ArevaEPRDCPEm Resource

From: WELLS Russell (AREVA) [Russell.Wells@areva.com]
Sent: Monday, March 28, 2011 12:54 PM
To: Tesfaye, Getachew
Cc: LENTZ Tony (EXTERNAL AREVA); SHARPE Robert (AREVA); RANSOM James (AREVA); LOWMAN Skip (AREVA); BENNETT Kathy (AREVA); DELANO Karen (AREVA); HALLINGER Pat (EXTERNAL AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WILLIFORD Dennis (AREVA)
Subject: Draft Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Question 14.03
Attachments: RAI 104 Question 14.03-1 Response US EPR DC - DRAFT.pdf

Getachew,

Attached is a draft response for RAI No. 104, Question 14.03, parts a.2 and a.3, in advance of the May 5, 2011 final date.

Let me know if the staff has questions or if this can be sent as a final response.

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)
Sent: Monday, March 28, 2011 12:49 PM
To: 'Tesfaye, Getachew'
Cc: LENTZ Tony (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 10

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	May 5, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: BRYAN Martin (External RS/NB)
Sent: Friday, January 07, 2011 2:45 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	March 28, 2011
RAI 104 — 14.03-1, Part a3	March 28, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Thursday, October 21, 2010 3:35 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); LENTZ Tony (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 8

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	January 7, 2011
RAI 104 — 14.03-1, Part a3	January 7, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Tuesday, August 31, 2010 5:24 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); LENTZ Tony (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	October 21, 2010
RAI 104 — 14.03-1, Part a3	October 21, 2010

Sincerely

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Tuesday, August 10, 2010 7:41 AM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); LENTZ Tony F (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	September 1, 2010
RAI 104 — 14.03-1, Part a3	September 1, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Friday, May 21, 2010 11:36 AM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); ROMINE Judy (AREVA NP INC); LENTZ Tony F (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 5

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	August 10, 2010
RAI 104 — 14.03-1, Part a3	August 10, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016

702 561-3528 cell
Martin.Bryan.ext@areva.com

From: Pederson Ronda M (AREVA NP INC)
Sent: Tuesday, December 08, 2009 6:58 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) is unable to provide a response to the remaining RAI No. 104 question at this time. The schedule for providing a response to the remaining parts of Question 14.03-1 is being revised because the associated subcompartment pressurization calculations are still being performed.

The revised schedule for technically correct and complete responses to the remaining parts of the question is provided below:

Question #	Response Date
RAI 104 — 14.03-1, Part a2	May 21, 2010
RAI 104 — 14.03-1, Part a3	May 21, 2010

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: WELLS Russell D (AREVA NP INC)
Sent: Friday, June 12, 2009 5:43 PM
To: 'Getachew Tesfaye'
Cc: Pederson Ronda M (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 3

Getachew,

AREVA NP Inc. (AREVA NP) provided responses to 2 of the 4 questions of RAI No. 104 on December 12, 2008. AREVA NP submitted Supplement 1 to the response on February 11, 2009 which provided a compete response to Question 14.03.11-1 and a partial response to Question 14.03-1. AREVA NP informed NRC on May 22, 2009 that a schedule for providing a complete response to Question 14.03-1 would be provided by June 12, 2009. The attached file, “RAI 104 Supplement 3 US EPR DC.pdf,” provides a partial response to the remaining question.

The schedule for providing a response to the remaining parts of the Question 14.03-1 is being revised because the associated containment analyses are scheduled to be performed as a part of the Response to RAI 209, Question 06.02.01-14 (due to the NRC by December 18, 2009).

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 104 Question 14.03-1, Parts a1 and a4.

The following table indicates the respective pages in the response document, "RAI 104 Supplement 3 US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 104 — 14.03-1, Part a	2	4

The revised schedule for a technically correct and complete response to the remaining parts of the question is provided below:

Question #	**Response Date**
RAI 104 — 14.03-1, Part a2	December 18, 2009
RAI 104 — 14.03-1, Part a3	December 18, 2009

Sincerely,

(Russ Wells on behalf of)

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
New Plants Deployment
AREVA NP, Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: WELLS Russell D (AREVA NP INC)
Sent: Friday, May 22, 2009 4:57 PM
To: 'Getachew Tesfaye'
Cc: Pederson Ronda M (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Supplement 2

Getachew,

AREVA NP is unable to provide a technically correct and complete response to the remaining part of RAI 104 that was scheduled to be completed by May 22, 2009. A revised schedule for responding to RAI 104, Question 14.03-1, Part a will be provided by June 12, 2009.

Sincerely,

(Russ Wells on behalf of)

Ronda Pederson
ronda.pederson@areva.com

Licensing Manager, U.S. EPR Design Certification
New Plants Deployment
AREVA NP, Inc.
An AREVA and Siemens company
3315 Old Forest Road
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Phone: 434-832-3694
Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, February 11, 2009 4:24 PM
To: Getachew Tesfaye
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104 (1344, 1447,1468, 1475), Supplement 1

Getachew,

AREVA NP Inc. provided responses to 2 of the 4 questions of RAI No. 104 on December 12, 2008. The attached file, "RAI 104 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to Question 14.03-1, Part b and Question 14.03.11-1, as committed, in the revised scheduled e-mailed on January 28, 2009.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 104 Questions 14.03-1, Part b and 14.03.11-1.

The following table indicates the respective pages in the response document, "RAI 104 Supplement 1 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 104 — 14.03-1, Part b	2	3
RAI 104 — 14.03.11-1	4	6

The schedule for technically correct and complete response to the remaining question is unchanged and provided below:

Question #	**Response Date**
RAI 104 — 14.03-1, Part a	May 22, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, January 28, 2009 6:55 PM
To: 'Getachew Tesfaye'
Cc: DUNCAN Leslie E (AREVA NP INC); DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104 (1344, 1447,1468, 1475), Supplement 1 Revised Schedule

Getachew,

AREVA NP is unable to provide technically correct and complete responses to the questions that were scheduled to be complete today.

The schedule for technically correct and complete responses has been revised as provided below.

Question #	Response Date
RAI 104 — 14.03-1, Part a	May 22, 2009
RAI 104 — 14.03-1, Part b	February 11, 2009
RAI 104 — 14.03.11-1	February 11, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: Pederson Ronda M (AREVA US)
Sent: Friday, December 12, 2008 4:27 PM
To: 'Getachew Tesfaye'
Cc: DUNCAN Leslie E (AREVA US); DELANO Karen V (AREVA US); BENNETT Kathy A (OFR) (AREVA US)
Subject: Response to U.S. EPR Design Certification Application RAI No. 104 (1344, 1447,1468, 1475), FSAR Ch. 14

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 104 Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the 4 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 104, Question 14.03.11-2.

The following table indicates the respective page(s) in the response document "RAI 104 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 104 — 14.03-1	2	2
RAI 104 — 14.03.11-1	3	3
RAI 104 — 14.03.11-2	4	5
RAI 104 — 14.03.07-1	6	7

A complete answer is not provided for 2 of the 4 questions. The schedule for a technically correct and complete response to each of these questions is provided below.

Question #	Response Date
RAI 104 — 14.03-1, Part a	May 22, 2009
RAI 104 — 14.03-1, Part b	January 28, 2009
RAI 104 — 14.03.11-1	January 28, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, November 14, 2008 2:01 PM
To: ZZ-DL-A-USEPR-DL
Cc: Anne-Marie Grady; Walton Jensen; Nan Chien; Christopher Jackson; Michael Miernicki; Joseph Colaccino; John Rycyna; Prosanta Chowdhury
Subject: U.S. EPR Design Certification Application RAI No. 104 (1344, 1447,1468, 1475), FSAR Ch. 14

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on October 20, 2008, and discussed with your staff on November 3 and 14, 2008. No change was made to the draft RAI as a result of those discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 2757

Mail Envelope Properties (1F1CC1BBDC66B842A46CAC03D6B1CD4104283C4F)

Subject: Draft Response to U.S. EPR Design Certification Application RAI No. 104, FSAR Ch 14, Question 14.03
Sent Date: 3/28/2011 12:53:35 PM
Received Date: 3/28/2011 12:55:03 PM
From: WELLS Russell (AREVA)

Created By: Russell.Wells@areva.com

Recipients:
"LENTZ Tony (EXTERNAL AREVA)" <Tony.Lentz.ext@areva.com>
Tracking Status: None
"SHARPE Robert (AREVA)" <Robert.Sharpe@areva.com>
Tracking Status: None
"RANSOM James (AREVA)" <James.Ransom@areva.com>
Tracking Status: None
"LOWMAN Skip (AREVA)" <Skip.Lowman@areva.com>
Tracking Status: None
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"HALLINGER Pat (EXTERNAL AREVA)" <Pat.Hallinger.ext@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
"WILLIFORD Dennis (AREVA)" <Dennis.Williford@areva.com>
Tracking Status: None
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	17939	3/28/2011 12:55:03 PM
RAI 104 Question 14.03-1 Response US EPR DC - DRAFT.pdf	3847621	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Response to

Request for Additional Information No. 104, Question 14.03-1.a.2 & a.3

11/14/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.03 - Inspections, Tests, Analyses, and Acceptance Criteria
SRP Section: 14.03.11 - Containment Systems and Severe Accidents - Inspections, Tests, Analyses, and Acceptance Criteria
SRP Section: 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: FSAR Ch. 14

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

DRAFT

Question 14.03-1:

a. Primary Containment

1. FSAR Section 6.2.1.1 describes possible events which might produce a negative containment pressure. Provide as an ITAAC requirement, verification that the as built containment can withstand the design maximum negative differential pressure across the containment building external wall.
2. The Containment Building is separated into a central portion containing the reactor system and a peripheral lower temperature portion containing equipment. Separation is accomplished by compartment walls, foils, doors, and dampers. The foils are located above the steam generator compartments and are designed to open at a fraction of a psi. The doors and dampers, located at lower elevations, must also open to avoid stratification so that steam flowing to the containment dome can circulate down the containment walls to reach the heat structures and the containment lower elevations. The doors and dampers are designed to open at various pressures from a few psi to greater than 13 psi. Provide as an ITAAC requirement verification that the opening characteristics of the foils, doors and dampers assumed in the analyses will be present for the as-built plant.
3. The size of the vent openings between containment compartments is important in analyses of containment mixing following design basis events as well as in beyond design basis events evaluated for hydrogen control. In addition the vent opening size is important for the evaluation of the short term pressure increase within containment subcompartments. Provide an ITAAC dealing with the flow areas of vent openings which will ensure that the vent openings are consistent with the values assumed in the safety analyses for containment mixing and for short term subcompartment pressure analysis.
4. For the containment subcompartments containing high energy lines for which an overpressure analysis was performed as described FSAR Section 6.2.1.2, provide an ITAAC to verify that the subcompartments were built to withstand pressures up to the design pressures assumed in FSAR Section 6.2.1.2.

b. Accident Response Instrumentation

1. FSAR Table 14.3-7 describes safety-significant containment instrumentation as containment pressure, containment water level, containment hydrogen concentration and containment radiation intensity. Provide justification that this instrumentation is sufficient for operators to deal with design and beyond design basis containment related events and justify that the information provided in Tier 1 adequately describes the test, analysis and acceptance criteria for this equipment for the as-built plant.

Response to Question 14.03-1.a2:

a.1 RAI 104, Supplement 3 provided the Response to Question 14.03-1, Part a.1.

a.2 U.S. EPR FSAR Tier 2, Section 6.2.1 will be revised to provide the opening characteristics of the foils, doors, and dampers assumed in the analyses. This revision discusses the containment design feature of transforming the two-room containment into a one-room containment to support the post-accident pressure and temperature response. To support the two-room to one-room design feature in the containment, the identified foils, dampers, and listing of the safety-related doors credited in the analyses and their opening characteristics are provided.

DRAFT

U.S. EPR FSAR Tier 2, Table 3.2.2-1, Section 3.8.3, Table 3.8-18, and Figure 3.8-137 through Figure 3.8-144 will be revised to identify the safety classification and seismic category of the containment doors and to provide their location at the applicable elevation in containment.

U.S. EPR FSAR Tier 1, Section 2.1.1.1, Table 2.1.1-6 (a), Table 2.1.1-8, ITTAC Item 2.16 through Item 2.19 for containment doors, Section 2.3.1, Table 2.3.1-1 and Table 2.3.1-3, ITAAC Item 2.1 through Item 5.6 for foils and dampers will be revised to provide ITAAC requirement verification for the opening characteristics of the foils, dampers, and safety-related doors credited in the containment analysis for supporting the large break loss of coolant accident (LBLOCA) and subcompartment analyses. Conforming changes will be made to U.S. EPR FSAR Tier 1 and Tier 2.

a.3 U.S. EPR FSAR Tier 2, Section 6.2.1 will be revised to provide the vent opening size (area) and flow area vent paths with connecting rooms credited in the subcompartment analyses where the pressure increase is greater than 5 psi in U.S. EPR FSAR Tier 2, Table 6.2.1-17. U.S. EPR FSAR Tier 2, Table 6.2.1-13 will be revised to identify the vent opening size (area) and flow area vent paths with connecting rooms credited in the LBLOCA for pressure relief resulting from pressurizer surge line breaks.

U.S. EPR FSAR Tier 2, Table 3.8-18 will be revised to identify the vent area of the containment doors.

U.S. EPR FSAR Tier 1, Section 2.1.1.1, Table 2.1.1-6 (b), Table 2.1.1-8, ITTAC Item 2.20 for vent path area for pressure relief will be revised to provide ITAAC requirement verification for the total vent path area credited in the containment analysis for supporting the safety analyses for containment mixing, short-term subcompartment pressure analysis, and LBLOCA pressure relief resulting from pressurizer surge line breaks. Conforming changes will be made to U.S. EPR FSAR Tier 1 and Tier 2.

a.4 RAI 104, Supplement 3 provided the Response to Question 14.03-1, Part a.4.

b.1 RAI 104, Supplement 1 provided the Response to Question 14.03-1, Part b.1.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.1.1.1, Table 2.1.1-6(a), Table 2.1.1-6(b), Table 2.1.1-8, Section 2.3.1, Table 2.3.1-1, Table 2.3.1-3, Table 2.4.1-3, Table 2.4.1-4, and Table 2.4.24-2 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 2, Table 3.2.2-1, Table 3.10-1, Table 3.11-1, Section 3.8.3, Table 3.8-18, Figure 3.8-137 through Figure 3.8-144, Section 6.2.1, Table 6.2.1-1 through Table 6.2.1-25, Figure 6.2.1-1 through Figure 6.2.1-9, and Figure 6.2.1-45 through Figure 6.2.1-64 will be revised as described in the response and indicated on the enclosed markup.

DRAFT

U.S. EPR Final Safety Analysis Report Markups

DRAFT

2.1.1.1 Reactor Building

1.0 Description

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 post-tensioned concrete structure, with an outside diameter of approximately 162 feet and a height of approximately 218 feet. It has an approximately 0.25 inch thick steel liner on its inside surface. The primary functions of the RCB are:

- To protect the safety-related SSC located within.
- To prevent the release of radiation during plant operations.
- To prevent the release of radiation and contamination in the event of accident conditions.
- To establish an essentially leak-tight barrier against the uncontrolled release of radioactivity.
- To accommodate the calculated pressure and temperature conditions resulting from any loss of coolant accident without exceeding the design leakage rate and with sufficient margin.

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.

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 core 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.

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The containment is separated into two regions referred to as the two room containment. Separation is maintained by rupture foils, convection foils, and doors, which open to transform the two room containment into a one room containment. Rupture foils and convection foils are part of the combustible gas control system (CGCS) and are addressed in Section 2.3.1. Doors used as separation barriers are designed to open or provide an opening to relieve pressure in support of the transformation, making them a “pressure

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relief device" for their respective compartments. The doors provide this pressure relief function by swinging open or by use of a pressure balance aperture (blowout panel) in the door.

2.0 Key Design Features

2.1 Six rib support structures, provided at the bottom of the reactor cavity, as shown on Figure 2.1.1-9, limit lower reactor pressure vessel head deformation due to thermal expansion and creep during severe accident mitigation.

2.2 As shown on Figure 2.1.1-4, a flooding barrier is provided to prevent ingress of water into the core melt spreading area.

2.3 Core melt cannot relocate to the upper containment due to the existence of concrete barriers, as shown on Figure 2.1.1-9.

2.4 The RB structures are Seismic Category I and are designed and 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).
- Internal events (including internal flood loads, accident pressure loads, accident thermal loads, accident pipe reactions, and pipe break loads, including reaction loads, jet impingement loads, and missile impact loads).
- External events (including rain, snow, flood, tornado, tornado-generated missiles and earthquake).

2.5 The RCB, including the liner plate and penetration assemblies, maintains its pressure boundary integrity at the design pressure.

2.6 The RCB is post-tensioned, pre-stressed concrete structure.

2.7 The RBA is separated from the SBs and the FB by an internal hazard protection barrier that has a minimum 3-hour fire rating, as indicated on Figure 2.1.1-20.

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

- As shown on Figure 2.1.1-4, RCB rooms which are adjacent to the IRWST contain wall openings slightly above the floor to allow water flow into the IRWST.
- As shown on Figure 2.1.1-5, 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.

2.9 RBA penetrations that contain high-energy pipelines, as described in Table 2.1.1 7, have guard pipes.

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2.10 Essential equipment required for plant shutdown located in the RB and RBA is located above the internal flood level.

2.11 The reactor pressure vessel, reactor coolant pumps, pressurizer, steam generators, and interconnecting RCS piping are insulated with reflective metallic insulation.

2.12 The RB structures have key dimensions that are confirmed after construction.

2.13 The RCB has a minimum containment free volume that is confirmed after construction.

2.14 The RCB and RB internal structures have a minimum containment heat sink surface area value.

2.15 The integrated leak rate from the RCB does not exceed the maximum allowable leakage rate.

2.16 The location of the doors and blowout panels is as listed in Table 2.1.1-6(a).

2.17 Seismic Category I doors and blowout panels can withstand seismic design basis loads without a loss of the function.

2.18 Doors and blowout panels provide pressure relief.

2.19 Doors with blowout panels are provided with missile restraint.

2.20 Vent path areas provide room (compartment) pressure relief.

3.0 Inspections, Tests, Analyses, and Acceptance Criteria

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Table 2.1.1-8 lists the RB ITAAC.

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Table 2.1.1-6(a)—Pressure Relief Doors in the Reactor Containment Building~~Table Deleted~~

RCB Elevation and Door No.	Vent Direction		Relief Pressure (psid)	Description	Function Pressure Relief	Seismic Category
	From Room	To Room				
-8 ft Door 4	-8 ft Room 7	-8 ft Room 2	< 1.74	Door, Blowout Panel	Open[1, 2]	I
-8 ft Door 7	-8 ft Room 16	-8 ft Room 13	< 1.74	Door, Blowout Panel	Open[1]	I
-8 ft Door 10	-8 ft Room 15	-8 ft Room 11	< 1.74	Door, Blowout Panel	Open[1]	I
-8 ft Door 11	-8 ft Room 14	-8 ft Room 9	< 1.74	Door, Blowout Panel	Open[1]	I
-8 ft Door 13	-8 ft Room 11	-8 ft Room 5	< 1.74	Door, Blowout Panel	Open[3]	I
-8 ft Door 14	-8 ft Room 9	-8 ft Room 5	< 1.74	Door, Blowout Panel	Open[3]	I
+5 ft Door 4	+5 ft Room 16	+5 ft Room 14	< 3.48	Door, Swing Open	Open[1, 2]	I
+5 ft Door 5	+5 ft Room 17	+5 ft Room 16	< 3.48	Door, Swing Open	Open[3]	I
+5 ft Door 13	+5 ft Room 21	+5 ft Room 15	< 3.48	Door, Swing Open	Open[1]	I
+5 ft Door 14	+5 ft Room 16	+5 ft Room 13	< 3.48	Door, Swing Open	Open[1, 2]	I
+29 ft Door 2	+29 ft Room18	+29 ft Room 15	< 3.48	Door, Swing Open	Open[2]	I
+45 ft Door 2	+45 ft Room 18	+45 ft Room 22	< 3.48	Door, Swing Open	Open[2]	I
+45 ft Door 15	+45 ft Room 22	+45 ft Room 13	< 1.74	Door, Blowout Panel	Open[2]	I

Notes:

1. Door supports subcompartment pressure relief (subcompartment pressure greater than 5 psi).
2. Door supports pressure relief for LBLOCA pressurizer surge line breaks.
3. Door supports subcompartment pressure relief (subcompartment pressure less than or equal to 5 psi).

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Table 2.1.1-6(b)—Vent Path Areas in Reactor Containment Building for Pressure Relief

Room Name	Function Pressure Relief	Total Vent Path Area (ft^2)
-8 ft Room 2	(1)	55.68
-8 ft Room 7	(1)	24.86
-8 ft Room 14	(1)	5.92
-8 ft Room 15	(1)	5.92
-8 ft Room 16	(1)	24.11
-8 ft Room 17	(1)	18.19
+5 ft Room 16	(1)	61.46
+5 ft Room 20	(1)	21.35
+5 ft Room 21	(1)	55.15
+5 ft Room 22	(1)	13.89
+45 ft Room 2	(1)	1123.09
+45 ft Room 3	(1)	1167.82
+45 ft Room 6	(1)	1167.82
+45 ft Room 7	(1)	1123.09
+64 ft Room 1	(1)	617.79
+64 ft Room 2	(1)	639.9
+64 ft Room 5	(1)	639.9
+64 ft Room 6	(1)	617.79
+64 ft Room 14	(1)	98.14
+79 ft Room 12	(1)	55.46
-8 ft Room 7 +5 ft Room 16 +29 ft Room 18 +45 ft Room 18 +45 ft Room 22	(2)	97.85

Notes:

1. Supports subcompartment pressure relief (subcompartments pressure greater than 5 psi).
2. Supports pressure relief for LBLOCA pressruizer surge line breaks.

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Table 2.1.1-8—Reactor Building ITAAC (6 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.15	The integrated leak rate from the RCB does not exceed the maximum allowable leakage rate.	A test will be performed to evaluate the RCB leakage rate.	The leakage rate does not exceed 0.25% of RCB air mass per day at containment pressure of 55 psig.
2.16	The location of the doors and blowout panels is as listed in Table 2.1.1-6(a).	An inspection will be performed of the location of the doors and blowout panels.	The doors and blowout panels are located as listed in Table 2.1.1-6(a).
2.17	Seismic Category I doors and blowout panels can withstand seismic design basis loads without a loss of the function.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the Seismic Category I doors and blowout panels using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the Seismic Category I doors and blowout panels to verify that the components, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).	a. Seismic qualification reports (SQDP, EQDP, or analyses) exist and conclude that the Seismic Category I doors and blowout panels identified in Table 2.1.1-6(a) can withstand seismic design basis loads without a loss of the function listed. b. Inspection reports exist and conclude that the Seismic Category I doors and blowout panels identified in Table 2.1.1-6(a), including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).

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Table 2.1.1-8—Reactor Building ITAAC (6 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.18	Doors and blowout panels provide pressure relief.	a. Type tests and as-built testing will be performed for the swing doors to demonstrate the ability of the doors to open. b. Type tests will be performed to demonstrate the ability of the blowout panels to open. c. An inspection will be performed to verify the vent direction.	a. The pressure at which the swing doors listed in Table 2.1.1-6(a) begins to open is less than or equal to 3.48 psid. b. The pressure at which the blowout panels listed in Table 2.1.1-6(a) open is less than or equal to 1.74 psid. c. The doors listed in listed in Table 2.1.1-6(a) provide the vent direction as identified.
2.19	Doors with blowout panels are provided with missile restraint.	An inspection will be performed to verify that the doors with blowout panels are provided with a missile restraint.	The doors with blowout panels listed in Table 2.1.1-6(a) have a missile restraint.
2.20	Vent path areas provide room (compartment) pressure relief.	An inspection will be performed to verify the total vent path area.	The minimum total vent path area is greater than or equal to the value listed in Table 2.1.1-6(b) for the rooms (compartments) listed.

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2.3 Severe Accident Systems

2.3.1 Combustible Gas Control System

1.0 Description

The combustible gas control system (CGCS) prevents damage to the containment or emergency equipment in the event of an accident with ensuing mass and energy release. In addition, for a severe accident with core degradation, the system inhibits potential damage by controlling the combustible gas concentration in containment.

The CGCS provides the following safety-related function:

- Mixing of the containment atmosphere.

The CGCS provides the following non-safety-related functions:

- Controlling combustible gas concentrations.
- Maintaining containment structural integrity by limiting the pressure to within the containment design pressure resulting from a combustible gas ignition from the most severe accident.
- Maintaining the two zone separation between accessible and equipment space.

2.0 Arrangement

2.1 The location of the CGCS equipment is as listed in Table 2.3.1-1.

3.0 Mechanical Design Features

3.1 Components identified as Seismic Category I in Table 2.3.1-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.3.1-1.

4.0 Instrumentation and Controls (I&C) Design Features, Displays and Controls

4.1 Displays listed in Table 2.3.1-2—CGCS Equipment I&C and Electrical Design are retrievable in the main control room (MCR) and the remote shutdown station (RSS) as listed in Table 2.3.1-2.

4.2 The CGCS equipment controls are provided in the MCR and the RSS as listed in Table 2.3.1-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.3.1-2 responds to the state requested by a test signal.

5.0 Electrical Power Design Features

5.1 Hydrogen mixing dampers listed in Table 2.3.1-1 fail open on loss of power.

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6.0 Environmental Qualifications

6.1 Components in Table 2.3.1-2, that are designated as harsh environment, will perform the function listed in Table 2.3.1-2 in the environments that exist during and following design basis events.

7.0 Equipment and System Performance

7.1 The hydrogen mixing dampers listed in Table 2.3.1-1 provide pressure relief for design basis events.

7.2 The convection foils listed in Table 2.3.1-1 provide pressure relief for design basis events.

7.3 The rupture foils listed in Table 2.3.1-1 provide pressure relief for design basis events.

7.4 The fusible link of the convection foils listed in Table 2.3.1-1 fails at the designed temperature.

7.5 The burst element of the convection foils listed in Table 2.3.1-1 opens at the designed pressure.

7.6 The burst element of the rupture foils listed in Table 2.3.1-1 opens at the designed pressure.

8.0 Inspections, Tests, Analyses, and Acceptance Criteria

8.1 Table 2.3.1-3 lists the Combustible Gas Control System ITAAC.

~~The combustible gas control system (CGCS) prevents damage to the containment or emergency equipment, in the event of a severe accident with core degradation, by controlling the combustible gas concentration in containment.~~

~~The CGCS does not provide any safety related functions.~~

~~The CGCS provides the following non-safety related functions:~~

- ~~Mixing of the containment atmosphere.~~
- ~~Controlling combustible gases concentrations.~~
- ~~Ensuring containment structural integrity by limiting the pressure to within the containment design pressure resulting from a combustible gas ignition from the most severe accident.~~

~~2.0Mechanical Design Features~~

~~2.1The CGCS contains the passive autocatalytic recombiners (PAR), mixing dampers, and hydrogen foils.~~

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~~**3.0Electrical Power Design Features**~~

~~3.1Mixing dampers listed in Table 2.3.1-1 fail open on loss of power.~~

~~**4.0Inspections, Tests, Analyses, and Acceptance Criteria**~~

~~4.1Table 2.3.1-2 lists the CGCS ITAAC.~~

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Table 2.3.1-1—Combustible Gas Control System Equipment Mechanical Design (4 Sheets)

Description	Tag Number	Location	Function	Seismic Category
Recombiner	30JMT10AT001[1]	Room 30UJA18019, surge line area	N/A	II
Recombiner	30JMT10AT002	Room 30UJA18007, SG loop 3 area	N/A	II
Recombiner	30JMT10AT003	Room 30UJA18008, SG loop 4 area	N/A	II
Recombiner	30JMT10AT004	Room 30UJA18003, SG loop 1 area	N/A	II
Recombiner	30JMT10AT005	Room 30UJA18004, SG loop 2 area	N/A	II
Recombiner	30JMT10AT006[1]	Room 30UJA18018, spray valves area	N/A	II
Recombiner	30JMT10AT007[1]	Room 30UJA23019, pressurizer area	N/A	II
Recombiner	30JMT10AT008	Room 30UJA23006, RCP loop 3 area	N/A	II
Recombiner	30JMT10AT009	Room 30UJA23015, annual space accumulator tank loop 3 (0°-90°) area	N/A	II
Recombiner	30JMT10AT010	Room 30UJA23006, RCP loop 3 area	N/A	II
Recombiner	30JMT10AT011	Room 30UJA23007, SG loop 3 area	N/A	II
Recombiner	30JMT10AT012	Room 30UJA23008, SG loop 4 area	N/A	II
Recombiner	30JMT10AT013	Room 30UJA23016, annual space accumulator tank loop 4 (90°-180°) area	N/A	II
Recombiner	30JMT10AT014	Room 30UJA23009, RCP loop 4 area	N/A	II
Recombiner	30JMT10AT015	Room 30UJA23009, RCP loop 4 area	N/A	II
Recombiner	30JMT10AT016[1]	Room 30UJA15001, reactor cavity	N/A	II
Recombiner	30JMT10AT017	Room 30UJA23002, RCP loop 1 area	N/A	II
Recombiner	30JMT10AT018	Room 30UJA23002, RCP loop 1 area	N/A	II
Recombiner	30JMT10AT019	Room 30UJA23013, annual space accumulator tank loop 1 (180°-270°) area	N/A	II
Recombiner	30JMT10AT020	Room 30UJA23003, SG loop 1 area	N/A	II

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Table 2.3.1-1—Combustible Gas Control System Equipment Mechanical Design (4 Sheets)

Description	Tag Number	Location	Function	Seismic Category
Recombiner	30JMT10AT021	Room 30UJA23004, SG loop 2 area	N/A	II
Recombiner	30JMT10AT022	Room 30UJA23005, RCP loop 2 area	N/A	II
Recombiner	30JMT10AT023	Room 30UJA23014, annual space accumulator tank loop 2 (270°-0°) area	N/A	II
Recombiner	30JMT10AT024	Room 30UJA23005, RCP loop 2 area	N/A	II
Recombiner	30JMT10AT025[1]	Room 30UJA29019, pressurizer area	N/A	II
Recombiner	30JMT10AT026	Room 30UJA29016, access area (equipment hatch)	N/A	II
Recombiner	30JMT10AT027	Room 30UJA29013, set down area operating floor	N/A	II
Recombiner	30JMT10AT028	Room 30UJA29018 operating floor access area	N/A	II
Recombiner	30JMT10AT029[1]	Room 30UJA34019, pressurizer heat safety relief valves	N/A	II
Recombiner	30JMT10AT030	Room 30UJA34007, SG loop 3 area	N/A	II
Recombiner	30JMT10AT031	Room 30UJA34007, SG loop 3 area	N/A	II
Recombiner	30JMT10AT032	Room 30UJA34008, SG loop 4 area	N/A	II
Recombiner	30JMT10AT033	Room 30UJA34008, SG loop 4 area	N/A	II
Recombiner	30JMT10AT034	Room 30UJA34003, SG loop 1 area	N/A	II
Recombiner	30JMT10AT035	Room 30UJA34003, SG loop 1 area	N/A	II
Recombiner	30JMT10AT036	Room 30UJA34004, SG loop 2 area	N/A	II
Recombiner	30JMT10AT037	Room 30UJA34004, SG loop 2 area	N/A	II
Recombiner	30JMT10AT038	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT039	Room 30UJA40001, dome area	N/A	II

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Table 2.3.1-1—Combustible Gas Control System Equipment Mechanical Design (4 Sheets)

Description	Tag Number	Location	Function	Seismic Category
Recombiner	30JMT10AT040	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT041	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT042	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT043	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT044	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT045	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT046	Room 30UJA40001, dome area	N/A	II
Recombiner	30JMT10AT047	Room 30UJA40001, dome area	N/A	II
Hydrogen Mixing Damper	30JMT20AA001	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA002	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA003	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA004	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA005	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA006	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA007	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms	open	I
Hydrogen Mixing Damper	30JMT20AA008	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms	open	I

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Table 2.3.1-1—Combustible Gas Control System Equipment Mechanical Design (4 Sheets)

Description	Tag Number	Location	Function	Seismic Category
Rupture Foils	30JMT20AB101-30JMT20AB129	SG (Loop 1) pressure equalization ceiling	open	I
Convection Foils	30JMT20AB151-30JMT20AB180	SG (Loop 1) pressure equalization ceiling	open	I
Rupture Foils	30JMT20AB201-30JMT20AB229	SG (Loop 2) pressure equalization ceiling	open	I
Convection Foils	30JMT20AB251-30JMT20AB280	SG (Loop 2) pressure equalization ceiling	open	I
Rupture Foils	30JMT20AB301-30JMT20AB329	SG (Loop 3) pressure equalization ceiling	open	I
Convection Foils	30JMT20AB351-30JMT20AB380	SG (Loop 3) pressure equalization ceiling	open	I
Rupture Foils	30JMT20AB401-30JMT20AB429	SG (Loop 4) pressure equalization ceiling	open	I
Convection Foils	30JMT20AB451-30JMT20AB480	SG (Loop 4) pressure equalization ceiling	open	I

1) Small PAR; the remaining PARs are large.

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Table 2.3.1-2—CGCS Equipment I&C and Electrical Design

Description	Tag Number(1)	Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls
Hydrogen Mixing Damper	30JMT20AA001	Reactor Containment Building	3^N / 4^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA002	Reactor Containment Building	3^N / 4^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA003	Reactor Containment Building	4^N / 3^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA004	Reactor Containment Building	4^N / 3^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA005	Reactor Containment Building	1^N / 2^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA006	Reactor Containment Building	1^N / 2^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA007	Reactor Containment Building	2^N / 1^A	Yes	Yes	Position / N/A	Open-Close/ N/A
Hydrogen Mixing Damper	30JMT20AA008	Reactor Containment Building	2^N / 1^A	Yes	Yes	Position / N/A	Open-Close/ N/A

1) Equipment tag numbers are provided for information only and are not part of the certified design.

2) ^{N} denotes the division the component is normally powered from. ^{A} denotes the division the component is powered from when alternate feed is implemented.

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~~Table 2.3.1-1—CGCS Equipment Design (3 Sheets)~~

~~Equipment Description~~	~~Equipment Location~~
~~Recombiner 30JMT10AT001~~[2]	~~Room 30UJA18-019, surge line area~~
~~Recombiner 30JMT10AT002~~	~~Room 30UJA18-007, SG loop 3 area~~
~~Recombiner 30JMT10AT003~~	~~Room 30UJA18-008, SG loop 4 area~~
~~Recombiner 30JMT10AT004~~	~~Room 30UJA18-003, SG loop 1 area~~
~~Recombiner 30JMT10AT005~~	~~Room 30UJA18-004, SG loop 2 area~~
~~Recombiner 30JMT10AT006~~[2]	~~Room 30UJA18-018, spray valves area~~
~~Recombiner 30JMT10AT007~~[2]	~~Room 30UJA23-019, pressurizer area~~
~~Recombiner 30JMT10AT008~~	~~Room 30UJA23-006, RCP loop 3 area~~
~~Recombiner 30JMT10AT009~~	~~Room 30UJA23-015, annual space accumulator tank loop 3 (0°-90°) area~~
~~Recombiner 30JMT10AT010~~	~~Room 30UJA23-006, RCP loop 3 area~~
~~Recombiner 30JMT10AT011~~	~~Room 30UJA23-007, SG loop 3 area~~
~~Recombiner 30JMT10AT012~~	~~Room 30UJA23-008, SG loop 4 area~~
~~Recombiner 30JMT10AT013~~	~~Room 30UJA23-016, annual space accumulator tank loop 4 (90°-180°) area~~
~~Recombiner 30JMT10AT014~~	~~Room 30UJA23-009, RCP loop 4 area~~
~~Recombiner 30JMT10AT015~~	~~Room 30UJA23-009, RCP loop 4 area~~
~~Recombiner 30JMT10AT016~~[2]	~~Room 30UJA15-001, reactor cavity~~
~~Recombiner 30JMT10AT017~~	~~Room 30UJA23-002, RCP loop 1 area~~
~~Recombiner 30JMT10AT018~~	~~Room 30UJA23-002, RCP loop 1 area~~
~~Recombiner 30JMT10AT019~~	~~Room 30UJA23-013, annual space accumulator tank loop 1 (180°-270°) area~~
~~Recombiner 30JMT10AT020~~	~~Room 30UJA23-003, SG loop 1 area~~
~~Recombiner 30JMT10AT021~~	~~Room 30UJA23-004, SG loop 2 area~~
~~Recombiner 30JMT10AT022~~	~~Room 30UJA23-005, RCP loop 2 area~~
~~Recombiner 30JMT10AT023~~	~~Room 30UJA23-014, annual space accumulator tank loop 2 (270°-0°) area~~
~~Recombiner 30JMT10AT024~~	~~Room 30UJA23-005, RCP loop 2 area~~
~~Recombiner 30JMT10AT025~~[2]	~~Room 30UJA29-019, pressurizer area~~
~~Recombiner 30JMT10AT026~~	~~Room 30UJA29-016, access area (equipment hatch)~~
~~Recombiner 30JMT10AT027~~	~~Room 30UJA29-013, set down area operating floor~~
~~Recombiner 30JMT10AT028~~	~~Room 30UJA29-018 operating floor access area~~
~~Recombiner 30JMT10AT029~~[2]	~~Room 30UJA34-019, pressurizer heat safety relief valves~~

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~~Table 2.3.1-1—CGCS Equipment Design (3 Sheets)~~

~~Equipment Description~~	~~Equipment Location~~
~~Recombiner 30JMT10AT030~~	~~Room 30UJA34-007, SG loop 3 area~~
~~Recombiner 30JMT10AT031~~	~~Room 30UJA34-007, SG loop 3 area~~
~~Recombiner 30JMT10AT032~~	~~Room 30UJA34-008, SG loop 4 area~~
~~Recombiner 30JMT10AT033~~	~~Room 30UJA34-008, SG loop 4 area~~
~~Recombiner 30JMT10AT034~~	~~Room 30UJA34-003, SG loop 1 area~~
~~Recombiner 30JMT10AT035~~	~~Room 30UJA34-003, SG loop 1 area~~
~~Recombiner 30JMT10AT036~~	~~Room 30UJA34-004, SG loop 2 area~~
~~Recombiner 30JMT10AT037~~	~~Room 30UJA34-004, SG loop 2 area~~
~~Recombiner 30JMT10AT038~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT039~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT040~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT041~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT042~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT043~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT044~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT045~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT046~~	~~Room 30UJA40-001, dome area~~
~~Recombiner 30JMT10AT047~~	~~Room 30UJA40-001, dome area~~
~~Mixing damper 30JMT20AA001~~	~~Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA002~~	~~Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA003~~	~~Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA004~~	~~Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA005~~	~~Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA006~~	~~Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA007~~	~~Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms~~
~~Mixing damper 30JMT20AA008~~	~~Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms~~
~~Rupture and convection foils, combined minimum area of 107ft^2.~~ [1]	~~SG (Loop 1 and Loop 2) pressure equalization ceiling~~

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~~**Table 2.3.1-1—CGCS Equipment Design (3 Sheets)**~~

~~Equipment Description~~	~~Equipment Location~~
~~Rupture and convection foils, combined minimum area of 107ft^2.~~ [1]	~~SG (Loop 3 and Loop 4) pressure equalization ceiling~~

~~1) The combined minimum area of 214 ft^2 (107 ft^2 per SG pressure equalization ceiling) is based on analyses that safety significant CGCS performance is maintained with 75% of foils failing to open. Therefore, (0.25)*(375 ft^2 rupture foils) + (0.25)*(480 ft^2 convection foils) = 214 ft^2.~~

~~Small PAR (recombination rate of 2.6 lbm/hr). The remaining large PARs have a recombination rate of 11.8 lbm/hr.~~

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Table 2.3.1-~~2~~3—Combustible Gas Control System ITAAC (4 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
~~2.1~~	~~The CGCS contains PAR, mixing dampers, and rupture and convection foils.~~	~~An inspection will be performed of the equipment listed in Table 2.3.1-1.~~	~~The CGCS contains the PAR, mixing dampers, and rupture and convection foils listed in Table 2.3.1-1.~~
~~3.1~~	~~Mixing dampers listed in Table 2.3.1-1 fail open on loss of power.~~	~~Testing will be performed for the mixing dampers listed in Table 2.3.1-1 to fail open on loss of power.~~	~~Following loss of power, the mixing dampers listed in Table 2.3.1-1 fail open.~~
2.1	The location of the CGCS equipment is as listed in Table 2.3.1-1.	An inspection will be performed of the location of the equipment listed in Table 2.3.1-1.	The equipment listed in Table 2.3.1-1 is located as listed in Table 2.3.1-1.
3.1	Components identified as Seismic Category I in Table 2.3.1-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.3.1-1.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the components identified as Seismic Category I in Table 2.3.1-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. Inspections will be performed of the Seismic Category I components identified in Table 2.3.1-1 to verify that the components, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).	a. Seismic qualification reports (SQDP, EQDP, or analyses) exist and conclude that the Seismic Category I components identified in Table 2.3.1-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.3.1-1. b. Inspection reports exist and conclude that the Seismic Category I components identified in Table 2.3.1-1, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).

