ArevaEPRDCPEm Resource

From: WELLS Russell D (AREVA NP INC) [Russell.Wells@areva.com]
Sent: Monday, April 20, 2009 6:36 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. 173, FSAR Ch 9, Supplement 1
Attachments: RAI 173 Supplement 1 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided responses to 3 of the 19 questions of RAI No.173 on February 20, 2009. The attached file, "RAI 173 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to 4 of the remaining 16 questions, as committed.

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 173 Questions 9.01.05-1, 09.01.05-6, and 9.01.05-11.

The following table indicates the respective pages in the response document, "RAI 173 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 173 — 9.01.05-1	2	2
RAI 173 — 9.01.05-6	3	3
RAI 173 — 9.01.05-11	4	4
RAI 173 — 9.01.05-12	5	5

The schedule for technically correct and complete responses to the remaining 12 questions is unchanged and provided below:

Question #	Response Date
RAI 173 — 9.01.05-4	May 21, 2009
RAI 173 — 9.01.05-5	May 21, 2009
RAI 173 — 9.01.05-7	May 21, 2009
RAI 173 — 9.01.05-8	July 27, 2009
RAI 173 — 9.01.05-9	July 27, 2009
RAI 173 — 9.01.05-10	July 27, 2009
RAI 173 — 9.01.05-13	July 27, 2009
RAI 173 — 9.01.05-14	July 27, 2009
RAI 173 — 9.01.05-15	May 21, 2009
RAI 173 — 9.01.05-16	July 27, 2009
RAI 173 — 9.01.05-17	May 21, 2009
RAI 173 — 9.01.05-18	May 21, 2009

Sincerely,

(Russ Wells on behalf of)
Ronda Pederson
ronda.pederson@areva.com

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New Plants Deployment
AREVA NP, Inc.
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From: Pederson Ronda M (AREVA NP INC)
Sent: Friday, February 20, 2009 2:40 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 173 (1853), FSARCh. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 173 Response US EPR DC.pdf" provides technically correct and complete responses to 3 of the 19 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 173 Questions 9.01.05-2, 9.01.05-3 and 9.01.05-19.

The following table indicates the respective pages in the response document, "RAI 173 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 173 — 9.01.05-1	2	2
RAI 173 — 9.01.05-2	3	3
RAI 173 — 9.01.05-3	4	4
RAI 173 — 9.01.05-4	5	5
RAI 173 — 9.01.05-5	6	6
RAI 173 — 9.01.05-6	7	7
RAI 173 — 9.01.05-7	8	8
RAI 173 — 9.01.05-8	9	9
RAI 173 — 9.01.05-9	10	10
RAI 173 — 9.01.05-10	11	11
RAI 173 — 9.01.05-11	12	12
RAI 173 — 9.01.05-12	13	13
RAI 173 — 9.01.05-13	14	14
RAI 173 — 9.01.05-14	15	15
RAI 173 — 9.01.05-15	16	16
RAI 173 — 9.01.05-16	17	17
RAI 173 — 9.01.05-	18	18

17		
RAI 173 — 9.01.05-18	19	19
RAI 173 — 9.01.05-19	20	20

A complete answer is not provided for 16 of the 19 questions. The schedule for technically correct and complete responses to these questions is unchanged and provided below.

Question #	Response Date
RAI 173 — 9.01.05-1	April 20, 2009
RAI 173 — 9.01.05-4	May 21, 2009
RAI 173 — 9.01.05-5	May 21, 2009
RAI 173 — 9.01.05-6	May 21, 2009
RAI 173 — 9.01.05-7	May 21, 2009
RAI 173 — 9.01.05-8	July 27, 2009
RAI 173 — 9.01.05-9	July 27, 2009
RAI 173 — 9.01.05-10	July 27, 2009
RAI 173 — 9.01.05-11	April 20, 2009
RAI 173 — 9.01.05-12	April 20, 2009
RAI 173 — 9.01.05-13	July 27, 2009
RAI 173 — 9.01.05-14	July 27, 2009
RAI 173 — 9.01.05-15	May 21, 2009
RAI 173 — 9.01.05-16	July 27, 2009
RAI 173 — 9.01.05-17	May 21, 2009
RAI 173 — 9.01.05-18	May 21, 2009

