REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8110080166 DOC.DATE: 81/10/01 NOTARIZED: NO DOCKET #
FACIL:50-269 Oconee Nuclear Station, Unit 1, Duke Power Co. 05000269
50-270 Oconee Nuclear Station, Unit 2, Duke Power Co. 05000270
50-287 Oconee Nuclear Station, Unit 3, Duke Power Co. 05000287
AUTH.NAME AUTHOR AFFILIATION
PARKER,W.O. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director
STOLZ,J.F. Operating Reactors Branch 4

SUBJECT: Forwards evaluation results of reactor bldg,control of heavy loads,supplementing 810624,0730 0831 ltrs.W/33 oversize drawings.Aperture cards will be available in PDR.

DISTRIBUTION CODE: A033S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 16
TITLE: Control of Heavy Loads Near Spent Fuel (USI A-36) Operating Reactor

NOTES:AEOD/Ornstein:1cc. 05000269
AEOD/Ornstein:1cc 05000270
AEOD/Ornstein:1cc 05000287

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
ACTION:	ORB #4 BC		7	7	CLEMENSON,F.	04	4	4
INTERNAL:	A/D CORE & CS	11	1	1	I&E	07	2	2
	OR ASSESS BR	12	1	1	RAD ASSESS BR	10	1	1
	REG FILE	01	1	1	REQUA,G.	09	1	1
EXTERNAL:	ACRS	13	16	16	LPDR	03	1	1
	NRC PDR	02	1	1	NSIC	06	1	1
	NTIS		1	1				

DRAWINGS TO: BC

APERTURE CARD DIST

OCT 14 1981

TOTAL NUMBER OF COPIES REQUIRED: LTTR 39 (38) ENCL 39 (38)

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

October 1, 1981

A-36

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. J. F. Stolz, Chief
Operating Reactors Branch No. 4

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Sir:

Supplementing my letters of June 24, 1981, July 30, 1981, and August 31, 1981, please find attached results of the evaluation of the Oconee Nuclear Station Reactor Building, control of heavy loads, in Attachment 1 and the associated drawings in Attachment 2.

Very truly yours,

William O. Parker, Jr.

JLJ/php
Attachments

Drawings To: BC
Aperture Card
Dist
A033
S.1/1

ATTACHMENT 1

OCONEE NUCLEAR STATION

REACTOR BUILDING

CONTROL OF HEAVY LOADS

(NUREG 0612)

INTRODUCTION

The information presented in this report is the result of a detailed evaluation of load handling systems as requested by the NRC in their letter dated December 22, 1980 concerning NUREG 0612 "The Control of Heavy Loads at Nuclear Power Plants."

SCOPE

This report addresses the requirements set forth in Section 2.1 of Enclosure 3 of the NRC's letter as they pertain to the Reactor Building at the Oconee Nuclear Station.

INITIAL REVIEW

Crane/Load List

A list containing all load handling systems and their respective loads was compiled and compared to the Reactor Building General Arrangement drawings by Station personnel in order to verify that the drawings correctly represented "as built conditions."

Modes of Operation

For the purpose of our review we broke the operating conditions in the Reactor Buildings down into four Modes.

- Mode 1 (Full or Reduced Power)

  During this Mode the reactor is in operation. All vital systems are required.

- Mode 2 (Hot Shutdown)

  In this Mode the reactor has been shut down but the reactor coolant system is pressurized above 300 psig and its temperature remains above 200^{o}F. During this Mode all vital systems are required.

- Mode 3 (Cold-Shutdown, Fuel Loaded)

  In this Mode the reactor is completely shut down and the reactor coolant system depressurized allowing removal of the reactor head. Fuel is present in the core. During this Mode only decay heat removal systems are needed.

- Mode 4 (Cold Shutdown, Fuel Unloaded)

  This Mode is identical to Mode 3 except there is no fuel present in the vessel. No vital systems are required.

Review of Load Handling Systems Used During Different Modes of Operation

- Mode 1

During this Mode miscellaneous hoists are used for minor repair work but do not handle heavy loads. Operation of the Polar Crane is prohibited as specified in its Enclosure to the Station Directive. Under these conditions a heavy load drop can not occur precluding the need to investigate further the load handling systems or operations during this Mode.

