LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES UNIT NO. 3

RESPONSE TO NRC DRAFT - TECHNICAL EVALUATION REPORT (TER) FOR WATERFORD 3 SES ON CONTROL OF HEAVY LOADS

SUPPLEMENT NO. 1

November 1983

CONTENTS

1.0 INTRODUCTION

Pursuant to our commitment in our "Response to NRC Draft - Technical Evaluation Report (TER) for Waterford 3 SES on Control of Heavy Loads dated January 1983" to submit a compliance evaluation for the Reactor Vessel (Closure) Head Lift Rig when review is completed by the rig vendor, we are now herein submitting the results of our evaluation in this Supplement No. 1.

We have evaluated the lift rig design and fabrication for compliance with Guideline 4 - Special Lifting Devices, [NUREG-0612, Article 5.1.1(4)] and the associated requirements of ANSI N14.6-1978.

2.0 REACTOR VESSEL (CLOSURE) HEAD LIFTING RIG

This rig is listed as Item No. 1 of Section 6.0 in the "Response to NRC Draft - Technical Evaluation Report (TER) for Waterford 3 SES on Control of Heavy Loads dated January 1983."

A stress summary for the rig using static plus dynamic loads are shown on Table 1 (Page 6).

The following tabulation lists the Section Referenced and the degree of compliance for the above-listed rig.

	ANSI N14.6-1978 Section Referenced	Reactor Vessel (Closure) Head Lift Rig
	Section 3.1	
3.1.1	Limitations on the use of lifting devices	Used only for the RV closure head and the cavity seal plate
3.1.2	Identification of critical components and definition of critical characteristics	All lifting components are considered critical. See Table 1 (Page 6) for listing.
3.1.3	Signed stress analyses, demonstrating appropriate margins of safety	Safety margins demonstrated on Table 1 (Page 6)
3.1.4	Indication of permissible repair procedures	Repairs shall be made to comply with original Lift Rig Specifications. Fabricator (repairer) has responsibility for detailed repair procedures.
	Section 3.2	
3.2.1	Use of stress design factors of 3 for minimum yield strength and 5 for ultimate strength	See Table 1 (Page 6) for stress evaluation.

ANSI N14.6-1978 Section Referenced		Reactor Vessel (Closure) Head Lift Rig
3.2.4	Similar stress design factors for load bearing pins, links, and adapters.	See Table 1 (Page 6) for stress evaluation.
3.2.5	Slings used comply with ANSI B30.9.	Not applicable since no rope or chain is used for lifting.
3.2.6	Subject materials to deadweight test or charpy impact test	Vital numbers identified with their piece numbers, were impact tested using the charpy V-notch method. The required values listed in Section III of ASME Code 1971 Edition through Summer 1973 Addenda, were met at +10°F.
	Section 3.3	
3.3.1	Consideration of problems related to possible galling	No lifting element is subject to lamellar tearing.
3.3.4	Design shall assure even distribution of the load	See Table 1 (Page 6) for compliance.
3.3.5	Retainers fitted for load carrying components which may become inadvertently disengaged	All vital members with connecting pins have cotter pins for positive locking against unplanned disengagement.
3.3.6	Verification that remote actuating mechanisms securely engaged or disengaged	Not applicable since no remote actuating mechanisms are used.
	Section 4.1	
4.1.3	Verify selection and use of material	Materials verified from mill test reports or certifications and reviewed for compliance to the design specification.
4.1.4	Compliance with fabrication practice	Fabrication practices complied in accordance with approved procedures and methods as verified by surveillance and receipt inspection of components.

ANSI N14.6-1978 Section Referenced		Reactor Vessel (Closure) Head Lift Rig
4.1.5	Qualification of welders, procedures, and operators	Weld procedures, materials and operators were qualified under Section IX of the ASME Boiler and Pressure Vessel Code.
4.1.6	Provisions for a quality assurance program	All requirements of the design specification were performed under a quality assurance program in effect at the time of fabrication.
4.1.7	Provisions for identification certification of materials	All material identified by piece numbers and/or code numbers in accordance with drawing requirements. Material certifications conforms to design specification.
4.1.9	Verification that materials or services are produced under appropriate controls and qualifications	Certificate of Equipment letter issued by vendor verifying compliance with design specification controls.
	Section 5.1	
5.1.3	Implementation of a periodic testing schedule and a system to indicate the date of expiration.	NDE in accordance with ASME B&PV Code for Class 2 Component Supports. However, visual inspection of rig prior to use is recommended.
5.1.4	Provisions for establishing operating procedures	Procedures for the use of Lift Rig are detailed in the removal of the RV head Instruction Manual.
5.1.5.1	Identification of subassemblies may be exchanged	No part is to be exchanged with a part from a similar rig without a detailed study of the geometry and the material pedigree.
5.1.5.2	Suitable Markings	Complies

