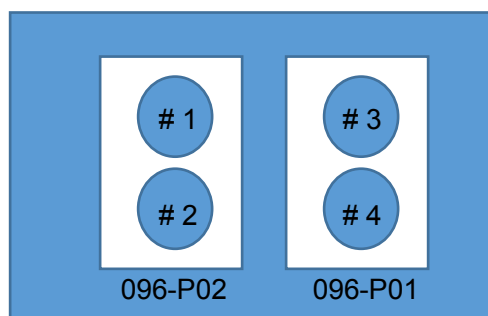
The Filter Area (086-A01A) shown in Figure 12.3-3 is an open space above the filter cubicles used for replacement of the spent filters. Therefore, shielding for this area is not required. The arrow marker for the Filter Area in Figure 12.3-3 looks like it is indicating the Filter Cartridge Storage Room (077-A15A), which is shown in Figure 12.3-2. Minimum shield thicknesses for the Filter Cartridge Storage Room are provided in Table 12.3-4.

In addition, the minimum shield thicknesses for other missing rooms such as Chemical Drain Sump Pump room (055-A31B), Condensate Return Unit room (055-A46A), Valve room (055-A59A), and Refueling Canal (119-A01B) will also be added in DCD Table 12.3-4.

Table 12.3-4 was originally prepared to provide the minimum shield thicknesses required to maintain the radiation zone during normal operation. However, since the eventual shield thicknesses are determined to provide accessibility to vital areas during post-accident conditions, Table 12.3-4 is updated to provide the thicknesses which meet both normal operation and accident conditions. In addition, Table 12.3-4 is updated to correct some discrepancies between the table and the supporting shielding calculations.

In addition, DCD Tier 1 Table 2.2.1-1 will be revised to incorporate the consistent information with Tier 2 Table 12.03-8 on the minimum required shielding thickness for the south wall of the volume control tank room as indicated in Attachment 2.

2. As shown in DCD Figure 12.3-12, Room 063-P05 is the Spent Resin Long-term Storage Tank Room, and Room 063-P06 is a room for "Future Use". Therefore, Table 12.3-4 will be updated to correct this discrepancy.
3. Two delay beds are located in a cubicle. The first and second delay beds are located in Room 096-P02, and the third and fourth beds are in Room 096-P01 as below;



Impact on DCD

DCD Tier 1 Table 2.2.1-1 and Tier 2 Table 12.3-4 will be revised as indicated in Attachments 1 and 2.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

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Table 12.3-4 (1 of 7)

This table should be revised based on "A" after this table

Design Basis Radiation Shield Thicknesses

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Containment Building							
069-C01	ICI Cavity	-	60	79	60	-	-
078-C01	Reactor Cavity	80	80	79	79	-	-
080-C01	Holdup Volume Tank	36	36	-	79	-	-
100-C03	Reactor Drain Tank	24	24	48	24	-	-
100-C04	Letdown HX Room	24	24	48	24	-	-
128-C01	Regenerative HX Room	60	60	48	48	-	-
Auxiliary Building							
050-A01C	CS Pump & Miniflow HX Room	10	20	10	20	Ground	27
050-A01D	CS Pump & Miniflow HX Room	20	10	10	20	Ground	27
050-A02C	SI Pump Room	10	17	10	10	Ground	25
050-A02D	SI Pump Room	17	10	10	10	Ground	25
050-A03A	SI Pump Room	25	17	10	10	Ground	25
050-A03B	SI Pump Room	17	10	10	10	Ground	25
050-A04A	SC Pump and Miniflow HX Room	10	20	22	24	Ground	27
050-A04B	SC Pump and Miniflow HX Room	20	21	22	24	Ground	27
055-A01C	CS HX Room	10	10	10	10	Ground	10
055-A01D	CS HX Room	10	10	10	10	Ground	10
055-A08C	Floor Drain Sump Pump Room	17	10	14	10	Ground	14
055-A08D	Floor Drain Sump Pump Room	10	10	14	10	Ground	14
055-A14C	Pipe Chase and Valve Room	13	10	20	13	Ground	16
055-A14D	Pipe Chase and Valve Room	10	21	10	21	Ground	21
055-A18A	Pipe Chase and Valve Room	29	10	29	20	Ground	16
055-A18B	Pipe chase and Valve Room	15	21	10	10	Ground	21
055-A21A	Pipe Chase and Valve Room	10	23	25	32	Ground	32