- Mode 2

This Mode represents conditions at Hot Shutdown. The Polar Crane and 3rd Floor Jib Crane are the only load handling systems used during this Mode. For this reason we will limit our review to these two cranes.

- Mode 3

During this Mode all load handling systems are subject to use. All load handling systems will be reviewed.

- Mode 4

A heavy load drop during this Mode would have no impact on the Station since the Unit is down with the fuel unloaded and out of the building. For this reason it will not be necessary to review load handling systems and operations during this Mode.

Based on this review, only load handling operations during Modes 2 and 3 require further investigation.

Drawings

Two sets of General Arrangement drawings were prepared to represent the load handling operations in the Reactor Buildings during Modes 2 and 3.

The Mode 2 or "Hot Shutdown" drawings show the load drop areas of load handling systems used during Hot Shutdown and all the vital systems located within the load drop areas.

The Mode 3 or "Cold Shutdown" drawings show the load drop areas of load handling systems used at Cold Shutdown and all systems necessary for decay heat removal located within the load drop areas.

Both sets of drawings show the reactor vessel when located within a load drop area.

Development of Load Drop Areas

Load drop areas were developed for each load handling system used during Modes 2 and 3 as shown on the attached General Arrangement drawings. The load drop area of all cranes, except the Polar Crane at Hot Shutdown, was defined as the area over which the hook may pass if trolley and bridge travel were un-

restricted. The load drop area of the Polar Crane at Hot Shutdown was defined by the historical boundaries of the area over which the crane travels while servicing the Control Rod Drives. Use of the Polar Crane is limited by Station Directive 3.3.28 (M) to this one function during Mode 2. The load drop area for monorails was taken to be the vertical projection of the monorail on the floor. All load drop areas include an allowance for load shape and are projected to the basement.

Locating Vital Systems in the Load Drop Areas During Hot Shutdown - Mode 2

"Vital Systems" defined as those systems necessary for safe shutdown or decay heat removal, located within the load drop areas of load handling systems operated at Hot Shutdown were identified and superimposed on the Hot Shutdown General Arrangement drawings.

Locating Decay Heat Removal Systems in the Load Drop Areas During Cold Shutdown - Mode 3

Systems required for decay heat removal which are located in the load drop areas of load handling systems used at Cold Shutdown were superimposed on the Cold Shutdown drawing series.

Load Handling Systems to Receive Further Consideration

The list of load handling systems with their respective loads was reviewed to determine which systems handle heavy loads (1500 lbs. or more) during Modes 2 or 3. The relevant drawings were then reviewed to determine which cranes or hoists handling heavy loads also contained required systems or the reactor vessel in their load drop areas. These systems received further evaluation. The remaining systems were eliminated from consideration as insignificant.

Summary of Initial Review

Table I summarizes the results of the initial review of load handling systems in the Reactor Buildings. This Table identifies cranes and hoists handling heavy loads during Hot or Cold Shutdown and indicates if required systems or the reactor vessel is located within their load drop areas.

FINAL REVIEW

Scope

The load handling systems identified in Table I as handling heavy loads over decay heat removal systems and the reactor vessel at Cold Shutdown or vital systems and the reactor vessel at Hot Shutdown were reviewed for compliance with Section 2.1.3 of Enclosure 3 to the NRC's letter dated December 22, 1980 concerning NUREG 0612. The results of that review are described in the following sections and summarized in Table II.

Establishment of Safe Load Paths

Safe load paths were established for all load handling systems identified in columns 10, 11, 12, or 13 of Table I. The safe load for cranes avoid required systems and the reactor vessel where possible.

Location of Safe Load Paths on General Arrangement Drawings

Safe load paths for cranes are shown on the attached General Arrangement drawings.

Location of Safe Load Paths at the Station

The safe load paths for the movement of heavy loads in the Reactor Buildings will be painted during the next scheduled outage. Safe load paths will not be painted where they cross the fuel transfer canal. The location of safe load paths in this area will be fully described and shown by sketch in Enclosures to the Station Directive.

Description of Safe Load Paths in Directives

Oconee Nuclear Station Directive 3.3.28 (M) has been implemented to explain the purpose of the safe load paths and includes Enclosures showing and/or describing the actual paths.