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Table 2.3.1-~~2~~3—Combustible Gas Control System ITAAC (4 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.1	Displays listed in Table 2.3.1-2 are retrievable in the MCR and the RSS as listed in Table 2.3.1-2	Tests will be performed for the retrieveability of the displays in the MCR or the RSS as listed in Table 2.3.1-2.	a. The displays listed in Table 2.3.1-2 as being retrieved in the MCR can be retrieved in the MCR. b. The displays listed in Table 2.3.1-2 as being retrieved in the RSS can be retrieved in the RSS.
4.2	Controls exist in the MCR and the RSS as identified in Table 2.3.1-2.	Tests will be performed for the existence of control signals from the MCR and the RSS to the equipment listed in Table 2.3.1-2.	a. The controls listed in Table 2.3.1-2 as being in the MCR exist in the MCR. b. The controls listed in Table 2.3.1-2 as being in the RSS exist in the RSS.
4.3	Equipment listed as being controlled by a PACS module in Table 2.3.1-2 responds to the state requested by a test signal.	A test will be performed using test signals.	Equipment listed as being controlled by a PACS module in Table 2.3.1-2 responds to the state requested by the test signal.
5.1	Hydrogen mixing dampers listed in Table 2.3.1-1 fail open on loss of power.	Testing will be performed for the hydrogen mixing dampers listed in Table 2.3.1-1 to fail open on loss of power.	Following loss of power, the hydrogen mixing dampers listed in Table 2.3.1-1 fail open.

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Table 2.3.1-~~2~~3—Combustible Gas Control System ITAAC (4 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
6.1	Components in Table 2.3.1-2, that are designated as harsh environment, will perform the function listed in Table 2.3.1-1 in the environments that exist during and following design basis events.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the components listed as harsh environment in Table 2.3.1-2 to perform the function listed in Table 2.3.1-1 for the environmental conditions that could occur during and following design basis events. b. Components listed as harsh environment in Table 2.3.1-2 will be inspected to verify installation in accordance with the construction drawings including the associated wiring, cables and terminations. Deviations to the construction drawings will be reconciled to the EQDP.	a. Environmental Qualification Data Packages (EQDP) exist and conclude that the components listed as harsh environment in Table 2.3.1-2 can perform the function listed in Table 2.3.1-1 during and following design basis events including the time required to perform the listed function. b. Inspection reports exists and conclude that the components listed in Table 2.3.1-2 as harsh environment have been installed per the construction drawings and any deviations have been reconciled to the EQDP.
7.1	The hydrogen mixing dampers listed in Table 2.3.1-1 provide pressure relief for design basis events.	An inspection will be performed to verify that the hydrogen mixing dampers listed in Table 2.3.1-1 provide sufficient area for pressure relief.	The hydrogen mixing dampers listed in Table 2.3.1-1 provide a minimum combined total open area of 64 ft^2.
7.2	The convection foils listed in Table 2.3.1-1 provide pressure relief for design basis events.	An inspection will be performed to verify that the convection foils listed in Table 2.3.1-1 provide sufficient area for pressure relief.	The convection foils listed in Table 2.3.1-1 provide a minimum combined total open area of 450 ft^2.
7.3	The rupture foils listed in Table 2.3.1-1 provide pressure relief for design basis events.	An inspection will be performed to verify that the rupture foils listed in Table 2.3.1-1 provide sufficient area for pressure relief.	The rupture foils listed in Table 2.3.1-1 provide a minimum combined total open area of 420 ft^2.

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Table 2.3.1-~~2~~3—Combustible Gas Control System ITAAC (4 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
7.4	The fusible link of the convection foils listed in Table 2.3.1-1 fails at the designed temperature.	Type tests, analyses, or a combination of type tests and analyses will be performed to demonstrate the ability of the fusible link to open	The fusible link opens at or before reaching a temperature of 185 °F.
7.5	The burst element of the convection foils listed in Table 2.3.1-1 opens at the designed pressure.	Type tests will be performed to demonstrate the ability of the burst element to open.	The burst element opens bidirectionally at a delta pressure of 0.7 psid ± 30%.
7.6	The burst element of the rupture foils listed in Table 2.3.1-1 opens at the designed pressure.	Type tests will be performed to demonstrate the ability of the burst element to open.	The burst element opens bidirectionally at a delta pressure of 0.7 psid ± 30%.

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Table 2.4.1-3—Protection System Automatic Engineered Safety Feature Signals and Input Variables (2 Sheets)

Engineered Safety Feature Signal	Input Variable
Safety Injection System Actuation	Pressurizer Pressure (NR)
	Hot Leg Pressure (WR)
	Hot Leg Temperature (WR)
	RCS Loop Level
Emergency Feedwater System Actuation	SG Level (WR)
	LOOP Signal
	SIS Actuation signal
Emergency Feedwater System Isolation	SG Level (WR)
	SG Isolation Signal
Partial Cooldown Actuation	SIS Actuation signal
Main Steam Relief Train (MSRT) Opening	SG Pressure
MSRT Isolation	SG Pressure
Main Steam Isolation	SG Pressure
	SG Isolation Signal
	Containment Equipment Compartment Pressure
	Containment Service Compartment Pressure (NR)
Main Feedwater Isolation	SG Level (NR)
	SG Pressure
	RT Breaker Position
	SG Isolation Signal
	Containment Equipment Compartment Pressure
	Containment Service Compartment Pressure (NR)
Containment Isolation Stage 1	Containment Service Compartment Pressure (NR)
	~~Containment Service Compartment Pressure (WR)~~
	Containment Equipment Compartment Pressure
	Containment High Range Activity
	SIS Actuation Signal

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Table 2.4.1-3—Protection System Automatic Engineered Safety Feature Signals and Input Variables (2 Sheets)

Engineered Safety Feature Signal	Input Variable
Containment Isolation Stage 2	Containment Service Compartment Pressure (WR)
CVCS Charging Isolation	Pressurizer Level (NR)
CVCS Isolation for Anti-Dilution	Boron Concentration
	Boron Temperature
	CVCS Charging Flow
	Cold Leg Temperature (WR)
Emergency Diesel Generator Actuation	LOOP Signal
	SIS Actuation Signal
PSRV Opening	Hot Leg Pressure (NR)
SG Isolation	Main Steam Line Activity
	SG Level (NR)
	Partial cooldown actuated signal
Reactor Coolant Pump Trip	RCP Differential Pressure
	Containment Isolation Stage 2 Signal
Main Control Room Air Conditioning System (CRACS) Isolation and Filtering	MCR Air Intake Duct Activity
Turbine Trip	RT Breaker Position
Loss of Offsite Power (LOOP)	Bus loss of voltage
	Bus degraded voltage
Hydrogen Mixing Dampers Opening	Containment Service Compartment Pressure (NR)
	Containment Equipment Compartment/Containment Service Compartment Differential Pressure

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Table 2.4.1-4—Protection System Manually Actuated Functions

Reactor Trip
SIS Actuation
Partial Cooldown Actuation
MSRT Actuation
MSRT Isolation
Main Steam Isolation
Main Feedwater (MFW) Isolation
Containment Isolation
SG Isolation
CRACS Isolation and Filtering
EDG Actuation
EFWS Isolation
EFWS Actuation
CVCS Isolation
Anti-Dilution Isolation
PSRV Opening
RCP Trip
Hydrogen Mixing Dampers Opening ← 14.03-1

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Table 2.4.24-2—Functions Automatically Actuated by the DAS

Reactor trip on low SG pressure
Reactor trip on low SG level
Reactor trip on high SG level
Reactor trip on low reactor coolant system (RCS) flow (two loops)
Reactor trip on low-low RCS flow (one loop)
Reactor trip on high neutron flux (power range)
Reactor trip on low hot leg pressure
Reactor trip on high pressurizer (PZR) pressure
Turbine trip on reactor trip
EFWS actuation on low SG level
SIS actuation on low PZR pressure
Main steam isolation on low SG pressure with signal to PAS to generate partial cooldown through TBS
Containment isolation on high containment activity (also includes functions that cascade from containment isolation: Annulus ventilation and Safeguard Building HVAC reconfiguration)
MFWS isolation on low SG pressure
MFWS isolation on high SG level
Opening of containment ~~H_2~~ hydrogen mixing dampers on high containment pressure or high containment compartment differential pressure

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Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
PA	**Circulating Water Supply System**	NS	E	NSC	No	UMA, UZT	
STRUCTURES							
UFA, UJA, UJB, UJH, UJK, UJE, JM	**Nuclear Island Structural System (Fuel, Reactor, Safeguard Buildings)**	S	N/A	I	Yes	UFA, UJA, UJB, UJH, UJK, UJE, JM	
JMK	Piping Containment Penetrations	S	B	I	Yes	UJA, UJB	ASME Class 2[2]
JML	Cable Containment Penetrations	S	B	I	Yes	UJA, UJB	ASME Class 2[2]
UJA	Safety-Related Reactor Building Doors	S	N/A	I	Yes	UJA	Must maintain structural integrity during SSE and opens on dif. pressure to support LBB and subcompartment analysis.
UJA	Non-Safety-Related Reactor Building Doors	NS-AQ	N/A	II	Yes	UJA	
UJA	Pressurizer Compartment Rupture Foils	NS-AQ	N/A	II	Yes	UJA	

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- Core melt retention area.
- Convection and rupture foils.
- Reactor containment building doors.

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These major RB internal structures are further described in Section 5.4, which contains descriptions of steel supports for the RV, four SGs, four RCPs, and the PZR.

Supports are also provided for distribution systems as part of the RB internal structures, which include pipe supports; equipment supports; cable tray and conduit supports; and heating, ventilation and air conditioning (HVAC) duct supports. Platforms, ladders, stairs, guard rails, and other miscellaneous structures are provided for equipment access and maintenance.

3.8.3.1.1 Reactor Vessel Support Structure and Reactor Cavity

The RV support structure is comprised of a reinforced circular concrete wall that extends from the top of the RB internal structures basemat at elevation -20 feet, 2 inches to the steel supports for the RV piping at approximately elevation +20 feet. This circular wall also serves as the interior wall for the IRWST, and provides radiation shielding for the RV and RCP. A narrow chamber extends through the circular wall just above the internal structures basemat to provide an outlet from the bottom of the RV cavity to the core melt retention area. The top, inside edge of the circular concrete wall supports eight steel RV support assemblies that are located under the RCP nozzles. Section 5.4.14 describes the design of the RV steel supports. The circular concrete wall also functions as the primary radiation shield wall around the RV. The wall is approximately 8 feet, 11 inches thick. The reactor refueling cavity begins at the top of the circular wall at elevation +24 feet, 5 inches.

Large penetrations in the circular RV support concrete wall are provided for the primary loop piping and the cavity ventilation system. A permanently installed cavity seal ring and neutron shield assembly rests on an embedded ring at the top of the wall. This seal and shield assembly is fabricated of stainless steel and radiation shielding material that bridges the annular gap between the RV and vessel cavity concrete wall. This ring seals the lower RV cavity to prevent water leakage from the refueling canal located above.

This seal is designed to accommodate the expansion and contraction of the RPV during heatup and cooldown. The cavity seal is designed to Seismic Category I requirements and to meet the stress limits of ASME BPVC, Section III, Subsection ND. Seal and structural welds are made in accordance with ASME BPVC, Section IX and are examined in accordance with ASME BPVC, Section V. The cavity seal does not rely on inflated seals, gaskets, o-rings, or other active components. The cavity seal is also

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3.8.3.1.12 Reactor Containment Building Rupture and Convection Foils

The rupture and convection foils are installed at the steam generator pressure equalization ceiling and are part of the CONVECT system. The design and performance of the CONVECT system is described in Section 6.2.5.

3.8.3.1.13 Reactor Containment Building Doors

The RCB design allows personnel access to designated areas during plant normal operating conditions for planned maintenance and inspection activities. To make the RCB accessible during these normal plant operating conditions, the RCB is separated into two regions. This two-region concept is referred to as the "two-room" or "two zone containment." The two regions or rooms in the RCB are the non-accessible and the accessible area. The containment dome, the annular rooms, and the operation area are part of the accessible or service areas. The equipment spaces inside the secondary shield wall and the primary or bioshield wall are part of the non-accessible area, which is surrounded by walls, closed radiation doors (radiation shielding for personnel and equipment), and the CONVECT system discussed in Section 3.8.3.1.12.

The two-room RCB design, versus one room, maintains a permanent containment environmental envelope that allows access and entry to the accessible service spaces at defined periods during power operation. Separation is provided by concrete walls and physical barriers, or "doors," that can be closed to separate adjoining rooms or compartments. Doors, used as barriers as part of the two-room containment, are designed to open or provide an opening to relieve pressure in the case of a high energy line break (HELB), making them a "pressure relief device" for their respective compartments.

The RCB has several different doors designs. Table 3.8-18 lists the RCB doors, and Figure 3.8-137 through Figure 3.8-144 show their location by elevation. Different door types provide barriers for access control, water tight sealing, pressure relief, and radiation shielding. Some doors provide multiple functions. The radiation doors provide shielding protection for equipment and personnel. The shielding provided by the doors is equivalent to the concrete wall in which the door is installed.

RCB doors fall into four general types of design:

- Radiation protection doors, with a pressure relief function.
- Radiation protection doors, without a pressure relief function.
- Interior building room doors, with a pressure relief function.
- Interior building room doors, without a pressure relief function.

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RCB radiation protection doors are large and are typically integrated in the shield walls surrounding the equipment spaces or inaccessible areas of the RCB during normal operation of the plant. The RCB has 47 radiation protection doors. Forty-five of the radiation protection doors also provide a pressure relief function. These 45 radiation doors are designed so that the whole door "swings" open during a pressure differential related accident to meet its pressure relief function. This swinging or bursting open response to the differential pressure generated across the doors during a HELB accident verifies that an acceptable differential pressure across structural walls of adjacent rooms or compartments is maintained. These 45 radiation protection doors have a swing/burst pressure of 2.9 psid and only open in one direction. The doors open into the room where the hinges are mounted. In the case of the radiation protection doors that have an active and an inactive leaf, both the active and the inactive leaf are assumed to swing open. These doors require special attention because their momentum and significant weight in a "burst" opening can impact civil structures. Door stops and other features are used to limit adverse impact, while still maintaining the opening efficiency of the doors. A portion of these doors are credited in the analyses to prevent compartment overpressurization during a HELB and are classified as safety-related and Seismic Category I as shown in Table 3.2.2-1 and Table 3.8-18. Refer to Section 6.2.1.2 for the dynamic effects of postulated HELB in individual compartments and allowable venting capability to prevent differential pressures from reaching the structural limits of the compartment walls. The only doors credited to open are safety-related doors identified in Table 6.2.1-13 and Table 3.8-18. The remaining radiation doors are classified as non-safety augmented quality (NS-AQ) and Seismic Category II as shown in Table 3.2.2-1 and Table 3.8-18.

Two radiation protection doors exist at Elevation +5 feet that do not provide a pressure relief function. These doors are motor-operated, rolling doors without hinges.

Other interior building room doors are primarily used to divide hallways and rooms. In addition to providing personnel access, these interior door types may also provide functions such as leak tightness. The RCB has 45 interior building doors. Forty-three of these doors provide a pressure relief function. These doors are designed with an integral pressure relief aperture or "blowout panel." The pressure relief aperture is designed to open or burst in only one direction to meet its pressure relief function during a pressure differential accident. Generally, these 43 interior building room doors have a burst pressure of 1.45 psid. A portion of these doors are credited in the analyses to prevent compartment over pressurization during a HELB and are classified as safety-related and Seismic Category I as shown in Table 3.2.2-1 and Table 3.8-18. Refer to Section 6.2.1.2 for the dynamic effects of postulated HELB in individual compartments and allowable venting capability to prevent differential pressures from reaching the structural limits of the compartment walls. The only doors with burst panels credited to open are safety-related doors identified in Table 6.2.1-13 and Table

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3.8-18. The remaining interior building doors are classified as NS-AQ and Seismic Category II as shown in Table 3.2.2-1 and Table 3.8-18.

The pressure relief door -8 feet, door 8 is the venting area room door for the spreading compartment and has a higher burst pressure up to 2.9 psid.

The doors with blowout panels are provided with panel or missle restraints to prevent their momentum from adversely impacting civil, mechanical, electrical, or I&C components in the immediate area.

There are two interior building room doors at Elevation +17 feet that do not provide a pressure relief function. These two doors provide access and entrance to the RV cavity pool area and the transfer canal pool area, are part of the pool liner, and are required to be water tight, with no pressure relief function or bust pressure capability required in support of a HELB.

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3.8.3.2 Applicable Codes, Standards, and Specifications

The following codes, standards, specifications, design criteria, regulations, and regulatory guides are used in the design, fabrication, construction, testing, and inservice inspection of concrete and steel RB internal structures (GDC 1, GDC 2, GDC 4 and GDC 5). Section 5.4.14 describes the applicable codes, standards, and specifications for the design of NSSS component supports.

3.8.3.2.1 Codes and Standards

- ACI 301-05, Specifications for Structural Concrete for Buildings.
- ACI 304R-00, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- ACI 305.1-06, Specification for Hot-Weather Concreting.
- ACI 306R-88 (Re-approved 2002), Cold-Weather Concreting (Reference 49).
- ACI 306.1-90 (Re-approved 2002), Standard Specification for Cold Weather Concreting.
- ACI 308R-01, Guide to Curing Concrete (Reference 50).
- ACI 308.1-98, Standard Specification for Curing Concrete (Reference 39).
- ACI 311.4R-05, Guide for Concrete Inspection (Reference 40).
- ACI 347-04, Guide to Formwork for Concrete.
- ACI 349-01/349-R01, Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary on Code Requirements for Nuclear Safety Related Concrete Structures (exception described in 3.8.4.4 and 3.8.4.5) (GDC 1).

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Table 3.8-18—Reactor Containment Building Doors
Sheet 1 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4]		Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
		To Room	From Room				
-8 ft Door 1	30.89	-8 ft Room 3	-8 ft Room 2	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
-8 ft Door 2	30.89	-8 ft Room 4	-8 ft Room 2	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
-8 ft Door 3	5.92	IRWST	-8 ft Room 3	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
-8 ft Door 4	5.92	-8 ft Room 7	-8 ft Room 2	1.45 + 20%	Pressure Relief Blowout Panel	S	I
-8 ft Door 5	5.92	IRWST	-8 ft Room 4	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
-8 ft Door 6	13.24	-8 ft Room 8	-8 ft Room 7	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
-8 ft Door 7	5.92	-8 ft Room 16	-8 ft Room 13	1.45 + 20%	Pressure Relief Blowout Panel	S	I
-8 ft Door 8	21.85	-8 ft Room 6	-8 ft Room 9	2.90 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
-8 ft Door 9	5.92	-8 ft Room 5	-8 ft Room 3	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
-8 ft Door 10	5.92	-8 ft Room 15	-8 ft Room 11	1.45 + 20%	Pressure Relief Blowout Panel	S	I
-8 ft Door 11	5.92	-8 ft Room 14	-8 ft Room 9	1.45 + 20%	Pressure Relief Blowout Panel	S	I
-8 ft Door 12	5.92	-8 ft Room 5	-8 ft Room 4	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
-8 ft Door 13	5.92	-8 ft Room 11	-8 ft Room 5	1.45 + 20%	Pressure Relief Blowout Panel	S	I
-8 ft Door 14	5.92	-8 ft Room 9	-8 ft Room 5	1.45 + 20%	Pressure Relief Blowout Panel	S	I
-8 ft Door 15	13.89	-8 ft Room 10	-8 ft Room 5	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+5 ft Door 1	5.92	+5 ft Room 13	+5 ft Room 18	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+5 ft Door 2	5.92	+5 ft Room 14	+5 ft Room 18	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II

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Table 3.8-18—Reactor Containment Building Doors
Sheet 2 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4] To Room	Opening Direction[4] From Room	Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
+5 ft Door 4	28.63	+5 ft Room 16	+5 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	S	I
+5 ft Door 5	20.77	+5 ft Room 17	+5 ft Room 16	2.90 + 20%	Pressure Relief Radiation Swing Door	S	I
+5 ft Door 6	26.48	+5 ft Room 27	+5 ft Room 13	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+5 ft Door 7	26.48	+5 ft Room 28	+5 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+5 ft Door 8	27.12	+5 ft Room 4	+5 ft Room 27	N/A[1]	Radiation Door	NS-AQ	II
+5 ft Door 9	27.12	+5 ft Room 7	+5 ft Room 28	N/A[1]	Radiation Door	NS-AQ	II
+5 ft Door 10	5.92	+5 ft Room 12	+5 ft Room 10	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+5 ft Door 12	20.88	+5 ft Room 19	+5 ft Room 12	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+5 ft Door 13	19.91	+5 ft Room 21	+5 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	S	I
+5 ft Door 14	13.89	+5 ft Room 16	+5 ft Room 13	2.90 + 20%	Pressure Relief Radiation Swing Door	S	I
+5 ft Door 20	5.92	+5 ft Room 24	+5 ft Room 27	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+5 ft Door 21	5.92	+5 ft Room 23	+5 ft Room 27	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+5 ft Door 22	5.92	+5 ft Room 25	+5 ft Room 28	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+5 ft Door 23	5.92	+5 ft Room 26	+5 ft Room 28	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+17 ft Door 1	5.92	+17 ft Room 14	+17 ft Room 11	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II

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Table 3.8-18—Reactor Containment Building Doors
Sheet 3 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4] To Room	Opening Direction[4] From Room	Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
+17 ft Door 2	22.71	+17 ft Room 6	+17 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 3	22.93	+17 ft Room 5	+17 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 4	22.82	+17 ft Room 23	+17 ft Room 18	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 5	5.92	+17 ft Room 26	+17 ft Room 15	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+17 ft Door 6	5.92	+17 ft Room 25	+17 ft Room 14	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+17 ft Door 7	22.06	+17 ft Room 2	+17 ft Room 24	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 8	26.48	+17 ft Room 4	+17 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 9	26.48	+17 ft Room 7	+17 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 10	26.48	+17 ft Room 3	+17 ft Room 13	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 11	26.48	+17 ft Room 8	+17 ft Room 16	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 12	5.92	+17 ft Room 13	+17 ft Room 10	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+17 ft Door 13	23.35	+17 ft Room 9	+17 ft Room 16	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 14	22.06	+17 ft Room 24	+17 ft Room 13	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+17 ft Door 15	5.92	+17 ft Room 20	+17 ft Room 13	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II

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Table 3.8-18—Reactor Containment Building Doors
Sheet 4 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4] To Room	Opening Direction[4] From Room	Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
+17 ft Door *1 (RV Cavity Entrance)	N/A	+17 ft Room 23	+17 ft Room 1	None[2]	Water Tight[3]	NS-AQ	II
+17 ft Door *2 (Fuel Transfer Canal Entrance)	N/A	+17 ft Room 21	+17 ft Room 20	None[2]	Water Tight[3]	NS-AQ	II
+29 ft Door 1	5.92	+29 ft Room 15	+29 ft Room 12	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+29 ft Door 2	21.64	+29 ft Room 29	+29 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	S	I
+29 ft Door 3	26.26	+29 ft Room 7	+29 ft Room 16	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 4	26.26	+29 ft Room 6	+29 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 5	26.26	+29 ft Room 8	+29 ft Room 16	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 6	30.57	+29 ft Room 5	+29 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 7	24.00	+29 ft Room 10	+29 ft Room 17	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 8	5.92	+29 ft Room 14	+29 ft Room 11	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+29 ft Door 9	26.48	+29 ft Room 20	+29 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 12	26.26	+29 ft Room 3	+29 ft Room 20	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+29 ft Door 13	5.92	+29 ft Room 18	+29 ft Room 19	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II

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Table 3.8-18—Reactor Containment Building Doors
Sheet 5 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4]		Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
		To Room	From Room				
+45 ft Door 1	5.92	+45 ft Room 14	+45 ft Room 10	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 2	21.85	+45 ft Room 18	+45 ft Room 22	2.90 + 20%	Pressure Relief Radiation Swing Door	S	I
+45 ft Door 3	24.22	+45 ft Room 5	+45 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+45 ft Door 4	24.22	+45 ft Room 4	+45 ft Room 13	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+45 ft Door 5	21.85	+45 ft Room 21	+45 ft Room 22	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+45 ft Door 6	5.92	+45 ft Room 23	+45 ft Room 13	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 7	5.92	+45 ft Room 24	+45 ft Room 14	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 8	11.84	+45 ft Room 17	+45 ft Room 15	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 9	11.84	+45 ft Room 16	+45 ft Room 12	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 10	5.92	+45 ft Room 17	+45 ft Room 15	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 11	5.92	+45 ft Room 16	+45 ft Room 12	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 12	19.91	+45 ft Room 20	+45 ft Room 15	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+45 ft Door 13	5.92	+45 ft Room 12	+45 ft Room 9	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+45 ft Door 14	21.85	+45 ft Room 19	+45 ft Room 12	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+45 ft Door 15	5.92	+45 ft Room 13	+45 ft Room 22	1.45 + 20%	Pressure Relief Blowout Panel	S	I
+64 ft Door 1	5.92	+64 ft Room 10	+64 ft Room 7	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II

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Table 3.8-18—Reactor Containment Building Doors
Sheet 6 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4] To Room	Opening Direction[4] From Room	Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
+64 ft Door 2	21.64	+64 ft Room 11	+64 ft Room 14	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+64 ft Door 3	19.96	+64 ft Room 3	+64 ft Room 13	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+64 ft Door 4	21.64	+64 ft Room 4	+64 ft Room 11	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+64 ft Door 5	5.92	+64 ft Room 15	+64 ft Room 11	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+64 ft Door 6	5.92	+64 ft Room 10	+64 ft Room 16	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+64 ft Door 7	5.92	+64 ft Room 9	+64 ft Room 16	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+79 ft Door 1	5.92	+79 ft Room 7	+79 ft Room 7	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+79 ft Door 2	5.92	+79 ft Room 7	+79 ft Room 20	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+79 ft Door 3	48.44	+79 ft Room 11	+79 ft Room 9	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+79 ft Door 4	24.22	+79 ft Room 20	+79 ft Room 12	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+79 ft Door 5	21.85	+79 ft Room 3	+79 ft Room 11	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+79 ft Door 6	21.85	+79 ft Room 4	+79 ft Room 10	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+79 ft Door 9	24.33	+79 ft Room 10	+79 ft Room 20	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+79 ft Door 10	5.92	+79 ft Room 19	+79 ft Room 10	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II
+79 ft Door 13	5.92	+79 ft Room 18	+79 ft Room 9	1.45 + 20%	Pressure Relief Blowout Panel	NS-AQ	II

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Table 3.8-18—Reactor Containment Building Doors
Sheet 7 of 7

RCB Elevation and Door No.	Vent Area (ft^2)	Opening Direction[4]		Burst Pressure (psid)	Door Function	Safety Class	Seismic Category
		To Room	From Room				
+94 ft Door 11	19.91	+94 ft Room 3	+94 ft Room 1	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II
+94 ft Door 12	19.91	+94 ft Room 4	+94 ft Room 11	2.90 + 20%	Pressure Relief Radiation Swing Door	NS-AQ	II

Notes:

1. This door has no pressure relief function and is a motor operated rolling door without hinges.
2. This door is part of the pool liner and has no pressure relief function.
3. The water tight function only applies when the refueling cavity is flooded for refueling activities.
4. The observer stands in the "From" room and the door swings open towards the observer. The observer is looking at the hinges and enters the "To" room.

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Figure 3.8-137—Reactor Containment Building Door Locations at Elevation -8 feet

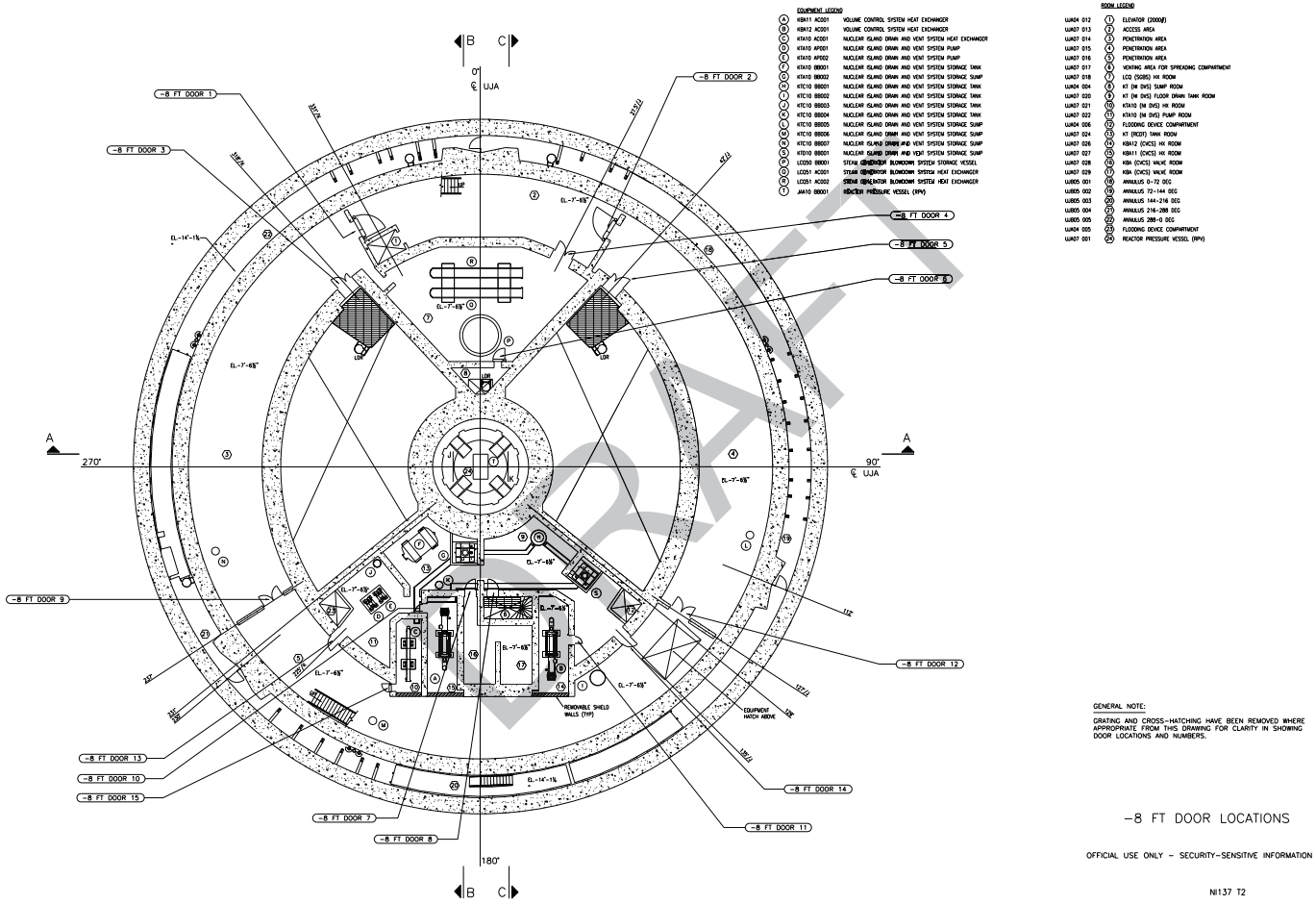

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Figure 3.8-138—Reactor Containment Building Door Locations at Elevation +5 feet

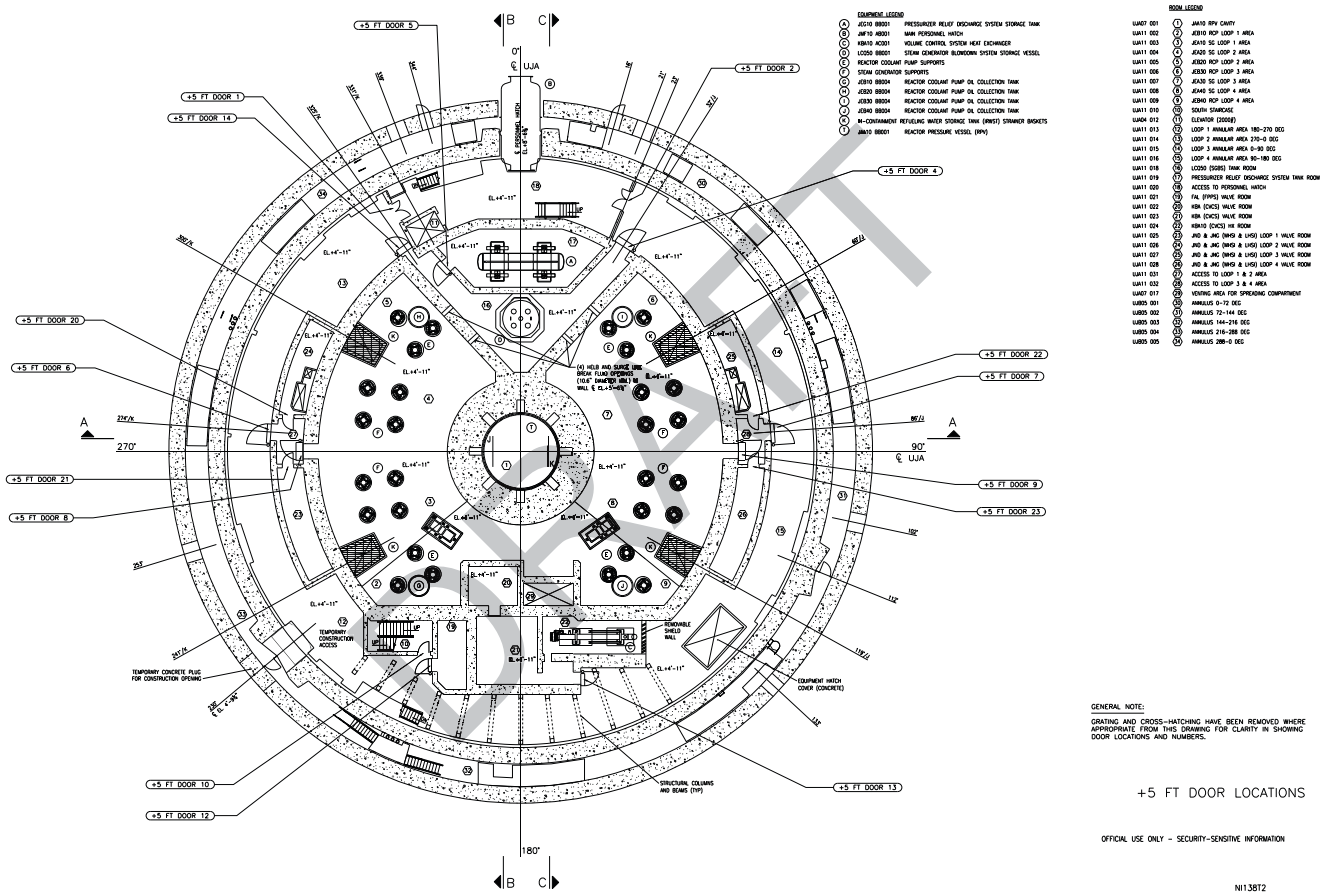

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Figure 3.8-139—Reactor Containment Building Door Locations at Elevation +17 feet