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This table should be revised based on "A" after this table

Table 12.3-4 (2 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Auxiliary Building (cont.)							
055-A21B	Pipe Chase and Valve Room	25	10	20	10	Ground	32
055-A22A	Pipe Chase	10	10	33	21	Ground	10
055-A22B	Pipe Chase	10	10	24	21	Ground	13
055-A30A	SC HX Room	22	35	35	22	Ground	25
055-A30B	SC HX Room	35	27	35	22	Ground	28
055-A33A	Equipment Drain Sump Pump Room	10	22	14	10	Ground	14
055-A33B	Equipment Drain Sump Pump Room	19	10	10	10	Ground	15
055-A34A	Floor Drain Sump Pump Room	10	22	10	22	Ground	11
055-A34B	Floor Drain Sump Pump Room	22	10	10	22	Ground	34
055-A38A	Boronometer Room	25	25	16	25	Ground	28
055-A39A	Process Radiation Monitor Room	19	19	11	19	Ground	21
055-A42A	Charging Pump Room	17	24	24	28	Ground	22
055-A43A	Charging Pump Miniflow HX Room	10	18	10	15	Ground	19
055-A45A	Pipe Chase	27	17	25	10	Ground	24
055-A47B	Primary Off-Gas Sample Pump Room	16	14	16	15	Ground	14
055-A51B	Equipment Drain Tank Room	12	28	37	26	Ground	24
055-A52B	Reactor Drain Pump Room	13	12	10	13	Ground	10
055-A53B	Reactor Drain Pump Room	13	12	23	10	Ground	10
055-A54B	Aux. Charging Pump Room	10	14	14	12	Ground	13
055-A55B	Charging Pump Room	14	14	14	39	Ground	17
055-A56A	Valve Room	12	10	28	18	Ground	19
055-A56B	Valve Room	14	20	12	10	Ground	10
055-A58A	Pipe Chase	18	10	26	26	Ground	20
068-A06A	Gas Stripper Room	37	35	45	35	30	24
068-A07A	Hot Pipe Way	13	29	31	29	24	24

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This table should be revised based on "A" after this table

Table 12.3-4 (3 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Auxiliary Building (cont.)							
068-A08B	Hot Pipe Way	33	24	24	22	23	30
068-A09B	Valve Room	36	17	23	36	10	14
068-A10A	Filter and Demin. Valve Area	10	10	33	33	30	19
068-A11A	Filter and Demin. Valve Area	15	36	15	27	21	21
068-A12A	Filter and Demin. Valve Area	10	18	10	18	17	29
077-A01A	Reactor Drain Filter Pit	35	10	10	14	24	23
077-A02A	SFP Cleanup Filter Pit	10	10	10	10	23	23
077-A03A	SFP Demin Filter Pit	10	17	10	24	23	23
077-A04A	SFP Cleanup Filter Pit	10	10	10	10	23	23
077-A05A	SFP Demin. Filter Pit	10	10	10	10	23	23
077-A06A	Purification Filter Pit	10	10	10	10	10	39
077-A07A	Reactor Makeup Water Filter Pit	18	32	24	18	10	10
077-A08A	Purification Filter Pit	10	10	10	10	10	39
077-A09A	SGBD Filter Pit	10	10	10	10	22	23
077-A10A	Seal Injection Filter Pit	10	10	10	11	24	24
077-A11A	SGBD Filter Pit	10	10	10	10	22	23
077-A12A	Seal Injection Filter Pit	10	13	10	10	14	24
077-A13A	SGBD Filter Pit	35	10	10	10	22	23
077-A14A	Boric Acid Filter Pit	13	18	10	29	10	13
077-A15A	Filter Cartridge Storage	32	39	39	39	18	39
078-A21A	Pipe Chase	10	35	48	21	10	22
078-A21B	Pipe Chase	36	10	24	21	10	10
078-A32A	SPF Cleanup Demin. Room	10	23	23	21	10	24
078-A33A	SG Blowdown Demin. Room	33	10	25	10	10	23
078-A34A	Pre-Holdup IX Room	33	15	15	33	24	15
078-A35A	Purification IX Room	12	24	29	43	29	42
078-A36A	Boric Acid IX Room	24	18	18	18	18	18