Measures Taken to Insure Load Handling Operations Remain Within Safe Load Paths

Measures taken to insure heavy loads handled by cranes remain within safe load paths include placing the safe load path on the General Arrangement drawings, painting the path at the Station, and the inclusion of the cranes into Station Directive 3.3.28 (M) with proper Enclosures. The Enclosures are attached to the appropriate crane and include; a sketch of the safe load path, instructions for special lifts, the appropriate procedures where required and any restrictions placed on the crane. This Directive with Enclosures has been incorporated into the Operator Training Program.

Establishment of Load Handling Procedures

The Directive with attached Enclosures described above fully comply with the requirements set forth in Section 5.2.2(2) of NUREG 0612 for load handling procedures.

Summary of Results

Table II was prepared for each load handling system in columns 10, 11, 12, or 13 of Table I and summarizes the information requested in Sections 2.1-3c through 2.1-3g of Enclosure 3. The Table is self explanatory.

CONCLUSION

The initial review of load handling systems in the Reactor Buildings revealed a total of 3 cranes which handle heavy loads over required systems or the reactor vessel. Further investigation of these systems showed that they comply fully with all parts of Section 2.1-3 of Enclosure 3 with the exception of the painting of safe load paths at the station. These safe load paths will be painted during the next scheduled outage placing these systems in full compliance with Sections 2.1-3 of Enclosure 3.

All information requested under Section 2.1 of Enclosure 3 for the Reactor Buildings is included in this report.

TABLE I

REACTOR BUILDING

Crane or Hoist	G.A. No. See Dwg. 0-28	Operates During Hot Shutdown	Does Not Handle Heavy Loads		Vital Equipment Not Located In Load Drop Area		Reactor Vessel Not Located In Load Drop Area		Handles Heavy Loads and Has Vital Equipment In Load Drop Area		Handles Heavy Loads and Has Reactor Vessel In Load Drop Area	
			H.S.*	C.S.*	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.
(1) Letdown Cooler Monorail	RB1		N/A		N/A	X	N/A	X	N/A		N/A	
Oil drum lifting hoist	RB2		N/A		N/A	X	N/A	X	N/A		N/A	
Equipment Hatch Hoist	RB3		N/A		N/A	X	N/A	X	N/A		N/A	
3rd Floor Jib Crane	RB4	X	X		X	X	X	X				
Main Fuel Handling Bridge (Fuel Hoist)	RB5		N/A	X	N/A		N/A		N/A		N/A	
Main Fuel Handling Bridge (Control Rod Hoist)	RB6		N/A	X	N/A		N/A		N/A		N/A	
Aux.-Fuel Handling Bridge	RB7		N/A	X	N/A		N/A		N/A		N/A	
White Rabbit	RB8		N/A	X	N/A	X	N/A	X	N/A		N/A	
1A1 OTSG Jib Crane	RB9		N/A	X	N/A		N/A	X	N/A		N/A	
1A2 OTSG Jib Crane	RB10		N/A	X	N/A		N/A	X	N/A		N/A	
1B1 OTSG Jib Crane	RB11		N/A	X	N/A		N/A	X	N/A		N/A	
1B2 OTSG Jib Crane	RB12		N/A	X	N/A		N/A	X	N/A		N/A	

*H.S. and C.S. stand for "Hot Shutdown" conditions and "Cold Shutdown" conditions respectively.

TABLE I

REACTOR BUILDING

Crane or Hoist	G.A. No. See Dwg. 0-28	Operates During Hot Shutdown	Does Not Handle Heavy Loads		Vital Equipment Not Located In Load Drop Area		Reactor Vessel Not Located In Load Drop Area		Handles Heavy Loads and Has Vital Equipment In Load Drop Area		Handles Heavy Loads and Has Reactor Vessel In Load Drop Area	
			H.S.*	C.S.*	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.
CRD Air Hoist	RB13		N/A	X	N/A		N/A		N/A		N/A	
Rod Drive Crane	RB14		N/A	X	N/A		N/A		N/A		N/A	
Polar Crane	RB15	X							X	X	X	X
Letdown (1) Cooler Monorail	RB16		N/A		N/A	X	N/A	X	N/A		N/A	
Oil Drum Lifting Hoist	RB17		N/A		N/A	X	N/A	X	N/A		N/A	
Equipment Hatch Hoist	RB18		N/A		N/A	X	N/A	X	N/A		N/A	
3rd Floor Jib Crane	RB19	X	X		X	X	X	X				
Main Fuel Handling Bridge (Fuel Hoist)	RB20		N/A	X	N/A		N/A		N/A		N/A	
Main Fuel Handling Bridge (Control Rod Hoist)	RB21		N/A	X	N/A		N/A		N/A		N/A	
Aux. Fuel Handling Bridge	RB22		N/A	X	N/A		N/A		N/A		N/A	
White Rabbit	RB23		N/A	X	N/A		N/A		N/A		N/A	

*H.S. and C.S. stand for "Hot Shutdown" conditions and "Cold Shutdown" conditions respectively.