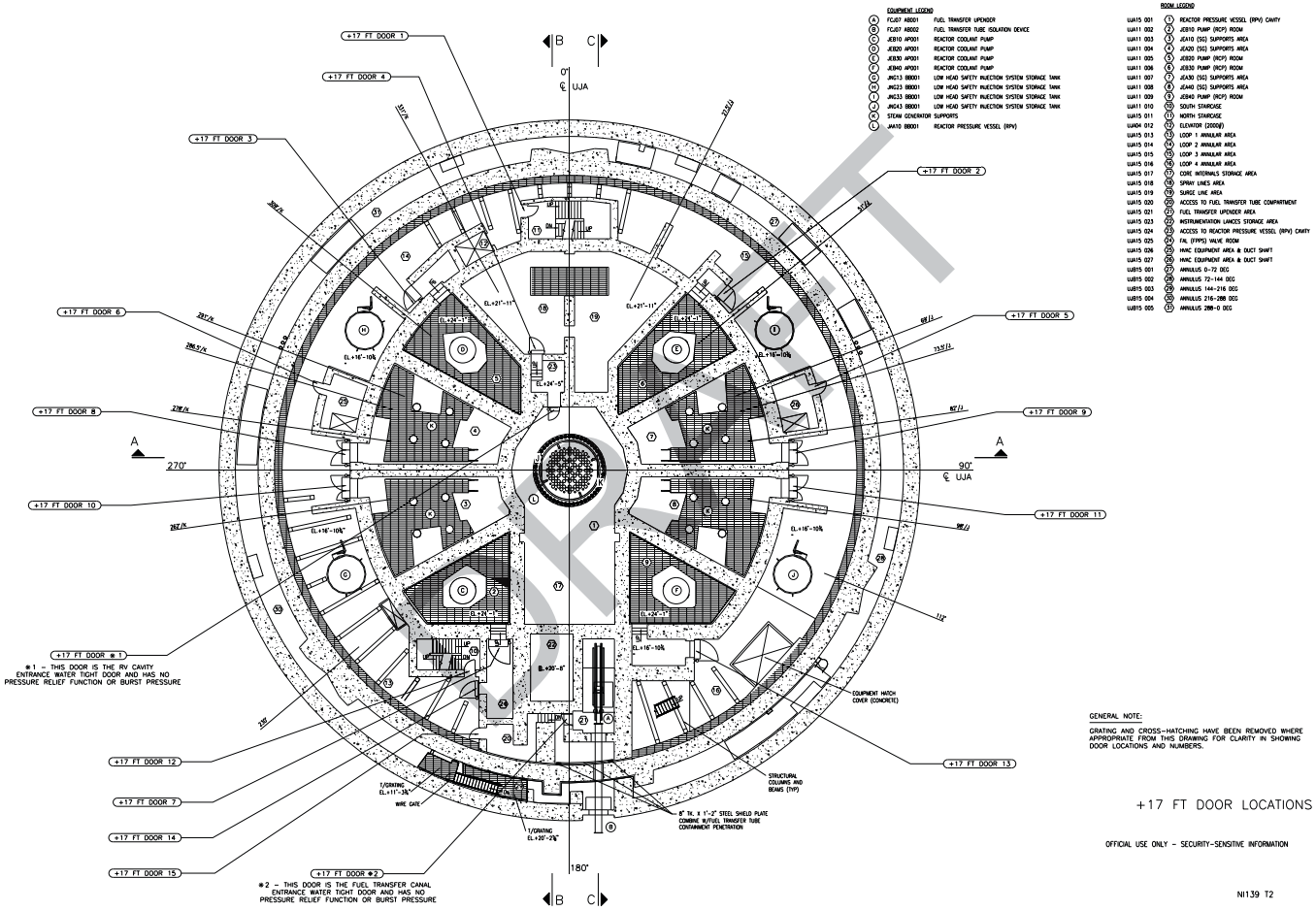

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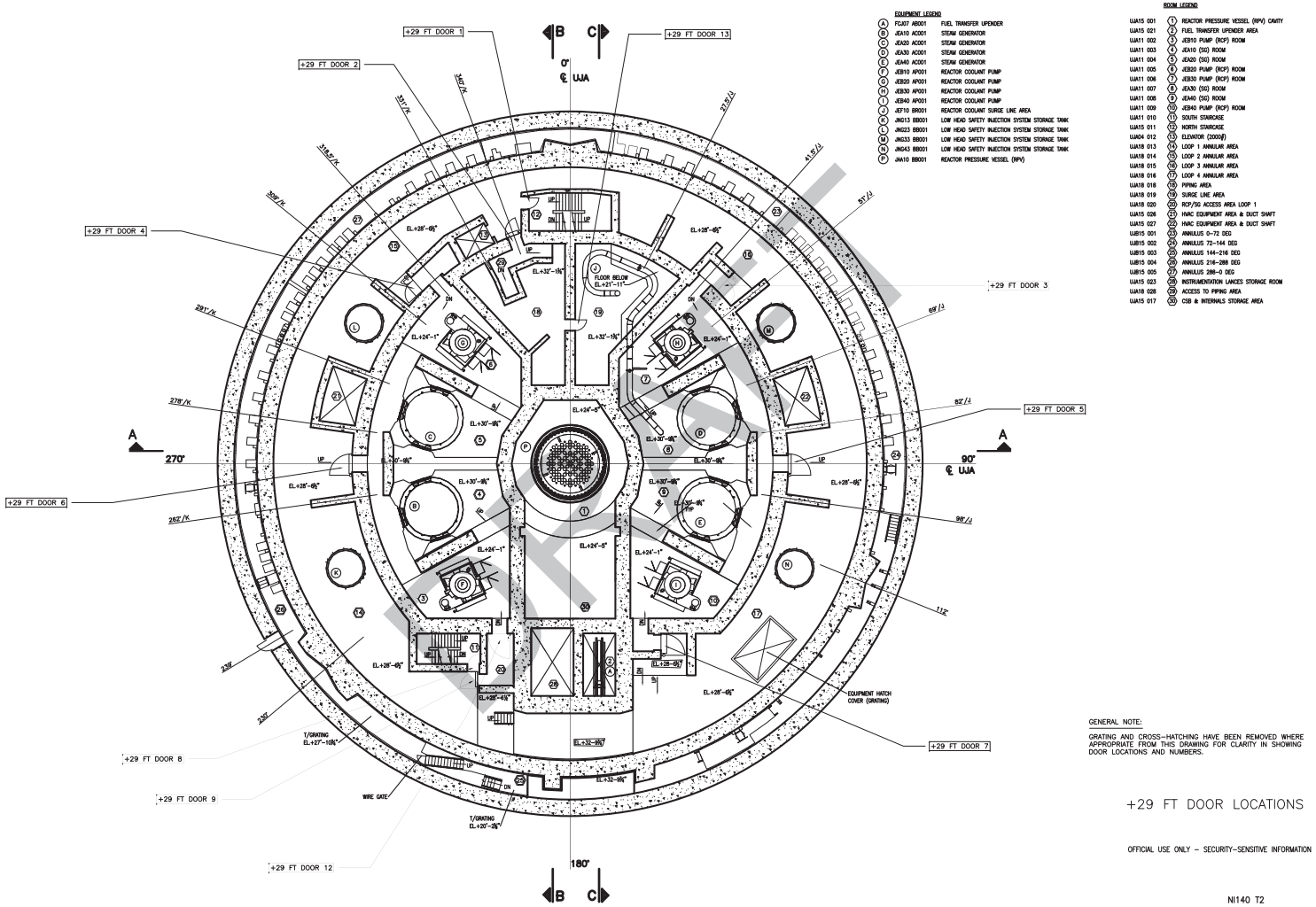
Figure 3.8-140—Reactor Containment Building Door Locations at Elevation +29 feet



EQUIPMENT LEGEND

A	FCA07 AB001	FUEL TRANSFER UPENDER
B	JEA10 AC001	STEAM GENERATOR
C	JEA20 AC001	STEAM GENERATOR
D	JEA30 AC001	STEAM GENERATOR
E	JEA40 AC001	STEAM GENERATOR
F	JEB10 AP001	REACTOR COOLANT PUMP
G	JEB20 AP001	REACTOR COOLANT PUMP
H	JEB30 AP001	REACTOR COOLANT PUMP
J	JEB40 AP001	REACTOR COOLANT PUMP
L	JEF10 BR001	REACTOR COOLANT SURGE LINE AREA
K	JNG13 BB001	LOW HEAD SAFETY INJECTION SYSTEM STORAGE TANK
L	JNG23 BB001	LOW HEAD SAFETY INJECTION SYSTEM STORAGE TANK
M	JNG33 BB001	LOW HEAD SAFETY INJECTION SYSTEM STORAGE TANK
N	JNG43 BB001	LOW HEAD SAFETY INJECTION SYSTEM STORAGE TANK
P	JNA10 BB001	REACTOR PRESSURE VESSEL (RPV)

ROOM LEGEND

UJA15 001	1	REACTOR PRESSURE VESSEL (RPV) CAVITY
UJA15 021	2	FUEL TRANSFER UPENDER AREA
UJA11 002	3	JEB10 PUMP (RCP) ROOM
UJA11 003	4	JEA10 (SG) ROOM
UJA11 004	5	JEA20 (SG) ROOM
UJA11 005	6	JEB20 PUMP (RCP) ROOM
UJA11 006	7	JEB30 PUMP (RCP) ROOM
UJA11 007	8	JEA30 (SG) ROOM
UJA11 008	9	JEA40 (SG) ROOM
UJA11 009	10	JEB40 PUMP (RCP) ROOM
UJA11 010	11	SOUTH STAIRCASE
UJA15 011	12	NORTH STAIRCASE
UJA04 012	13	ELEVATOR (2000kg)
UJA18 013	14	LOOP 1 ANNULAR AREA
UJA18 014	15	LOOP 2 ANNULAR AREA
UJA18 015	16	LOOP 3 ANNULAR AREA
UJA18 016	17	LOOP 4 ANNULAR AREA
UJA18 018	18	PIPING AREA
UJA18 019	19	SURGE LINE AREA
UJA18 020	20	RCP/SG ACCESS AREA LOOP 1
UJA15 026	21	HVAC EQUIPMENT AREA & DUCT SHAFT
UJA15 027	22	HVAC EQUIPMENT AREA & DUCT SHAFT
UJB15 001	23	ANNULUS 0–72 DEG
UJB15 002	24	ANNULUS 72–144 DEG
UJB15 003	25	ANNULUS 144–216 DEG
UJB15 004	26	ANNULUS 216–288 DEG
UJB15 005	27	ANNULUS 288–0 DEG
UJA15 023	28	INSTRUMENTATION LANCES STORAGE ROOM
UJA18 028	29	ACCESS TO PIPING AREA
UJA15 017	30	CSB & INTERNALS STORAGE AREA

GENERAL NOTE:

GRATING AND CROSS–HATCHING HAVE BEEN REMOVED WHERE APPROPRIATE FROM THIS DRAWING FOR CLARITY IN SHOWING DOOR LOCATIONS AND NUMBERS.

+29 FT DOOR LOCATIONS

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Figure 3.8-141—Reactor Containment Building Door Locations at Elevation +45 feet

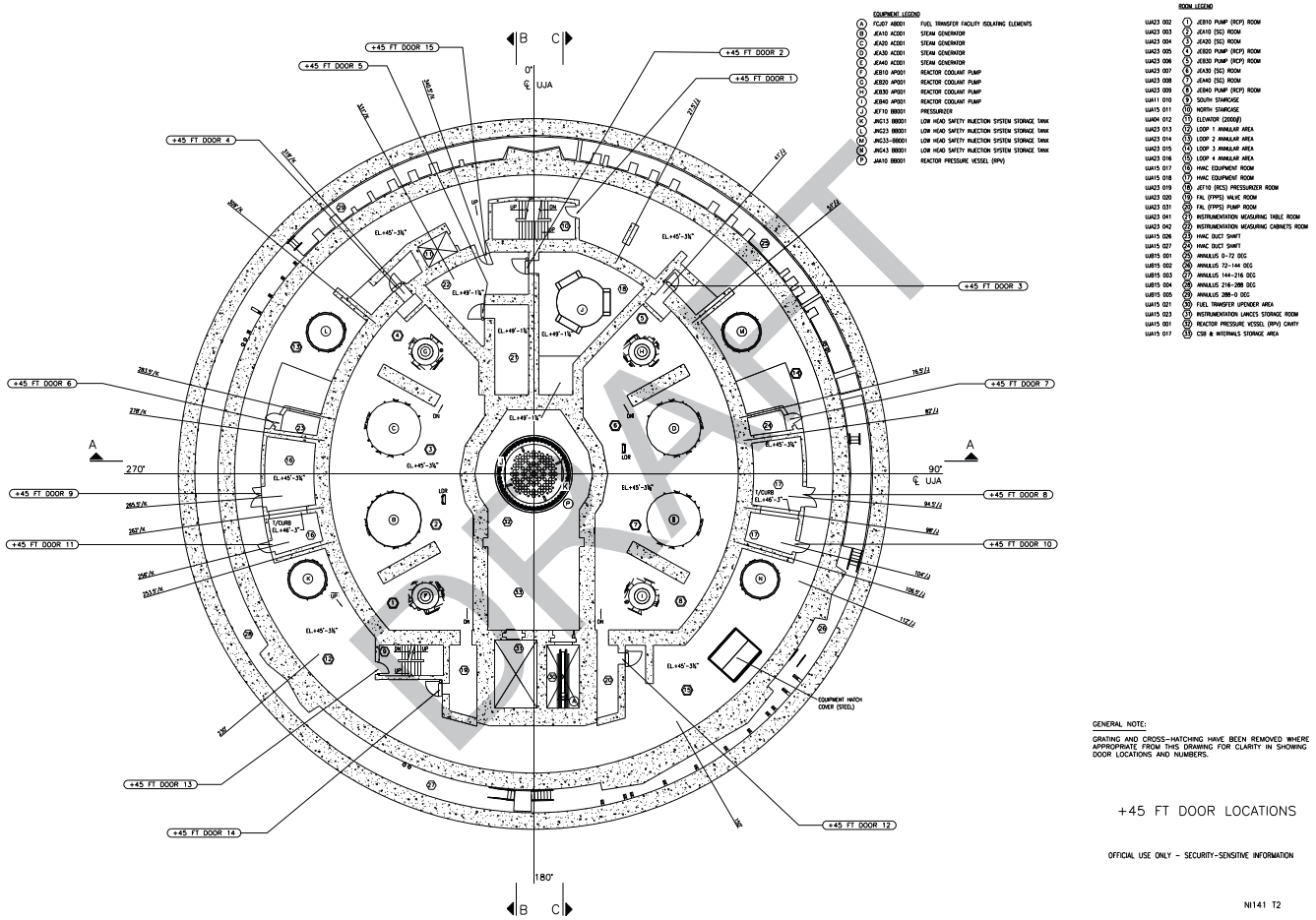

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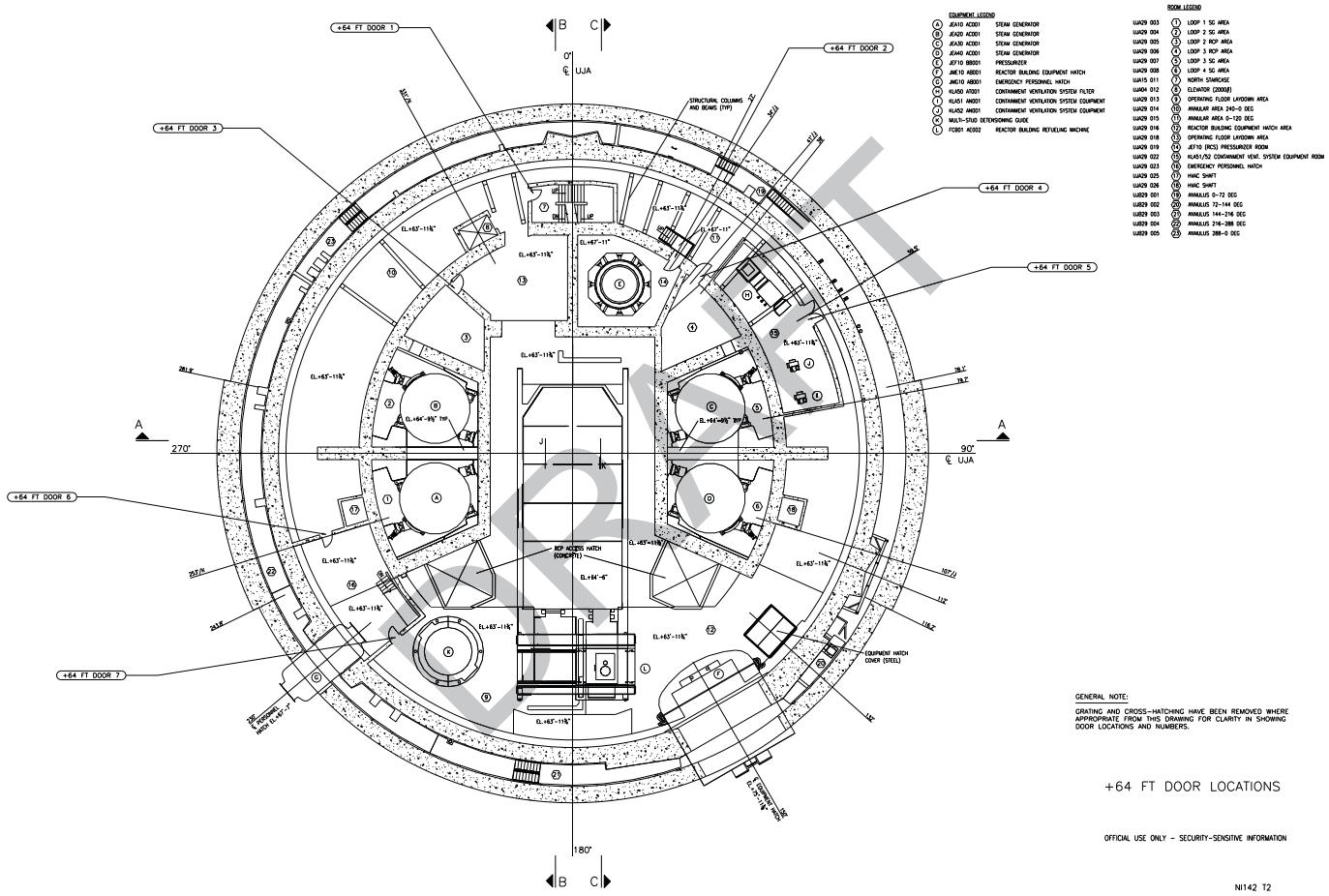
Figure 3.8-142—Reactor Containment Building Door Locations at Elevation +64 feet



COMPONENT LEGEND

A	JEA10 AC001	STEAM GENERATOR
B	JEA20 AC001	STEAM GENERATOR
C	JEA30 AC001	STEAM GENERATOR
D	JEA40 AC001	STEAM GENERATOR
E	JEF10 BB001	PRESSURIZER
F	JME10 AB001	REACTOR BUILDING EQUIPMENT HATCH
G	JME10 AB001	EMERGENCY PERSONNEL HATCH
H	KLA50 AF001	CONTAINMENT VENTILATION SYSTEM FILTER
I	KLA51 AH001	CONTAINMENT VENTILATION SYSTEM EQUIPMENT
J	KLA52 AH001	CONTAINMENT VENTILATION SYSTEM EQUIPMENT
K	MULTI-STUD DETENSIONING GUIDE	
L	FCB01 AE002	REACTOR BUILDING REFUELING MACHINE

ROOM LEGEND

UJA29 003	1	LOOP 1 SG AREA
UJA29 004	2	LOOP 2 SG AREA
UJA29 005	3	LOOP 2 RCP AREA
UJA29 006	4	LOOP 3 RCP AREA
UJA29 007	5	LOOP 3 SG AREA
UJA29 008	6	LOOP 4 SG AREA
UJA15 011	7	NORTH STAIRCASE
UJA04 012	8	ELEVATOR (2000kg)
UJA29 013	9	OPERATING FLOOR LAYDOWN AREA
UJA29 014	10	ANNULAR AREA 240–0 DEG
UJA29 015	11	ANNULAR AREA 0–120 DEG
UJA29 016	12	REACTOR BUILDING EQUIPMENT HATCH AREA
UJA29 018	13	OPERATING FLOOR LAYDOWN AREA
UJA29 019	14	JEF10 (RCS) PRESSURIZER ROOM
UJA29 022	15	KLA51/52 CONTAINMENT VENT. SYSTEM EQUIPMENT ROOM
UJA29 023	16	EMERGENCY PERSONNEL HATCH
UJA29 025	17	HVAC SHAFT
UJA29 026	18	HVAC SHAFT
UJB29 001	19	ANNULUS 0–72 DEG
UJB29 002	20	ANNULUS 72–144 DEG
UJB29 003	21	ANNULUS 144–216 DEG
UJB29 004	22	ANNULUS 216–288 DEG
UJB29 005	23	ANNULUS 288–0 DEG

GENERAL NOTE:

GRATING AND CROSS-HATCHING HAVE BEEN REMOVED WHERE APPROPRIATE FROM THIS DRAWING FOR CLARITY IN SHOWING DOOR LOCATIONS AND NUMBERS.

+64 FT DOOR LOCATIONS

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Figure 3.8-143—Reactor Containment Building Door Locations at Elevation +79 feet

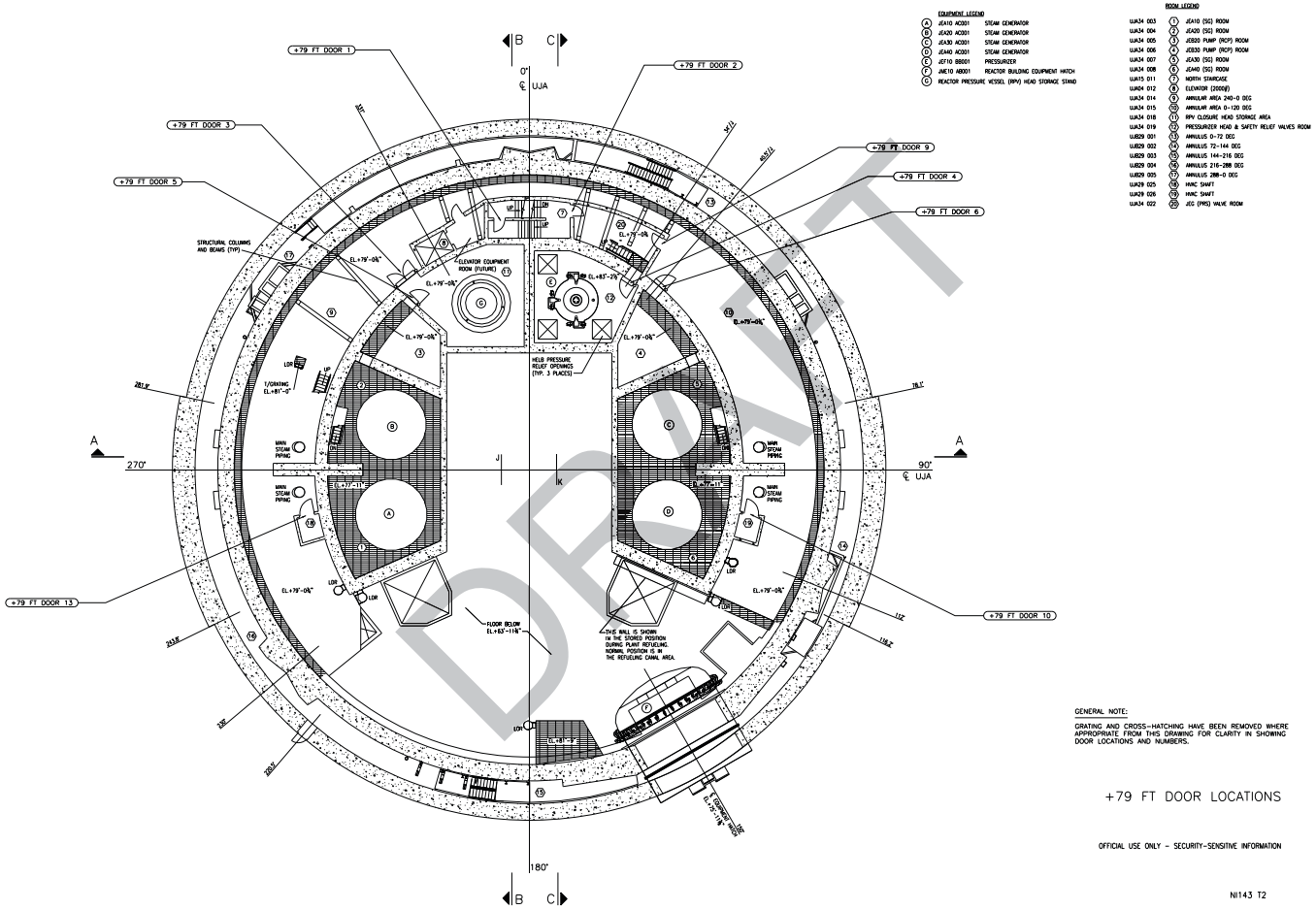

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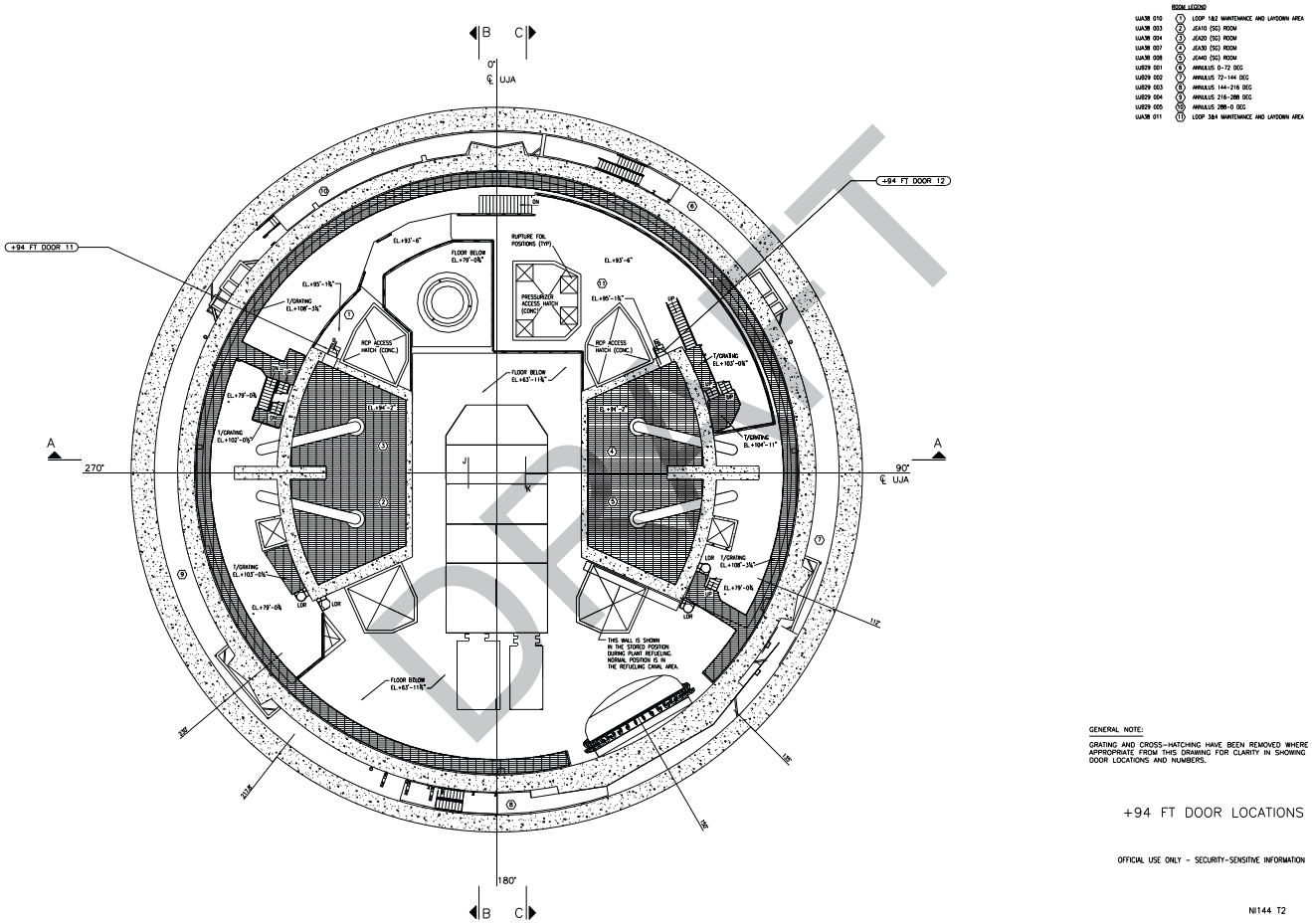
Figure 3.8-144—Reactor Containment Building Door Locations at Elevation +94 feet



ROOM LEGEND

UA38 010	1	LOOP 1&2 MAINTENANCE AND LAYDOWN AREA
UA38 003	2	JEA10 (SG) ROOM
UA38 004	3	JEA20 (SG) ROOM
UA38 007	4	JEA30 (SG) ROOM
UA38 008	5	JEA40 (SG) ROOM
UB29 001	6	ANNULUS 0-72 DEG
UB29 002	7	ANNULUS 72-144 DEG
UB29 003	8	ANNULUS 144-216 DEG
UB29 004	9	ANNULUS 216-288 DEG
UB29 005	10	ANNULUS 288-0 DEG
UA38 011	11	LOOP 3&4 MAINTENANCE AND LAYDOWN AREA

GENERAL NOTE:

GRATING AND CROSS-HATCHING HAVE BEEN REMOVED WHERE APPROPRIATE FROM THIS DRAWING FOR CLARITY IN SHOWING DOOR LOCATIONS AND NUMBERS.

+94 FT DOOR LOCATIONS

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Next File

14.03-1

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment (Sheet 151 of 197)

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)		Safety Class (Note 4)		EQ Program Designation (Note 5)	
Convection Foil – SG Loop 4	30JMT20AB477	30UJA34008	H	H	ES	SI	S	C/NM	Y (4)	Y (5)
Convection Foil – SG Loop 4	30JMT20AB478	30UJA34008	H	H	ES	SI	S	C/NM	Y (4)	Y (5)
Convection Foil – SG Loop 4	30JMT20AB479	30UJA34008	H	H	ES	SI	S	C/NM	Y (4)	Y (5)
Convection Foil – SG Loop 4	30JMT20AB480	30UJA34008	H	H	ES	SI	S	C/NM	Y (4)	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT001	30UJA18019	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT002	30UJA18007	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT003	30UJA18008	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT004	30UJA18003	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT005	30UJA18004	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT006	30UJA18018	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT007	30UJA23019	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT008	30UJA23006	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT009	30UJA23015	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT010	30UJA23006	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT011	30UJA23007	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT012	30UJA23008	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT013	30UJA23016	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT014	30UJA23009	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT015	30UJA23009	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT016	30UJA15001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT017	30UJA23002	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT018	30UJA23002	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT019	30UJA23013	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT020	30UJA23003	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT021	30UJA23004	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT022	30UJA23005	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT023	30UJA23014	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT024	30UJA23005	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT025	30UJA29019	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT026	30UJA29016	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT027	30UJA29013	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT028	30UJA29018	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT029	30UJA34019	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)

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Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment (Sheet 152 of 197)

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)		Safety Class (Note 4)		EQ Program Designation (Note 5)	
Passive Autocatalytic Recombiner	30JMT10AT030	30UJA34007	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT031	30UJA34007	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT032	30UJA34008	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT033	30UJA34008	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT034	30UJA34003	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT035	30UJA34003	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT036	30UJA34004	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT037	30UJA34004	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT038	30UJA38001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT039	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT040	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT041	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT042	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT043	30UJA38001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT044	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT045	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT046	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
Passive Autocatalytic Recombiner	30JMT10AT047	30UJA40001	H	H	~~ES~~	SII	NS-AQ	~~C/NM~~	~~Y (4)~~	Y (5)
ELECTRICAL SYSTEMS										
Class 1E Uninterruptible Power Supply (EUPS)										
As a result of the EQ program screening, no components in this system were identifed for seismic qualification.										
Emergency Power Supply (EPSS)										
As a result of the EQ program screening, no components in this system were identifed for seismic qualification.										
Non-Class 1E Uninterruptible Power Supply (NUPS)										
As a result of the EQ program screening, no components in this system were identifed for seismic qualification.										
Lighting & Small Power System (LGT)										
As a result of the EQ program screening, no components in this system were identifed for seismic qualification.										
Normal Power Supply (NPSS)										
As a result of the EQ program screening, no components in this system were identifed for seismic qualification.										
12-Hour Uninterruptible Power Supply (12UPS)										

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Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment (Sheet 82 of 130)

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Combustion Air System Valve Actuators	30XJQ40AA	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Gas System Valve Actuators	30XJR10AA	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Gas System Valve Actuators	30XJR20AA	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Gas System Valve Actuators	30XJR30AA	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Gas System Valve Actuators	30XJR40AA	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Lube Oil System Valve Actuators	30XJV10AA	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Lube Oil System Valve Actuators	30XJV20AA	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Lube Oil System Valve Actuators	30XJV30AA	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Lube Oil System Valve Actuators	30XJV40AA	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Starting Air System Valve Actuators	30XJX10AA	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Starting Air System Valve Actuators	30XJX20AA	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Starting Air System Valve Actuators	30XJX30AA	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Starting Air System Valve Actuators	30XJX40AA	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Ac Synchronous Generator Electrical	30XKA10AG	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Ac Synchronous Generator Electrical	30XKA20AG	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Ac Synchronous Generator Electrical	30XKA30AG	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Ac Synchronous Generator Electrical	30XKA40AG	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Combustible Gas Control System (CGCS)							
H2 Mixing Damper 01	30JMT20AA001	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 02	30JMT20AA002	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 03	30JMT20AA003	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 04	30JMT20AA004	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 05	30JMT20AA005	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 06	30JMT20AA006	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 07	30JMT20AA007	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 08	30JMT20AA008	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 01 – Open (M)	30JMT20CG001A	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 01 – Closed (M)	30JMT20CG001B	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 02 – Open (M)	30JMT20CG002A	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 02 – Closed (M)	30JMT20CG002B	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 03 – Open (M)	30JMT20CG003A	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 03 – Closed (M)	30JMT20CG003B	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 04 – Open (M)	30JMT20CG004A	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)

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Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment (Sheet 83 of 130)

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
H2 Mixing Damper 04 – Closed (M)	30JMT20CG004B	30UJA07015	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 05 – Open (M)	30JMT20CG005A	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 05 – Closed (M)	30JMT20CG005B	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 06 – Open (M)	30JMT20CG006A	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 06 – Closed (M)	30JMT20CG006B	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 07 – Open (M)	30JMT20CG007A	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 07 – Closed (M)	30JMT20CG007B	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 08 – Open (M)	30JMT20CG008A	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
H2 Mixing Damper 08 – Closed (M)	30JMT20CG008B	30UJA07014	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 1 – Two Room Containment	30JMT20CP001	30UJA34003	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 2 – Two Room Containment	30JMT20CP002	30UJA34003	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 3 – Two Room Containment	30JMT20CP003	30UJA34004	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 4 – Two Room Containment	30JMT20CP004	30UJA34004	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 5 – Two Room Containment	30JMT20CP005	30UJA34007	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 6 – Two Room Containment	30JMT20CP006	30UJA34007	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 7 – Two Room Containment	30JMT20CP007	30UJA34008	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
Delta Pressure 8 – Two Room Containment	30JMT20CP008	30UJA34008	H	H	ES SI	S 1E EMC	Y(1) Y(5) Y(6)
ELECTRICAL SYSTEMS							
Class 1E Uninterruptible Power Supply (EUPS)							
31BGA01 120 V Panelboard	31BGA01GW001	31UJK18026	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BGT01 480 V to 120 V Transformer	31BGT01GW001	31UJK18026	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BRA 480 V Bus (MCC)	31BRA00GW001	31UJK18026	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BRU01 Inverter	31BRU01GU001	31UJK18030	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BRW10 AC/DC Converter	31BRW10GR001	31UJK18025	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BRW12 AC/DC Converter	31BRW12GR001	31UJK18025	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BRW16 AC/DC Converter	31BRW16GR001	31UBP10002	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BTD01 Battery	31BTD01GR001	31UJK14028	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BTP01 Battery Charger	31BTP01GR001	31UJK18030	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BTP02 Battery Charger	31BTP02GR001	31UJK18030	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BUC 250 VDC Bus (Switchboard)	31BUC00GW001	31UJK18030	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BUW11 DC/DC Converter	31BUW11GR001	31UJK18025	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)
31BUW13 DC/DC Converter	31BUW13GR001	31UJK18025	M	M	RT ES PAM SI	S 1E EMC	Y (5) Y (6)

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exposed to the hot walls of the nuclear steam supply system. The cooler, accessible areas are the "service space."

In the event of an accident, communication is established between the two zones by opening mixing dampers, ~~and~~ foils, and safety-related doors, thereby transforming the containment into a single convective volume. This transformation into a single convective volume is performed by the CONVECT system and safety-related doors, which equalizes pressure between the containment compartments and promotes efficient mixing of the atmosphere by establishing a global convective pathway. The CONVECT system of convection foils, rupture foils, and mixing dampers is part of the combustible gas control system (CGCS).

The containment is designed so that the CONVECT system and safety-related doors, in conjunction with recirculation features built into the in-containment refueling water storage tank (IRWST) and re-alignment of the emergency core cooling system (ECCS) system to the hot legs, will rapidly reduce the containment pressure and temperature following a LOCA. These systems maintain the containment pressure and temperature at acceptably low levels (GDC 38). As a result, the containment can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any LOCA (GDC 50).

The containment is provided with the means for monitoring the reactor containment atmosphere, spaces containing components for recirculation of LOCA fluids, effluent discharge paths, and the plant environs for radioactivity that may be released during normal operations, including anticipated operational occurrences, and from postulated accidents (GDC 64).

The containment conforms to the functional requirements of 10 CFR part 50, Appendix K, which defines acceptable evaluation models and calculation of minimum containment pressure for evaluating ECCS capability, specifically for sources of heat during the LOCA and containment pressure control requirements. Refer to Section 15.6.5 for compliance with 10 CFR part 50, Appendix K requirements.

Section 6.2.1.1 addresses those aspects of containment design and evaluation that relate to its accident mitigation functions. Containment performance during refueling operations and reduced primary inventory conditions are discussed in Section 6.2.1.1.1, and the disposition of GL 88-17 for the U.S. EPR design is provided in Section 5.4.7.2.1 and in Table 15.0-60. Section 3.8 provides a physical description of the containment and presents the design criteria relating to construction techniques, static loads, and seismic loads.

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The determination and evaluation of the minimum containment pressure transient are addressed in Section 6.2.1.5.

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6.2.1.1.2 Design Features

The principal containment design features impacting the post accident pressure and temperature response are the IRWST, ~~the CONVECT system~~ the conversion from a two-room containment into a one-room containment and passive heat sinks inside the containment.

The function of the IRWST is to provide a large reserve of borated water. It is the safety-related source of water for emergency core cooling in the event of a LOCA, and is a source of water for containment cooling and for core melt cooling in the event of a severe accident. The IRWST contains a minimum of 500,000 gallons of borated water and is maintained at a temperature between 60°F and 122°F. The IRWST resides at the lowest point in the containment, and drain paths allow water discharged from the RCS to drain into the IRWST.