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This table should be revised based on "A" after this table

Table 12.3-4 (4 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Auxiliary Building (cont.)							
078-A37A	Deborating IX Room	15	12	10	26	24	24
078-A38A	SFP Cleanup Pump Room	18	16	23	10	32	32
078-A39A	Gas Stripper Effluent Radiation Monitor Room	23	23	23	10	16	35
078-A40B	Boric Acid Concentrator Room	16	23	23	14	16	16
100-A32B	SFP Cooling HX Room	10	10	10	10	10	10
100-A29B	Pipe and HVAC Chase	10	10	10	10	10	10
100-A13A	Mechanical Penetration Room	25	22	22	30	34	14
100-A13B	Mechanical Penetration Room	35	10	23	21	36	10
100-A16D	Pipe Chase	23	21	23	23	10	13
100-A16C	Pipe Chase	21	10	10	10	10	10
100-A24A	SFP Cooling HX Room	12	10	12	32	24	10
100-A26A	Valve Room	28	20	20	28	32	10
100-A25A	Volume Control Tank Room	42	47	42	47	48	53
111-A01B	Cask Loading Pit	48	14	48	48	42	-
114-A01B	Spent Fuel Pool	62	60	59	71	73	-
120-A16B	Mechanical Penetration Room	29	27	10	21	18	29
120-A16A	Mechanical Penetration Room	23	12	23	21	17	19
120-A23A	Valve Room	18	11	18	18	18	18
120-A14A	SG Blowdown Regen. HX Room	12	10	10	21	14	21
137-A19A	SG Blowdown Flash Tank Room	18	18	18	21	18	18
156-A14A	Aux. Bldg Controlled Area (I) Normal Exhaust ACU Room	18	18	18	18	18	18
174-A15B	Containment High- and Low-volume Purge ACU Room	21	21	21	21	15	10
195-A08B	Aux. Bldg. Controlled Area (II) Normal Exhaust ACU Room	18	18	18	18	18	18

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This table should be revised based on "A" after this table

Table 12.3-4 (5 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Compound Building							
063-P01	Hot Pipe Chase	10	28	28	10	Ground	10
063-P02	GRS Header Drain Tank Room	35	40	48	36	Ground	18
063-P03	Valve Room	30	10	37	27	Ground	10
063-P04	GRS Inlet Skid Room	21	32	10	21	Ground	10
063-P05	Future Use	27	35	48	36	Ground	46
063-P06	Spent Resin Long-term Storage Tank Room	36	27	48	36	Ground	39
063-P07	Valve Room	16	29	36	30	Ground	10
063-P08	Low-activity Spent Resin Tank Room	27	32	35	10	Ground	10
063-P09	Valve Room	16	36	10	16	Ground	18
063-P13	Hot Pipe Chase	40	33	40	33	Ground	22
063-P14	Hot Tool Room	15	10	10	10	Ground	32
063-P21	Equip. Waste Pump Room	17	19	10	20	Ground	17
063-P22	Equip. Waste Pump Room	10	17	10	21	Ground	18
063-P23	Equip. Waste Tank Room	13	33	20	22	Ground	27
063-P24	Equip. Waste Tank Room	16	13	21	22	Ground	27
063-P25	Floor Drain Pump Room	14	10	11	19	Ground	10
063-P26	Normal Sump Pump Room	14	14	11	14	Ground	16
063-P27	Chemical Waste Pump Room	10	14	10	13	Ground	16
063-P28	Floor Drain Tank Room	16	16	19	20	Ground	29
063-P29	Floor Drain Tank Room	16	16	19	20	Ground	29
063-P30	Chemical Waste Tank Room	10	16	14	10	Ground	15
063-P31	Chemical Waste Tank Room	10	10	13	10	Ground	15
063-P36	Chemical Drain Sump Pump Room	10	10	10	10	Ground	14