Sincerely,

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From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, January 22, 2009 9:37 AM
To: ZZ-DL-A-USEPR-DL
Cc: Gerard Purciarello; Peter Wilson; John Segala; Peter Hearn; Joseph Colaccino; Michael Miernicki; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 173 (1853), FSARCh. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 9, 2009, and on January 16, 2009, you informed us that the RAI is clear and no further clarification is needed. Draft RAI Questions 09.01.05-4 and 09.01.05-12 were modified to correct typographical errors. 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: 417

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Subject: Response to U.S. EPR Design Certification Application RAI No. 173, FSAR Ch 9, Supplement 1
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From: WELLS Russell D (AREVA NP INC)

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RAI 173 Supplement 1 Response US EPR DC.pdf	123182	

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Return Notification: No
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Response to

Request for Additional Information No. 173, Supplement 1

01/22/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.01.05 - Overhead Heavy Load Handling Systems
Application Section: 9.1.5

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

Question 09.01.05-1:

FSAR Section 9.1.5.1, “Design Bases,” specifies that the cranes for the U.S. EPR are designed in accordance with the requirements of American Society of Mechanical Engineers (ASME) NOG-1, “Rules for Construction of Overhead and Gantry Cranes.” and ASME NUM-1, “Rules for Construction of Cranes, Monorails, and Hoists (With Bridge or Trolley or Hoist of the Under hung Type).” These standards have been developed using guidance provided by NUREG-0612, “Control of Heavy Loads at Nuclear Power Plants,” NUREG-0554, “Single-Failure-Proof Cranes for Nuclear Power Plants,” ASME B30.2, "Overhead and Gantry Cranes," and CMAA-70, “Specification for Top Running and Gantry Type Multiple Girder Electric Overhead Traveling Cranes.” Cranes are designated as ASME NOG-1, Type I, II, or III based on their requirements to handle critical loads and their seismic design criteria. FSAR Table 3.2.2-1 lists the design code for each crane (NUM-1 or NOG-1), but does not list the Type (I, II, or III). FSAR Section 9.1.5 also does not specify Type. Since the crane type defines the crane’s ability to withstand a safe shutdown earthquake (SSE) and hold its load during an SSE, the applicant needs to clearly define which design code (NUM-1 or ASME NOG-1) and Type (I, II, or III) is applicable for each crane in FSAR Table 3.2.2-1. The FSAR needs to be changed accordingly.

Response to Question 09.01.05-1:

The crane’s configuration (e.g., top running) determines the design code. Top running, multiple girder overhead and gantry cranes are designed in accordance with ASME NOG-1. Those cranes, monorails, and lifting equipment with the bridge, trolley or hoist of the underhung type are designed in accordance with ASME NUM-1.

U.S. EPR FSAR, Tier 2, Table 9.1.5-1 has been revised to include the crane type and applicable design codes. In conjunction with this response, AREVA NP reviewed the cranes with the potential to handle heavy loads, and as a result additional cranes were identified and are included in U.S. EPR FSAR, Tier 2, Tables 3.2.2-1 and 9.1.5-1. In addition, the seismic classifications of some of the cranes in Table 3.2.2-1 were revised. The equipment in Tables 3.2.2-1 and 9.1.5-1 were compared, and additions were made to Table 9.1-5-1 for consistency; these changes are in the attached markups.

FSAR Impact:

U.S. EPR FSAR, Tier 2, Table 3.2.2-1 and Table 9.1.5-1 will be revised as described in the response and indicated on the enclosed markup.