Containment heat removal is accomplished by recirculation of cooled IRWST water injected into the RCS where the ECCS absorbs residual energy. The heated ECCS returning to the IRWST is subsequently cooled by LHSI heat exchangers.

The CONVECT system, consisting of rupture and convection foils in the steam generator equipment room ceiling and mixing dampers in the wall between the lower accessible area and the IRWST air space, transforms the two-room containment into a one-room containment. A steel framework at the upper boundary of the steam generator equipment rooms, houses rupture and convection foils with a combined opening area of ~~855~~870 ft^2.

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Large break LOCA (LBLOCA) and small break LOCA (SBLOCA) events establish different requirements for flow cross sectional area which is achieved by the different system components. For the LBLOCA, the full cross sectional area (~~855~~870 ft^2) is used to limit the pressure peak. As a consequence of low mass and energy release during a SBLOCA event, the opening of all the rupture foils may not occur. For effective steam distribution in the containment, a minimum free-flow cross-sectional area of ~~480~~450 ft^2 is fulfilled by the convection foils alone.

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Eight fail-safe-open mixing dampers, with a total free flow cross-sectional area of 64 ft^2, connect the IRWST air space to the lowest accessible room. These open ~~passively~~ via spring tension on loss of power in fail-safe mode. They can also be opened and closed manually.

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Safety-related doors are required to complete the transformation of the two-room containment into a one-room containment following a break of the pressurizer surgeline inside the pressurizer compartment.

The passive heat sinks inside the primary containment consist of all painted and unpainted concrete, steel structures and liner for the containment shell and IRWST surfaces. The IRWST heat sinks are exposed to the water in the pool. The remaining heat sinks are exposed to the containment atmosphere. These areas are approximately the same temperature as the containment ambient temperature during normal plant operation. The list of passive heat sinks in the U.S. EPR Containment and their parameters are listed in Table 6.2.1-4—Containment Heat Sink Inventory. Selected heat sinks were not included in the containment pressure-temperature analysis for conservatism. The minimum heat sink surface area for Tier 1, Section 2.1.1.1 is 64,998 m^2 or 699,633 ft^2.

The design pressure of the containment is 62 psig. Calculated containment pressures, based on the conservative analyses, are described in Sections 6.2.1.3 and 6.2.1.4.

The functional capability and frequency of operation of the systems provided to maintain the containment and subcompartment atmospheres within prescribed pressures, temperatures, and humidity limits during normal operation are discussed in Section 9.4.7.

6.2.1.1.3 Design Evaluation

Containment and subcompartment design parameters are provided in Table 6.2.1-5—Containment Initial and Boundary Conditions, and Table 6.2.1-4. The general arrangement drawings for the reactor containment are provided in Section 3.8.1. The structural design of the containment and the subcompartments, as well as the applicable codes, standards and guides that apply to the design of the containment structure, are addressed in Section 3.8. The structural design considers the effects of postulated piping ruptures, as discussed in Section 3.6.

The severity of the temperature rise and pressure peak resulting from a LOCA or MSLB depends upon the nature, size, and location of the postulated rupture. The U.S. EPR containment is designed to contain the energy released from the RCS in the event of a LOCA or from the steam generator (SG) during an MSLB.

In the case of a LOCA, reactor coolant at the primary system temperature is the source of the mass and energy released into the containment. A portion of the coolant is converted to steam and will remain as steam if its enthalpy is sufficient. Coolant released from the primary system causes an increase in containment steam mass, which in turn increases pressure and temperature.

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Table 6.2.1-9 lists ~~forty-three~~54 cases for the MSLB, with ~~five~~14 break sizes ranging from the double-ended guillotine break to the ~~0.1~~0.005 square foot break area, and power levels from 100 percent to 0 percent of rated thermal power (RTP). The peak containment pressure results from the assumed double-ended guillotine MSLB with a failure of one MSIV at 20 percent RTP.

The requirements of 10 CFR part 50, Appendix K, Part I.A list the required features of the evaluation models for sources of heat during the LOCA. For the heat sources of 10 CFR part 50, Appendix K, it must be assumed that the reactor has been operating continuously at a power level at least 1.02 times rated thermal power to allow for instrumentation error. The assumed power level may be decreased provided the proposed alternative value has been demonstrated to account for uncertainties of power level with a lower instrumentation error. The core power is measured using a secondary side-heat balance with feedwater flow rate. A heat balance measurement uncertainty of approximately 0.5 percent of rated thermal power, or 1.005, is applicable to the core power for the U.S. EPR design. This value is achieved with the use of an ultrasonic flow meter for the feedwater flow rate. This value is consistent with the assumption used in the safety analysis in Section 15.0.0.3.1.

The heat removal due to safety injection system/residual heat removal (SIS/RHR) system operation is simulated in the GOTHIC Version 7.2b computer code by specifying heat exchanger input values from Table 6.2.1-3. The GOTHIC heat exchanger model was benchmarked against heat exchanger performance data to provide a conservative representation.

Table 6.2.1-5 lists the initial containment conditions, based on the range of the normal expected conditions within the containment, with consideration given to maximizing the calculated peak containment pressure. Selection of these conditions is described in Analysis of Containment Response to Postulated Pipe Ruptures Using GOTHIC. (Reference 1)

The highest calculated containment pressure is produced by a hot leg break LOCA with the single active failure of one train of ECCS. A summary of the results of the containment pressure and temperature analyses for the spectrum of postulated LOCAs is listed in Table 6.2.1-6, Table 6.2.1-7, and Table 6.2.1-8, and for MSLBs in Table 6.2.1-9.

The IRWST is located near the basement floor of the Containment Building. The tank contains a minimum of 500,000 gallons of borated water and is maintained at a temperature between 60°F and 122°F. For the most limiting DBA, the IRWST temperature remains within the limit that supports continuous operation of the safety injection pumps to mitigate the consequences of the accident. The operation of the safety injection pumps provides the necessary cooling to limit containment

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temperature and pressure within design requirements. A graph illustrating IRWST temperature versus time is presented in Figure 6.3-7.

The SIS has four accumulators to provide water to the RCS in the event of a LOCA. The accumulators' non-condensable cover gas (nitrogen) and the mass and energy release rates of the accumulators are included in the short-term model, and are supplied as input boundary conditions to the forcing functions in the long-term GOTHIC model. The nitrogen is assumed to enter the containment starting at time zero and is completely released at time 20 seconds, although the actual release of the nitrogen does not occur until the accumulators' liquid empties into the RCS loops. The calculations require that the nitrogen gas be assigned a temperature value. Since the nitrogen is stored within the accumulators above the water volume, the gas expands as the water drains from the accumulator into the RCS. The expansion results in polytrophic (pV^n) cooling. The cooled gas flows from the accumulators through the RCS piping, and to the containment atmosphere, where it mixes with the RCS coolant, causing the nitrogen temperature to rise to the RCS coolant temperature. Since the RCS is depressurizing through the break, the RCS temperature would be lower than the normal operating temperatures. A bounding value of 565.5°F is assigned to the nitrogen. This value corresponds to the RCS cold leg temperature. This conservative assumption is applied with all break locations.

The long-term system behavior during various LOCAs has been evaluated to verify the ability of the SIS/RHR system to keep the reactor vessel flooded and maintain the containment within design conditions following a LOCA. This evaluation is based on the conservative predictions of the performance of the ESF consistent with the single failures assumed for each accident analyzed.

After a DBA, the conditions in containment are measured by post-accident monitoring instrumentation described in Section 7.5.

6.2.1.2 Containment Subcompartments

6.2.1.2.1 Design Basis

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The containment internal compartments protect against dynamic effects, including the effects of missiles, pipe whipping, and fluid discharge, that result from equipment failures and from events and conditions outside the containment. The containment internal compartments are designed to accommodate the effects of environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including LOCAs (GDC 4).

The reactor containment structure design, including access openings and penetrations, allows the containment internal compartments to accommodate the calculated pressure and temperature conditions resulting from any LOCA. The design must

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withstand these conditions without exceeding the design leakage rate requirement (GDC 50).

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Subcompartments within containment can withstand the transient differential pressures of ~~a~~ postulated pipe breaks. The subcompartment walls are challenged by the differential pressures resulting from a postulated ~~break in a~~ high-energy line break (HELB) within individual compartments. These rooms are arranged to allow venting of HELBs to prevent differential pressures from reaching the structural limits of compartment walls.

Fluid systems are considered high energy when, during normal plant conditions, the systems are operated or maintained under conditions where either or both of the following criteria are met:

- Operating temperature exceeds 200°F.
- Operating pressure exceeds 275 psig.

Fluid systems are considered moderate-energy systems when operated at the above conditions for 2 percent or less of the time the systems are in operation, or for less than 1 percent of the plant operation time.

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For the U.S. EPR design, the leak before break (LBB) concept is applied (Section 3.6.3) to preclude the need to design components, piping, and supports for the structural dynamic effects of postulated large or double-ended primary system pipe ruptures equal to the pressurizer surge line area or larger. The LBB concept also precludes the need to consider double-ended steam line ruptures in the structural design of the subcompartment, ~~steam~~ system components, and supports.

The combination of the NSSS concentrated loads and the subcompartment differential pressure creates critical loading scenarios on the supporting structural elements. These elements are then labeled as critical sections for the Reactor Building interior structures. Appendix 3E presents the Reactor Building critical sections and the structural evaluations associated with them. Table 6.2.1-10 lists all rooms adjacent to a critical section which contain a HELB.

6.2.1.2.2 Design Features

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The general arrangement drawings for the reactor containment are provided in Section 3.8.1. These drawings form the basis of the subcompartment analysis models. ~~Simplified drawings illustrating the model used for the containment subcompartment analyses are provided in this section.~~

Subcompartments are evaluated based on the mass and energy discharge from each high-energy line in the compartment. Table 6.2.1-11 lists the subcompartment, HELB

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line, conditions and energy discharge for the line with the highest energy discharge in each of subcompartments. Table 6.2.1-12 lists the mass and energy discharge rates for each of the limiting lines identified in Table 6.2.1-11. Subcompartments without high-energy lines are omitted from further analyses.

~~The subcompartments identified to undergo the highest concentrated loading conditions, such as nuclear steam supply system (NSSS) supports, are selected for determination of the differential pressures across the supporting walls. The combination of the NSSS concentrated loads and the subcompartment differential pressure creates critical loading scenarios on the supporting structural elements. These elements are then labeled as critical sections for the Reactor Building interior structures. Appendix 3E presents the Reactor Building critical sections and the structural evaluations associated with them.~~

~~Subcompartments adjacent to critical sections are evaluated based on the mass and energy flux from each high-energy line in the compartment (Table). Subcompartments without high-energy lines are omitted from further analyses.~~

The U.S. EPR principal containment subcompartment design parameters ~~are provided in Table , Table , Table 6.2.1-13, and Table , which~~ include the ~~free~~ volume and vent area for each ~~critical~~ subcompartment ~~along with the neighboring subcompartment volumes~~. The vent paths considered in the subcompartment analysis include open doors, grates, and through-wall openings. The effects of vent areas that become available after the occurrence of a postulated pipe break (e.g., blowout panels, hinged doors~~, collapsing insulation~~) are ~~specifically noted and~~ conservatively treated. The only doors credited to open are the safety grade doors listed in Table 6.2.1-13.

6.2.1.2.3 Design Evaluation

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High-energy lines identified for the subcompartments are compared based on the full-power operating conditions. The mass flux from the postulated pipe rupture is then calculated using the Moody and Henry-Fauske critical flow models. With the cross-sectional area for each of the high-energy lines known, the energy flow is calculated. The highest energy flow for each subcompartment will be selected for subsequent subcompartment analyses. The critical flow rate is held constant for most of the HELB calculations. Some subcompartment calculations shorten the duration based on a limited inventory (e.g., isolation of one side of the break), while others use the CRAFT2 or RELAP5 system analysis codes to determine the mass and energy release as a function of time. These mass and energy rates are listed in Table 6.2.1-14 and Table 6.2.1-15, respectively.

The GOTHIC computer code is used to determine the differential pressure across subcompartment walls. The calculation of the pressure load uses aspects of the NRC-approved GOTHIC containment methodology pertinent to subcompartment pressure

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response in the Containment Response Topical Report (Reference 1). The suitability of the GOTHIC computer code to calculate differential pressures has been demonstrated in various experimental verifications.

Two detailed GOTHIC models are used for conducting the subcompartment analyses. The GOTHIC models define a subcompartment as any fully or partially enclosed volume in the primary containment that would limit the flow of fluid to the main containment volume. Large subcompartments are further divided into rooms at the elevations specified by the general arrangement drawings provided in Section 3.8.1. One GOTHIC model includes a node for each room in the equipment space, while the other includes a node for each room in the service space and pressurizer cavity. Together, they model each individual subcompartment and connect them hydraulically by junctions or flow paths.

The analysis approach is to inject the mass and energy release from the break into the relevant containment subcompartment. The appropriate GOTHIC model is selected based on the location of the break. The HELBs listed in Table 6.2.1-11 are either analyzed using GOTHIC or addressed by the analysis of a symmetrical room.

Each room, represented by a single node that yields a pressure increase greater than 5 psi, was subdivided into multiple cells, as shown in Figure 6.2.1-45 for UJA23004, so that the initial peaks or blowdown peaks inside the rooms are fully captured. These nodalization sensitivity studies showed that the pressure response either decreased or increased by less than 1 psi as a result of more rigorous nodalization. The principal containment subcompartment design parameters are provided in Table 6.2.1-16 and Table 6.2.1-17, which include the room volume and vent area for each subcompartment where the pressure increases more than 5 psi.

Assumptions for the distribution of mass and energy release are biased towards maximizing the subcompartment pressure. The vent flow behavior through the junctions in the model is based on a homogenous mixture in thermal equilibrium with 100 percent water entrainment. GOTHIC code options are used to force thermal equilibrium and disable drop to liquid conversion. A small break drop size is used to obtain velocity equilibrium. The NRC-accepted homogeneous equilibrium model (HEM) critical flow model for air-steam-water mixtures is used for the vent and other downstream junctions. The GOTHIC compressibility option is also used. The compressibility option has the effect of slightly increasing the loss coefficient because of increased density of upstream fluid when pressure drop across the junction becomes large.

Initial atmospheric conditions are chosen to maximize differential pressures. NRC-accepted initial conditions with air at the maximum allowable temperature, minimum absolute pressure, and zero percent relative humidity are used in each node of the GOTHIC models.

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Peak pressure results are presented in Table 6.2.1-18 for subcompartments with pressure increases greater than 5 psi. Plotted pressures are shown in Figure 6.2.1-46 to Figure 6.2.1-64, where the pressure increases greater than 5 psi that are adjacent to a critical section. The results of these evaluations are used in Section 3.8.3 to show that the subcompartments can withstand the applied loads, including the subcompartment pressures, and remain in allowable limits. The structural load calculations include a minimum load of 5 psi on the critical sections with an additional factor of 1.4 applied to the peak pressure predictions from these analyses prior to their use as inputs in the design of the structures.~~High-energy lines identified for the critical subcompartments are compared based on the full-power operating conditions. The mass flux from the postulated double-ended pipe rupture is then calculated using the Homogeneous Equilibrium Model (HEM). With the cross-sectional area for each of the high-energy lines known, the energy flux is calculated. The highest energy flux for each critical subcompartment will be selected for subsequent subcompartment analyses. These are listed in Table , Table 6.2.1-16, and Table 6.2.1-17.~~

~~The HEM model was used for the HELBs presented in Table with the exception of the pipe breaks inside the RCP and SG cavities (identified as rooms 30UJA15-006, 30UJA23-004 and 30UJA29-004). The mass and energy release data for these breaks were calculated using the system analysis code CRAFT2 and are presented in Table 6.2.1-16 and Table 6.2.1-17. The GOTHIC computer code is used to determine the differential pressure across subcompartment walls. The calculation of the pressure load uses aspects of the NRC approved GOTHIC containment methodology pertinent to subcompartment pressure response in the Containment Response Topical Report (Reference 1). The suitability of the GOTHIC computer code to calculate differential pressures has been demonstrated in various experimental verifications.~~

~~A multi-node GOTHIC model is used as the analysis tool for conducting the subcompartment analysis because it utilizes the modeling of individual regions or subcompartments and connects them hydraulically by junctions or flow paths. The subcompartments' rooms have been logically grouped together based on whether the rooms or regions experience gas flows significant enough to be considered well mixed.~~

~~Adjacent subcompartments with sufficient openings create a free exchange of gas flows between subcompartments and are grouped together into a lumped node. Subcompartments that include critical walls are separated from the lumped node and modeled as a single subcompartment or critical room node (Figure 6.2.1-1 through Figure 6.2.1-4). This re-nodalization is performed so that the magnitude of the initial peak or blowdown peak inside the critical room of interest is captured.~~

~~Each of the critical rooms, represented by a single node, was re-nodalized in the circumferential direction, into four nodes so that the initial peaks or blowdown peaks inside the various critical rooms are fully captured. These nodalization sensitivity~~

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~~studies showed that the pressure response generally varied by less than 1 psi as a result of more rigorous nodalization.~~

~~The HEM model in GOTHIC for air-steam-water mixtures is elected for the junctions connected to the blowdown volume. The critical flow regime is expected to exist, if at all, in the junctions connected to the blowdown volume. The compressibility option is actuated for the flow paths connected to the blowdown volume. The compressibility option has the effect of slightly increasing the loss coefficient because of increased density of upstream fluid when pressure drop across the junction becomes large. By selecting the HEM model for the flow paths connected to the blowdown volume, 100 percent droplet entrainment effects for these flow paths are captured.~~

~~The analysis approach is to inject the mass and energy release from the HELB into the relevant containment node that comprises the critical room or section that is exposed to the HELB. Initial conditions (e.g., containment pressure, temperature, relative humidity) at the receiving node and surrounding nodes are imposed to maximize the resultant differential pressure across the affected node. The axial effect is accounted for by injecting the mass and energy release at the elevation where the high energy line is located within the node.~~

~~The design pressure transients generated from postulated pipe breaks presented in Table and Figure 6.2.1-5 through Figure 6.2.1-9 for the identified critical sections are designed for as shown in Appendix 3E. The results of these evaluations show that the critical sections can withstand the applied loads, including the subcompartment pressures, and remain within allowable limits. The structural load calculations apply a factor of 1.4 to the peak pressure predictions from this analysis prior to their use as inputs in the design of the structures of interest.~~

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6.2.1.3 Mass and Energy Release Analyses for Postulated Loss of Coolant Accidents

The containment pressure response to a LOCA in a U.S. EPR is similar to that of a conventional Pressurized Water Reactor (PWR) with a large dry containment. However, containment sprays are not an engineered safety feature used to mitigate the containment pressure response in the U.S. EPR design. Termination of a LOCA event is achieved by quenching core region steaming with pumped safety injection. Following steam quench, hot liquid leaving the reactor coolant system drains to the IRWST, which is attached to an LHSI heat exchanger cooling chain providing the ultimate heat sink.

For the U.S. EPR design, the spectrum of LOCA breaks analyzed includes a range of cold leg pump discharge, cold leg pump suction, and hot leg breaks, ranging from a three-inch SBLOCA up to the largest postulated double-ended guillotine break. The double ended guillotine break of a large RCS pipe is the most limiting event for the

absorb the energy in containment and reduce the pressure. During the reflood phase of the event, steam generated in the core superheats. It approaches saturated conditions as the core water level increases. Steam from the core traverses the SG, absorbing additional energy from the secondary system. As a result, the energy content of the break effluent increases beyond the capacity of the containment heat structures, and the containment pressure begins to rise again. A reduction in the steam flow from the decreasing decay heat allows the crossover legs to begin to fill and form loop seals. The most penalizing condition occurs when the three intact loops no longer provide a vent path to the break such that steam from the core flows to the containment by a path that circumvents cold ECCS injection water. This condition causes a further increase in the containment pressure until the manual switchover of at least 75 percent of the LHSI to the hot legs. The limiting break configuration for the cold leg pump suction break scenario is a double-ended guillotine break with minimum safety injection supplied to the two cross-connected intact loops with no LOOP. Figure 6.2.1-14 through Figure 6.2.1-17 provide the pressure and temperature results for the most limiting cold leg pump suction scenarios. The temperature profile corresponds to the temperature in the equipment room area where the break occurs. Figure 6.2.1-38 shows the temperature profiles in the dome region at various elevations. This figure demonstrates that thermal stratification does not occur in the long term. Figure 6.2.1-39 shows the temperature profiles in different rooms below the dome area.

A blowdown peak of 66.44 psia occurs at 28.0 seconds. The containment pressure begins rise following refill until ECCS injecting in the hot legs can suppress core steam production. The post-reflood peak of 69.27 psia occurs at 3600 seconds when at least 1720 gpm of each of the available LHSI trains is aligned to the hot legs. The containment pressure continues to decrease, reaching 32.0 psia by the end of the analysis at 24 hours.

A break in the cold leg pump discharge piping produces the lowest peak containment pressure. The blowdown phase is similar in duration to the cold leg pump suction break and produces a similar containment pressure response. However, the reflood and post-reflood phases of the cold leg pump discharge event are less limiting than the pump suction break. Unlike the pump suction break, coolant delivery to the loop seal piping segment is significantly reduced because of a weir in the U.S. EPR reactor coolant pump design ~~rising above the top of the cold leg piping~~. As a result, the formation of loop seals is not likely until after re-alignment of the LHSI to the hot legs. The steam that goes through the intact loop must pass pumped injection locations on the way to the reactor vessel (RV) downcomer and through the break. As a result of the condensation on the safety injection fluid, the effluent through the RV side of the break has a lower enthalpy.

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The limiting break configuration for the cold leg pump discharge break scenario is a double-ended guillotine break with minimum available SIS and no postulated LOOP.

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Figure 6.2.1-18 through Figure 6.2.1-21 provide the pressure and temperature results for the limiting cold leg pump discharge scenarios. The temperature profile corresponds to the temperature in the equipment room area where the break occurs. Figure 6.2.1-40 shows the temperature profiles in the dome region at various elevations. This figure shows that there is adequate mixing in the dome region following the LOCA accident; therefore, thermal stratification does not occur. Figure 6.2.1-41 shows the temperature profiles in different rooms below the dome area. A blowdown peak of 65.44 psia occurs at 23.9 seconds. The containment pressure rises following refill until ECCS suppresses core steam production. The post-reflood peak of 68.4 psia occurs at 1860 seconds, and the containment pressure continues to decrease, reaching 32.6 psia by the end of the analysis at 24 hours.

The U.S. EPR LOCA analyses examine a spectrum of breaks and include variations in the SIS flow, offsite power availability, and pipe break size and configuration. In addition, sensitivity studies evaluate the smaller breaks to confirm that sufficient vent area between the equipment area and the accessible area exists. For these smaller breaks, the rupture foils in the CONVECT system are conservatively deactivated in the GOTHIC model and venting is delayed until the containment temperature at the pressure equalization ceiling (PEC) exceeds the temperature setpoint of the convection foils. The break location studies include a break of the pressurizer surgeline inside the pressurizer compartment to confirm venting from the pressurizer compartment to the accessible space is adequate. Critical parameters for the six safety-related doors credited in this analysis are included in ~~Table 6.2.1-18~~Table 6.2.1-13. 14.03-1

6.2.1.3.1 Mass and Energy Release Data

Blowdown mass and energy release data are presented in Table 6.2.1-19 through Table 6.2.1-21 for the limiting cases at each of the three break locations analyzed. The mass and energy at break in the above tables represent both short-term and long-term releases. For the short-term period, the phasic mass and energy release on both sides of the breaks (vessel side and steam generator side) are presented. For the long-term period, mass and energy releases are calculated internally by the GOTHIC with one break junction representing RCS connection to containment. As a result, only one set of data (RV side) is provided.

To maximize the containment peak pressure and temperature, the U.S. EPR LBLOCA and SBLOCA analyses use conservative assumptions that maximize the mass and energy released from the RCS to the containment atmosphere. These assumptions maximize the primary system inventory and the heat into the RCS, and also maximize transfer of mass and energy into the containment. In addition, the analyses assume that doors between different rooms in the containment remain closed during the entire transient. To provide conservatism, the computer models:

- Maximize the initial reactor power level.

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Emergency feedwater flow depends on the discharge pressure. However, MSLB analysis does not consider this, so the analysis assumes the highest possible flow to the SGs.

The emergency feedwater system isolates on high level in the SG. Since SG level is not modeled, isolation of the emergency feedwater is assumed to occur by operator action 30 minutes after the start of the event. Because peak containment pressure and temperature occur before 30 minutes, emergency feedwater flow is available for the duration of the analysis.

6.2.1.4.1.4 Postulated Break Size, Type, and Location

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Releases are analyzed for five MSL breaks: the double-ended guillotine break and break sizes of 1.0, 0.7, 0.52, and 0.3 square feet in area. Each of the break sizes are analyzed at seven initial power levels. Sensitivities on large split break sizes are performed only at lower power levels because the limiting case occurs at low power. Additional sensitivities of very small break sizes are also performed only at low power. The very small break size sensitivity studies are performed because the affected SG still has significant inventory at the time of EFWS isolation at 30 minutes. The break sensitivities are performed to verify that the limiting break size is identified.~~Releases are analyzed for five MSL breaks: the double-ended guillotine break and break sizes of 1.0, 0.7, 0.52 and 0.3 square feet in area. Each of the break sizes are analyzed at seven initial power levels. Additional sensitivities of very small break sizes are performed only at low power to confirm the limiting break size is identified. These sensitivity studies are performed because the affected SG still has significant inventory at the time of EFWS isolation at 30 minutes.~~

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Each SG is equipped with a flow orifice that limits the effective area for the MSLB. Although the area of the main steam line is 4.1 ft^2, the effective break area after main steam isolation is no greater than the flow restrictor throat area of 1.4 square feet.

Break location affects steam-line blowdown by virtue of the pressure losses that occur in the length of piping between the SG and the break location. The effect of the pressure loss is to reduce the effective break area seen by the SG. This reduces the rate of blowdown, but it does not significantly change the total release of energy to the containment. Therefore, piping pressure drop from the affected SG to the break location is ignored in all analyses. Because the location of the break within containment can affect the containment temperature and pressure response, break locations are analyzed in both the accessible and inaccessible areas.

6.2.1.4.1.5 Availability of Offsite Power

The U.S. EPR design does not have a containment spray system or containment fan coolers as part of the engineered safety features that would be delayed if there was a LOOP. Therefore, offsite power is assumed to be available, and the mass and energy

released from the break are maximized due to continued operation of the reactor coolant pumps. The energy transferred from the reactor coolant system to the SGs, with continued operation of the MFW and EFW pumps, maximizes the SG inventories available for release to containment.

6.2.1.4.1.6 Safety System Failures

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Six potential single failure scenarios for the MSLB event are considered:

1. Failure of the MFW pump to trip.
2. MFW isolation valves failure.
3. MFW control valve failure.
4. MSIV failure.
5. CONVECT system failure.
6. Containment door failure.

The most severe single active failure is the failure of an MSIV on the main steam line of the affected steam generator. An MSIV failure would provide additional fluid that is released to the containment via the break. This fluid comes from the blowdown of the steam piping between the break location and the isolation valves in the intact loops. This single failure is more severe than the failure of an MSIV on an intact loop because of the volume of the steam line that is isolated.

The single failure of the MSIV on the affected steam generator is more severe than any failure in the MFW system because of the redundancy of the valves in the main feedwater system. A failure in the CONVECT system would involve only a single foil, not the entire CONVECT system, and therefore a single failure of the CONVECT system is not as limiting as the MSIV failure. A containment door can not be the limiting single failure because no containment doors are credited in the analyses.~~The most severe single active failure is the failure of an MSIV on the main steam line of the affected steam generator. An MSIV failure would provide additional fluid that is released to the containment via the break. This fluid comes from the blowdown of all the steam piping between the break location and the isolation valves in the intact loops. This single failure is more severe than the failure of an MSIV on an intact loop due to the volume of the steam line that is isolated. Furthermore, this single failure is more severe than the failure of an isolation valve in the main feedwater system because of the redundancy of the valves in the main feedwater system.~~

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Table 6.2.1-1—Loss of Coolant Accidents
Sheet 3 of 3

Case	Break Location	Break Type[7]	Cd	Single Failure	ECCS	Offsite Power Configuration	Back Pressure
37	Pump Suction	DEG	1.0	1 Train ECCS[10, 12]	Min	No LOOP	Note 8
38	Pump Suction	DEG	1.0	1 Train ECCS [10]	Min	LOOP	Note 8
39	Pump Suction	DEG	1.0	1 Train ECCS [10, 11]	Min	No LOOP	Note 8
40	Pump Suction	DEG	1.0	1 Train ECCS [10, 11, 13]	Min	No LOOP	Note 8
41	Pump Discharge	DEG	1.0	1 Train ECCS [9, 11, 13]	Min	No LOOP	Note 8
42	Pump Discharge	0.5 ft^2 (9 in)	1.0	1 Train ECCS	Min	LOOP	Note 8
43	Pump Discharge	0.1963 ft^2 (6 in)	1.0	1 Train ECCS	Min	LOOP	Note 8
44	Pump Discharge	0.0491 ft^2 (3 in)	1.0	1 Train ECCS	Min	LOOP	Note 8
45	Hot Leg	0.0491 ft^2 (3 in)	1.0	1 Train ECCS	Min	LOOP	Note 8
46	Hot Leg	0.0491 ft^2 (3 in)	1.0	1 Train ECCS [14]	Min	LOOP	Note 8

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Notes:

1. Increased IRWST Temperature to 248°F.
2. Based on Case 17 with the percentage of LHSI to the intact loop to be 0%.
3. Based on Case 17 with the percentage of LHSI to the intact loop to be 25%.
4. Based on Case 25 with instantaneous feedwater isolation.
5. Long-Term LOCA Run Based on Case 25.

Table 6.2.1-2—Main Steam Line Breaks
Sheet 1 of 2

Case	Power Level (RTP)	Break Type[1]	Size	Single Failure	Offsite Power Configuration
1	100%	DEG	1.4 ft^2	MSIV	Available
2	100%	Split	1.0 ft^2	MSIV	Available
3	100%	Split	0.7 ft^2	MSIV	Available
4	100%	Split	0.52 ft^2	MSIV	Available
5	100%	Split	0.3 ft^2	MSIV	Available
6	80%	DEG	1.4 ft^2	MSIV	Available
7	80%	Split	1.0 ft^2	MSIV	Available
8	80%	Split	0.7 ft^2	MSIV	Available
9	80%	Split	0.52 ft^2	MSIV	Available
10	80%	Split	0.3 ft^2	MSIV	Available
11	60%	DEG	1.4 ft^2	MSIV	Available
12	60%	Split	1.0 ft^2	MSIV	Available
13	60%	Split	0.7 ft^2	MSIV	Available
14	60%	Split	0.52 ft^2	MSIV	Available
15	60%	Split	0.3 ft^2	MSIV	Available
16	50%	DEG	1.4 ft^2	MSIV	Available
17	50%	Split	1.0 ft^2	MSIV	Available
18	50%	Split	0.7 ft^2	MSIV	Available
19	50%	Split	0.52 ft^2	MSIV	Available
20	50%	Split	0.3 ft^2	MSIV	Available
21	40%	DEG	1.4 ft^2	MSIV	Available
22	40%	Split	1.0 ft^2	MSIV	Available
22(A)	40%	Split	3.0 ft^2	MSIV	Available
22(B)	40%	Split	1.72 ft^2	MSIV	Available
23	40%	Split	0.7 ft^2	MSIV	Available
24	40%	Split	0.52 ft^2	MSIV	Available
25	40%	Split	0.3 ft^2	MSIV	Available
26	20%	DEG	1.4 ft^2	MSIV	Available
26(A)	20%	DEG[2]	1.4ft^2	MSIV	Available
26(B)	20%	DEG [2, 3]	1.4ft^2	MSIV	Available

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Table 6.2.1-2—Main Steam Line Breaks
Sheet 2 of 2

Case	Power Level (RTP)	Break Type[1]	Size	Single Failure	Offsite Power Configuration
26(C)	20%	Split	8.25 ft^2	MSIV	Available
26(D)	20%	Split	4.12 ft^2	MSIV	Available
26(E)	20%	Split	3.0 ft^2	MSIV	Available
26(F)	20%	Split	1.72 ft^2	MSIV	Available
27	20%	Split	1.0 ft^2	MSIV	Available
28	20%	Split	0.7 ft^2	MSIV	Available
29	20%	Split	0.52 ft^2	MSIV	Available
30	20%	Split	0.3 ft^2	MSIV	Available
31	0%	DEG	1.4 ft^2	MSIV	Available
32	0%	Split	1.0 ft^2	MSIV	Available
32(A)	0%	Split	8.25 ft^2	MSIV	Available
32(B)	0%	Split	4.12 ft^2	MSIV	Available
32(C)	0%	Split	3.0 ft^2	MSIV	Available
32(D)	0%	Split	1.72 ft^2	MSIV	Available
32(E)	0%	Split[2]	1.72 ft^2	MSIV	Available
33	0%	Split	0.7 ft^2	MSIV	Available
34	0%	Split	0.52 ft^2	MSIV	Available
35	0%	Split	0.3 ft^2	MSIV	Available
35(A)	0%	Split[3]	0.3 ft^2	MSIV	Available
36	0%	Split	0.2 ft^2	MSIV	Available
37	0%	Split	0.15 ft^2	MSIV	Available
38	0%	Split	0.1 ft^2	MSIV	Available
39	0%	Split	0.01 ft^2	MSIV	Available
40	0%	Split	0.005 ft^2	MSIV	Available

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Notes:

1. DEG = double-ended guillotine.
2. No EFW supplied to broken SG.
3. Break located in the accessible space outside the SG towers.

Table 6.2.1-9—Peak Containment Pressure and Temperature for MSLB
Sheet 1 of 3

Description	Time of Peak Pressure (s)	Peak Pressure (psia)	Time of Peak Temperature (s)	Peak Temperature (°F)
100% Power Cases				
DEG[1]	56.0	54.8	28.0	406.9
1.0 ft^2 split	180.0	55.8	180.0	376.2
0.7 ft^2 split	300.0	55.4	275.0	388.8
0.52 ft^2 split	380.0	55.9	365.0	388.0
0.3 ft^2 split	1800.0	57.5	610.0	395.4
80% Power Cases				
DEG[1]	80.0	56.0	28.0	410.6
1.0 ft^2 split	185.0	56.6	57.0	377.6
0.7 ft^2 split	300.0	56.1	255.0	388.2
0.52 ft^2 split	420.0	56.6	400.0	387.1
0.3 ft^2 split	1800.0	58.3	670.0	401.2
60% Power Cases				
DEG[1]	41.0	58.0	26.0	418.0
1.0 ft^2 split	210.0	56.2	165.0	388.8
0.7 ft^2 split	300.0	56.4	265.0	388.4
0.52 ft^2 split	420.0	56.9	385.0	389.0
0.3 ft^2 split	1800.0	58.5	670.0	403.6
50% Power Cases				
DEG[1]	39.1	58.9	26.1	420.8
1.0 ft^2 split	240.0	56.4	96.0	381.7
0.7 ft^2 split	340.0	56.7	280.0	388.1
0.52 ft^2 split	440.0	57.0	405.0	386.3
0.3 ft^2 split	1800.0	58.6	762.0	400.7
40% Power Cases				
DEG[1]	39.1	59.8	26.1	423.3
3.0 ft^2 split	52.0	59.0	28.0	426.9
1.72 ft^2 split	140.0	57.6	42.0	392.2
1.0 ft^2 split	240.0	56.7	80.0	382.3

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Table 6.2.1-9—Peak Containment Pressure and Temperature for MSLB
Sheet 2 of 3

14.03-1

Description	Time of Peak Pressure (s)	Peak Pressure (psia)	Time of Peak Temperature (s)	Peak Temperature (°F)
0.7 ft^2 split	340.0	56.9	285.0	387.4
0.52 ft^2 split	1800.0	57.1	420.0	384.4
0.3 ft^2 split	1800.0	58.9	740.0	403.0
20% Power Cases				
DEG[1]	38.5	62.1	26.1	427.3
DEG[2]	34.1	62.7	26.1	428.5
DEG[2, 3]	18.15	66.4	18.1	479.5
8.25 ft^2 split	38.0	61.1	24.0	433.7
4.12 ft^2 split	41.0	61.4	24.0	428.3
3.0 ft^2 split	52.0	61.2	26.0	431.3
1.72 ft^2 split	100.0	59.4	38.0	398.3
1.0 ft^2 split	210.1	58.3	82.1	384.6
0.7 ft^2 split	340.0	58.0	320.0	382.8
0.52 ft^2 split	1800.0	58.4	500.0	380.9
0.3 ft^2 split	1800.0	59.6	950.0	391.5
0% Power Cases				
DEG[1]	41.0	60.5	2.0	401.2
8.25 ft^2 split	38.0	60.1	1.0	420.8
4.12 ft^2 split	42.0	58.7	31.0	363 .9
3.0 ft^2 split	47.0	57.9	34.0	369.4
1.72 ft^2 split	66.0	63.1	33.0	413.1
1.72 ft^2 split[3]	66.0	64.8	19.0	433.8
1.72 ft^2 split[2, 3]	56.0	65.6	19.0	435.0
1.0 ft^2 split	220.0	60.4	45.0	390.3
0.7 ft^2 split	320.0	60.4	285.0	395.1
0.52 ft^2 split	440.0	60.5	430.0	397.2
0.3 ft^2 split	1800.0	61.2	830.0	416.0
0.2 ft^2 split	1860.0	62.1	1330.0	407.8
0.15 ft^2 split	1900.0	62.9	1860.0	397.4
0.1 ft^2 split	2600.0	59.1	2540.0	372.8

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Table 6.2.1-9—Peak Containment Pressure and Temperature for MSLB
Sheet 3 of 3

Description	Time of Peak Pressure (s)	Peak Pressure (psia)	Time of Peak Temperature (s)	Peak Temperature (°F)
0.01 ft^2 split	1800.0	21.5	1800.0	196.7
0.005 ft^2 split	1800.0	19.2	1800.0	167.2
~~DEG[1]~~	~~41.5~~	~~60.4~~	~~2.0~~	~~401.1~~
~~1.0 ft^2 split~~	~~220.0~~	~~60.4~~	~~45.1~~	~~390.3~~
~~0.7 ft^2 split~~	~~340.0~~	~~60.0~~	~~325.0~~	~~377.5~~
~~0.52 ft^2 split~~	~~1800.0~~	~~59.9~~	~~580.0~~	~~377.4~~
~~0.3 ft^2 split~~	~~1800.0~~	~~61.5~~	~~1140.0~~	~~389.7~~
~~0.3 ft^2 split[3]~~	~~1800.0~~	~~59.0~~	~~1080.0~~	~~325.0~~
~~0.2 ft^2 split~~	~~1980.0~~	~~62.2~~	~~1980.0~~	~~382.7~~
~~0.15 ft^2 split~~	~~2540.0~~	~~59.3~~	~~2540.0~~	~~375.0~~
~~0.1 ft^2 split~~	~~3700.0~~	~~54.5~~	~~3700.0~~	~~364.0~~
~~0.01 ft^2 split~~	~~1800.0~~	~~21.4~~	~~1770.0~~	~~196.4~~
~~0.005 ft^2 split~~	~~1800.0~~	~~19.2~~	~~1800.0~~	~~167.5~~

Notes:

1. DEG = double-ended guillotine.
2. No EFW supplied to broken SG.
3. Break located in the accessible space outside the SG towers.