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This table should be revised based on "A" after this table

Table 12.3-4 (6 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Compound Building (cont.)							
063-P37	Monitor Tank Room	10	10	10	10	Ground	10
063-P39	Spent Resin Long-term Storage Tank Sump Pump Room	18	20	18	21	Ground	18
063-P40	Concentrate Pump Room	27	24	20	16	Ground	19
063-P41	Concentrate Holding Tank Room	21	27	37	28	Ground	10
063-P42	RO Feed Pump Room	10	10	28	16	Ground	28
063-P43	IX Feed Pump Room	16	10	16	10	Ground	35
063-P44	IX Feed Tank Room	14	16	11	14	Ground	23
063-P47	CTS HEPA Vacuum Skid Room	24	10	21	10	Ground	10
063-P48	CTS Dryer Skid Room	31	24	14	21	Ground	15
063-P49	CTS Vacuum Skid Room	18	18	21	18	Ground	14
063-P54	Monitor Tank Pump Room	10	10	10	10	Ground	14
063-P73	Instrument Calibrator Facility	36	48	18	48	Ground	36
077-P01	Hot Pipe Way	18	35	41	34	35	30
085-P01	Waste Gas Dryer Skid Room	17	25	25	19	17	22
085-P02	Waste Gas Dryer Skid Room	11	17	17	19	17	22
085-P03	Valve Room	48	11	30	34	18	35
085-P04	Charcoal Guard Bed Room	10	23	34	18	10	27
085-P06	Valve Room	19	34	36	30	10	27
085-P07	Valve Room	22	24	31	28	10	24
085-P08	Valve Room	24	19	22	24	19	24
085-P15	Valve Room	10	23	23	18	10	23
085-P16	Valve Room	10	22	21	19	10	22
085-P17	Valve Room	10	13	10	10	10	20
085-P20	Valve Room	12	19	19	19	10	16
085-P21	Charcoal Guard Bed Room	10	10	10	13	10	27
085-P31	Primary Sampling Room	10	10	10	10	10	10

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This table should be revised based on "A" after this table

Table 12.3-4 (7 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
<u>Compound Building (cont.)</u>							
085-P42	IX Module Room	10	30	24	27	10	28
085-P43	IX Module Room	30	10	24	30	10	28
085-P44	RO Feed Tank Room	10	22	32	22	19	25
085-P46	MF Membrane Module Room	23	10	25	17	18	16
085-P47	MF Membrane Module Room	23	16	10	12	15	21
085-P48	RO Membrane Module and Valve Skid Room	48	23	48	34	32	36
096-P01	Charcoal Delay Bed Room	22	19	21	14	28	17
096-P02	Charcoal Delay Bed Room	47	44	14	41	35	42
100-P08	Truck Bay	26	15	36	37	36	31
100-P09	Waste Drum Storage Area	20	26	27	13	21	31

Table 12.3-4 (1 of 7)

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“A”