Question 09.01.05-6:

The applicant did not specify the licensing basis for lifting devices for the single failure proof handling systems. Guidelines in SRP Section 9.1.5.III.4.C.ii specify that lifting devices for use with single-failure-proof handling system are to satisfy the criteria of American National Standards Institute (ANSI) N14.6, "Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More." If special lifting devices are not used, slings should be selected to satisfy the criteria of American Society of Mechanical Engineers (ASME) B30.9, "Slings". In addition, slings for use with single-failure-proof handling systems should be constructed of metallic material (chain or wire rope). Guidelines in SRP Section 9.1.5.III.4.C.ii also specify that special lifting device and slings used in single failure proof handling systems have either dual, independent load paths or a single load path with twice the design safety factor specified. Justify not specifying these guidelines for lifting devices and slings in single failure proof handling systems. The FSAR needs to be changed accordingly.

Response to Question 09.01.05-6:

Lifting devices for single-failure-proof systems will meet the design criteria specified in ANSI N14.6 ("Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More"). If special lifting devices are not used, slings that satisfy the criteria of ASME B30.9 ("Slings") will be used. In addition, slings for use with single-failure-proof handling systems will be metallic (chain or wire rope). Special lifting devices and slings used with single-failure-proof systems will have either dual, independent load paths or a single load path with twice the design safety factor.

FSAR Impact:

U.S. EPR FSAR, Tier 2, Section 9.1.5.2.2 and Section 9.1.5.2.3 will be revised as described in the response and indicated on the enclosed markup.

Question 09.01.05-11:

FSAR Section 9.1.5.1,"Design Basis," states that all cranes in the heavy load handling system are non seismic, except the reactor building (RB) polar crane and the refueling (RB) building crane. This statement conflicts with FSAR Table 3.2.2-1, "Classification Summary," which lists the main steam valve cranes and the steam generator cubicle cranes as seismic category II. The applicant needs to change the FSAR to make FSAR Section 9.1.5.1 and FSAR Table 3.2.2-1 consistent.

Response to Question 09.01.05-11:

The design basis in U.S. EPR FSAR, Tier 2, Section 9.1.5.1 will be revised as follows:

"The safety and seismic classifications of heavy-load-handling systems are based on the functions they perform and on their location relative to spent fuel, fuel in the core, nuclear materials, or equipment that may be required to achieve safe plant shutdown. Table 3.2.2-1 provides the safety and seismic classifications for the heavy-load-handling cranes."

In the response to RAI 173, Question 09.01.05-1, U.S. EPR FSAR, Tier 2, Section 9.1.5.1 has been revised to be consistent with Table 3.2.2-1.

FSAR Impact:

U.S. EPR FSAR, Tier 2, Section 9.1.5.1, will be revised as described in the response and indicated on the enclosed markup.

Question 09.01.05-12:

The non seismic cranes in the divisionally separated Safeguard Buildings, Emergency Power Generating Buildings, and ultimate heat sink/essential service water structures can all structurally fail during safe shutdown earthquake (SSE) causing loss of multiple divisions of safety related SSC. Also, the non seismic cranes in the non- divisionally separated Containment Building, Reactor Building Annulus and the Fuel Building (i.e. HVAC equipment room cranes, assembly crane, equipment lock crane, etc.) can also all structurally fail during an SSE causing loss of multiple divisions of safety related SSC. With the potential failure of multiple safety related divisions, the applicant has not met Regulatory Position C.2 of RG 1.29 and therefore has not met the requirements of GDC 2.

FSAR Section 9.1.5.1, “Design Basis,” states that General Design Criteria (GDC) 2 is satisfied because heavy load handling equipment (HLHE) is located inside structures which are designed to withstand the effects of natural phenomena, such as earthquake, tornados, and hurricanes. However, that does not satisfy GDC 2 either because as stated above, the cranes also must be designed to meet the guidelines of RG 1.29 and Section 2.5 of NUREG -00554 (if single failure proof) for cranes in areas that contain nuclear fuel or safety related structures, systems or components (SSC)

a) Explain how the requirements of GDC 2 are met when some cranes in the Safeguard Buildings, Emergency Power Generating Buildings, Containment Building, Reactor Building Annulus, and the Fuel Building and ultimate heat sink/essential service water structures are not seismically qualified and can possibly damage multiple divisions of safety related SSC during an SSE.

b) The applicant needs to establish the correct design basis for meeting the requirements of GDC 2 and correct FSAR Section 9.1.5.1 to state an accurate design basis as to why the heavy load handling equipment meets GDC 2.