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Table 6.2.1-10—Critical Rooms Containing HELBs
Sheet 1 of 4

Room Name	Adjacent Critical Section(s)
-8 ft Room 2	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
-8 ft Room 3	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
-8 ft Room 4	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
-8 ft Room 5	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
-8 ft Room 7	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
-8 ft Room 9	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
-8 ft Room 11	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
-8 ft Room 14	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
-8 ft Room 15	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
-8 ft Room 16	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
-8 ft Room 17	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
+5 ft Room 2	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 3	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 4	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 5	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 6	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 7	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area

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Table 6.2.1-10—Critical Rooms Containing HELBs
Sheet 2 of 4

Room Name	Adjacent Critical Section(s)
+5 ft Room 8	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 9	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 12	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+5 ft Room 13	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+5 ft Room 14	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+5 ft Room 15	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+5 ft Room 16	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls & Typical Primary Shield Wall / Reactor Vessel Support Area
+5 ft Room 18	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+5 ft Room 20	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
+5 ft Room 21	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
+5 ft Room 22	Reactor Building Internal Structures – Typical Elevation +1.5m Heavy Slab and Support Walls
+17 ft Room 2	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 3	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 4	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 5	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 6	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 7	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 8	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 9	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+17 ft Room 13	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+17 ft Room 14	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress

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Table 6.2.1-10—Critical Rooms Containing HELBs
Sheet 3 of 4

Room Name	Adjacent Critical Section(s)
+17 ft Room 15	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+17 ft Room 16	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+17 ft Room 19	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 3	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 4	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 5	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 6	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 7	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 8	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 9	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 10	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 14	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+29 ft Room 15	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+29 ft Room 16	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+29 ft Room 17	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+29ft Room 18	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+29 ft Room 19	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+45 ft Room 1	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+45 ft Room 2	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+45 ft Room 3	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+45 ft Room 4	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+45 ft Room 6	Reactor Building Internal Structures – Typical SG Cubicle Area Walls
+45 ft Room 7	Reactor Building Internal Structures – Typical SG Cubicle Area Walls

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Table 6.2.1-10—Critical Rooms Containing HELBs
Sheet 4 of 4

Room Name	Adjacent Critical Section(s)
+45 ft Room 12	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+45 ft Room 13	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+45 ft Room 14	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+45 ft Room 15	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+64 ft Room 1	Reactor Building Internal Structures – Typical Operating Floor Slab Area
+64 ft Room 2	Reactor Building Internal Structures – Typical Operating Floor Slab Area
+64 ft Room 5	Reactor Building Internal Structures – Typical Operating Floor Slab Area
+64 ft Room 6	Reactor Building Internal Structures – Typical Operating Floor Slab Area
+64 ft Room 10	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+64 ft Room 11	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+64 ft Room 12	Reactor Containment Building – Typical Cylinder Wall and Buttress & Equipment Hatch Area
+64 ft Room 14	Reactor Building Internal Structures – Typical Operating Floor Slab Area
+64 ft Room 16	Reactor Containment Building – Typical Cylinder Wall and Buttress & Typical Airlock and MS/FW Penetrations
+79 ft Room 9	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress
+79 ft Room 10	Reactor Containment Building – Typical Liner Plate & Typical Cylinder Wall and Buttress

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~~Table 6.2.1-10—Critical Subcompartments in Containment~~

~~Room Name (30UJA)~~	~~Room Description~~	~~System Name (Pipe Name)~~	~~Operating Pressure (psia)~~	~~Operating Temperature (°F)~~	~~NPS (in)~~	~~Accident Pressure (psia)~~
~~11—004~~	~~SG Loop 2~~	~~SIS/RHR (JJNA20 BR001)~~	~~2250.0~~	~~625.7~~	~~10~~	~~20.80~~
~~11—006~~	~~RCP Loop 3~~	~~CVCS (KBA35 BR002)~~	~~2324.0~~	~~512.3~~	~~4~~	~~*~~
~~11—027~~	~~SI valves Loop 3~~	~~SIS/RHR (JNG33 BR001)~~	~~814.7~~	~~140~~	~~12~~	~~16.90~~
~~15—004~~	~~SG Loop 2~~	~~CVCS (KBA34 BR019)~~	~~2324.0~~	~~512.3~~	~~3~~	~~*~~
~~15—006~~	~~RCP Loop 3~~	~~SIS/RHR(JNG33 BR007)~~	~~2250.0~~	~~563.4~~	~~10~~	~~29.02~~
~~18—004~~	~~SG Loop 2~~	~~SG Blowdown (LCQ10 BR012)~~	~~1144.3~~	~~561.0~~	~~2~~	~~*~~
~~23—004~~	~~SG Loop 2~~	~~FW(LAB70 BR005)~~	~~1131.2~~	~~446.3~~	~~20~~	~~28.36~~
~~29—004~~	~~SG Loop 2~~	~~FW(LAB70 BR005)~~	~~1131.2~~	~~446.3~~	~~20~~	~~31.07~~
~~29—019~~	~~Pressurizer Cavity~~	~~RCS (JEF10 BR004)~~	~~2250.0~~	~~653.0~~	~~6~~	~~17.82~~
~~34—004~~	~~SG Loop 2~~	~~SG (JEA20 BR302)~~	~~1123.0~~	~~559.0~~	~~1~~	~~*~~
~~34—019~~	~~Pressurizer Relief Valve Cavity~~	~~RCS (JEF10 BR004)~~	~~2250.0~~	~~653.0~~	~~6~~	~~18.59~~

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Table 6.2.1-11—Evaluated Subcompartment HELBs
Sheet 1 of 6

Room Number	Room Description	High Energy Line Pipe Name	Pipe Description	Line Pressure (psia)	Line Temperature (F)	Line Size (in)
-8 ft Room 2	Access Area	LCA90BR006	Main Condensate	575	420	6
-8 ft Room 3	Area for JND, JNG & JMQ (MHSI, LHSI, SAHRS) Pipe Penetrations	JNG13BR004	Low Head Safety Injection	815	140	2
-8 ft Room 4	Area for JND, JNG & JMQ (MHSI, LHSI, SAHRS) Pipe Penetrations	LCQ51BR103	Steam Generator Blowdown	315	338	6
-8 ft Room 5	Area for Hot Pipe penetrations from UFA	KBA14BR012	Chemical and Volume Control	380	340	6
-8 ft Room 7	LCQ (SGBS) HX Room	LCQ51BR001	Steam Generator Blowdown	265	406	6
-8 ft Room 9	KT (NI DVS) Floor Drain and Tank Room	KPL85BR004	Gaseous Waste Processing	190	212	2
-8 ft Room 11	KTA10 (NI DVS) Pumps Room	KTA10BR027	Nuclear Island Drain and Vent System – Primary Effluents	145	305	4
-8 ft Room 14	KBA12 (CVCS) HX Room	KBA12BR001	Chemical and Volume Control	2250	566	3
-8 ft Room 15	KBA11 (CVCS) HX Room	KBA11BR001	Chemical and Volume Control	2250	566	3
-8 ft Room 16	KBA (CVCS) Valve Room	KBA11BR001	Chemical and Volume Control	2250	566	3
-8 ft Room 17	KBA (CVCS) Valve Room	KBA10BR004	Chemical and Volume Control	2250	566	4

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Table 6.2.1-11—Evaluated Subcompartment HELBs
Sheet 2 of 6

Room Number	Room Description	High Energy Line Pipe Name	Pipe Description	Line Pressure (psia)	Line Temperature (F)	Line Size (in)
+5 ft Room 2	JEB10 (RCP) Oil Collection Tank Area	KBA10BR001	Chemical and Volume Control	2250	566	4
+5 ft Room 3	JEA10 (SG) Supports Area	JNA10BR001	Residual Heat Removal	2250	626	10
+5 ft Room 4	JEA20 (SG) Supports Area	JNA20BR001	Residual Heat Removal	2250	626	10
+5 ft Room 5	JEB20 (RCP) Oil Collection Tank Area	LCQ20BR001	Steam Generator Blowdown	1305	578	4
+5 ft Room 6	JEB30 (RCP) Oil Collection Tank Area	LCQ40BR001	Steam Generator Blowdown	1305	578	4
+5 ft Room 7	JEA30 (SG) Supports Area	JNA30BR001	Residual Heat Removal	2250	626	10
+5 ft Room 8	JEA40 (SG) Supports Area	JNA40BR001	Residual Heat Removal	2250	626	10
+5 ft Room 9	JEB40 (RCP) Oil Collection Tank Area	JEB40BR008	Reactor Coolant Pump	2250	566	3
+5 ft Room 12	Loop 1 Annular Area 180-270 Deg	KAB60BR038	Component Cooling Water	190	338	12
+5 ft Room 13	Loop 2 Annular Area 270-0 Deg	KAB60BR006	Component Cooling Water	190	338	12
+5 ft Room 14	Loop 3 Annular Area 0-90 Deg	LAR31BR006	Emergency Feedwater	1305	578	4
+5 ft Room 15	Loop 4 Annular Area 90-180 Deg	LAR41BR006	Emergency Feedwater	1305	578	4
+5 ft Room 16	LCQ50 (SGBS) Tank room	LCQ40BR905	Steam Generator Blowdown	265	420	16
+5 ft Room 18	Access to Personnel Airlock	LCA90BR006	Main Condensate	575	420	6
+5 ft Room 20	KBA (CVCS) Valve Room	KBA10BR002	Chemical and Volume Control	2250	566	4

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Table 6.2.1-11—Evaluated Subcompartment HELBs
Sheet 3 of 6

Room Number	Room Description	High Energy Line Pipe Name	Pipe Description	Line Pressure (psia)	Line Temperature (F)	Line Size (in)
+5 ft Room 21	KBA (CVCS) Valve Room	KBA10BR003	Chemical and Volume Control	2250	566	4
+5 ft Room 22	KBA10 (CVCS) HX Room	KBA10BR003	Chemical and Volume Control	2250	566	4
+5 ft Room 23	JND & JNG (MHSI & LHSI) Valve 1 Room	JNG13BR001	Low Head Safety Injection	815	140	12
+5 ft Room 24	JND & JNG (MHSI & LHSI) Valve 2 Room	JNG23BR001	Low Head Safety Injection	815	140	12
+5 ft Room 25	JND & JNG (MHSI & LHSI) Valve 3 Room	JNG33BR001	Low Head Safety Injection	815	140	12
+5 ft Room 26	JND & JNG (MHSI & LHSI) Valve 4 Room	JNG43BR001	Low Head Safety Injection	815	140	12
+17 ft Room 2	JEB10 Pump (RCP) Room	JNG13BR007	Low Head Safety Injection	2250	566	10
+17 ft Room 3	JEA10 (SG) Support Area	KBA34BR019	Chemical and Volume Control	2250	487	3
+17 ft Room 4	JEA20 (SG) Support Area	KBA34BR019	Chemical and Volume Control	2250	487	3
+17 ft Room 5	JEB20 Pump (RCP) Room	JNG23BR007	Low Head Safety Injection	2250	566	10
+17 ft Room 6	JEB30 Pump (RCP) Room	JNG33BR007	Low Head Safety Injection	2250	566	10
+17 ft Room 7	JEA30 (SG) Support Area	LCQ30BR003	Steam Generator Blowdown	1305	578	4
+17 ft Room 8	JEA40 (SG) Support Area	LCQ40BR003	Steam Generator Blowdown	1305	578	4
+17 ft Room 9	JEB40 Pump (RCP) Room	JNG43BR007	Low Head Safety Injection	2250	566	10
+17 ft Room 13	JNG13 (LHSI) Tank & Loop 1 Annular Area	JNG13BR001	Low Head Safety Injection	815	140	12

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Table 6.2.1-11—Evaluated Subcompartment HELBs Sheet 4 of 6

Room Number	Room Description	High Energy Line Pipe Name	Pipe Description	Line Pressure (psia)	Line Temperature (F)	Line Size (in)
+17 ft Room 14	JNG23 (LHSI) Tank & Loop 2 Annular Area	LCA90BR006	Main Condensate	575	420	6
+17 ft Room 15	JNG33 (LHSI) Tank & Loop 3 Annular Area	JNG33BR001	Low Head Safety Injection	815	140	12
+17 ft Room 16	JNG43 (LHSI) Tank & Loop 4 Annular Area	JNG43BR001	Low Head Safety Injection	815	140	12
+17 ft Room 18	Spray Lines Area	LCQ52BR001	Steam Generator Blowdown	200	382	12
+17 ft Room 19	Surge Line area	KBA35BR003	Chemical and Volume Control	2250	652	4
+29ft Room 3	JEB10 Pump (RCP) Room	JEW50BR002	Pump Seal Injection of CVCS	190	212	2
+29 ft Room 4	JEA10 (SG) Room	LCQ10BR012	Steam Generator Blowdown	1305	578	2
+29 ft Room 5	JEA20 (SG) Room	LCQ10BR012	Steam Generator Blowdown	1305	578	2
+29 ft Room 6	JEB20 Pump (RCP) Room	KBA34BR022	Chemical and Volume Control	2250	566	4
+29 ft Room 7	JEB30 Pump (RCP) Room	JEF10BR103	Reactor Coolant Pressurizing	2250	652	4
+29 ft Room 8	JEA30 (SG) Room	LCQ30BR012	Steam Generator Blowdown	1305	578	2
+29 ft Room 9	JEA40 (SG) Room	LCQ30BR012	Steam Generator Blowdown	1305	578	2
+29 ft Room 10	JEB40 Pump (RCP) Room	KBA34BR023	Chemical and Volume Control	2250	566	4
+29 ft Room 14	JNG13 (LHSI) Tank & Loop 1 Annular Area	LAR11BR006	Emergency Feedwater	1305	578	4
+29 ft Room 15	JNG23 (LHSI) Tank & Loop 2 Annular Area	LCA90BR006	Main Condensate	575	420	6

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Table 6.2.1-11—Evaluated Subcompartment HELBs
Sheet 5 of 6

Room Number	Room Description	High Energy Line Pipe Name	Pipe Description	Line Pressure (psia)	Line Temperature (F)	Line Size (in)
+29 ft Room 16	JNG33 (LHSI) Tank & Loop 3 Annular Area	LAR31BR006	Emergency Feedwater	1305	578	4
+29 ft Room 17	JNG43 (LHSI) Tank & Loop 4 Annular Area	QNJ41BR016	Supply to the KLA HVAC System	195	338	8
+29 ft Room 18	Spray Lines Area	LCQ52BR001	Steam Generator Blowdown	200	382	12
+29 ft Room 19	Surge Line area	KBA35BR003	Chemical and Volume Control	2250	652	4
+45 ft Room 1	JEB10 Pump (RCP) Room	JEW50BR021	Pump Seal Injection of CVCS	190	212	2
+45 ft Room 2	JEA10 (SG) Room	LAB60BR005	Feedwater	1133	446	20
+45 ft Room 3	JEA20 (SG) Room	LAB70BR005	Feedwater	1133	446	20
+45 ft Room 4	JEB20 Pump (RCP) Room	JEW50BR001	Pump Seal Injection of CVCS	2550	212	2
+45 ft Room 6	JEA30 (SG) Room	LAB80BR005	Feedwater	1133	446	20
+45 ft Room 7	JEA40 (SG) Room	LAB90BR005	Feedwater	1133	446	20
+45 ft Room 12	JNG13 (LHSI) Tank & Loop 1 Annular Area	LAB60BR005	Feedwater	1133	446	20
+45 ft Room 13	JNG23 (LHSI) Tank & Loop 2 Annular Area	LAB70BR005	Feedwater	1133	446	20
+45 ft Room 14	JNG33 (LHSI) Tank & Loop 3 Annular Area	LAB80BR005	Feedwater	1133	446	20
+45 ft Room 15	JNG43 (LHSI) Tank & Loop 4 Annular Area	LAB90BR005	Feedwater	1133	446	20
+45 ft Room 18	JEF10 (RCS) Pressurizer Room	JEF10BR103	Reactor Coolant Pressurizing	2250	652	4
+64 ft Room 1	JEA10 (SG) Room	LAB60BR005	Feedwater	1133	446	20

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Table 6.2.1-11—Evaluated Subcompartment HELBs Sheet 6 of 6

Room Number	Room Description	High Energy Line Pipe Name	Pipe Description	Line Pressure (psia)	Line Temperature (F)	Line Size (in)
+64 ft Room 2	JEA20 (SG) Room	LAB70BR005	Feedwater	1133	446	20
+64 ft Room 5	JEA30 (SG) Room	LAB80BR005	Feedwater	1133	446	20
+64 ft Room 6	JEA40 (SG) Room	LAB90BR005	Feedwater	1133	446	20
+64 ft Room 10	Annular Area, 240-0 Deg	LCA90BR006	Main Condensate	575	420	6
+64 ft Room 11	Annular Area, 0-120 Deg	LAR31BR006	Emergency Feedwater	1305	578	4
+64 ft Room 12	Access to Equipment Hatch	LAR41BR006	Emergency Feedwater	1305	578	4
+64 ft Room 14	JEF10 (RCS) Pressurizer Room	JEF10BR004	Reactor Coolant Pressurizing	2250	652	6
+64 ft Room 16	Access to Emergency Airlock	LAR11BR006	Emergency Feedwater	1305	578	4
+79 ft Room 5	JEA30 (SG) Room	KPL85BR030	Gaseous Waste Processing	365	450	2
+79 ft Room 9	Annular Area, 240-0 Deg	LCA90BR006	Main Condensate	575	420	6
+79 ft Room 10	Annular Area, 0-120 Deg	KPL85BR030	Gaseous Waste Processing	365	450	2
+79ft Room 12	Pressurizer Head & Safety Relief Valves Room	JEF10BR006	Reactor Coolant Pressurizing	2250	652	6

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~~Table 6.2.1-11—Free Volume and Vent Path Hydraulic Data for RCP Cavity (30UJA15-006)~~

~~Volume Data~~		~~Free Volume (ft^3)~~	~~From Elev. (ft)~~	~~To Elev. (ft)~~
~~Node No.~~	~~Room Code (See Arrangement Drawings) (30UJA)~~			
~~31~~	~~15-006~~	~~3208.2~~	~~15.22~~	~~24.08~~
~~Connecting Nodes~~				
~~2~~	~~04-003~~	~~52400.9~~	~~-22.47~~	~~0~~
~~8~~	~~11-001~~	~~2932.2~~	~~-20.67~~	~~24.41~~
~~10~~	~~11-006, 11-007, 15-007~~	~~21091.4~~	~~4.92~~	~~30.77~~
~~11~~	~~11-008, 11-009, 15-008, 15-009~~	~~25541.6~~	~~4.92~~	~~30.77~~
~~12~~	~~18-006, 18-007, 23-006, 23-007~~	~~35311.1~~	~~24.08~~	~~64.8~~
~~13~~	~~18-008, 18-009, 23-008, 23-009, 23-018, 23-031,~~	~~41082.43~~	~~24.08~~	~~64.8~~
~~22~~	~~11-015, 11-016, 11-027, 11-028, 11-032, 15-015, 15-016, 18-015, 18-016, 23-015, 23-016~~	~~176396.75~~	~~4.92~~	~~63.98~~

~~Vent Path No.~~	~~Node No.~~		~~Vent Area (ft^2)~~	~~Inertia Length (ft)~~	~~Form Loss Factor~~	~~Opening Type (Required ?P)~~	~~Delay Time (s)~~
	~~From~~	~~To~~					
~~Vent Path Data~~							
~~7~~	~~2~~	~~10~~	~~53.82~~	~~17.1~~	~~1.5~~	~~N/A~~	~~N/A~~
~~35~~	~~8~~	~~10~~	~~17.761~~	~~18.3~~	~~1.5~~	~~N/A~~	~~N/A~~
~~39~~	~~10~~	~~11~~	~~430.57~~	~~30.0~~	~~1.5~~	~~N/A~~	~~N/A~~
~~40~~	~~10~~	~~13~~	~~32.29~~	~~30.2~~	~~1.5~~	~~N/A~~	~~N/A~~
~~41~~	~~10~~	~~12~~	~~447.79~~	~~33.3~~	~~1.5~~	~~N/A~~	~~N/A~~
~~42~~	~~10~~	~~22~~	~~28.42~~	~~41.6~~	~~1.5~~	~~Door (1.45 psid)~~	~~Remains closed~~
~~43~~	~~10~~	~~22~~	~~47.15~~	~~41.6~~	~~1.5~~	~~Door (8.071 psid)~~	~~Remains closed~~
~~97~~	~~8~~	~~31~~	~~17.76~~	~~13.5~~	~~1.5~~	~~N/A~~	~~N/A~~
~~98~~	~~31~~	~~12~~	~~274.70~~	~~24.8~~	~~1.5~~	~~N/A~~	~~N/A~~
~~99~~	~~31~~	~~22~~	~~29.064~~	~~36.8~~	~~1.5~~	~~Door (8.071 psid)~~	~~Remains closed~~
~~100~~	~~10~~	~~31~~	~~241.12~~	~~17.4~~	~~1.5~~	~~N/A~~	~~N/A~~

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Table 6.2.1-12—Mass and Energy Discharge Rates for Bounding High Energy Line Breaks
Sheet 1 of 3

Pipe Name	Pipe Size (in)	Pipe Schedule	Pipe Area (ft2)	Pressure (psia)	Temp. (F)	Enthalpy (Btu/lb)	Mass Flux (lb/ft2-s)	Mass Disch. (lb/s)	Energy Disch. (Btu/s)	Break Config. (1)	Break Opening Time (s)	Notes
JEB40BR008	3	XXS	0.0289	2250	566	566.7	22402.5	1292.7	7.325E+05	_	0.003	_
JEF10BR004	6	160	0.1469	2250	652	1116.0	5133.8	753.9	8.414E+05	SE	0.003	_
JEF10BR006	6	160	0.1469	2250	652	1116.0	5133.8	753.9	8.414E+05	SE	0.003	_
JEF10BR103	4	160	0.0645	2250	652	1116.0	5133.8	331.0	3.694E+05	SE	0.002	_
JEW50BR001	2	160	0.0156	2550	212	185.8	38741.9	1205.6	2.240E+05	_	0.001	_
JEW50BR002	2	40S	0.0233	190	212	180.6	9874.0	460.2	8.310E+04	_	0.010	_
JEW50BR021	2	40S	0.0233	190	212	180.6	9874.0	460.2	8.310E+04	_	0.010	_
JNA10BR001	10	160	0.3941	2250	626	651.8	15831.9	6238.7	4.066E+06	SE	0.006	_
JNA20BR001	10	160	0.3941	2250	626	651.8	15831.9	6238.7	4.066E+06	SE	0.006	_
JNA30BR001	10	160	0.3941	2250	626	651.8	15831.9	6238.7	4.066E+06	SE	0.006	_
JNA40BR001	10	160	0.3941	2250	626	651.8	15831.9	6238.7	4.066E+06	SE	0.006	_
JNG13BR001	12	80S	0.7058	815	140	110.0	22292.1	31469.3	3.462E+06	_	0.010	_
JNG13BR004	2	40S	0.0233	815	140	110	22292.1	1038.8	1.143E+05		0.002	
JNG13BR007	10	160	0.3941	2250	566	566.7	22402.5	8828.0	5.003E+06	SE	0.006	_
JNG23BR001	12	80S	0.7058	815	140	110.0	22292.1	31469.3	3.462E+06	_	0.010	
JNG23BR007	10	160	0.3941	2250	566	566.7	22402.5	8828.0	5.003E+06	SE	0.006	_
JNG33BR001	12	80S	0.7058	815	140	110.0	22292.1	31469.3	3.462E+06	_	0.010	_
JNG33BR007	10	160	0.3941	2250	566	566.7	22402.5	8828.0	5.003E+06	SE	0.006	_
JNG43BR001	12	80S	0.7058	815	140	110.0	22292.1	31469.3	3.462E+06	_	0.010	_
JNG43BR007	10	160	0.3941	2250	566	566.7	22402.5	8828.0	5.003E+06	SE	0.006	_

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Table 6.2.1-12—Mass and Energy Discharge Rates for Bounding High Energy Line Breaks Sheet 2 of 3

Pipe Name	Pipe Size (in)	Pipe Schedule	Pipe Area (ft2)	Pressure (psia)	Temp. (F)	Enthalpy (Btu/lb)	Mass Flux (lb/ft2-s)	Mass Disch. (lb/s)	Energy Disch. (Btu/s)	Break Config. (1)	Break Opening Time (s)	Notes
KAB60BR006	12	STD	0.7854	190	338	309.3	6430.6	10101.2	3.125E+06	-	0.034	-
KAB60BR038	12	STD	0.7854	190	338	309.3	6430.6	10101.2	3.125E+06	-	0.034	-
KBA10BR001	4	160	0.0645	2250	566	566.7	22402.5	2888.5	1.637E+06	-	0.003	-
KBA10BR002	4	XXS	0.0542	2250	566	566.7	-	-	-	SE	0.003	(3)
KBA10BR003	4	XXS	0.0542	2250	566	566.7	-	-	-	SE	0.003	(3)
KBA10BR004	4	XXS	0.0542	2250	566	566.7	-	-	-	SE	0.003	(3)
KBA11BR001	3	XXS	0.0289	2250	566	566.7	-	-	-	SE	0.003	(3)
KBA12BR001	3	XXS	0.0289	2250	566	566.7	-	-	-	SE	0.003	(3)
KBA14BR012	6	40S	0.2006	380	340	311.7	11773.0	4724.0	1.473E+06	-	0.009	-
KBA34BR019	3	XXS	0.0289	2250	487	472.6	28080.9	1620.4	7.658E+05	-	0.003	-
KBA34BR022	4	160	0.0645	2250	566	566.7	22402.5	2888.5	1.637E+06	-	0.003	-
KBA34BR023	4	160	0.0645	2250	566	566.7	22402.5	2888.5	1.637E+06	-	0.003	-
KBA35BR003	4	160	0.0645	2250	652	1116.0	5133.8	331.0	3.694E+05	SE	0.003	-
KPL85BR004	2	40S	0.0233	190	212	1198.1	392.0	18.3	2.189E+04	-	0.010	-
KPL85BR030	2	40S	0.0233	365	450	1204.7	746.5	34.8	4.191E+04	-	0.005	
KTA10BR027	4	40s	0.0884	145	305	327.7	6475.0	1145	3.149E+05		0.025	
LAB60BR005	20	120	1.5763	1133	446	426.6	-	-	-	-	0.018	(2)
LAB70BR005	20	120	1.5763	1133	446	426.6	-	-	-	-	0.018	(2)
LAB80BR005	20	120	1.5763	1133	446	426.6	-	-	-	-	0.018	(2)
LAB90BR005	20	120	1.5763	1133	446	426.6	-	-	-	-	0.018	(2)
LAR11BR006	4	160	0.0645	1305	578	586.3	8890.1	1146.2	6.720E+05	-	0.005	
LAR31BR006	4	160	0.0645	1305	578	586.3	8890.1	1146.2	6.720E+05	-	0.005	-

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Table 6.2.1-12—Mass and Energy Discharge Rates for Bounding High Energy Line Breaks Sheet 3 of 3

Pipe Name	Pipe Size (in)	Pipe Schedule	Pipe Area (ft2)	Pressure (psia)	Temp. (F)	Enthalpy (Btu/lb)	Mass Flux (lb/ft2-s)	Mass Disch. (lb/s)	Energy Disch. (Btu/s)	Break Config. (1)	Break Opening Time (s)	Notes
LAR41BR006	4	160	0.0645	1305	578	586.3	8890.1	1146.2	6.720E+05	_	0.005	_
LCA90BR006	6	STD	0.2006	575	420	397.1	11865.4	4761.0	1.891E+06	_	0.007	_
LCQ10BR012	2	160	0.0156	1305	578	586.3	8890.1	276.6	1.622E+05	_	0.003	_
LCQ20BR001	4	120	0.0717	1305	578	586.3	8890.1	1275.0	7.475E+05	_	0.004	_
LCQ30BR003	4	120	0.0717	1305	578	586.3	8890.1	1275.0	7.475E+05	_	0.004	_
LCQ30BR012	2	160	0.0156	1305	578	586.3	8890.1	276.6	1.622E+05	_	0.003	_
LCQ40BR001	4	120	0.0717	1305	578	586.3	8890.1	1275.0	7.475E+05	_	0.004	_
LCQ40BR003	4	120	0.0717	1305	578	586.3	8890.1	1275.0	7.475E+05	_	0.004	_
LCQ40BR905	16	60	1.1767	265	420	1202.2	543.8	1279.6	1.538E+06	_	0.031	_
LCQ51BR001	6	STD	0.2006	265	406	381.7	4062.5	1630.1	6.221E+05	_	0.016	_
LCQ51BR103	6	STD	0.2006	315	338	309.5	10467.3	4200.1	1.300E+06	_	0.014	_
LCQ52BR001	12	60	0.7372	200	382	1198.8	412.2	607.7	7.285E+05	_	0.036	_
QNJ41BR016	8	STD	0.3474	195	338	309.3	6639.2	4613.0	1.427E+06	_	0.027	_

Notes:

1. "SE" indicates single-ended break where one end of the break is isolated by safety related valves. A blank indicates "double-ended" break.
2. Detailed mass and energy release rates generated by CRAFT2. See Table 6.2.1-14.
3. Detailed mass and energy release rates generated by RELAP. See Table 6.2.1-15.

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~~Table 6.2.1-12—Free Volume and Vent Path Hydraulic Data for SG Cavity (30UJA23-004)~~

~~Volume Data~~		~~Free Volume (ft^3)~~	~~From Elev. (ft)~~	~~To Elev. (ft)~~
~~Node No.~~	~~Room Code (See Arrangement Drawings) (30UJA)~~			
~~31~~	~~23-004~~	~~10797.5~~	~~45.28~~	~~64.8~~
~~Connecting Nodes~~				
~~4~~	~~11-004, 11-005, 15-004, 15-005~~	~~24299.7~~	~~4.92~~	~~30.77~~
~~5~~	~~18-002, 18-003, 23-002, 23-003, 23-017, 23-020~~	~~39785.3~~	~~24.08~~	~~64.8~~
~~6~~	~~18-004, 18-005, 23-005~~	~~27666.56~~	~~24.08~~	~~63.98~~
~~7~~	~~29-003, 29-004, 29-005, 34-003, 34-004, 34-005~~	~~37032.5~~	~~63.98~~	~~103.51~~
~~9~~	~~15-001, 15-017, 15-024~~	~~50948.6~~	~~24.41~~	~~60.53~~
~~21~~	~~11-013,14, 21, 25, 26, 31-15-13, 14, 20, 21, 25-18-13, 14-23-13, 14, 42~~	~~171746.58~~	~~4.92~~	~~63.98~~

~~Vent Path No.~~	~~Node No.~~		~~Vent Area (ft^2)~~	~~Inertia Length (ft)~~	~~Form Loss Factor~~	~~Opening Type (Required ΔP)~~	~~Delay Time (s)~~
	~~From~~	~~To~~					
~~Vent Path Data—~~							
~~20~~	~~4~~	~~6~~	~~722.5~~	~~32.9~~	~~1.5~~	~~N/A~~	~~N/A~~
~~24~~	~~5~~	~~6~~	~~468.46~~	~~28.8~~	~~1.5~~	~~N/A~~	~~N/A~~
~~28~~		~~7~~	~~258.34~~	~~39.7~~	~~1.5~~	~~N/A~~	~~N/A~~
~~29~~	~~31~~	~~9~~	~~5.17~~	~~30.5~~	~~1.5~~	~~N/A~~	~~N/A~~
~~30~~	~~6~~	~~21~~	~~78.58~~	~~41.0~~	~~1.5~~	~~Door (7.252 psid)~~	~~Remains Closed~~
~~97~~	~~5~~	~~31~~	~~378.9~~	~~27.4~~	~~1.5~~	~~N/A~~	~~N/A~~
~~98~~	~~31~~	~~7~~	~~271.91~~	~~29.5~~	~~1.5~~	~~N/A~~	~~N/A~~
~~99~~	~~6~~	~~31~~	~~340.15~~	~~29.7~~	~~1.5~~	~~N/A~~	~~N/A~~
~~100~~	~~31~~	~~6~~	~~132.62~~	~~24.9~~	~~1.5~~	~~N/A~~	~~N/A~~

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Table 6.2.1-13—Safety Grade Doors Credited to Open in Subcompartment Analyses

Reactor Building Elevation and Door Number	Vent Path Direction		Burst Pressure (psid)	Vent Area (ft^2)	Door Function – Pressure Relief
	From Room	To Room			
-8 ft Door 4 [2]	-8 ft Room 7	-8 ft Room 2	1.45+20%	5.92	Non Radiation Door, Blowout Panel
-8 ft Door 7	-8 ft Room 16	-8 ft Room 13	1.45+20%	5.92	Non Radiation Door, Blowout Panel
-8 ft Door 10	-8 ft Room 15	-8 ft Room 11	1.45+20%	5.92	Non Radiation Door, Blowout Panel
-8 ft Door 11	-8 ft Room 14	-8 ft Room 9	1.45+20%	5.92	Non Radiation Door, Blowout Panel
-8 ft Door 13	-8 ft Room 11	-8 ft Room 5	1.45+20%	5.92	Non Radiation Door, Blowout Panel
-8 ft Door 14	-8 ft Room 9	-8 ft Room 5	1.45+20%	5.92	Non Radiation Door, Blowout Panel
+5 ft Door 4 [2]	+5 ft Room 16	+5 ft Room 14	2.90+20%	28.63	Radiation Door, Swing Open
+5 ft Door 5	+5 ft Room 17	+5 ft Room 16	2.90+20%	20.77	Radiation Door, Swing Open
+5 ft Door 13	+5 ft Room 21	+5 ft Room 15	2.90+20%	19.91	Radiation Door, Swing Open
+5 ft Door 14 [2]	+5 ft Room 16	+5 ft Room 13	2.90+20%	13.89	Radiation Door, Swing Open
+29 ft Door 2 [2]	+29 ft Room 18	+29 ft Room 15	2.90+20%	21.64	Radiation Door, Swing Open
+45 ft Door 2 [2]	+45 ft Room 18	+45 ft Room 22	2.90+20%	21.85	Radiation Door, Swing Open
+45 ft Door 15 [2]	+45 ft Room 22	+45 ft Room 13	1.45+20%	5.92	Non Radiation Door, Blowout Panel

Notes:

1. Doors open into "To Room."
2. Door also credited to open in LBLOCA pressurizer surge line breaks discussed in Section 6.2.1.3.