Design Basis Radiation Shield Thicknesses

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Containment Building							
069-C01	ICI Cavity	-	60	79	60	Ground	-
078-C01	Reactor Cavity	80	80	79	79	Ground	-
080-C01	Holdup Volume Tank	36	36	-	79	Ground	-
100-C02	Steam Generator Cavity	36	36	30	36	Ground	-
100-C03	Reactor Drain Tank	24	24	48	24	-	24
100-C04	Letdown HX Room	24	24	48	24	-	24
128-C01	Regenerative HX Room	60	60	48	48	24	48
136-C02	Pressurizer Cavity	33	36	30	33	30	-
Auxiliary Building							
050-A01C	CS Pump & Miniflow HX Room	48	48	10	20	Ground	30
050-A01D	CS Pump & Miniflow HX Room	48	48	10	20	Ground	30
050-A02C	SI Pump Room	48	48	10	10	Ground	30
050-A02D	SI Pump Room	48	48	10	10	Ground	30
050-A03A	SI Pump Room	48	48	10	10	Ground	30
050-A03B	SI Pump Room	48	48	10	10	Ground	30
050-A04A	SC Pump and Miniflow HX Room	48	48	27	10	Ground	30
050-A04B	SC Pump and Miniflow HX Room	48	48	27	10	Ground	30
055-A01C	CS HX Room	10	10	10	10	Ground	10
055-A01D	CS HX Room	10	10	10	10	Ground	10
055-A08C	Floor Drain Sump Pump Room	14	10	14	10	Ground	14
055-A08D	Floor Drain Sump Pump Room	10	14	14	10	Ground	14
055-A14C	Pipe Chase and Valve Room	13	48	20	13	Ground	30
055-A14D	Pipe Chase and Valve Room	48	18	10	48	Ground	30
055-A18A	Pipe Chase and Valve Room	42	48	48	20	Ground	30
055-A18B	Pipe chase and Valve Room	48	42	48	10	Ground	30
055-A21A	Pipe Chase and Valve Room	10	48	25	29	Ground	32

“A”

Table 12.3-4 (2 of 7)

		Minimum Required Shield Thickness (inches)					
Room Number	Room Name	North	South	East	West	Floor	Ceiling
		Auxiliary Building (cont.)					
055-A21B	Pipe Chase and Valve Room	48	10	20	10	Ground	32
055-A22A	Pipe Chase	10	10	33	42	Ground	10
055-A22B	Pipe Chase	10	10	27	42	Ground	10
055-A30A	SC HX Room	22	30	30	22	Ground	25
055-A30B	SC HX Room	30	30	30	22	Ground	28
055-A31B	Chemical Drain Sump Pump Room	27	10	10	10	Ground	20
055-A33A	Equipment Drain Sump Pump Room	10	22	14	10	Ground	14
055-A33B	Equipment Drain Sump Pump Room	19	10	10	10	Ground	17
055-A34A	Floor Drain Sump Pump Room	10	22	10	22	Ground	11
055-A34B	Floor Drain Sump Pump Room	22	10	10	22	Ground	18
055-A38A	Boronometer Room	25	25	34	25	Ground	28
055-A39A	Process Radiation Monitor Room	19	19	11	19	Ground	21
055-A42A	Charging Pump Room	17	24	24	28	Ground	22
055-A43A	Charging Pump Miniflow HX Room	10	18	10	10	Ground	19
055-A45A	Pipe Chase	27	17	25	10	Ground	24
055-A46A	Condensate Return Unit Room	28	37	10	16	Ground	16
055-A47B	Primary Off-Gas Sample Pump Room	16	10	16	15	Ground	10
055-A51B	Equipment Drain Tank Room	12	28	37	26	Ground	24
055-A52B	Reactor Drain Pump Room	13	12	10	13	Ground	17
055-A53B	Reactor Drain Pump Room	13	12	23	10	Ground	17
055-A54B	Aux. Charging Pump Room	10	14	14	12	Ground	13
055-A55B	Charging Pump Room	14	14	14	20	Ground	17
055-A56A	Valve Room	10	18	28	10	Ground	19
055-A56B	Valve Room	14	20	12	10	Ground	10
055-A58A	Pipe Chase	18	10	26	26	Ground	10
055-A59A	Valve Room	19	10	26	34	Ground	24

Table 12.3-4 (3 of 7)

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“A”