Response to Question 09.01.05-12:

The seismic classifications of the above-referenced equipment have been re-evaluated and updated. The revised information is provided in the response to RAI 173, Question 09.01.05-1 and can be found in U.S. EPR FSAR Tier 2, Table 3.2.2-1. As a result, the statements regarding compliance with GDG 2 and NUREG-0554 (for single-failure-proof designs) are appropriate.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

U.S. EPR Final Safety Analysis Report Markups

Table 3.2.2-1—Classification Summary
Sheet 156 of 187

KKS System or Component Code	~~System or Component~~ SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Locatio (Note 1
SM, SN	**Cranes, Hoists, and Elevators**					
SMJ06	Assembly Crane	NS-AQ	N/A	~~NSC~~II	~~No~~Yes	UJA
SM	Balance of Cranes and Hoists	NS	N/A	NSC	No	All
SMK14	Decontamination Area Crane	NS	N/A	NSC	No	UKS
SMB11/12/21/31/41/42	Diesel Hall Cranes	NS-AQ	N/A	NSC	No	UBP
SMK12	Drum Storage Area Crane	NS	N/A	NSC	No	UKS
SN	Elevators	NS	N/A	NSC	No	UJA
SMK11	Entrance Area Crane	NS	N/A	NSC	No	UKS
SMF02/03	Equipment Lock Cranes	NS-AQ	N/A	~~NSC~~II	~~No~~Yes	UFA
SMK01	Hot Workshop Crane	NS	N/A	NSC	No	UKA
SMK13	Hot Workshop Crane	NS	N/A	NSC	No	UKS
SMJ02/03/04/05	HVAC Equipment Room Cranes	NS-AQ	N/A	~~NSC~~II	~~No~~Yes	UJA
SMJ32/33/34/35	Main Steam Valve Station Cranes	NS-AQ	N/A	II	Yes	UJH

09.01.05-1

Table 3.2.2-1—Classification Summary
Sheet 157 of 187

KKS System or Component Code	~~System or Component~~ SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Locatio (Note 1
SMQ05/06/07/08	Pump Room Cranes	NS-AQ	N/A	II	Yes	UQB
SMA01	Manual Hoists	NS	N/A	NSC	No	All
SMZ01	Outdoor Crane	NS-AQ	N/A	~~NSC~~II	~~No~~Yes	UZT
SMJ01	Polar Crane	NS-AQ	N/A	II	Yes	UJA
SMJ07/08/09/10	Steam Generator Cubicle Cranes	NS-AQ	N/A	II	Yes	UJA
((UKE	**Access Building**	NS-AQ	N/A	CS	No	UKE
UBZ	**Buried Conduit Duct Bank**	S	N/A	I	Yes	UBZ))
HVAC SYSTEMS						
SAB	**Main Control Room Air Conditioning System**					
30SAB11/14 AT003	Carbon Adsorbers	S	C	I	Yes	UJK
30SAB01/02/03/04 AT004	Demisters	S	C	I	Yes	UJK
30SAB45 AA004	Downstream Exhaust Air Isolation Damper	S	C	I	Yes	UJK

4. SSC important to safety are not shared with other reactor units (GDC 5).

5. For those items designated as single failure-proof, the design meets the applicable portions of NUREG-0554 (Reference 1) as modified by Generic Letter 83-042 (Reference 2). In addition, all HLHE meets the guidance of NUREG-0612 (Reference 3) as modified by Generic Letter 85-011 (Reference 4).

09.01.05-11

~~Heavy load handling systems are classified as non-safety or non-seismic, except for the Reactor Building (RB) polar crane and Fuel Building (FB) auxiliary crane located over the spent fuel pool (SFP), which are Seismic Category II.~~The safety and seismic classifications of heavy load handling systems are based on the functions they perform and on their location relative to spent fuel, fuel in the core, nuclear materials, or equipment that may be required to achieve safe plant shutdown. Table 3.2.2-1 provides the safety and seismic classifications for the heavy-load handling cranes.