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~~Table 6.2.1-13—Free Volume and Vent Path Hydraulic Data for SG Cavity (30UJA29-004)~~

~~Volume Data~~		~~Free Vol. (ft^3)~~	~~From Elev. (ft)~~	~~To Elev. (ft)~~
~~Node No.~~	~~Room Code (See Arrangement Drawings) (30UJA)~~			
~~31~~	~~29-004~~	~~5140.0~~	~~64.8~~	~~79.07~~
~~Connecting Nodes~~				
~~5~~	~~18-002, 18-003, 23-002, 23-003, 23-017, 23-020~~	~~39785.3~~	~~24.08~~	~~64.8~~
~~6~~	~~18-004, 18-005, 23-005~~	~~38464.1~~	~~24.08~~	~~63.98~~
~~7~~	~~29-003, 29 , 04, 29-005, 34-003, 34-004, 34-005~~	~~37032.5~~	~~63.98~~	~~103.51~~
~~16~~	~~23-019, 23-041, 29-019, 34-019~~	~~18921.6~~	~~49.11~~	~~91.86~~
~~23~~	~~29-014, 29-018, 34-014, 34-018~~	~~80170.9~~	~~63.98~~	~~93.5~~
~~25~~	~~15-023, 29-013, 29-016, 34-104, 34-108, 40-001~~	~~1579198.53~~	~~20.67~~	~~188.68~~

~~Vent Path No.~~	~~Node No.~~		~~Vent Area (ft^2)~~	~~Inertia Length (ft)~~	~~Form Loss Factor~~	~~Opening Type (Required ΔP)~~	~~Delay Time (s)~~
	~~From~~	~~To~~					
~~Vent Path Data~~							
~~25~~	~~5~~	~~7~~	~~271.19~~	~~40.1~~	~~1.5~~	~~N/A~~	~~N/A~~
~~28~~	~~6~~	~~7~~	~~258.342~~	~~40.1~~	~~1.5~~	~~N/A~~	~~N/A~~
~~31~~	~~7~~	~~16~~	~~10.76~~	~~24.7~~	~~1.5~~	~~N/A~~	~~N/A~~
~~32~~	~~7~~	~~25~~	~~318.62~~	~~103.8~~	~~1.5~~	~~Door (0.6962 psid)~~	~~Remains Closed~~
~~33~~	~~7~~	~~23~~	~~43.06~~	~~40.3~~	~~1.5~~	~~Door (1.45 psid)~~	~~Remains Closed~~
~~34~~	~~7~~	~~25~~	~~43.06~~	~~103.8~~	~~1.5~~	~~Door (7.252 psid)~~	~~Remains Closed~~
~~97~~	~~6~~	~~31~~	~~271.905~~	~~27.5~~	~~1.5~~	~~N/A~~	~~N/A~~
~~98~~	~~7~~	~~31~~	~~265,02~~	~~23.7~~	~~1.5~~	~~N/A~~	~~N/A~~
~~99~~	~~31~~	~~7~~	~~21.53~~	~~23.7~~	~~1.5~~	~~N/A~~	~~N/A~~
~~100~~	~~31~~	~~7~~	~~185.36~~	~~26.9~~	~~1.5~~	~~N/A~~	~~N/A~~

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Table 6.2.1-14—Mass and Energy Discharge Rates for Feedwater Lines (LABn0BR005) Sheet 1 of 2

Time (s)	Discharge Rate (lb/s)	Discharge Enthalpy (Btu/lb)
0.000	0	435.6
0.004	6772	435.6
0.008	23270	437.2
0.012	43239	439.6
0.016	42335	440.5
0.020	41589	441.5
0.024	42731	443.0
0.028	40484	443.5
0.032	42311	445.3
0.036	40084	445.7
0.040	41547	447.4
0.044	39986	448.0
0.048	40510	449.3
0.052	40050	450.4
0.056	39489	451.3
0.060	39714	452.6
0.064	38571	453.4
0.068	39292	454.9
0.072	38116	455.6
0.076	38391	456.9
0.080	37565	457.8
0.084	37622	459.0
0.088	37768	460.2
0.092	37233	461.2
0.096	37746	462.5
0.100	36977	463.4
0.117	37115	466.2
0.133	36625	470.0
0.150	36154	473.5
0.167	35718	476.8
0.183	35371	480.1

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Table 6.2.1-14—Mass and Energy Discharge Rates for Feedwater Lines (LABn0BR005) Sheet 2 of 2

Time (s)	Discharge Rate (lb/s)	Discharge Enthalpy (Btu/lb)
0.200	35014	483.3
0.217	34349	486.2
0.233	33843	488.9
0.250	33483	491.5
0.267	33072	493.9
0.283	32663	496.0
0.300	32390	498.1
0.317	32125	500.1
0.333	31808	501.9
0.350	31556	503.7
0.367	31321	505.3
0.383	31091	506.8
0.400	30891	508.2
0.417	30677	509.5
0.433	30464	510.7
0.450	30279	511.9
0.467	30104	513.0
0.483	29936	514.1
1.000	24529	530.0
10.0	24529	530.0

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~~Table 6.2.1-14 Free Volume and Vent Path Hydraulic Data for PZR Cavities (30UJA29-019 and UJA34-019)~~

~~Volume Data~~		~~Free Volume (ft³)~~	~~From Elev. (ft)~~	~~To Elev. (ft)~~
~~Node No.~~	~~Room Code (See Arrangement Drawings) (30UJA)~~			
~~31~~	~~29-019~~	~~5347.0~~	~~67.91~~	~~81.56~~
~~32~~	~~34-019~~	~~4415.6~~	~~83.2~~	~~91.86~~
~~Connecting Nodes~~				
~~7~~	~~29-003, 29 , 04, 29-005, 34-003, 34-004, 34-005~~	~~37032.5~~	~~63.98~~	~~103.51~~
~~14~~	~~29-006, 29-007, 29-008, 34-006, 34-007, 34-008~~	~~37032.49~~	~~63.98~~	~~103.51~~
~~15~~	~~11-018, 11-019, 15-018, 15-019, 18-018, 18-019~~	~~40696.1~~	~~4.92~~	~~49.11~~
~~16~~	~~23-019, 23-041~~	~~9158.9~~	~~49.11~~	~~65.29~~
~~21~~	~~11-13, 14, 21, 25, 26, 31, 15-13, 14, 20, 21, 25, 18-13, 14, 23-13, 14, 42~~	~~171746.58~~	~~4.92~~	~~63.98~~
~~24~~	~~29-015, 29-022, 34-015, 34-022~~	~~63922.87~~	~~63.98~~	~~93.5~~

~~Vent Path No.~~	~~Node No.~~		~~Vent Area (ft²)~~	~~Inertia Length (ft)~~	~~Form Loss Factor~~	~~Opening Type (Required ?P)~~	~~Delay Time (s)~~
	~~From~~	~~To~~					
~~Vent Path Data~~							
~~31~~	~~7~~	~~31~~	~~10.76~~	~~25.2~~	~~1.5~~	~~N/A~~	~~N/A~~
~~52~~	~~14~~	~~32~~	~~26.91~~	~~26.6~~	~~1.5~~	~~N/A~~	~~N/A~~
~~56~~	~~15~~	~~16~~	~~71.69~~	~~30.2~~	~~1.5~~	~~N/A~~	~~N/A~~
~~61~~	~~16~~	~~21~~	~~43.06~~	~~39.7~~	~~1.5~~	~~Door (1.450 psid)~~	~~Remains Closed~~
~~62~~	~~32~~	~~24~~	~~21.53~~	~~34.6~~	~~1.5~~	~~Door (1.450 psid)~~	~~Remains Closed~~
~~63~~	~~31~~	~~24~~	~~21.53~~	~~33.2~~	~~1.5~~	~~Door (7.252 psid)~~	~~Remains Closed~~
~~97~~	~~16~~	~~31~~	~~21.529~~	~~14.9~~	~~1.5~~	~~N/A~~	~~N/A~~
~~98~~	~~31~~	~~32~~	~~21.529~~	~~11.2~~	~~1.5~~	~~N/A~~	~~N/A~~

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Table 6.2.1-15—Mass and Energy Discharge Rates for Letdown and Charging Lines
Sheet 1 of 3

Time (s)	Pipe Name					
	KBA10BR002 / KBA10BR003		KBA10BR004		KBA11BR001 / KBA12BR001	
	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)
0.00	0.0	565.5	0.0	566.9	0.0	566.9
2.00E-03	45.8	565.5	17.8	566.9	17.8	566.9
0.10	751.2	562.3	371.1	563.3	301.6	566.0
0.20	831.9	564.2	474.5	564.5	429.5	568.5
0.30	822.9	556.5	523.1	565.3	430.1	569.0
0.40	800.8	549.1	519.8	565.7	429.7	569.3
0.50	796.9	543.6	519.0	566.2	429.3	569.6
0.60	794.6	539.5	518.6	566.4	429.1	569.7
0.70	795.9	535.4	518.3	566.6	428.8	570.0
0.80	795.3	531.7	518.0	566.8	428.7	570.0
0.90	794.2	528.1	517.9	566.8	428.6	570.1
1.00	792.0	524.9	517.8	566.9	428.6	570.1
1.20	786.6	520.7	517.7	567.0	428.4	570.2
1.40	802.6	512.5	517.6	567.0	428.3	570.3
1.60	874.5	498.3	517.5	567.1	428.3	570.3
1.80	880.5	490.7	517.5	567.1	428.3	570.3
2.00	886.5	483.5	517.3	567.3	428.3	570.3
2.20	892.5	476.5	517.5	567.1	428.2	570.4
2.40	898.5	469.7	517.5	567.1	428.4	570.1
2.60	903.5	463.5	517.5	567.1	428.0	570.7
2.80	908.0	458.0	517.5	567.1	428.5	570.0
3.00	910.5	453.8	517.5	567.1	428.0	570.7
3.20	913.5	449.5	517.5	567.1	428.5	570.0
3.40	915.0	446.3	517.5	567.1	428.0	570.7
3.60	916.5	443.5	517.5	567.1	428.5	570.0
3.80	918.0	440.9	517.5	567.1	428.0	570.7
4.00	918.5	439.0	517.5	567.1	428.0	570.7

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Table 6.2.1-15—Mass and Energy Discharge Rates for Letdown and Charging Lines
Sheet 2 of 3

Time (s)	Pipe Name					
	KBA10BR002 / KBA10BR003		KBA10BR004		KBA11BR001 / KBA12BR001	
	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)
4.20	919.5	437.2	517.5	567.1	428.5	569.9
4.40	920.0	435.7	517.0	567.6	428.0	570.7
4.60	920.5	434.4	517.5	567.1	428.5	570.0
4.80	921.0	433.2	517.5	567.1	428.0	570.7
5.00	921.5	432.0	517.5	567.1	428.5	570.0
5.20	921.5	431.1	517.5	567.1	428.0	570.7
5.40	922.0	430.2	517.5	567.1	428.5	570.0
5.60	922.0	429.4	517.5	567.1	428.0	570.7
5.80	922.5	428.5	517.5	567.1	428.5	570.0
6.00	922.5	427.8	517.5	567.1	428.0	570.7
6.20	922.5	427.2	517.5	567.1	428.5	570.0
6.40	923.0	426.4	517.5	567.1	428.0	570.7
6.60	923.5	425.5	517.5	567.1	428.0	570.7
6.80	923.0	425.2	517.0	567.6	428.5	569.9
7.00	923.5	424.4	517.5	567.1	428.0	570.7
7.20	923.5	423.8	517.5	567.1	428.5	570.0
7.40	924.0	423.1	517.5	567.1	428.0	570.7
7.60	923.5	422.8	517.5	567.1	428.5	570.0
7.80	924.0	422.1	517.5	567.1	428.0	570.7
8.00	924.5	421.3	517.5	567.1	428.5	570.0
8.20	924.0	421.1	517.5	567.1	428.0	570.7
8.40	924.5	420.4	517.5	567.1	428.5	570.0
8.60	924.5	420.0	517.5	567.1	428.0	570.7
8.80	924.5	419.5	517.5	567.1	428.5	570.0
9.00	925.0	418.9	517.5	567.1	428.0	570.7
9.20	925.0	418.5	517.0	567.6	428.0	570.7
9.40	925.0	418.1	517.5	567.1	428.5	570.0
9.60	925.0	417.7	517.5	567.1	428.0	570.6

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Table 6.2.1-15—Mass and Energy Discharge Rates for Letdown and Charging Lines
Sheet 3 of 3

Time (s)	Pipe Name					
	KBA10BR002 / KBA10BR003		KBA10BR004		KBA11BR001 / KBA12BR001	
	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)	Discharge Rate Rate (lb/s)	Discharge Enthalpy (Btu/lb)
9.80	925.0	417.3	517.5	567.1	428.5	570.0
10.00	925.5	416.7	517.5	567.1	428.0	570.7

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~~Table 6.2.1-15 High Energy Lines in Critical Subcompartments~~

~~Room Name (30 UJA)~~	~~Pipe Name~~	~~Pressure (psia)~~	~~Temp. (°F)~~	~~Pipe ID (in)~~	~~Enthalpy (BTU/lb$_m$)~~	~~Mass Flux (lb$_m$/ft^2–s)~~	~~CSA (ft^2)~~	~~Energy Flux (MMBTU/hr)~~
~~11–004~~	~~JNA20 BR001~~	~~2250~~	~~625.7~~	~~8.5~~	~~651.8~~	~~15831.9~~	~~0.394~~	~~14.638101×10^3~~
~~11–006~~	~~KBA35 BR002~~	~~2324.0~~	~~512.3~~	~~3.438~~	~~501.7042~~	~~16233.5300~~	~~0.0645~~	~~3.7803532×10^3~~
~~11–027~~	~~JNG33 BR001~~	~~814.7~~	~~140.0~~	~~11.376~~	~~110.0~~	~~22292.1~~	~~0.706~~	~~12.4618588×10^3~~
~~15–004~~	~~KBA34 BR019~~	~~2324.0~~	~~512.3~~	~~2.624~~	~~501.7042~~	~~16233.5300~~	~~0.0376~~	~~2.2021571×10^3~~
~~15–006~~	~~JNG33 BR007~~	~~2250.0~~	~~563.4~~	~~8.500~~	~~See Table 6.2.1-16~~			
~~18–004~~	~~LCQ10 BR012~~	~~1144.3~~	~~561.0~~	~~1.687~~	~~563.5935~~	~~3657.1790~~	~~0.0155~~	~~2.303574×10^2~~
~~23–004~~	~~LAB70 BR005~~	~~1131.2~~	~~446.3~~	~~17.000~~	~~See Table 6.2.1-17~~			
~~29–004~~	~~LAB70 BR005~~	~~1131.2~~	~~446.3~~	~~17.000~~	~~See Table 6.2.1-17~~			
~~29–019~~	~~JEF10 BR004~~	~~2250.0~~	~~653.0~~	~~5.187~~	~~1116.8417~~	~~2968.1370~~	~~0.1467~~	~~3.5024176×10^3~~
~~34–004~~	~~JEA20 BR302~~	~~1123.0~~	~~559.0~~	~~0.815~~	~~1187.7103~~	~~1384.4530~~	~~0.0036~~	~~4.28908×10^1~~
~~34–019~~	~~JEF10 BR004~~	~~2250.0~~	~~653.0~~	~~5.187~~	~~1116.8417~~	~~2968.1370~~	~~0.1467~~	~~3.5024176×10^3~~

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Table 6.2.1-16—Subcompartment Volumes (For Subcompartments Where the Pressure Increase is More Than 5 psi)

Room Number	Room Description	Volume (ft^3)	Elevation (ft)	Height (ft)
-8 ft Room 2	Access Area	11464	-7.5	10.5
-8 ft Room 7	LCQ (SGBS) HX Room	9210	-7.5	10.5
-8 ft Room 14	KBA12 (CVCS) HX Room	1542	-7.5	10.5
-8 ft Room 15	KBA11 (CVCS) HX Room	1471	-7.5	10.5
-8 ft Room 16	KBA (CVCS) Valve Room	1584	-7.5	10.5
-8 ft Room 17	KBA (CVCS) Valve Room	1260	-7.5	10.5
+5 ft Room 16	LCQ50 (SGBS) Tank room	9234	4.9	15.0
+5 ft Room 20	KBA (CVCS) Valve Room	2053	4.9	15.6
+5 ft Room 21	KBA (CVCS) Valve Room	4471	4.9	14.6
+5 ft Room 22	KBA10 (CVCS) HX Room	2020	4.9	10.3
+45 ft Room 2	JEA10 (SG) Room	7195	45.3	18.7
+45 ft Room 3	JEA20 (SG) Room	7408	45.3	18.7
+45 ft Room 6	JEA30 (SG) Room	7408	45.3	18.7
+45ft Room 7	JEA40 (SG) Room	7195	45.3	18.7
+64 ft Room 1	JEA10 (SG) Room	4992	64.0	15.1
+64 ft Room 2	JEA20 (SG) Room	5004	64.0	15.1
+64 ft Room 5	JEA30 (SG) Room	5004	64.0	15.1
+64 ft Room 6	JEA40 (SG) Room	4992	64.0	15.1
+64 ft Room 14	JEF10 (RCS) Pressurizer Room	5509	67.9	13.6
+79 ft Room 12	Pressurizer Head & Safety Relief Valves Room	3168	83.2	8.7

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~~Table 6.2.1-16 Mass and Energy Release Data (RCP Cavity~~

~~Time (s)~~	~~Mass flow Rate (lb_m/s)~~	~~Energy Flow Rate (BTU/s)~~	~~Enthalpy (BTU/lb_m)~~
~~0.000~~	~~0.00~~	~~0.00E+00~~	~~0.00~~
~~0.004~~	~~6126.72~~	~~3.32E+06~~	~~541.36~~
~~0.008~~	~~9383.54~~	~~5.07E+06~~	~~539.96~~
~~0.012~~	~~10657.90~~	~~5.76E+06~~	~~540.86~~
~~0.016~~	~~10596.60~~	~~5.73E+06~~	~~540.80~~
~~0.020~~	~~10815.80~~	~~5.85E+06~~	~~540.95~~
~~0.024~~	~~11546.70~~	~~6.25E+06~~	~~541.51~~
~~0.028~~	~~11227.80~~	~~6.08E+06~~	~~541.25~~
~~0.032~~	~~11558.60~~	~~6.26E+06~~	~~541.53~~
~~0.036~~	~~12987.10~~	~~7.05E+06~~	~~542.78~~
~~0.040~~	~~13873.50~~	~~7.54E+06~~	~~543.59~~
~~0.044~~	~~13424.20~~	~~7.29E+06~~	~~543.15~~
~~0.048~~	~~13254.10~~	~~7.20E+06~~	~~543.00~~
~~0.052~~	~~13286.00~~	~~7.21E+06~~	~~543.03~~
~~0.056~~	~~12962.00~~	~~7.03E+06~~	~~542.73~~
~~0.060~~	~~12792.40~~	~~6.94E+06~~	~~542.58~~
~~0.064~~	~~12242.50~~	~~6.64E+06~~	~~542.09~~
~~0.068~~	~~11695.00~~	~~6.33E+06~~	~~541.63~~
~~0.072~~	~~12014.00~~	~~6.51E+06~~	~~541.90~~
~~0.076~~	~~12611.50~~	~~6.84E+06~~	~~542.42~~
~~0.080~~	~~13002.00~~	~~7.06E+06~~	~~542.77~~
~~0.084~~	~~12962.40~~	~~7.04E+06~~	~~542.73~~
~~0.088~~	~~12699.60~~	~~6.89E+06~~	~~542.49~~
~~0.092~~	~~12305.70~~	~~6.67E+06~~	~~542.15~~
~~0.096~~	~~12006.90~~	~~6.51E+06~~	~~541.89~~
~~0.100~~	~~12158.00~~	~~6.59E+06~~	~~542.02~~
~~0.117~~	~~11851.40~~	~~6.42E+06~~	~~541.76~~
~~0.133~~	~~12705.30~~	~~6.89E+06~~	~~542.52~~
~~0.150~~	~~12637.90~~	~~6.86E+06~~	~~542.47~~
~~0.167~~	~~11692.50~~	~~6.33E+06~~	~~541.65~~
~~0.183~~	~~11526.20~~	~~6.24E+06~~	~~541.52~~
~~0.200~~	~~11912.40~~	~~6.45E+06~~	~~541.84~~
~~0.217~~	~~11471.80~~	~~6.21E+06~~	~~541.48~~
~~0.233~~	~~11039.60~~	~~5.97E+06~~	~~541.13~~
~~0.250~~	~~10967.30~~	~~5.93E+06~~	~~541.07~~
~~0.267~~	~~10968.00~~	~~5.93E+06~~	~~541.07~~
~~0.283~~	~~11011.90~~	~~5.96E+06~~	~~541.11~~

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~~Time (s)~~	~~Mass flow Rate (lb_m/s)~~	~~Energy Flow Rate (BTU/s)~~	~~Enthalpy (BTU/lb_m)~~
~~0.300~~	~~10869.00~~	~~5.88E+06~~	~~541.01~~
~~0.317~~	~~10608.70~~	~~5.74E+06~~	~~540.81~~
~~0.333~~	~~10660.70~~	~~5.77E+06~~	~~540.85~~
~~0.350~~	~~10439.50~~	~~5.64E+06~~	~~540.69~~
~~0.367~~	~~10115.00~~	~~5.47E+06~~	~~540.46~~
~~0.383~~	~~9926.03~~	~~5.36E+06~~	~~540.33~~
~~0.400~~	~~9788.35~~	~~5.29E+06~~	~~540.23~~
~~0.417~~	~~9690.09~~	~~5.23E+06~~	~~540.16~~
~~0.433~~	~~9923.69~~	~~5.36E+06~~	~~540.33~~
~~0.450~~	~~10153.30~~	~~5.49E+06~~	~~540.49~~
~~0.467~~	~~10022.10~~	~~5.42E+06~~	~~540.40~~
~~0.483~~	~~9971.50~~	~~5.39E+06~~	~~540.36~~

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Table 6.2.1-17—Subcompartment Vent Paths (For Subcompartments Where the Pressure Increase is More Than 5 psi)
Sheet 1 of 4

Room Number	Connecting Room Number	Opening Type	Inertia Length (ft)	Forward Loss Coefficient	Reverse Loss Coefficient	Time Delay (s)	Vent Path Area (ft²)	Total Vent Path Area (ft²)
-8 ft Room 2	+5 ft Room 18	Annulus gap	10.42	2.59	2.58		55.68	
	-							55.68
-8 ft Room 7	-8ft Room 2	Door, blowout panel	32.95	2.78	2.78	0.5	5.92	
	+5 ft Room 16	Floor opening	12.76	2.72	2.69		18.94	
	-							24.86
-8 ft Room 14	-8 ft Room 9	Door, blowout panel	15.32	2.71	2.68	0.5	5.92	
	-							5.92
-8 ft Room 15	-8 ft Room 11	Door, blowout panel	16.16	2.72	2.68	0.5	5.92	
	-							5.92
-8 ft Room 16	-8 ft Room 13	Door, blowout panel	15.28	2.71	2.66	0.5	5.92	
	-8 ft Room 17	Open access	11.74	2.24	2.3		18.19	
	-							24.11
-8 ft Room 17	-8 ft Room 16	Open access	11.74	2.24	2.3		18.19	
	-							18.19

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Table 6.2.1-17—Subcompartment Vent Paths (For Subcompartments Where the Pressure Increase is More Than 5 psi)
Sheet 2 of 4

Room Number	Connecting Room Number	Opening Type	Inertia Length (ft)	Forward Loss Coefficient	Reverse Loss Coefficient	Time Delay (s)	Vent Path Area (ft²)	Total Vent Path Area (ft²)
+5 ft Room 16	+5 ft Room 13	Door, swing open	28.9	2.74	2.72	0.75	13.89	
	+5 ft Room 14	Door, swing open	29.93	2.68	2.63	0.75	28.63	
	-8 ft Room 16	Floor opening	12.76	2.72	2.69		18.94	
	-							61.46
+5 ft Room 20	+5 ft Room 21	Open access	14.64	2.44	2.25		21.35	
	-							21.35
+5 ft Room 21	+5 ft Room 15	Door, swing open	28.83	2.7	2.58	0.75	19.91	
	+5 ft Room 20	Open access	14.64	2.44	2.25		21.35	
	+5 ft Room 22	Open access	16.18	2.55	2.6		13.89	
	-							55.15
+5 ft Room 22	+5 ft Room 21	Open access	16.18	2.55	2.6		13.89	
	-							13.89
+45 ft Room 2	+45 ft Room 1	Open access	23.53	1.31	1.06		242.02	
	+45 ft Room 3	Open access	26.13	0.42	0.42		516.02	
	+29 ft Room 4	Grating	17.72	0.81	0.81		196.28	
	+64 ft Room 1	Grating	16.9	0.85	0.84		168.77	
	-							1123.09

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Table 6.2.1-17—Subcompartment Vent Paths (For Subcompartments Where the Pressure Increase is More Than 5 psi)
Sheet 3 of 4

Room Number	Connecting Room Number	Opening Type	Inertia Length (ft)	Forward Loss Coefficient	Reverse Loss Coefficient	Time Delay (s)	Vent Path Area (ft²)	Total Vent Path Area (ft²)
+45 ft Room 3	+45 ft Room 2	Open access	26.13	0.42	0.42		516.02	
	+45 ft Room 4	Open access	24.23	0.99	1.18		280.52	
	+29 ft Room 5	Grating	17.72	0.8	0.8		202.11	
	+64 ft Room 2	Grating	16.9	0.86	0.84		169.17	
	-							1167.82
+45 ft Room 6	+45 ft Room 5	Open access	24.42	1.2	1.02		280.52	
	+45 ft Room 7	Open access	26.13	0.42	0.42		516.02	
	+29 ft Room 8	Grating	17.72	0.8	0.8		202.11	
	+64 ft Room 5	Grating	16.9	0.86	0.84		169.17	
	-							1167.82
+45 ft Room 7	+45 ft Room 6	Open access	26.13	0.42	0.42		516.02	
	+45 ft Room 8	Open access	23.53	1.06	1.31		242.02	
	+29 ft Room 9	Grating	17.72	0.81	0.81		196.28	
	+64 ft Room 6	Grating	16.9	0.85	0.84		168.77	
	-							1123.09
+64 ft Room 1	+64 ft Room 2	Open access	24.95	1.19	1.19		280.25	
	+45 ft Room 2	Grating	16.9	0.85	0.84		168.77	
	+79 ft Room 1	Grating	19.52	0.84	0.84		168.77	
	-							617.79

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Table 6.2.1-17—Subcompartment Vent Paths (For Subcompartments Where the Pressure Increase is More Than 5 psi)
Sheet 4 of 4

Room Number	Connecting Room Number	Opening Type	Inertia Length (ft)	Forward Loss Coefficient	Reverse Loss Coefficient	Time Delay (s)	Vent Path Area (ft²)	Total Vent Path Area (ft²)
+64 ft Room 2	+64 ft Room 1	Open access	24.95	1.19	1.19		280.25	
	+64 ft Room 3	Open access	19.99	2.47	2.61		21.31	
	+45 ft Room 3	Grating	16.9	0.86	0.84		169.17	
	+79 ft Room 2	Grating	19.52	0.84	0.84		169.17	
	-							639.9
+64 ft Room 5	+64 ft Room 4	Open access	20.19	2.61	2.48		21.31	
	+64 ft Room 6	Open access	24.95	1.19	1.19		280.25	
	+45 ft Room 6	Grating	16.9	0.86	0.84		169.17	
	+79 ft Room 5	Grating	19.52	0.84	0.84		169.17	
	-							639.9
+64 ft Room 6	+64 ft Room 5	Open access	24.95	1.19	1.19		280.25	
	+45 ft Room 7	Grating	16.9	0.85	0.84		168.77	
	+79 ft Room 6	Grating	19.52	0.84	0.84		168.77	
	-							617.79
+64 ft Room 14	+45 ft Room 18	Floor opening	14.91	2.48	2.48		42.68	
	+79 ft Room 12	Floor opening	11.15	2.39	2.39		55.46	
	-							98.14
+79 ft Room 12	+64 ft Room 14	Floor opening	11.15	2.39	2.39		55.46	
	-							55.46

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~~Table 6.2.1-17 Mass and Energy Release Data (SG Cavity)~~

~~Time (s)~~	~~Mass flow Rate (lb_m/s)~~	~~Energy Flow Rate (BTU/s)~~	~~Enthalpy (BTU/lb_m)~~
~~0.000~~	~~0.00~~	~~0.00E+00~~	~~0.00~~
~~0.004~~	~~4313.62~~	~~1.88E+06~~	~~435.57~~
~~0.008~~	~~23269.80~~	~~1.02E+07~~	~~437.21~~
~~0.012~~	~~43239.00~~	~~1.90E+07~~	~~439.58~~
~~0.016~~	~~42334.50~~	~~1.86E+07~~	~~440.53~~
~~0.020~~	~~41588.90~~	~~1.84E+07~~	~~441.49~~
~~0.024~~	~~42730.80~~	~~1.89E+07~~	~~443.04~~
~~0.028~~	~~40484.20~~	~~1.80E+07~~	~~443.48~~
~~0.032~~	~~42311.30~~	~~1.88E+07~~	~~445.27~~
~~0.036~~	~~40084.00~~	~~1.79E+07~~	~~445.67~~
~~0.040~~	~~41547.20~~	~~1.86E+07~~	~~447.35~~
~~0.044~~	~~39986.10~~	~~1.79E+07~~	~~447.97~~
~~0.048~~	~~40510.00~~	~~1.82E+07~~	~~449.35~~
~~0.052~~	~~40050.30~~	~~1.80E+07~~	~~450.36~~
~~0.056~~	~~39489.20~~	~~1.78E+07~~	~~451.33~~
~~0.060~~	~~39713.90~~	~~1.80E+07~~	~~452.61~~
~~0.064~~	~~38570.70~~	~~1.75E+07~~	~~453.35~~
~~0.068~~	~~39292.30~~	~~1.79E+07~~	~~454.87~~
~~0.072~~	~~38115.50~~	~~1.74E+07~~	~~455.61~~
~~0.076~~	~~38390.50~~	~~1.75E+07~~	~~456.95~~
~~0.080~~	~~37564.60~~	~~1.72E+07~~	~~457.84~~
~~0.084~~	~~37416.00~~	~~1.72E+07~~	~~459.02~~
~~0.088~~	~~37273.90~~	~~1.72E+07~~	~~460.25~~
~~0.092~~	~~36450.50~~	~~1.68E+07~~	~~461.17~~
~~0.096~~	~~36674.80~~	~~1.70E+07~~	~~462.55~~
~~0.100~~	~~35618.30~~	~~1.65E+07~~	~~463.36~~
~~0.117~~	~~35260.70~~	~~1.64E+07~~	~~466.24~~
~~0.133~~	~~34516.00~~	~~1.62E+07~~	~~469.96~~
~~0.150~~	~~33790.60~~	~~1.60E+07~~	~~473.46~~
~~0.167~~	~~33114.40~~	~~1.58E+07~~	~~476.85~~
~~0.183~~	~~32511.90~~	~~1.56E+07~~	~~480.14~~
~~0.200~~	~~31899.90~~	~~1.54E+07~~	~~483.27~~
~~0.217~~	~~31235.80~~	~~1.52E+07~~	~~486.18~~
~~0.233~~	~~30678.10~~	~~1.50E+07~~	~~488.94~~
~~0.250~~	~~30264.30~~	~~1.49E+07~~	~~491.54~~
~~0.267~~	~~29799.50~~	~~1.47E+07~~	~~493.88~~

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~~Time (s)~~	~~Mass flow Rate (lb_m/s)~~	~~Energy Flow Rate (BTU/s)~~	~~Enthalpy (BTU/lb_m)~~
~~0.283~~	~~29339.00~~	~~1.46E+07~~	~~496.04~~
~~0.300~~	~~29012.10~~	~~1.45E+07~~	~~498.13~~
~~0.317~~	~~28693.10~~	~~1.43E+07~~	~~500.10~~
~~0.333~~	~~28325.20~~	~~1.42E+07~~	~~501.94~~
~~0.350~~	~~28019.00~~	~~1.41E+07~~	~~503.68~~
~~0.367~~	~~27730.00~~	~~1.40E+07~~	~~505.30~~
~~0.383~~	~~27448.90~~	~~1.39E+07~~	~~506.80~~
~~0.400~~	~~27194.90~~	~~1.38E+07~~	~~508.20~~
~~0.417~~	~~26926.30~~	~~1.37E+07~~	~~509.48~~
~~0.433~~	~~26663.00~~	~~1.36E+07~~	~~510.69~~
~~0.450~~	~~26423.40~~	~~1.35E+07~~	~~511.86~~
~~0.467~~	~~26194.00~~	~~1.34E+07~~	~~512.98~~
~~0.483~~	~~25975.70~~	~~1.34E+07~~	~~514.06~~

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Table 6.2.1-18—Subcompartment Peak HELB Pressures

Room Name	Room Description	HELB Pipe Name	Single-node Peak Pressure (psia)	Single-node Peak Pressure Time (s)	Subdivided node Peak Pressure (psia)
-8 ft Room 2	Access Area	LCA90BR006	25.30	2.01	24.91
-8 ft Room 7	LCQ (SGBS) HX Room	LCQ51BR001	22.15	32.70	22.19
-8 ft Room 14	KBA12 (CVCS) HX Room	KBA12BR001	32.2	7.11	31.97
-8 ft Room 15	KBA11 (CVCS) HX Room	KBA11BR001	32.2	6.66	31.99
-8 ft Room 16	KBA (CVCS) Valve Room	KBA11BR001	32.2	9.25	32.11
-8 ft Room 17	KBA (CVCS) Valve Room	KBA10BR004	39.39	10.0	39.45
+5 ft Room 16	LCQ50 (SGBS) Tank room	LCQ40BR905	26.92	0.32	26.22
+5 ft Room 20	KBA (CVCS) Valve Room	KBA10BR002	23.09	0.72	23.02
+5 ft Room 21	KBA (CVCS) Valve Room	KBA10BR003	21.71	0.64	21.51
+5 ft Room 22	KBA10 (CVCS) HX Room	KBA10BR003	25.49	0.82	25.55
+45 ft Room 2	JEA10 (SG) Room	LAB60BR005	22.40	0.48	22.50
+45 ft Room 3	JEA20 (SG) Room	LAB70BR005	22.30	0.52	22.55
+45 ft Room 6	JEA30 (SG) Room	LAB80BR005	22.30	0.52	22.55
+45 ft Room 7	JEA40 (SG) Room	LAB90BR005	22.60	0.48	22.08
+64 ft Room 1	JEA10 (SG) Room	LAB60BR005	25.39	0.02	23.88
+64 ft Room 2	JEA20 (SG) Room	LAB70BR005	25.23	0.02	24.32
+64 ft Room 5	JEA30 (SG) Room	LAB80BR005	25.23	0.02	+64 ft Room 2
+64 ft Room 6	JEA40 (SG) Room	LAB90BR005	25.95	0.16	25.95
+64 ft Room 14	JEF10 (RCS) Pressurizer Room	JEF10BR004	22.62	1.25	22.62
+79 ft Room 12	Pressurizer Head & Safety Relief Valves Room	JEF10BR006	23.57	1.30	23.63

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~~Table 6.2-1-18 List of U.S. EPR Safety Related Doors~~

~~Door #~~	~~From Room #~~	~~To Room #~~	~~Burst Pressure~~	~~Vent Area~~
~~07D4004B~~	~~UJA07-013~~	~~UJA07-018~~	~~1.45 psid +20%~~	~~5.92 ft^2~~
~~11D4003B~~	~~UJA11-014~~	~~UJA11-018~~	~~2.90 psid +20%~~	~~28.63 ft^2~~
~~11D4004B~~	~~UJA11-015~~	~~UJA11-018~~	~~2.90 psid +20%~~	~~28.63 ft^2~~
~~18D4002B~~	~~UJA18-014~~	~~UJA18-018~~	~~2.90 psid +20%~~	~~21.64 ft^2~~
~~23D4002B~~	~~UJA23-042~~	~~UJA23-019~~	~~2.90 psid +20%~~	~~21.85 ft^2~~
~~23D4015B~~	~~UJA23-014~~	~~UJA23-042~~	~~1.45 psid +20%~~	~~5.92 ft^2~~

1. ~~Doors open into the "From" room.~~

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Table 6.2.1-25—MSLB Reactor Trip and Isolation Signal Summary
Sheet 3 of 6

40% Power										
	DEG		1.0 ft²		0.7 ft²		0.52 ft²		0.3 ft²	
	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)
Reactor Trip	SG ΔP	0.7	HCP	8.8	HCP	12.0	HCP	15.5	HCP	25.7
Main Steam Isolation	SG ΔP	0.7	HCP	9.0	HCP	12.2	HCP	15.7	HCP	25.9
MFW Isolation	SG ΔP	0.8	HCP	9.0	HCP	12.2	HCP	15.7	HCP	25.9
Foil Opens Faulted SG	Press. and Temp.	0.01	Press. and Temp.	0.03	Press. and Temp.	0.04	Press. and Temp.	0.2	Press. and Temp.	0.8
Foil Opens Intact SG	Press. and Temp.	0.3	Temp.	49.8	Temp.	60.9	Temp.	72.9	Temp.	346.9
	3.0 ft²		1.72 ft²							
	Function	Time (sec)	Function	Time (sec)						
Reactor Trip	SG ΔP	0.9	HCP	5.4						
Main Steam Isolation	SG ΔP	0.9	HCP	5.6						
MFW Isolation	SG ΔP	1.2	HCP	5.6						
Foil Opens Faulted SG	Press. and Temp.	0.01	Press. and Temp.	0.01						
Foil Opens Intact SG	Press. and Temp.	0.3	Temp.	12.2						

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Table 6.2.1-25—MSLB Reactor Trip and Isolation Signal Summary
Sheet 4 of 6

20% Power										
	DEG		1.0 ft^2		0.7 ft^2		0.52 ft^2		0.3 ft^2	
	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)
Reactor Trip	SG ΔP	0.8	HCP	8.7	HCP	11.8	HCP	15.6	HCP	26.5
Main Steam Isolation	SG ΔP	0.8	HCP	8.9	HCP	12.0	HCP	15.9	HCP	26.7
MFW Isolation	SG ΔP	1.0	HCP	8.9	HCP	12.0	HCP	15.9	HCP	26.7
Foil Opens Faulted SG	Press. and Temp.	0.01	Press. and Temp.	0.03	Press. and Temp.	0.04	Press. and Temp.	0.2	Press. and Temp.	0.8
Foil Opens Intact SG	Press. and Temp.	0.3	Temp.	49.2	Temp.	58.9	Temp.	77.3	Temp.	348.8
	8.25 ft^2		4.12 ft^2		3.00 ft^2		1.72 ft^2			
	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)		
Reactor Trip	SG ΔP	0.8	SG ΔP	0.9	SG ΔP	0.9	HCP	4.7		
Main Steam Isolation	SG ΔP	0.8	SG ΔP	0.9	SG ΔP	0.9	HCP	4.9		
MFW Isolation	SG ΔP	1.0	SG ΔP	1.1	SG ΔP	1.3	HCP	4.9		
Foil Opens Faulted SG	Press. and Temp	0.01	Press. and Temp	0.001	Press. and Temp	0.01	Press. and Temp	0.01		
Foil Opens Intact SG	Press. and Temp	0.3	Press. and Temp	0.3	Press. and Temp	0.3	Press. and Temp	8.4		

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Table 6.2.1-25—MSLB Reactor Trip and Isolation Signal Summary
Sheet 5 of 6

0% Power										
	DEG		1.0 ft²		0.7 ft²		0.52 ft²		0.3 ft²	
	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)
Reactor Trip	SG ΔP	0.8	HCP	8.0	HCP	10.9	HCP	14.9	HCP	26.3
Main Steam Isolation	SG ΔP	0.8	HCP	8.2	HCP	11.1	HCP	15.1	HCP	26.5
MFW Isolation	SG ΔP	~~0.9~~1.0	HCP	8.2	HCP	11.1	HCP	15.1	HCP	26.5
Foil Opens Faulted SG	Press. and Temp.	0.01	Press. and Temp.	0.03	Press. and Temp.	0.04	Press. and Temp.	0.2	Press. and Temp.	0.8
Foil Opens Intact SG	Press. and Temp.	0.3	Temp.	45.2	Temp.	~~53.1~~53.0	Temp.	61.8	Temp.	349.6
	0.2 ft²		0.15 ft²		0.1 ft²		0.01 ft²		0.005 ft²	
	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)
Reactor Trip	HCP	41.3	HCP	56.0	HCP	85.2	HCP	1270.0	Did Not Occur	-
Main Steam Isolation	HCP	41.6	HCP	56.2	HCP	85.4	HCP	1270.2	Did Not Occur	-
MFW Isolation	HCP	41.6	HCP	56.2	HCP	85.4	HCP	1270.2	Did Not Occur	-
Foil Opens Faulted SG	Press. and Temp.	1.4	Press. and Temp.	1.9	Press. and Temp.	2.8	Press. and Temp.	24.5	Press. and Temp.	42.0
Foil Opens Intact SG	Temp.	368.4	Temp.	386.9	Temp.	427.8	Did Not Occur	-	Did Not Occur	-

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Table 6.2.1-25—MSLB Reactor Trip and Isolation Signal Summary
Sheet 6 of 6