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Auxiliary Building (cont.)							
068-A06A	Gas Stripper Room	37	35	45	35	30	24
068-A07A	Hot Pipe Way	13	29	31	29	24	24
068-A08B	Hot Pipe Way	33	24	24	20	23	30
068-A09B	Valve Room	19	17	23	19	17	10
068-A10A	Filter and Demin. Valve Area	10	10	33	33	30	24
068-A11A	Filter and Demin. Valve Area	10	24	10	22	24	21
068-A12A	Filter and Demin. Valve Area	10	18	10	18	17	29
077-A01A	Reactor Drain Filter Pit	35	10	10	15	10	23
077-A02A	SFP Cleanup Filter Pit	10	10	10	10	23	23
077-A03A	SFP Demin Filter Pit	10	17	10	24	23	23
077-A04A	SFP Cleanup Filter Pit	10	10	10	10	23	23
077-A05A	SFP Demin. Filter Pit	10	10	10	10	23	23
077-A06A	Purification Filter Pit	10	10	10	10	10	39
077-A07A	Reactor Makeup Water Filter Pit	18	32	24	18	10	10
077-A08A	Purification Filter Pit	10	10	10	10	10	39
077-A09A	SGBD Filter Pit	10	10	10	10	22	23
077-A10A	Seal Injection Filter Pit	10	10	10	11	24	24
077-A11A	SGBD Filter Pit	10	10	10	10	22	23
077-A12A	Seal Injection Filter Pit	10	13	10	10	13	24
077-A13A	SGBD Filter Pit	35	10	10	10	22	23
077-A14A	Boric Acid Filter Pit	13	18	10	29	10	13
077-A15A	Filter Cartridge Storage	32	39	39	39	25	39
078-A21A	Pipe Chase	10	36	48	48	10	24
078-A21B	Pipe Chase	36	10	48	48	10	10
078-A32A	SPF Cleanup Demin. Room	10	22	22	21	12	24
078-A33A	SG Blowdown Demin. Room	33	10	23	10	10	23
078-A34A	Pre-Holdup IX Room	33	15	15	33	15	24
078-A35A	Purification IX Room	12	24	29	43	29	42
078-A36A	Boric Acid IX Room	24	18	18	18	18	18

“A”

Table 12.3-4 (4 of 7)

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Auxiliary Building (cont.)							
078-A37A	Deborating IX Room	15	12	10	24	24	24
078-A38A	SFP Cleanup Pump Room	23	23	23	10	23	32
078-A39A	Gas Stripper Effluent Radiation Monitor Room	23	23	23	10	16	35
078-A40B	Boric Acid Concentrator Room	16	23	23	14	16	16
086-A01A	Filter Area	-	-	18	21	13	10
100-A32B	SFP Cooling HX Room	10	10	10	10	10	10
100-A29B	Pipe and HVAC Chase	10	12	10	66	10	10
100-A13A	Mechanical Penetration Room	48	48	48	48	34	13
100-A13B	Mechanical Penetration Room	48	10	48	48	36	10
100-A16D	Pipe Chase	48	48	48	48	10	23
100-A16C	Pipe Chase	48	48	48	48	13	10
100-A24A	SFP Cooling HX Room	12	10	12	40	24	10
100-A26A	Valve Room	28	41	21	28	32	10
100-A25A	Volume Control Tank Room	42	42	42	47	48	53
111-A01B	Cask Loading Pit	48	14	48	48	42	-
114-A01B	Spent Fuel Pool	62	60	59	68	71	-
119-A01B	Refueling Canal	60	59	62	48	62	-
120-A16B	Mechanical Penetration Room	29	27	33	48	18	29
120-A16A	Mechanical Penetration Room	20	24	20	48	17	19
120-A23A	Valve Room	18	25	18	18	10	18
120-A14A	SG Blowdown Regen. HX Room	12	10	10	21	14	21
137-A19A	SG Blowdown Flash Tank Room	18	18	18	21	18	18
156-A14A	Aux. Bldg Controlled Area (I) Normal Exhaust ACU Room	18	18	18	18	18	18
174-A15B	Containment High- and Low-volume Purge ACU Room	21	21	21	21	15	10
195-A08B	Aux. Bldg. Controlled Area (II) Normal Exhaust ACU Room	18	18	18	18	18	18

Table 12.3-4 (5 of 7)

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“A”