TABLE I

REACTOR BUILDING

Crane or Hoist	G.A. No. See Dwg. 0-28	Operates During Hot Shutdown	Does Not Handle Heavy Loads		Vital Equipment Not Located In Load Drop Area		Reactor Vessel Not Located In Load Drop Area		Handles Heavy Loads and Has Vital Equipment In Load Drop Area		Handles Heavy Loads and Has Reactor Vessel In Load Drop Area	
			H.S.*	C.S.*	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.
2A1 OTSG Jib Crane	RB24		N/A	X	N/A		N/A	X	N/A		N/A	
2A2 OTSG Jib Crane	RB25		N/A	X	N/A		N/A	X	N/A		N/A	
2B1 OTSG Jib Crane	RB26		N/A	X	N/A		N/A	X	N/A		N/A	
2B2 OTSG Jib Crane	RB27		N/A	X	N/A		N/A	X	N/A		N/A	
Rod Drive Crane	RB28		N/A	X	N/A		N/A		N/A		N/A	
CRD Air Hoist	RB29		N/A	X	N/A		N/A		N/A		N/A	
Polar Crane	RB30	X							X	X	X	X
Letdown (1) Cooler Mono-rail	RB31		N/A		N/A	X	N/A	X	N/A		N/A	
Oil Drum Lifting Hoist	RB32		N/A		N/A	X	N/A	X	N/A		N/A	
Equipment Hatch Hoist	RB33		N/A		N/A	X	N/A	X	N/A		N/A	
3rd Floor Jib Crane	RB34	X	X		X	X	X	X				
Main Fuel Handling Bridge (Fuel Hoist)	RB35		N/A	X	N/A		N/A		N/A		N/A	

*H.S. and C.S. stand for "Hot Shutdown" conditions and "Cold Shutdown" conditions respectively.

TABLE I

REACTOR BUILDING

Crane or Hoist	G.A. No. See Dwg. 0-28	Operates During Hot Shutdown	Does Not Handle Heavy Loads		Vital Equipment Not Located In Load Drop Area		Reactor Vessel Not Located In Load Drop Area		Handles Heavy Loads and Has Vital Equipment In Load Drop Area		Handles Heavy Loads and Has Reactor Vessel In Load Drop Area	
			H.S.*	C.S.*	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.
Main Fuel Handling Bridge (Control Rod Hoist)	RB36		N/A	X	N/A		N/A		N/A		N/A	
Aux. Fuel Handling Bridge	RB37		N/A	X	N/A		N/A		N/A		N/A	
White Rabbit	RB38		N/A	X	N/A		N/A		N/A		N/A	
3A1 OTSG Jib	RB39		N/A	X	N/A		N/A	X	N/A		N/A	
3A2 OTSG Jib Crane	RB40		N/A	X	N/A		N/A	X	N/A		N/A	
3B1 OTSG Jib Crane	RB41		N/A	X	N/A		N/A	X	N/A		N/A	
3B2 OTSG Jib Crane	RB42		N/A	X	N/A		N/A	X	N/A		N/A	
Rod Drive Crane	RB43		N/A	X	N/A		N/A		N/A		N/A	
CRD Air Hoist	RB44		N/A	X	N/A		N/A		N/A		N/A	
Polar Crane	RB45	X							X	X	X	X
R.B. Cooler Monorail (1)	RB46		N/A		N/A	X	N/A	X	N/A		N/A	
R.B. Cooler Monorail (1)	RB47		N/A		N/A	X	N/A	X	N/A		N/A	
R.B. Cooler Monorail (1)	RB48		N/A		N/A	X	N/A	X	N/A		N/A	
R.B. Cooler Monorail (1)	RB49		N/A		N/A	X	N/A	X	N/A		N/A	

*H.S. and C.S. stand for "Hot Shutdown" conditions and "Cold Shutdown" conditions respectively.