	8.25 ft^2		4.12 ft^2		3.00 ft^2		1.72 ft^2			
	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)	Function	Time (sec)		
Reactor Trip	SG ΔP	0.8	SG ΔP	0.9	SG ΔP	0.9	SG ΔP	4.7		
Main Steam Isolation	SG ΔP	0.8	SG ΔP	0.9	SG ΔP	0.9	SG ΔP	4.9	14.03-1	
MFW Isolation	SG ΔP	1.0	SG ΔP	1.1	SG ΔP	1.3	SG ΔP	4.9		
Foil Opens Faulted SG	Press. and Temp	0.004	Press. and Temp	0.004	Press. and Temp	0.004	Press. and Temp	0.01		
Foil Opens Intact SG	Press. and Temp	0.3	Press. and Temp	0.3	Press. and Temp	0.3	Press. and Temp	3.3		

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Figure 6.2.1-1—~~RCP Cavity Nodalization Diagram (UJA15-006)~~Figure Deleted

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Figure 6.2.1-2—~~SG Cavity Nodalization Diagram (UJA23-004~~Figure Deleted

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Figure 6.2.1-3—~~SG Cavity Nodalization Diagram (UJA29-004~~Figure Deleted

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Figure 6.2.1-4—~~PZR Cavities Nodalization Diagram (30UJA29-019 and UJA34-019)~~Figure Deleted

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Figure 6.2.1-5—~~RCP Cavity Pressure vs. Time (UJA15-006)~~Figure Deleted

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Figure 6.2.1-6—~~SG Cavity Pressure vs. Time (UJA23-004~~Figure Deleted~~)~~

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Figure 6.2.1-7—~~SG Cavity Pressure vs. Time (UJA29-004)~~Figure Deleted

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Figure 6.2.1-8—~~Pressurizer Cavity Pressure vs. Time (UJA29-019)~~Figure Deleted

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Figure 6.2.1-9—~~Pressurizer Cavity Pressure vs. Time (UJA34-019)~~Figure Deleted

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Figure 6.2.1-45—JEA 10 (SG) Room Example Nodalization Diagram

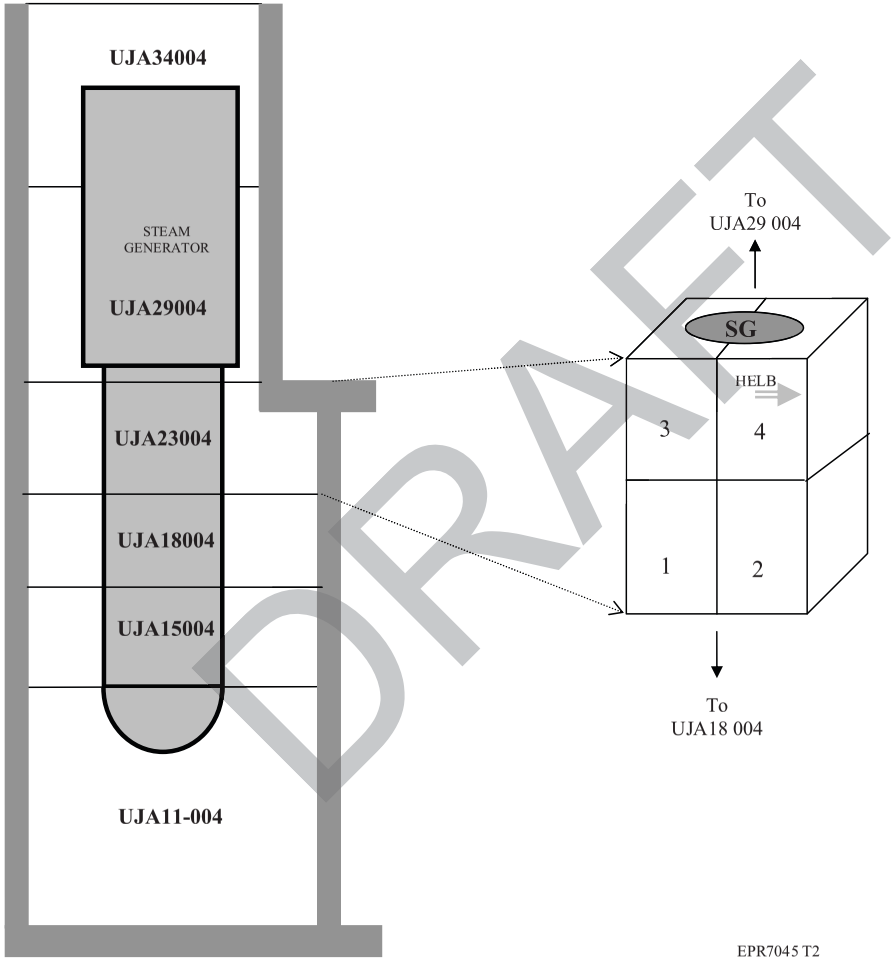

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Figure 6.2.1-46—Access Area Pressure vs. Time (UJA07013)

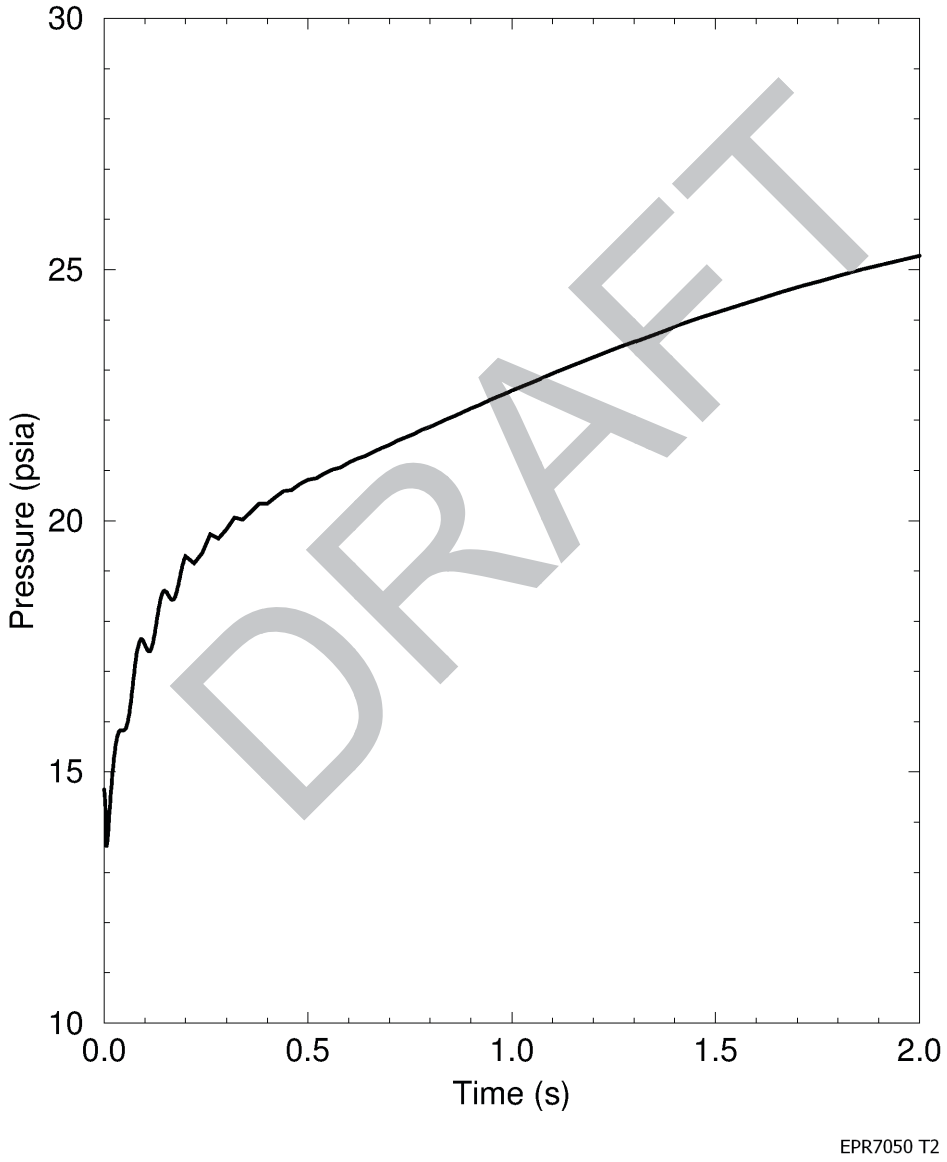

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Figure 6.2.1-47—LCQ (SGBS) HX Room Pressure vs. Time (UJA07018)

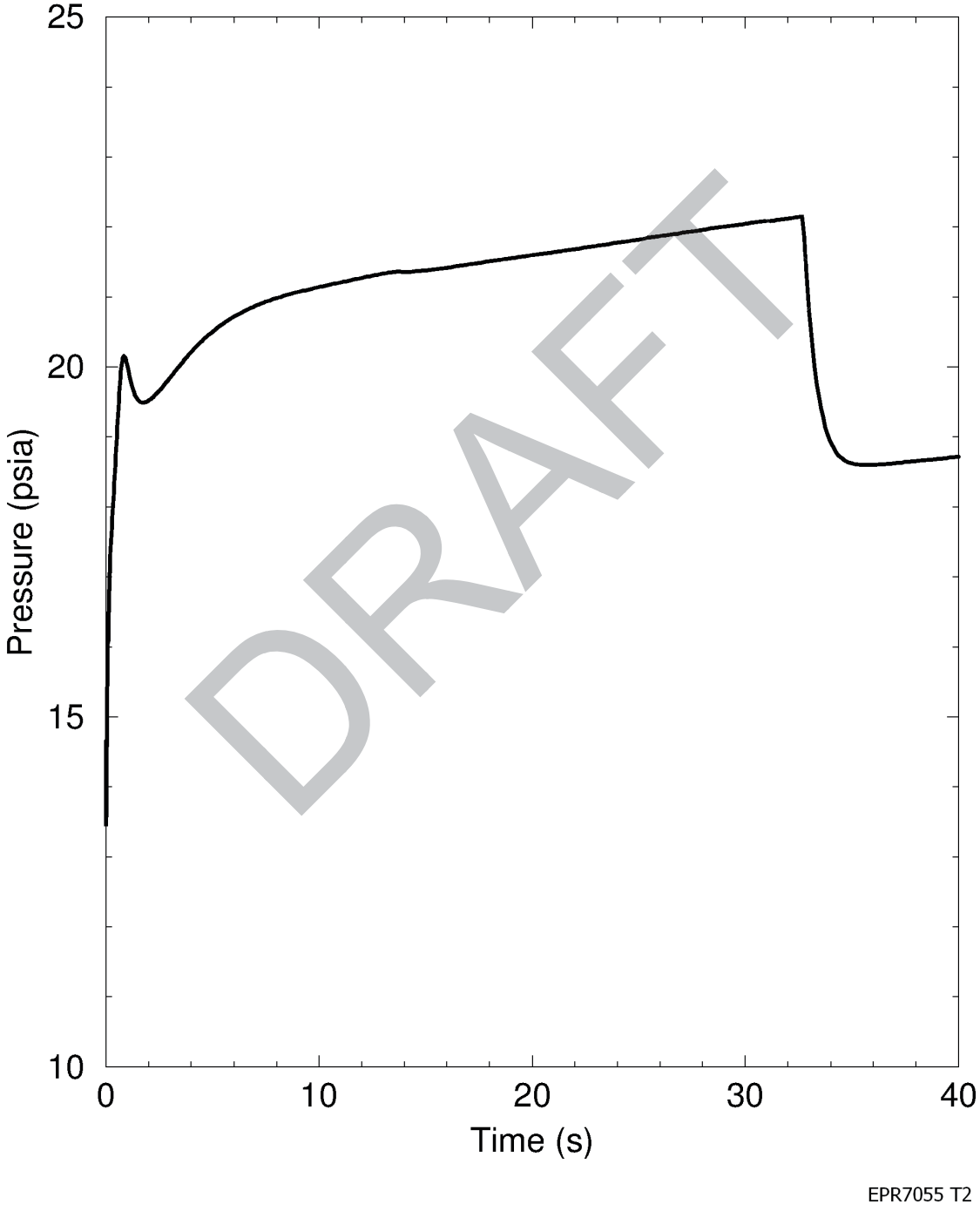

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Figure 6.2.1-48—KBA12 (CVCS) HX Room Pressure vs. Time (UJA07026)

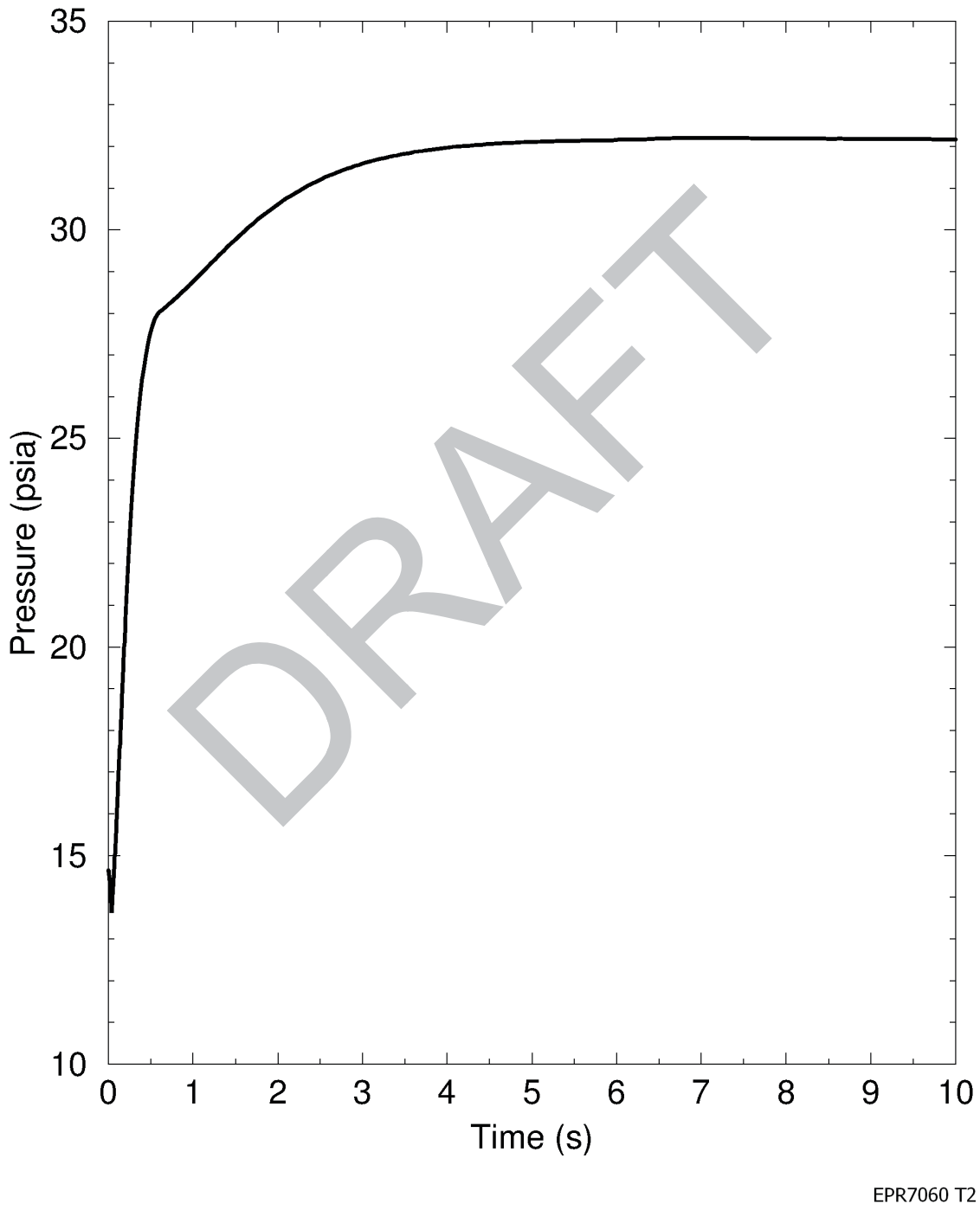

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Figure 6.2.1-49—KBA11 (CVCS) HX Room Pressure vs. Time (UJA07027)

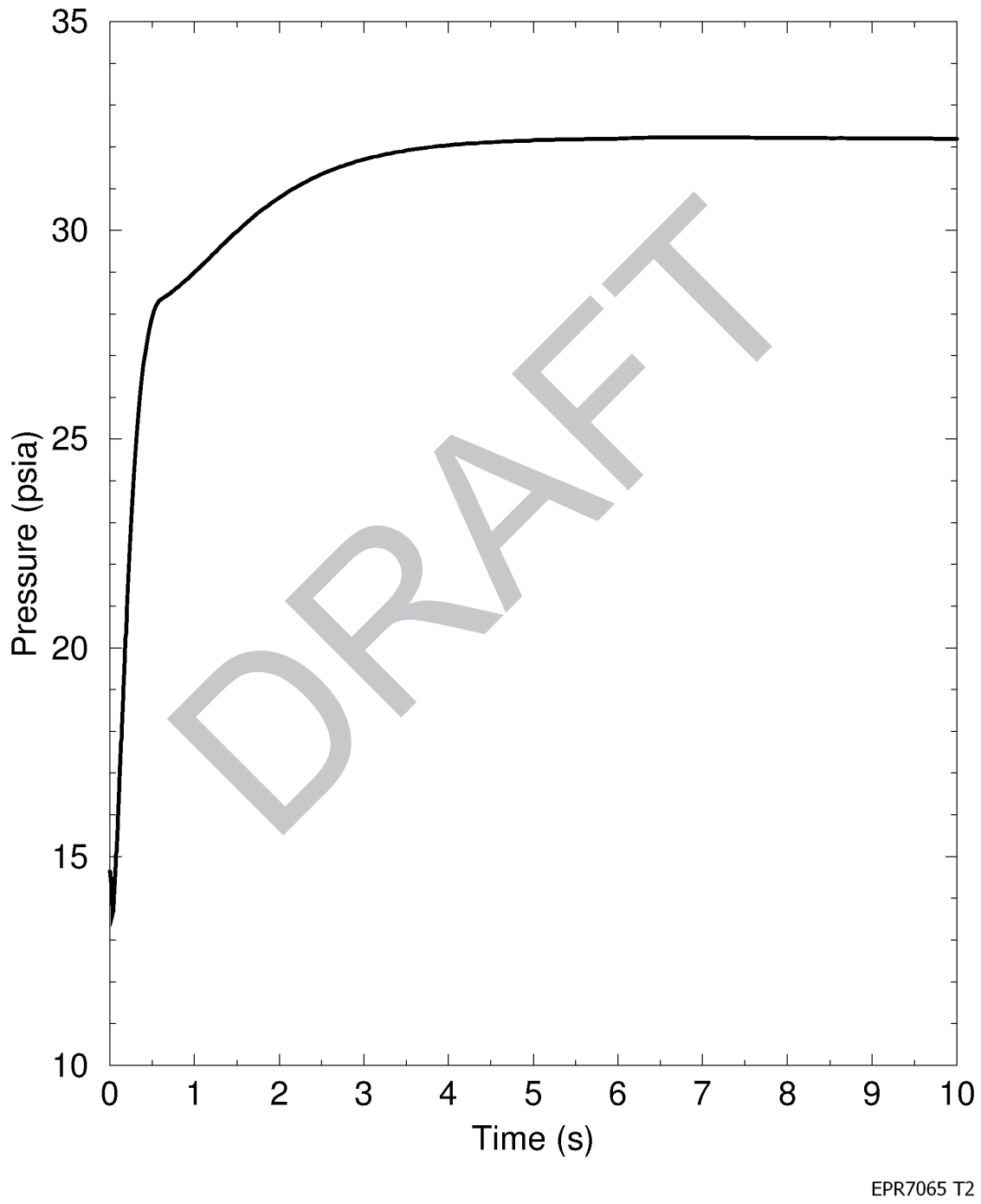

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Figure 6.2.1-50— KBA (CVCS) Valve Room Pressure vs. Time (UJA07028)

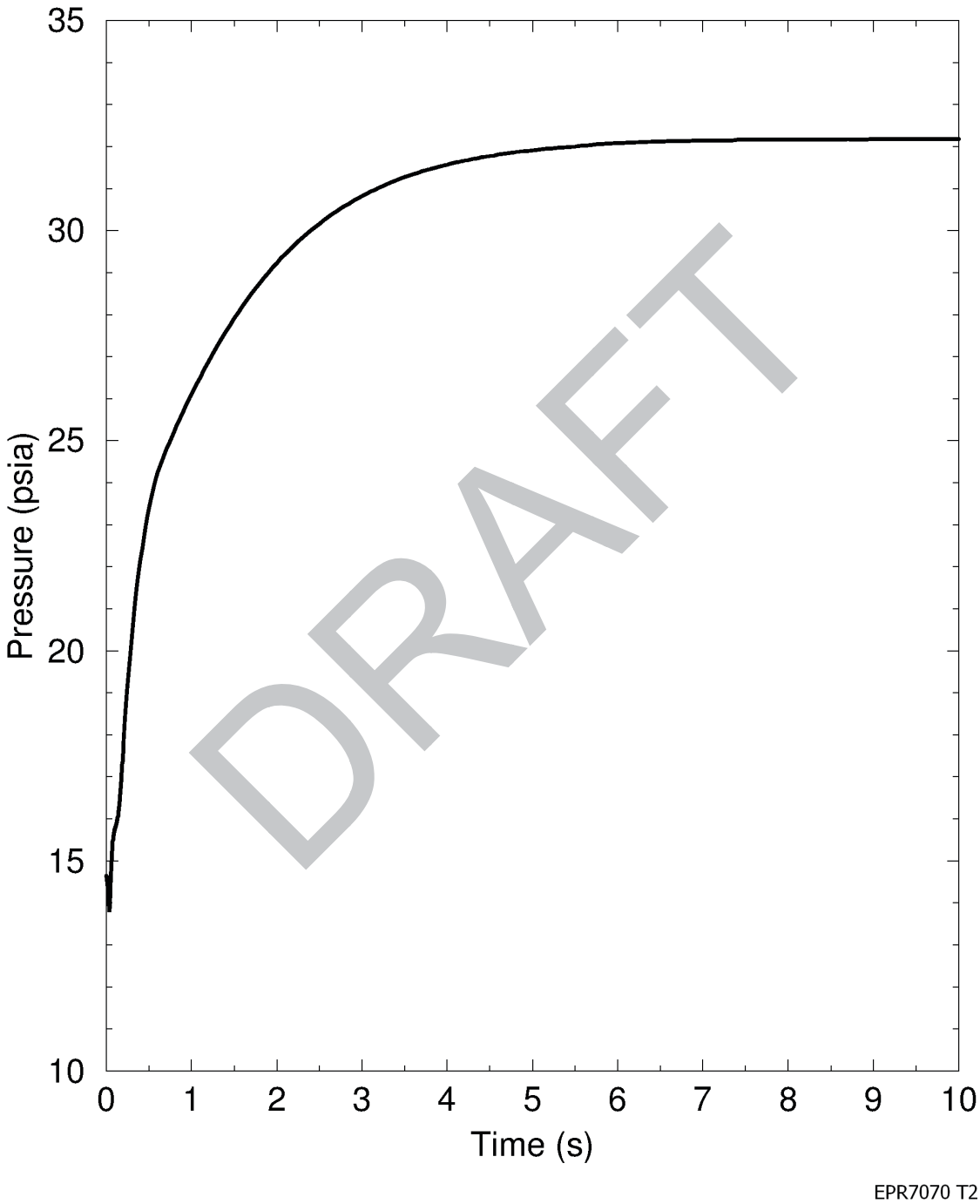

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Figure 6.2.1-51—KBA (CVCS) Valve Room Pressure vs. Time (UJA07029)

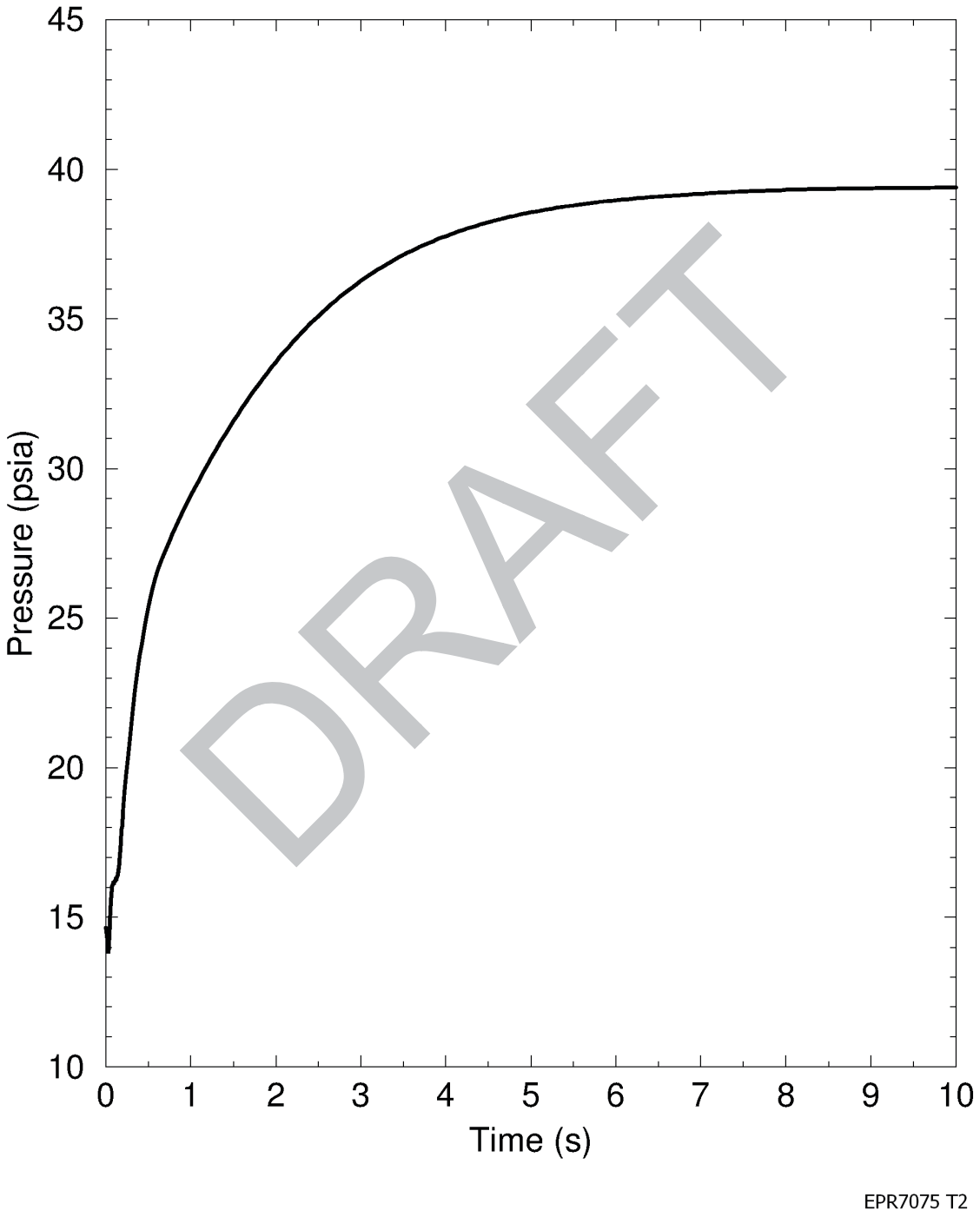

Figure 6.2.1-52—LCQ50 (SGBS) Tank Room Pressure vs. Time (UJA11018)

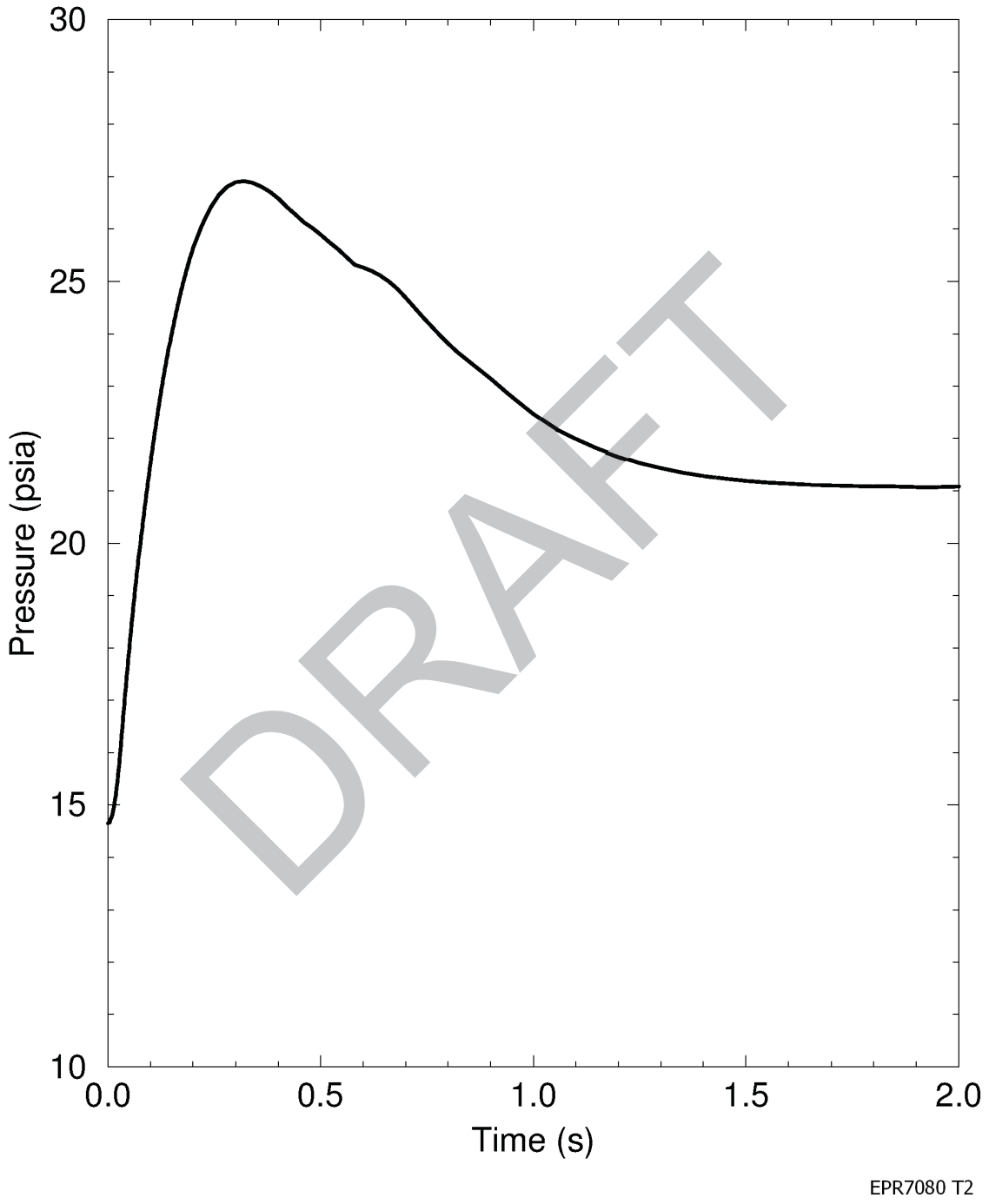

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Figure 6.2.1-53— KBA (CVCS) Valve Room Pressure vs. Time (UJA11022)

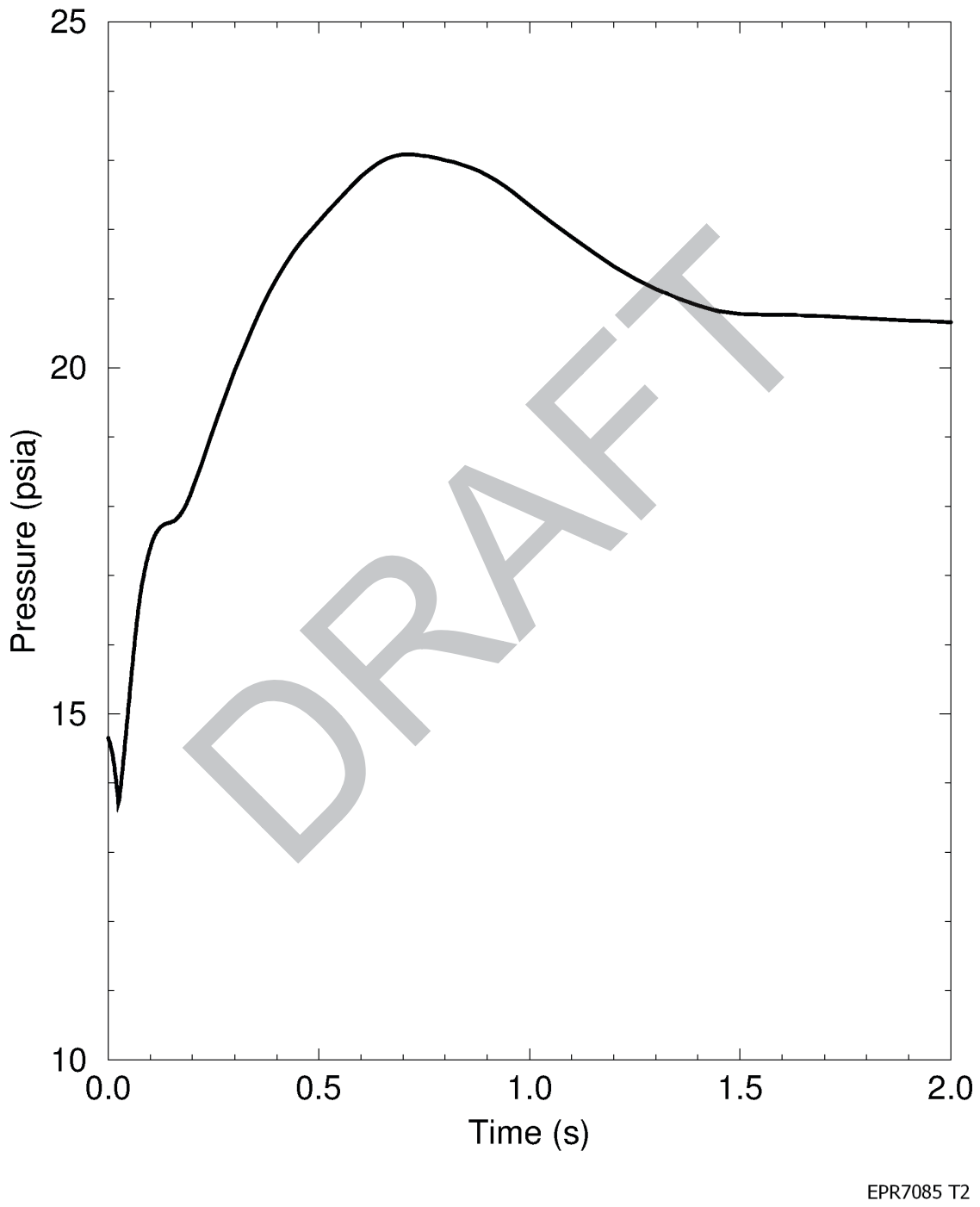

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Figure 6.2.1-54—KBA (CVCS) Valve Room Pressure vs. Time (UJA11023)

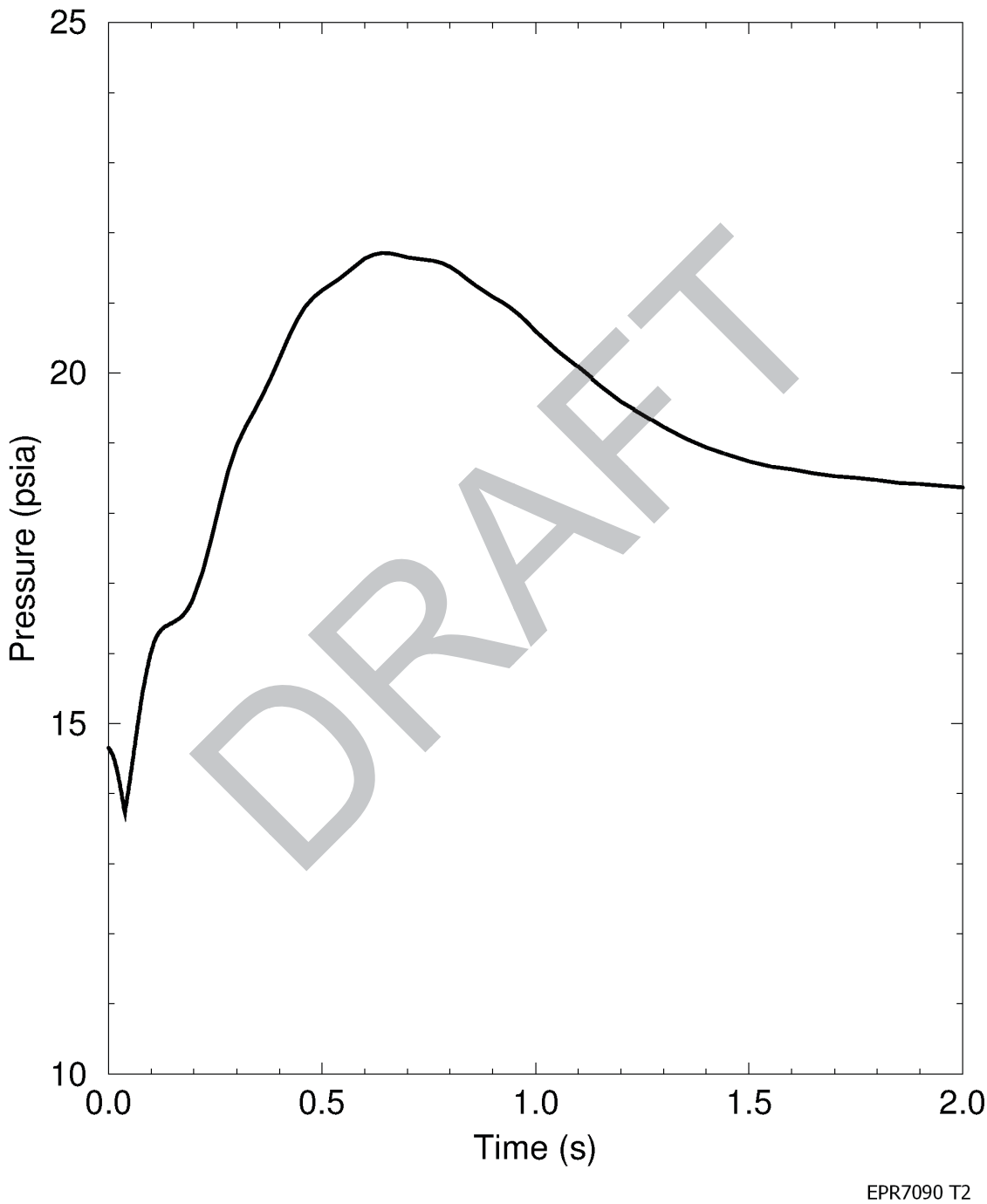

Figure 6.2.1-55—KBA10 (CVCS) HX Room Pressure vs. Time (UJA11024)