ANSI N14.6-1978 Section Referenced		Reactor Vessel (Closure) Head Lift Rig
5.1.6	Maintaining a full record of history	This requirement is being met as follows: a) This device is used to lift the RV head only. b) The lift rig is qualified for predetermined load. c) The lift rig is visually inspected prior to every lift. d) The lift rig is used during the refueling outage only.
5.1.7	Conditions for removal from service	Subject to results of NDE testing and inspection.
	Section 5.2	
5.2.1	Load test to 150 percent and appropriate inspections prior to initial use	The rig was load tested to 125 percent of its design load.
5.2.2	Qualification of replacement parts	Replacement parts are to be fabricated to original criteria and will be load tested by Fabricator or LP&L.
	Section 5.3	
5.3.1	Satisfying annual load test or inspection requirements	Annual inspection and NDE in accordance with ASME B&PV Code for Class 2 Component Supports.
5.3.2	Testing following major maintenance	There are no requirements for load testing after major maintenance. However, it is recommended that any repairs be analytically evaluated and NDE tested on a case-by-case basis.
5.3.4	Testing after application of substantial stresses	It is recommended that no load test should be done unless the results of the analytical evaluation and NDE testing show a need for it.

	ANSI N14.6-1978 Section Referenced	Reactor Vessel (Closure) Head Lift Rig
5.3.6	Inspections by operating personnel	Not applicable
5.3.7	Nonoperating or maintenance personnel	Not applicable

This special lifting device was designed and fabricated before the issuance of ANSI N14.6-1978 and thus does not meet all requirements in the standard. However, the fabrication methods met the intent of the standard. The device was load tested prior to first use and will be inspected before every use.