		Minimum Required Shield Thickness (inches)					
Room Number	Room Name	North	South	East	West	Floor	Ceiling
		Compound Building					
063-P01	Hot Pipe Chase	10	28	28	10	Ground	17
063-P02	GRS Header Drain Tank Room	35	40	48	36	Ground	18
063-P03	Valve Room	27	30	37	10	Ground	10
063-P04	GRS Inlet Skid Room	21	32	10	21	Ground	13
063-P05	Spent Resin Long-term Storage Tank Room	27	35	48	36	Ground	46
063-P06	Future Use	36	27	48	36	Ground	39
063-P07	Valve Room	16	29	36	30	Ground	14
063-P08	Low-activity Spent Resin Tank Room	27	32	35	10	Ground	10
063-P09	Valve Room	16	36	10	16	Ground	18
063-P13	Hot Pipe Chase	40	33	40	33	Ground	19
063-P14	Hot Tool Room	15	10	10	10	Ground	32
063-P21	Equip. Waste Pump Room	17	19	10	20	Ground	17
063-P22	Equip. Waste Pump Room	10	17	10	21	Ground	17
063-P23	Equip. Waste Tank Room	13	33	20	22	Ground	27
063-P24	Equip. Waste Tank Room	16	13	21	22	Ground	27
063-P25	Floor Drain Pump Room	14	10	11	19	Ground	10
063-P26	Normal Sump Pump Room	14	14	10	19	Ground	16
063-P27	Chemical Waste Pump Room	10	14	10	15	Ground	16
063-P28	Floor Drain Tank Room	16	16	19	20	Ground	29
063-P29	Floor Drain Tank Room	16	16	19	20	Ground	29
063-P30	Chemical Waste Tank Room	10	16	15	10	Ground	15
063-P31	Chemical Waste Tank Room	10	10	15	10	Ground	15
063-P36	DWS Drain Sump Pump Room	10	10	10	10	Ground	10

Table 12.3-4 (6 of 7)

“A”

		Minimum Required Shield Thickness (inches)					
Room Number	Room Name	North	South	East	West	Floor	Ceiling
		Compound Building (cont.)					
063-P37	Monitor Tank Room	10	18	11	18	Ground	10
063-P38	PSS-Solidification & Drum Conveyer Room	17	24	24	21	Ground	14
063-P39	Spent Resin Long-term Storage Tank Sump Pump Room	18	20	18	21	Ground	18
063-P40	Concentrate Pump Room	27	24	20	16	Ground	19
063-P41	Concentrate Holding Tank Room	21	27	33	28	Ground	10
063-P42	RO Feed Pump Room	10	10	28	16	Ground	24
063-P43	IX Feed Pump Room	16	10	16	10	Ground	24
063-P44	IX Feed Tank Room	14	16	11	10	Ground	23
063-P47	CTS HEPA Vacuum Skid Room	24	10	21	10	Ground	10
063-P48	CTS Dryer Skid Room	31	24	17	21	Ground	15
063-P49	CTS Vacuum Skid Room	10	10	21	10	Ground	18
063-P54	Monitor Tank Pump Room	10	10	10	10	Ground	14
063-P73	Instrument Calibrator Facility	36	43	18	48	Ground	36
085-P01	Waste Gas Dryer Skid Room	17	25	25	19	17	22
085-P02	Waste Gas Dryer Skid Room	11	17	10	19	17	22
085-P03	Valve Room	48	11	30	26	18	36
085-P04	Charcoal Guard Bed Room	26	26	34	18	10	23
085-P06	Valve Room	19	26	36	30	19	27
085-P07	Valve Room	27	24	30	30	14	24
085-P08	Valve Room	24	19	22	24	19	24
085-P15	Valve Room	10	21	21	18	10	23
085-P16	Valve Room	10	22	18	19	10	22
085-P17	Valve Room	10	10	10	14	10	17
085-P20	Valve Room	16	16	16	16	10	16
085-P21	Charcoal Guard Bed Room	26	26	18	34	10	23
085-P31	Primary Sampling Room	10	10	10	10	10	10