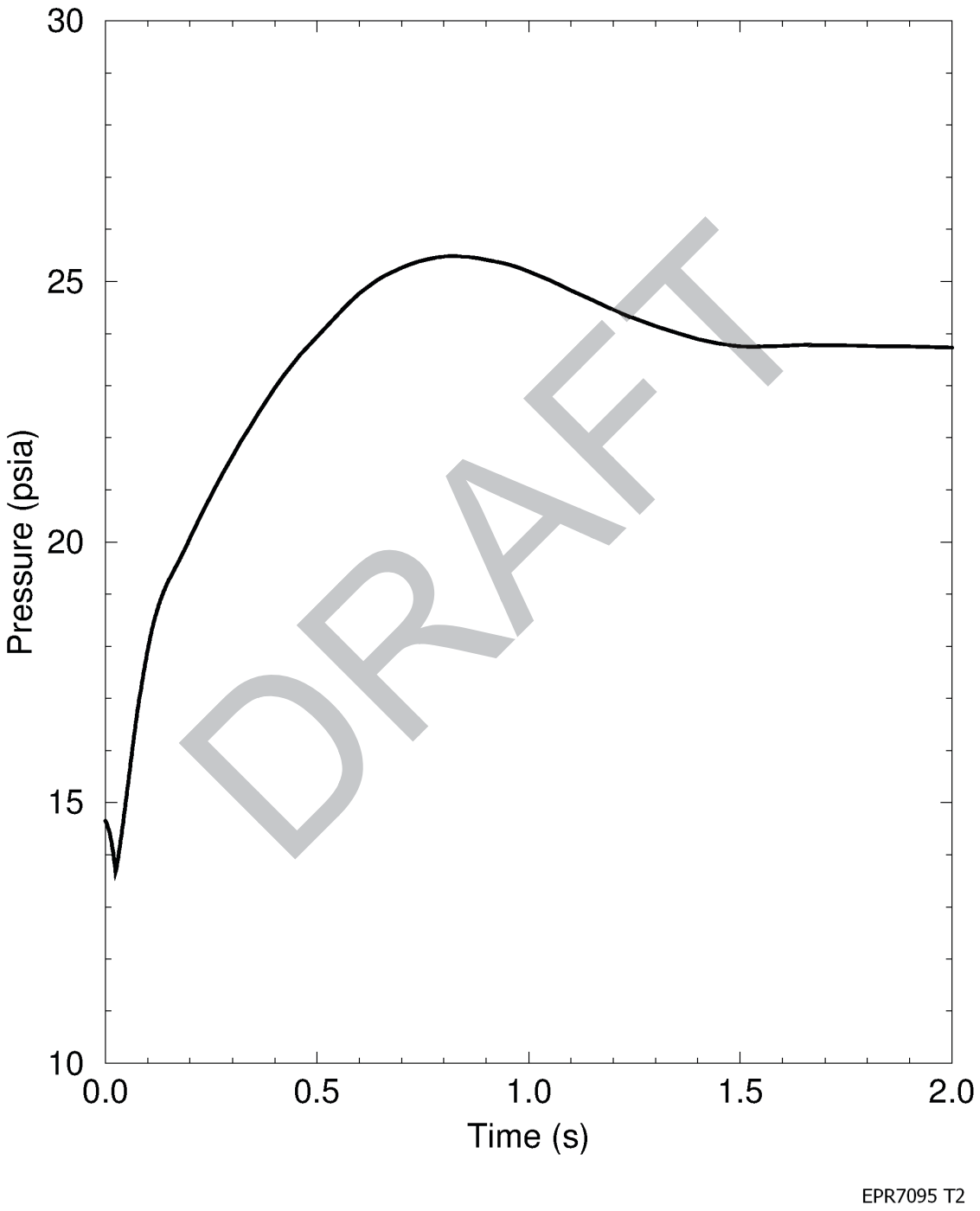

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Figure 6.2.1-56—JEA10 (SG) Room Pressure vs. Time (UJA23003)

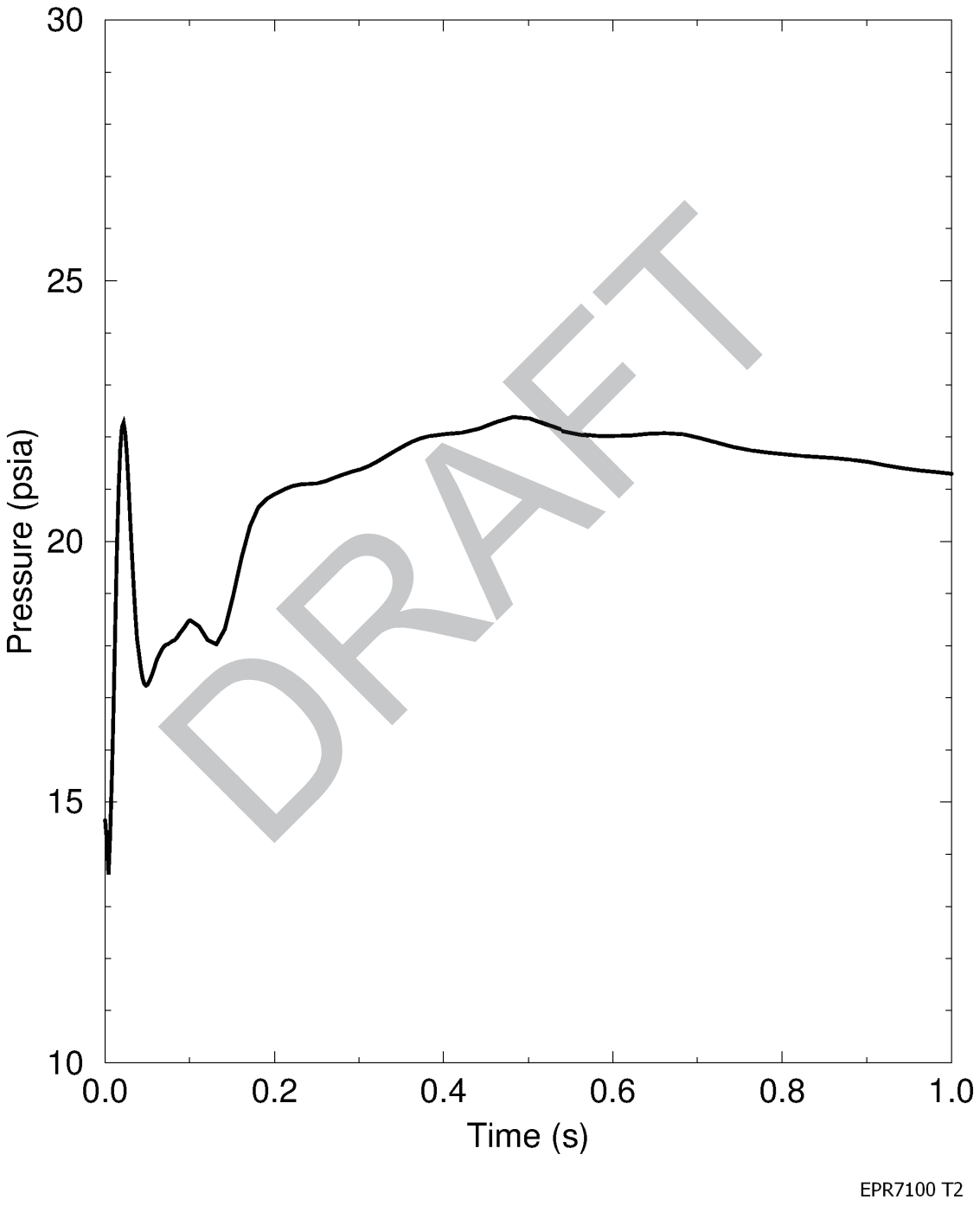

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Figure 6.2.1-57—JEA20 (SG) Room Pressure vs. Time (UJA23004)

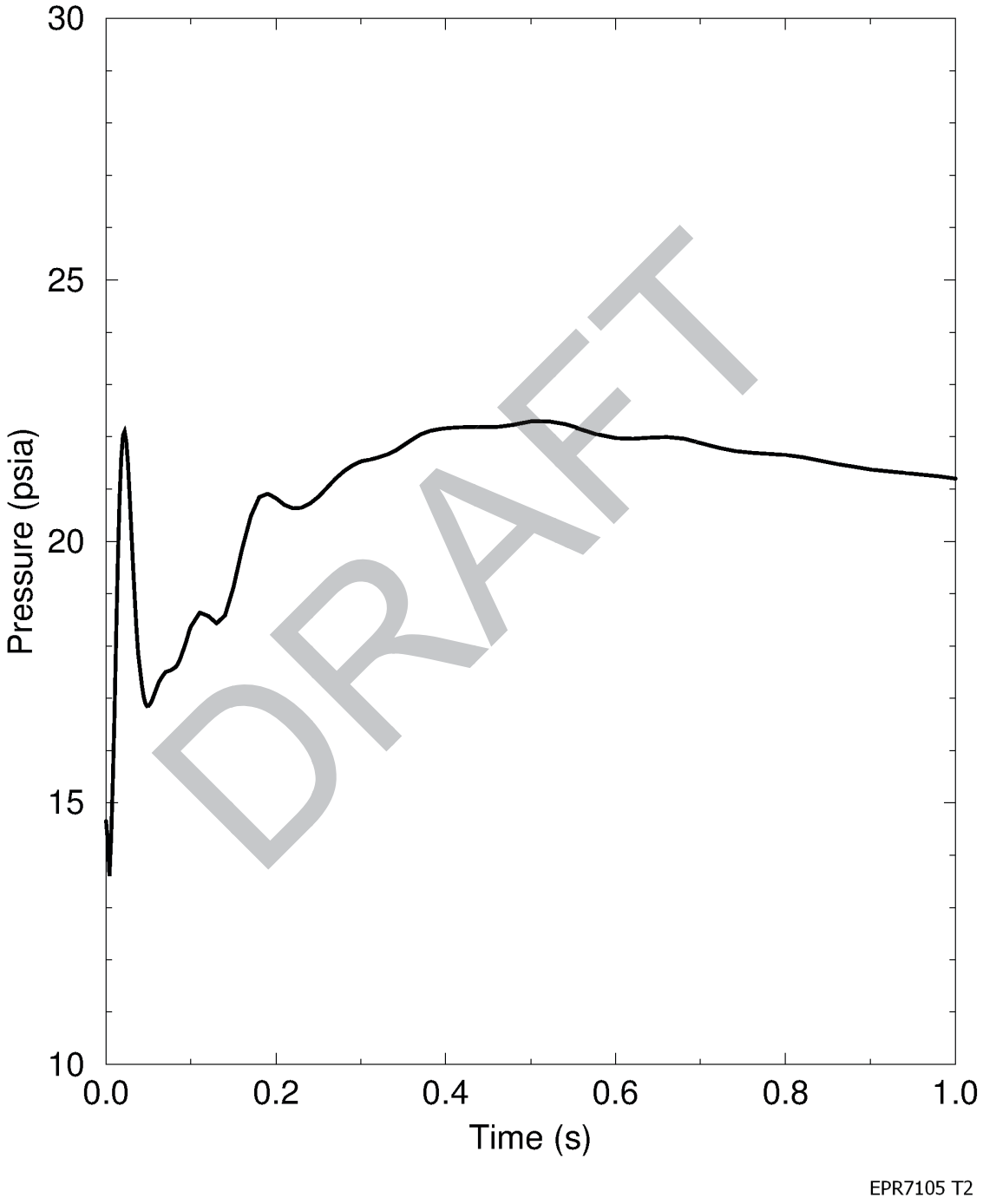

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Figure 6.2.1-58—JEA40 (SG) Room Pressure vs. Time (UJA23008)

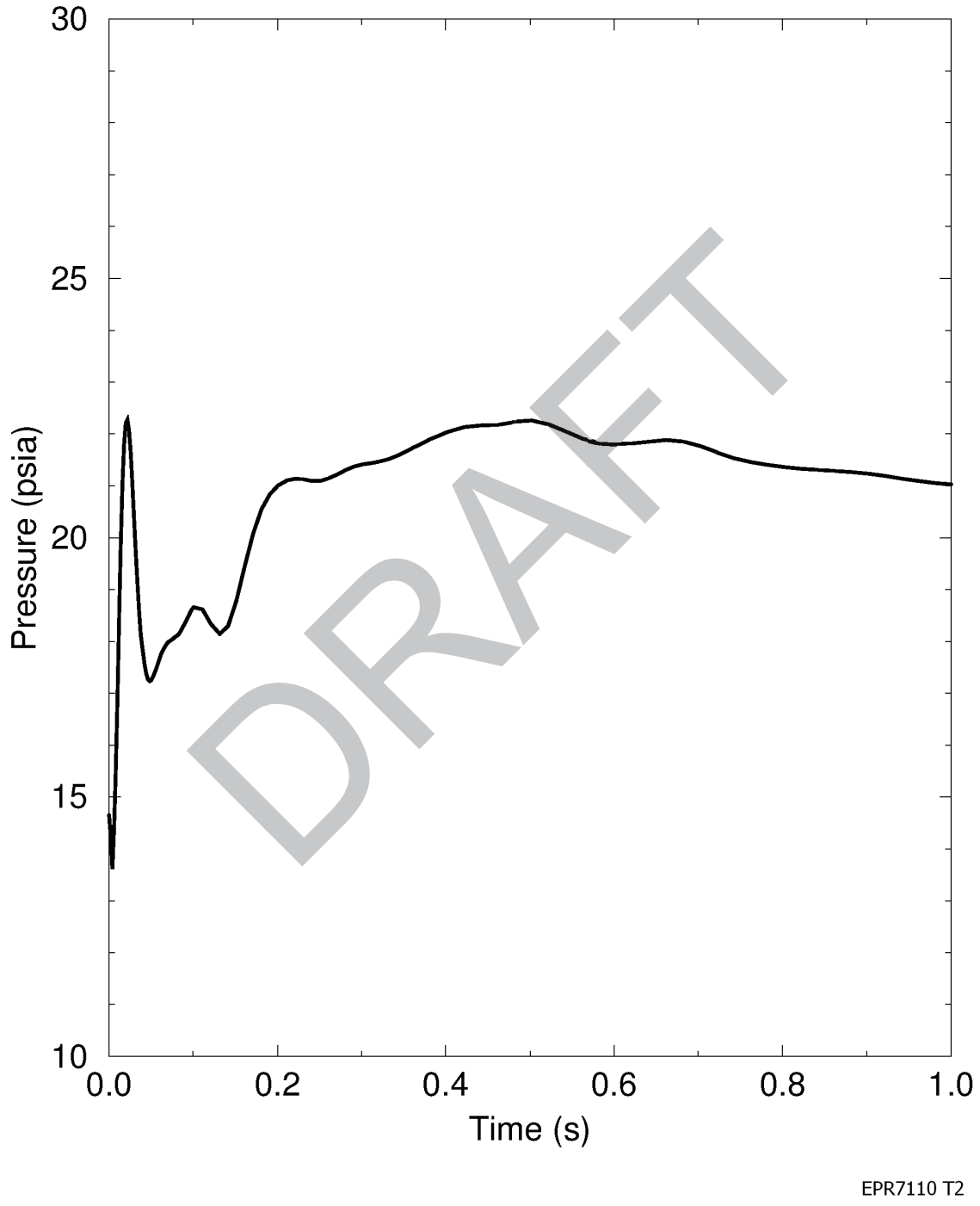

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Figure 6.2.1-59— JEA10 (SG) Room Pressure vs. Time (UJA29003)

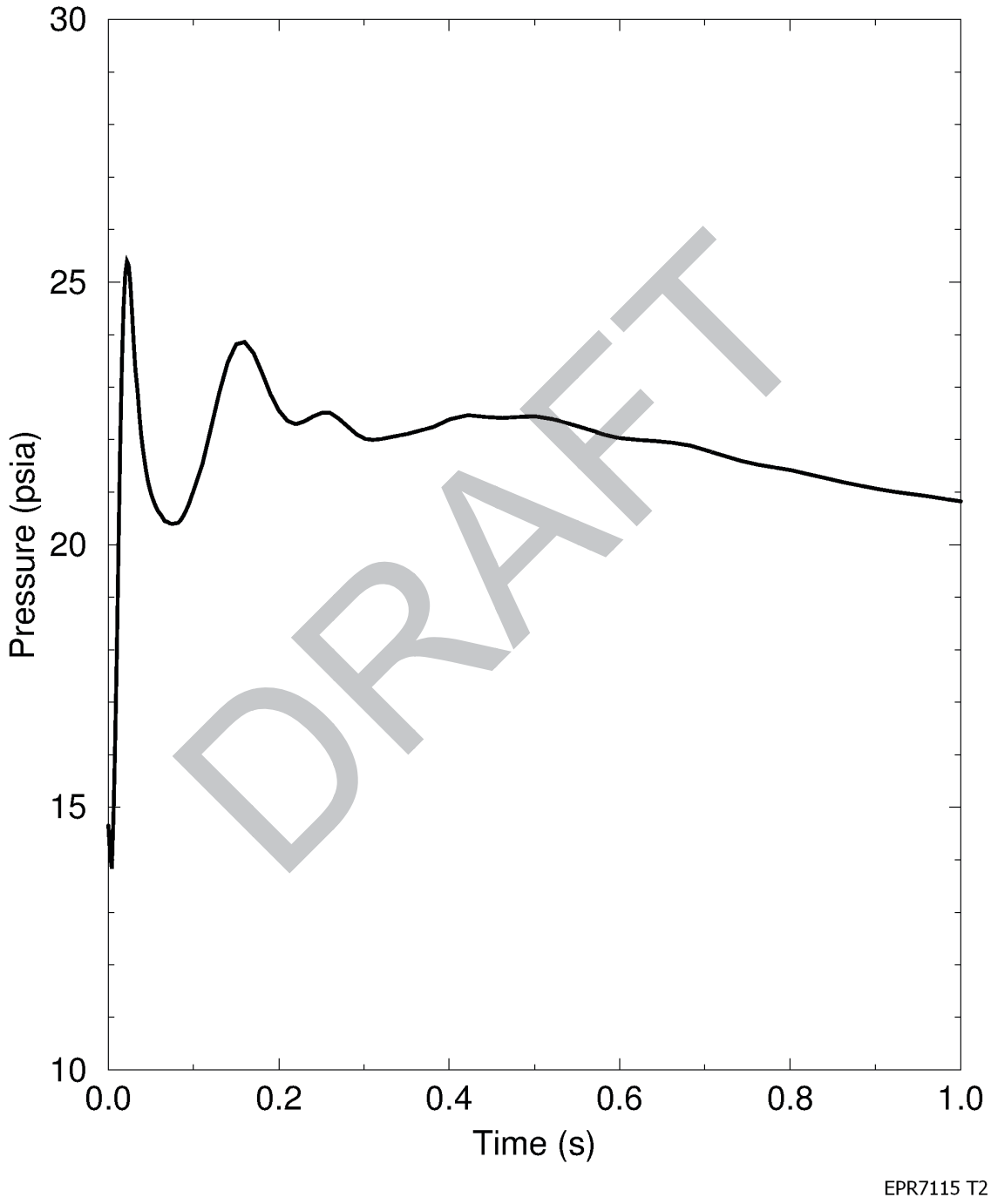

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Figure 6.2.1-60—JEA20 (SG) Room Pressure vs. Time (UJA29004)

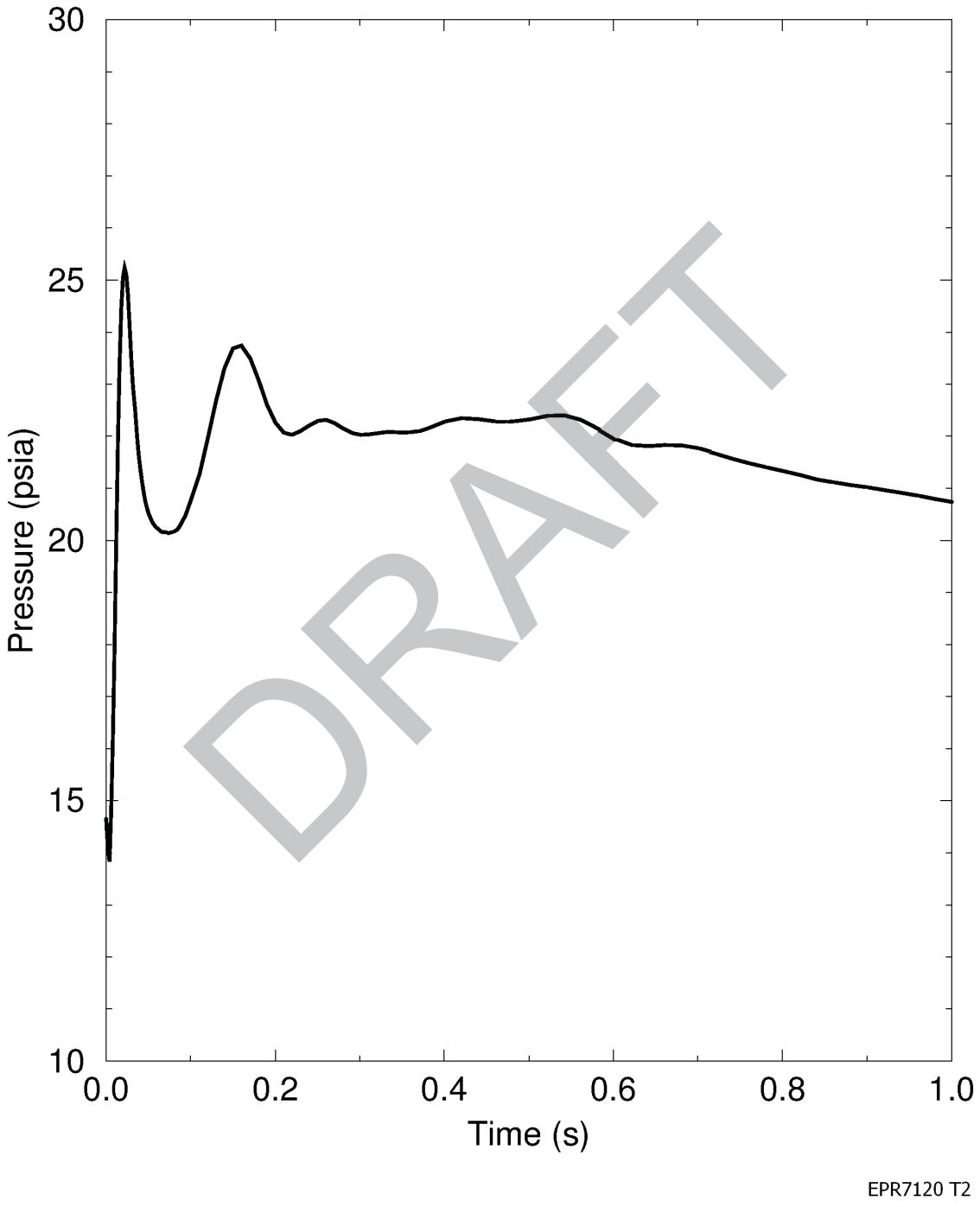

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Figure 6.2.1-61—JEA30 (SG) Room Pressure vs. Time (UJA29007)

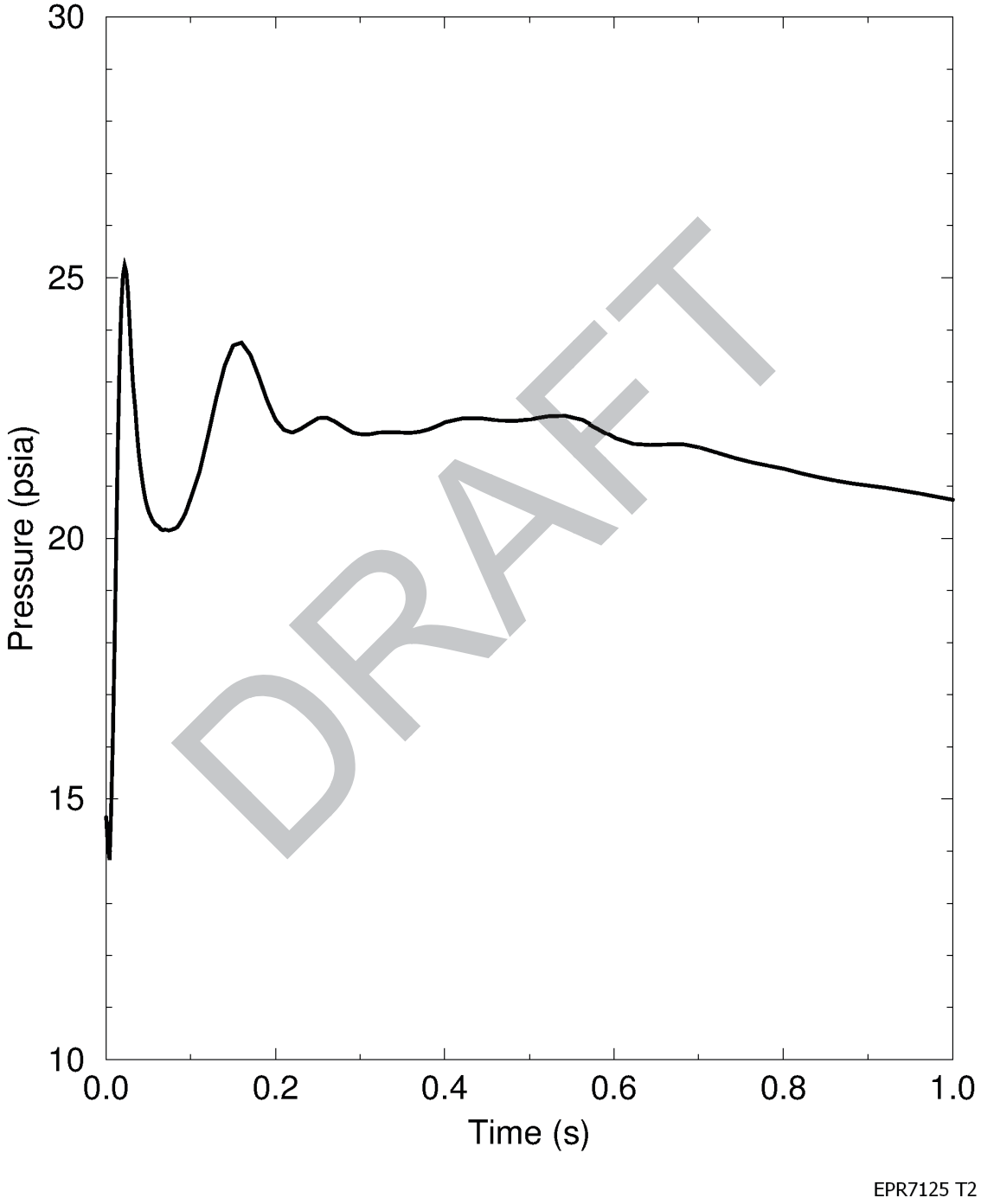

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Figure 6.2.1-62—JEA40 (SG) Room Pressure vs. Time (UJA29008)

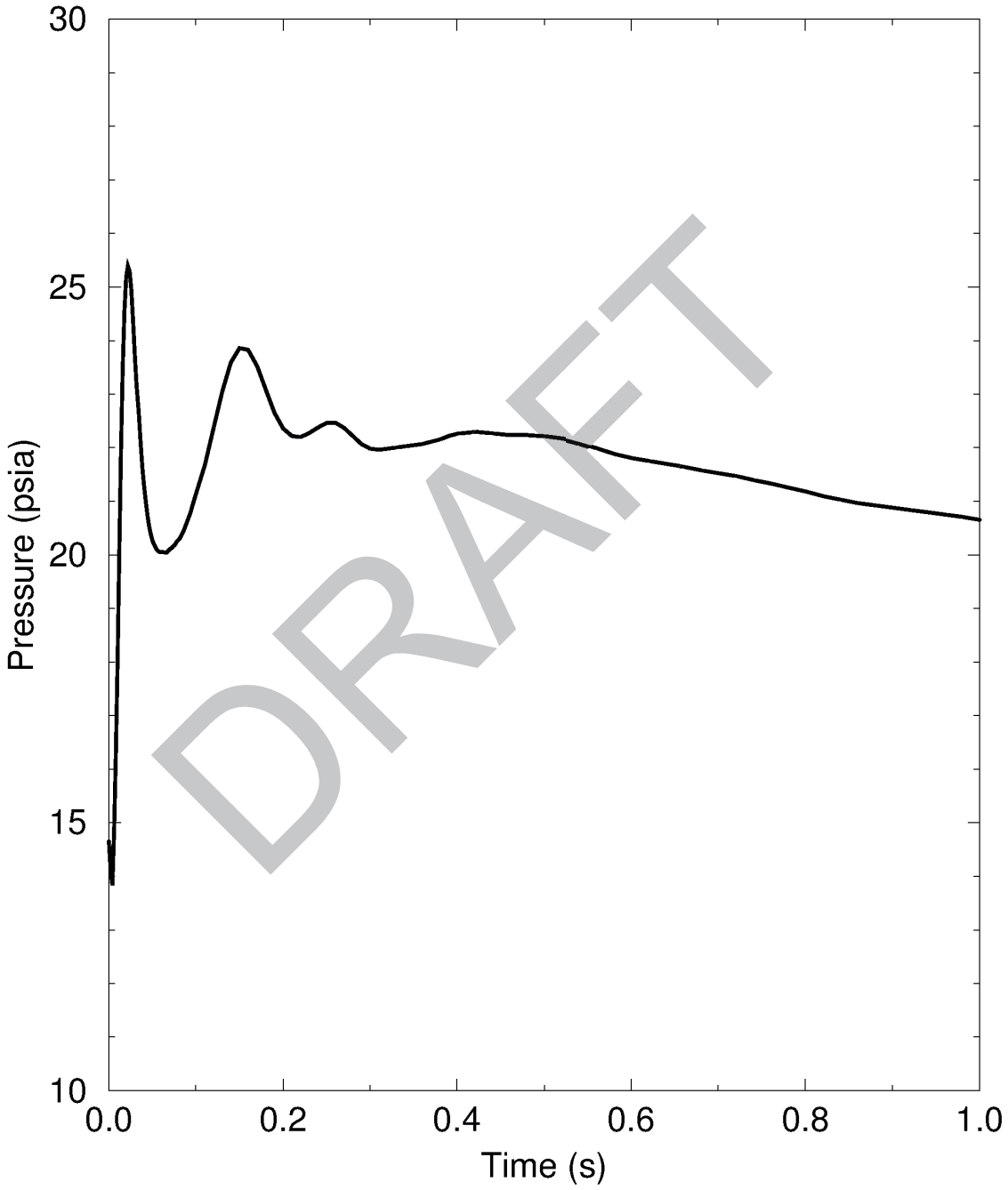

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Figure 6.2.1-63—JEF10 (RCS) Pressurizer Room Pressure vs. Time (UJA29019)

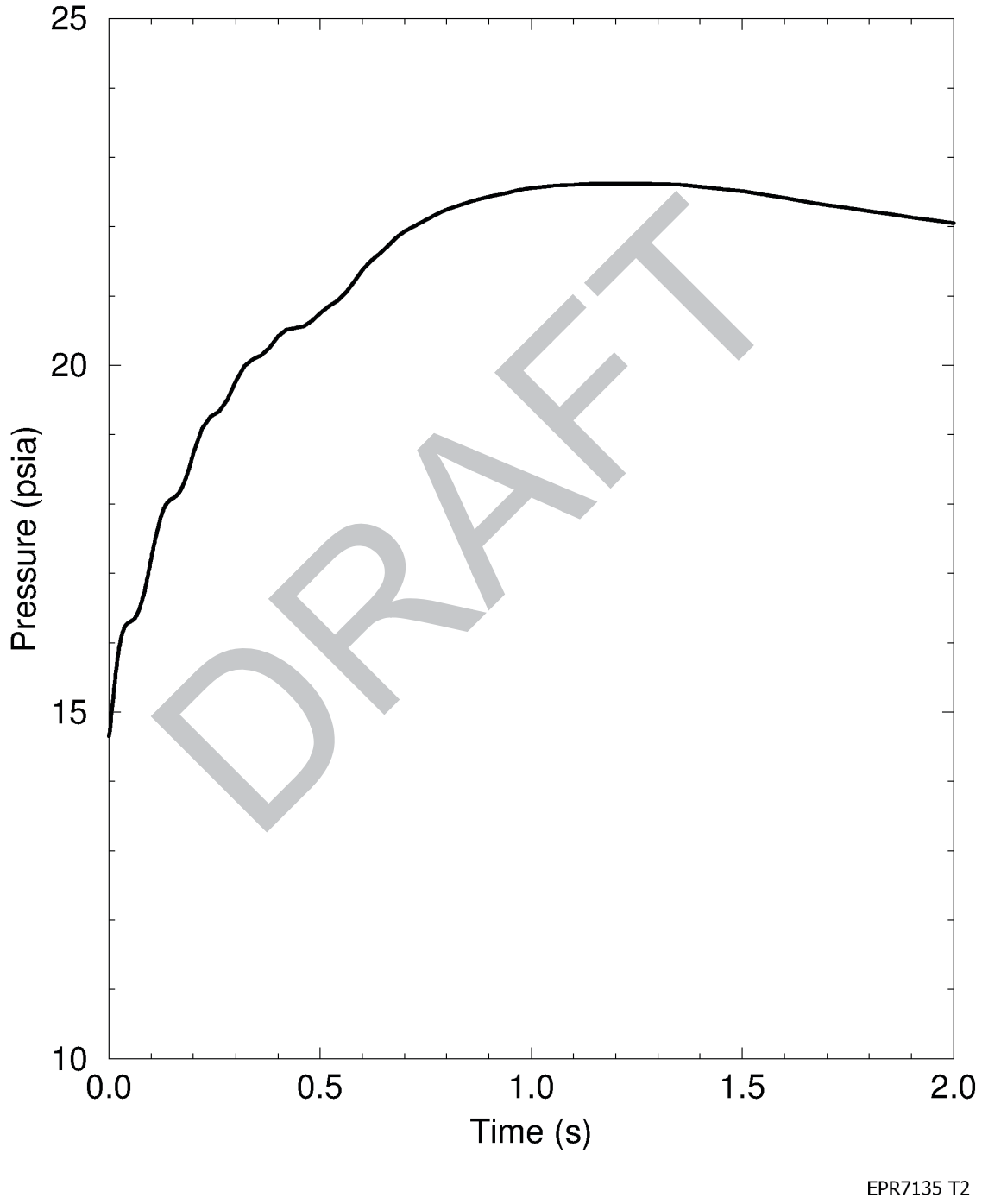

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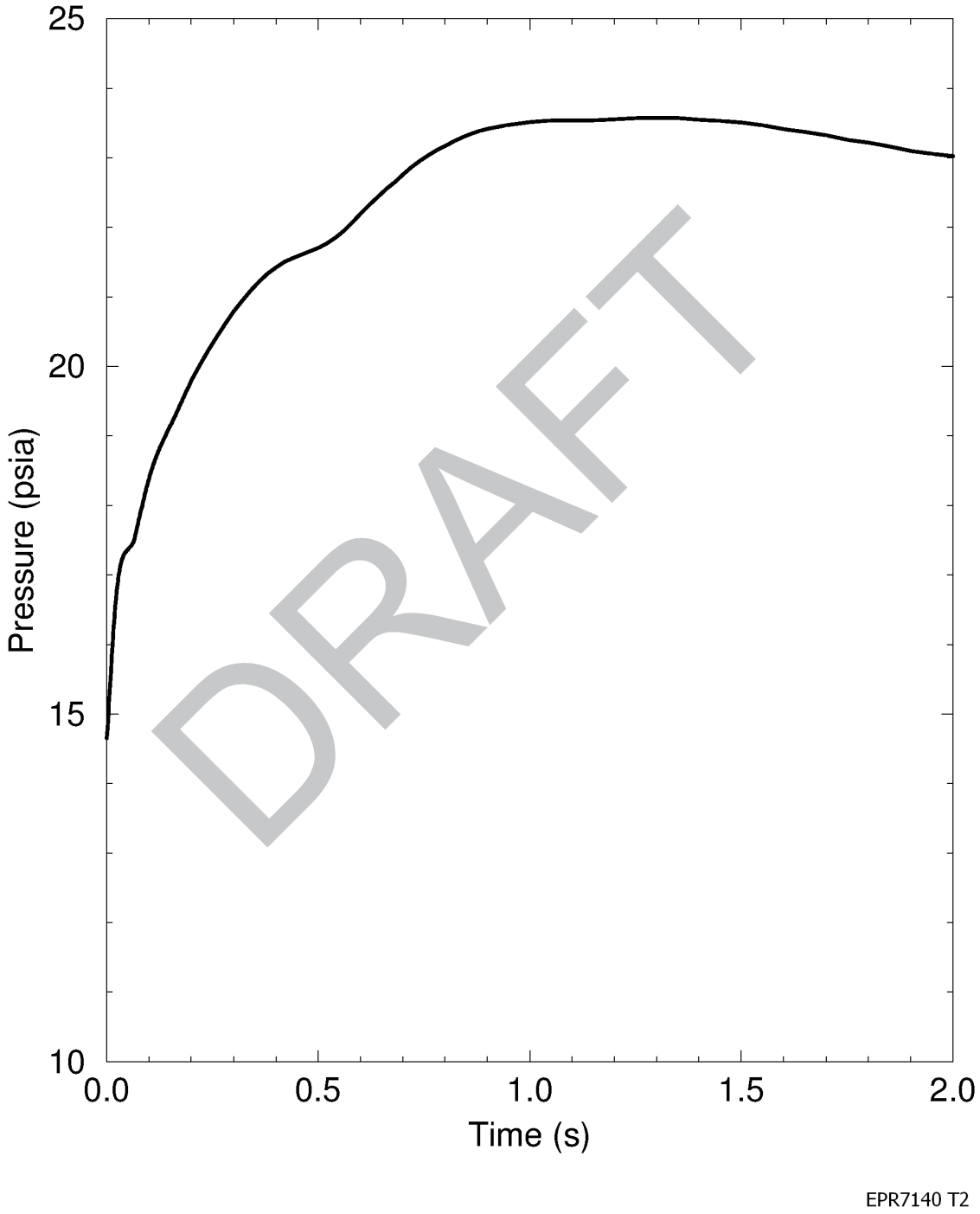
Figure 6.2.1-64—Pressurizer Head & Safety Relief Valves Room Pressure vs. Time (UJA34019)



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