TABLE NO. 1

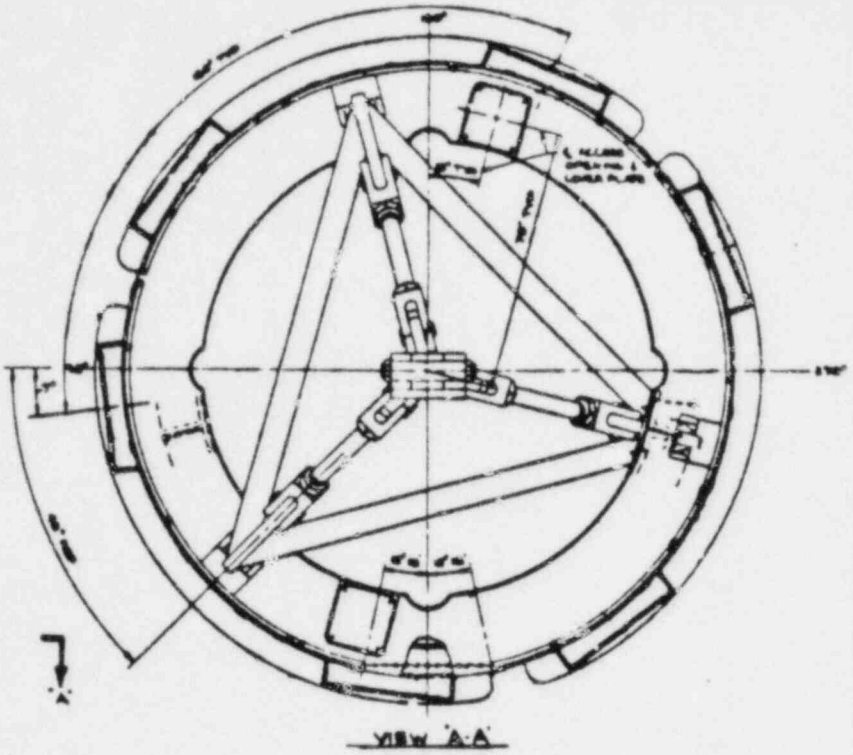
SUMMARY OF STRESS LEVELS AND SAFETY FACTORS IN HEAD LIFT RIG COMPONENTS

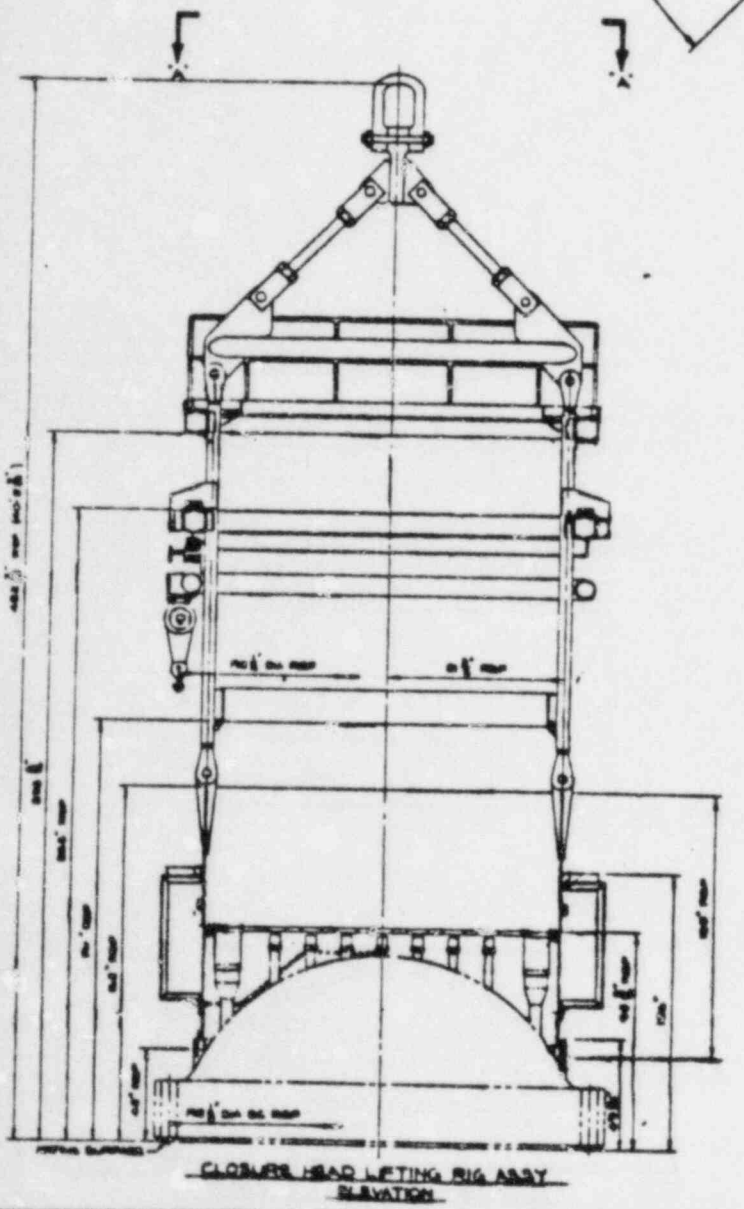
REF: COMBUSTION ENGINEERING REPORT CENC-1259, CONTRACT NO. 74170, 6/76 AND CE LETTER C-CE-8445 DATED APRIL 15, 1983

Element	Stress Condition	Normal Load Stress	Minimum Yield Strength	Minimum Ultimate Strength	Material	Ratio: Yield/Normal	Ratio: Ultimate/Normal
Tripod	Tension	7.8	36.0	70.0	SA-105-2	4.6	9.0
Lifting Eye	Shear	7.8	20.4[1]	46.7[2]	SA-105-2	2.6*	6.0
Tripod Lifting	Tension	12.7	36.0	70.0	SA-105-2	2.8*	5.5
Eye Shank	Shear	7.0	20.4[1]	46.7[2]	SA-105-2	2.9*	6.7
Lifting	Tension	6.0	38.0	70.0	SA-516-70	6.3	11.7
Frame Lug	Shear	8.4	21.5[1]	46.7[2]	SA-516-70	2.6*	5.6
	Bearing	12.4	38.0	70.0	SA-516-70	3.1	5.6
Pin	Shear	7.9	42.5[1]	66.2[2]	SA-193-B7	5.4	8.4
	Bearing	12.4	75.0	100.0	SA-193-B7	6.0	8.1
Rod	Tension	10.1	131.4[3]	158.2[3]	4340	13.0	15.7
	Shear (Thd)	4.2	74.5[1]	105.5[2]	4340	17.7	25.1
Clevis	Tension	7.6	36.0	70.0	SA-105-2	4.7	9.2
	Shear	7.6	20.4[1]	46.7[2]	SA-105-2	2.7*	6.1
	Bearing	9.8	36.0	70.0	SA-105-2	3.7	7.1
Support Strut	Compression	6.4	35.0	60.0	SA-106-B	5.5	9.4
and Weld	Shear	6.3	19.8[1]	40.2[2]	SA-106-B	3.1	6.3
Extension Legs	Tension	6.5	36.0	58.0	SA-36	5.5	8.9
and Weld	Shear	4.5	20.4[1]	38.7[2]	SA-36	4.5	8.6
Skirt Lug	Bearing	8.8	38.0	70.0	SA-516-70	4.3	7.9
and Weld	Tension	6.0	38.0	70.0	SA-516-70	6.3	11.7
	Shear (Lug)	6.0	21.5[1]	46.7[2]	SA-516-70	3.6	7.8
	Shear (Weld)	3.3	21.5[1]	46.7[2]	SA-516-70	6.5	14.1
Skirt	Tension	2.5	38.0	70.0	SA-516-70	15.2	28.0
Stud	Tension	3.4	75.0	100.0	SA-193-B7	22.1	29.4
	Shear (Ext Thds)	4.3	42.5	66.7	SA-193-B7	9.9	15.5
	Shear (Int Thds)	3.7	42.5	66.7	SA-193-B7	11.5	18.0

[1] .58 minimum tensile yield [2] .67 minimum ultimate tensile [3] taken from mill certificate of tests

* The safety margins are lower than required by ANSI N14.6-1978. However, the safety margins are not significantly lower than the required.





LOUISIANA POWER & LIGHT CO. Waterford Steam Electric Station	Lifting Rig to Closure Head	Figure III