In addition to equipment design (single failure-proof systems and interlocks) other means are used to reduce the consequences of load handling incidents. These include:

- Design of power plant and arrangement of systems to limit movement of heavy loads over or near safety-related or safe shutdown components.
- Minimizing the elevation between the lifted load and the plant structures.
- Establishment of safe load paths over robust power plant structures.
- Analyses of heavy load drops to confirm damage is acceptable.

The equipment that is used to lift heavy loads is designed and fabricated to codes consistent with the seismic category assigned by RG 1.29 and industry standard specifications, as described in Section 3.2.

The cranes for the U.S. EPR are designed in accordance with the requirements of ASME NOG-1 (Reference 5) and ASME NUM-1 (Reference 6). These standards have been developed using guidance provided by Reference 3, Reference 1, ASME B30.2 (Reference 7) and CMAA-70 (Reference 8). Cranes are designated as NOG-1, Type I, II, or III based on their requirements to handle critical loads and their seismic design criteria.

9.1.5.2 System Description

9.1.5.2.1 General Description

Table 9.1.5-1—Heavy Load Handling Equipment, includes a listing of the primary HLHE which are located in areas containing safety-related equipment that could be potentially impacted by drops of heavy loads.

The RB polar crane is equipped with trolleys that traverse the length of the bridge. The trolleys provide structural support for the associated hoisting equipment.

The RB polar crane is provided with three electric hoists. The main hoist is supported by a single trolley and has a rated capacity of 320 metric tons. The secondary trolley supports two hoist units, one rated at 35 metric tons and another rated at five metric tons.

09.01.05-6

Special lifting devices used with this crane will satisfy the design criteria specified in ANSI N14.6 ("Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More"). If special lifting devices are not used, slings will be selected that satisfy the criteria of ASME B30.9 ("Slings"). In addition, slings for use with single-failure-proof handling systems will be constructed of metallic material (chain or wire rope). Special lifting devices and slings will have either dual independent load paths or a single load path with twice the design safety factor.

9.1.5.2.3 Fuel Building Auxiliary Crane

The FB auxiliary crane, located over the spent pool, is designed in accordance with ASME NOG-1 as a single failure-proof crane (Type I). As a Type I crane, the FB auxiliary crane is capable of handling the maximum critical load (i.e., not drop the load) during an SSE. The FB auxiliary crane is designed to Seismic Category II criteria and in conformance with Reference 1, Reference 2, Reference 3 and Reference 4.

The heavy loads the FB auxiliary crane normally handles include:

- Slot gates.
- New fuel containers.

09.01.05-6

In addition, the auxiliary crane can be used to handle spent fuel assemblies in the event that the spent fuel mast bridge is not available.

Special lifting devices used with this crane will satisfy the design criteria specified in ANSI N14.6 ("Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More"). If special lifting devices are not used, slings will be selected that satisfy the criteria of ASME B30.9 ("Slings"). In addition, slings for use with single-failure-proof handling systems will be constructed of metallic material (chain or wire rope). Special lifting devices and slings will have either dual independent load paths or a single load path with twice the design safety factor.

9.1.5.2.4 Other Overhead Load Handling Systems

Other than the RB polar crane, other major cranes in the RB include four single girder bridge cranes used for servicing heating, ventilation and air conditioning (HVAC) equipment, four jib cranes located within the steam generator cubicles and an