Table 12.3-4 (7 of 7)

“A”

Room Number	Room Name	Minimum Required Shield Thickness (inches)					
		North	South	East	West	Floor	Ceiling
Compound Building (cont.)							
085-P32	Primary Sampling Sink Room	10	13	12	12	14	18
085-P42	IX Module Room	10	30	30	27	14	28
085-P43	IX Module Room	30	10	30	30	14	28
085-P44	RO Feed Tank Room	10	27	32	22	19	25
085-P45	Drum Removal Chase	15	15	15	15	-	25
085-P46	MF Membrane Module Room	23	10	20	15	18	16
085-P47	MF Membrane Module Room	23	16	10	12	15	16
085-P48	RO Membrane Module and Valve Skid Room	43	24	43	34	32	36
096-P01	Charcoal Delay Bed Room	22	19	21	14	28	17
096-P02	Charcoal Delay Bed Room	47	44	14	38	36	42
100-P02	GRS Equipment Removal Area	13	11	38	10	23	10
100-P07	Future Extension Area	24	30	36	37	24	31
100-P08	Truck Bay	24	24	36	37	36	31
100-P09	Waste Drum Storage Area	28	24	36	26	34	31
100-P10	Spent Filter Drum Storage Area	36	28	48	37	36	43
120-P01	Gaseous Radwaste Sample Control Panel Room	10	10	10	11	17	25
120-P02	Gaseous Radwaste Sample Valve Rack Room	20	10	25	17	17	25

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Table 2.2.1-1 (8 of 10)

100'-0"

Wall or Section Description	Column Lines	Floor Elevation or Elevation Range	Concrete Thickness ⁽¹⁾	Applicable Radiation Shielding Wall (Yes/No)
Column Line AD Wall	From 15 to 17 From 22 to 26	From 55'-0" to 120'-0" From 55'-0" to 156'-0"	3'-0"	Yes
Column Line AD Wall	From 12 to 15	From 78'-0" to 100'-0"	2'-6"	No
Column Line AD Wall	From 12 to 15	From 137'-6" to 156'-0"	2'-6"	No
Column Line AD Wall	From 12 to 15	From 156'-0" to 174'-0"	2'-0"	Yes
Column Line AE Wall	From 12 to 15 From 22 to 23	From 55'-0" to 195'-0" From 55'-0" to 156'-0"	3'-0"	Yes
Column Line AE Wall	From 23 to 24	From 100'-0" to 137'-6"	3'-0"	Yes
Column Line AE Wall	From 24 to 25	From 100'-0" to 137'-6"	4'-0"	Yes
Column Line AE Wall	From 23 to 26	From 137'-6" to 156'-0"	3'-0"	Yes
Column Line AF Wall	From 12 to 15	From 55'-0" to 156'-0"	2'-6"	No
Column Line AF Wall	From 22 to 26	From 55'-0" to 120'-0"	4'-0"	Yes
Column Line AF Wall	From 22.5 to 25.5	From 120'-0" to 156'-0"	8'-7"	Yes
Column Line AF Wall	From 22 to 26	From 156'-0" to 213'-6"	4'-0"	Yes
Column Line AF Wall	From 13 to 15	From 174'-0" to 195'-0"	3'-0"	No
Column Line AG Wall	From 12 to 15 From 22 to 23	From 55'-0" to 195'-0"	3'-0"	Yes
Column Line AG Wall	From 25 to 26	From 55'-0" to 171'-0"	3'-0"	Yes
Column Line AH Wall	From 15 to 17	From 55'-0" to 120'-0"	3'-0"	Yes
Column Line AH Wall	From 12 to 15	From 78'-0" to 100'-0"	2'-6"	No

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Column Line AD Wall	From 22 to 24 From 25 to 26	From 100'-0" to 137'-6"	3'-0"	Yes
Column Line AD Wall	From 24 to 25	From 100'-0" to 137'-6"	3'-6"	Yes
Column Line AD Wall	From 22 to 26	From 137'-6" to 156'-0"	3'-0"	Yes