TABLE I

REACTOR BUILDING

Crane or Hoist	G.A. No. See Dwg. 0-28	Operates During Hot Shutdown	Does Not Handle Heavy Loads		Vital Equipment Not Located In Load Drop Area		Reactor Vessel Not Located In Load Drop Area		Handles Heavy Loads and Has Vital Equipment In Load Drop Area		Handles Heavy Loads and Has Reactor Vessel In Load Drop Area	
			H.S.*	C.S.*	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.	H.S.	C.S.
R.B. Cooler Monorail (1)	RB50		N/A		N/A	X	N/A	X	N/A		N/A	
R.B. Cooler Monorail (1)	RB51		N/A		N/A	X	N/A	X	N/A		N/A	
Oil Drum Lifting Monorail (1)	RB52		N/A	X	N/A	X	N/A	X	N/A		N/A	
Oil Drum Lifting Monorail (1)	RB53		N/A	X	N/A	X	N/A	X	N/A		N/A	
Oil Drum Lifting Monorail (1)	RB54		N/A	X	N/A	X	N/A	X	N/A		N/A	

*H.S. and C.S. stand for "Hot Shutdown" conditions and "Cold Shutdown" conditions respectively.

(1) This monorail is used to handle a specific piece of equipment and has no permanent trolley or hoist attached.

TABLE II

Crane or Hoist: Polar Crane (Hot Shutdown)

General Arrangement No: RB-15, RB-30, RB-45

Capacity: 185/20 Tons

Compliances

Crane Inspection

ANSI B30.2-1976, Ch 2-2: yes

Crane Design

CMAA Spec 70: (1)

ANSI B30.2-1976, Ch 2-1: (1)

Operator Training

ANSI B30.2-1976: yes

Load	Load Weight	Safe Load Paths			Is Movement Governed by a Load Handling Procedure?	Procedures For Deviation From SLP?	Lifting Device Used	Compliance to ANSI & NUREG 0612 Specs
		Located on GA Dwgs	Painted* on Floor at Plant	Described in Procedures				
Shield Block	15 Tons	Yes	(2)	Yes	Yes	No	Yes	Yes

TABLE II

Crane or Hoist: Polar Crane (Cold Shutdown)

General Arrangement No: RB-15, RB-30, RB-45

Capacity: 185/20 Tons

Compliances

Crane Inspection

ANSI B30.2-1976, Ch 2-2: yes

Crane Design

CMAA Spec 70: (1)

ANSI B30.2-1976, Ch 2-1 (1)

Operator Training

ANSI B30.2-1976: yes

Load	Load Weight	Safe Load Paths			Is Movement Governed by a Load Handling Procedure?	Procedures For Deviation From SLP?	Lifting Device Used	Compliance to ANSI & NUREG 0612 Specs
		Located on GA Dwgs	Painted* on Floor at Plant	Described in Procedures				
Shield Block	15 Tons	Yes	(2)	Yes	Yes	No	Yes	Yes
RV Head	106.4 Tons	Yes	(3)	Yes	Yes	No	Yes	Yes
RV Upper Internals	30 Tons	Yes	(3)	Yes	Yes	No	Yes	Yes
Indexing Fixture	25 Tons	Yes	(2)	Yes	Yes	No	Yes	Yes
Reactor Coolant Pump Motor	50 Tons	Yes	(3)	Yes	Yes	Yes	Yes	Yes

(1) This crane was designed in accordance with Duke Power Company Specification #OS-107 in addition to Electric Overhead Crane Institute Spec #61 and USAS B30.2.0-1967.

The combination of requirements set forth in these specifications generally meet or exceed those specified in CMAA Spec #70 and ANSI B30.2.0-1976. A review of the past performance of this crane indicated there have been no problems attributable to its design.

For these reasons we feel that the design of this crane is comparable to cranes designed in accordance with CMAA Spec #70 and ANSI B30.2.0-1976.

(2) This load is placed on top of the D-Ring in one of the heavy load laydown areas as shown on the drawings. It is moved down the center line of the transfer canal then over to these areas. Since the majority of the safe load path is over the transfer canal, we will not paint the safe load path.

(3) The portions of this loads safe load path which passes through the transfer canal will not be painted.

*This work will be done during the next scheduled outage of each unit.

ATTACHMENT 2