09.01.05-1

Table 9.1.5-1—Heavy Load Handling Equipment
Sheet 1 of 2

COMPONENT	CRANE / HOIST TYPE	LOCATION	MAXIMUM LOAD RATING	SINGLE FAILURE -PROOF	DESIGN CODE	CRANE TYPE
Reactor Building Polar Crane	Double Girder Electric Overhead Traveling (EOT) Bridge Crane	Containment Building	320 metric tons	Yes	NOG-1	I
Fuel Building Auxiliary Crane	Double Girder EOT Bridge Crane	Fuel Building	20 metric tons	Yes	NOG-1	I
HVAC Equipment Room Cranes	Single Girder Bridge Crane	Containment Building	2 metric tons	No	NUM-1	II
Steam Generator Cubicle Cranes	Jib Crane	Containment Building	2 metric tons	No	NUM-1	II
Assembly Crane	Electric Underhung Bridge Crane	Containment Building	5 metric tons	No	NUM-1	II
Equipment Lock Crane	Double Girder EOT Bridge Crane	Fuel Building	90 metric tons	No	NOG-1	II
Equipment Lock Crane	Electric Underhung Bridge Crane	Fuel Building	20 metric tons	No	NUM-1	II
Diesel Hall Cranes	Electric Underhung Bridge Crane	Emergency Power Generating Buildings	2 metric tons	No	NUM-1	II
Main Steam Valve Station Cranes	Electric Underhung Bridge Crane	Safeguard Buildings	5 metric tons	No	NUM-1	II
Hot Workshop Crane	Double Girder Crane	Nuclear Auxiliary Building	10 metric tons	No	NOG-1	III
Entrance Area Crane	Double Girder Bridge Crane	Radwaste Building	20 metric tons	No	NOG-1	III
Drum Storage Area Crane	Double Girder Crane	Radwaste Building	2 metric tons	No	NOG-1	III
Hot Workshop Crane	Double Girder Crane	Radwaste Building	16 metric tons	No	NOG-1	III

09.01.05-1

Table 9.1.5-1—Heavy Load Handling Equipment
Sheet 2 of 2

COMPONENT	CRANE / HOIST TYPE	LOCATION	MAXIMUM LOAD RATING	SINGLE FAILURE -PROOF	DESIGN CODE	CRANE TYPE
Decontamination Area Crane	Single Girder Crane	Radwaste Building	5 metric tons	No	NUM-1	III
Gantry Crane	Double Girder Crane	Outside Fuel Building	160 metric tons	No	NOG-1	II
Pump Room Cranes	Jib Crane	ESW Pump Structure	1 metric ton	No	NUM-1	II

NOTES:

One metric ton equals 1000 kg, or approximately 2205 lb.

~~COMPONENT~~	~~CRANE / HOIST TYPE~~	~~LOCATION~~	~~MAXIMUM LOAD RATING[1]~~	~~SINGLE FAILURE-PROOF~~
~~Reactor Building Polar Crane~~	~~Double Girder Electric Overhead Traveling (EOT) Bridge Crane~~	~~Containment Building~~	~~320 metric tons~~	~~Yes~~
~~Fuel Building Auxiliary Crane~~	~~Double Girder EOT Bridge Crane~~	~~Fuel Building~~	~~20 metric tons~~	~~Yes~~
~~HVAC Equipment Room Cranes~~	~~Single Girder Bridge Crane~~	~~Containment Building~~	~~2 metric tons~~	~~No~~
~~Steam Generator Cubicle Cranes~~	~~Jib Crane~~	~~Containment Building~~	~~2 metric tons~~	~~No~~
~~Assembly Crane~~	~~Electric Underhung Bridge Crane~~	~~Containment Building~~	~~5 metric tons~~	~~No~~
~~Equipment Lock Crane~~	~~Double Girder EOT Bridge Crane~~	~~Fuel Building~~	~~90 metric tons~~	~~No~~
~~Equipment Lock Crane~~	~~Electric Underhung Bridge Crane~~	~~Fuel Building~~	~~20 metric tons~~	~~No~~
~~Diesel Hall Cranes~~	~~Electric Underhung Bridge Crane~~	~~Emergency Power Generating Buildings~~	~~2 metric tons~~	~~No~~
~~Main Steam Valve Station Cranes~~	~~Electric Underhung Bridge Crane~~	~~Safeguard Buildings~~	~~5 metric tons~~	~~No~~

09.01.05-1

Next File