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SUBJECT: Informs of util evaluation of 840827 heavy loads SER to ensure implementation consistency w/SER & to provide clarification of implementation.

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October 5, 1984

Director, Office of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Branch Chief
Licensing Branch No. 3
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

The NRC's December 22, 1980 letter required SCE to review provisions for handling and control of heavy loads at San Onofre Units 2 and 3 with respect to the guidelines of NUREG-0612. SCE's letters of July 7, 1981, April 30, 1982, June 30, 1982, August 3, 1982 and August 25, 1982 provided information in response to the NRC's request. Subsequently, on August 27, 1984 the NRC provided a Safety Evaluation Report (SER) in response to SCE submittals for the handling and control of heavy loads.

SCE has evaluated the August 27, 1984 heavy loads SER to ensure that SCE's implementation is consistent with the information contained in the SER and to provide clarification of the SER and SCE's implementation as appropriate. The SER provides NRC responses to information presented by SCE regarding the following criteria from Section 5.1.1 of NUREG-0612:

- o Guideline 1 - Safe Load Paths
- o Guideline 2 - Load Handling Procedures
- o Guideline 3 - Crane Operator Training
- o Guideline 4 - Special Lifting Devices
- o Guideline 5 - Lifting Devices (not specially designed)
- o Guideline 6 - Cranes (Inspection, Testing and Maintenance)
- o Guideline 7 - Crane Design

Guideline 1

Section 2.3.1 (Safe Load Paths) of the SER correctly summarizes the information presented by SCE and concludes that safe load paths have been developed for all applicable heavy loads. If there is to be a heavy load lifted outside a previously defined safe load path, then approved, written alternative procedures will be provided consistent with Section 5.1.1(1) of NUREG-0612. SCE's implementation is consistent with the SER evaluation.

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Guideline 2

Section 2.3.2 (Load Handling Procedures) of the SER correctly summarizes the information presented by SCE and concludes that San Onofre Units 2 and 3 are consistent with the intent of the criteria of Guideline 2. SCE currently has procedures governing the handling of heavy loads consistent with the guidelines of NUREG-0612.

Guideline 3

Section 2.3.3 (Crane Operator Training) of the SER correctly summarizes the information presented by SCE regarding Guideline 3 which addresses procedures for the qualification and training of crane operators and concludes that San Onofre Units 2 and 3 are consistent with the criteria of NUREG-0612. SCE currently has procedures consistent with the guidelines of NUREG-0612.

Guideline 4

Section 2.3.4. (Special Lifting Devices) of the SER summarizes the information presented by SCE. Specifically SCE requested the following three exceptions:

1. Relaxation of the initial 150% load acceptance test to an initial 125% load acceptance test.
2. Extension of the three month visual inspection interval to visual inspections prior to use.
3. Exclusion of components from the annual inspection frequency requirements because of the length of the refueling intervals and exclusion of several components from certain inspections because inspections would require disassembly not normally performed or removal of protective coatings.

Relative to the first exception the SER concludes that the initial 125% load acceptance test is acceptable and demonstrates the reliability of the lifting devices. SCE's submittals did not specifically address similar relaxation from the requirements of Sections 5.3.1(1), 5.3.2 and 5.3.3 of the ANSI N14.6-1978 standard for demonstrating continuing compliance and neither did the NRC SER. SCE concludes that based on the adequacy of the justification for relaxing the initial load acceptance test from 150% to 125%, a 125% load test is reasonable and appropriate for Section 5.3.1(1), 5.3.2, and 5.3.3. of ANSI N14.6-1978 for demonstrating continuing compliance. Accordingly, to demonstrate continuing compliance based on Section 5.3.1(1) of ANSI N14.6-1978, SCE will conduct a load test every five (5) years (plus or minus one year) using 125% of the maximum operational load for the reactor vessel head lift rig and for the upper guide structure lift rig in conjunction with performing inspections described below.

Regarding the second exception, SCE concludes that the SER permits visual inspection prior to use (vs. every three months) and that this frequency is reasonable and acceptable based on the length of the refueling interval.

Regarding the third exception, SCE concludes that the SER permits relaxation from an annual inspection frequency to inspection prior to use if not performed within the last 12 months based on the length of the refueling interval. SCE concludes that the SER also exempts several components from certain inspections prior to use because inspections would require disassembly not normally performed or removal of protective coatings. Enclosure (1) describes the implementation of the prior to use inspection program for the special lifting devices.

A complete NDE inspection of the special lifting devices will also be performed every five (5) years (plus or minus one year) which will include, as practical, disassembly, removal of paint, etc. These inspections will be those listed (or equivalent) in the Response to Comment 10 in the August 3, 1982 SCE heavy loads submittal to the NRC. Optionally, SCE may conduct these inspections on the schedule designated in Section XI of the ASME Boiler and Pressure Vessel Code, Division 1, Subsection IWC-2400.

The 125% load tests and remainder of the complete NDE (i.e. inspections remaining after the Enclosure 1 NDE inspections have been performed) will be performed after the reactor vessel head is lifted to the operating deck and after the reactor internals are lifted from the reactor vessel. The 125% load test and complete NDE inspection intervals (five plus or minus one year or ASME code Section XI schedule, as applicable) begin at the time of the low power operating license for each unit; the Units 2 and 3 Low Power Operating Licenses were issued on February 16, 1982 and November 15, 1982 respectively. Therefore, the first 125% load tests will be performed by February 16, 1987 plus or minus one year and November 15, 1987 plus or minus one year for Units 2 and 3 respectively. Each subsequent 125% load test would then be conducted within five plus or minus one year of the previous five year interval. Note that plus or minus one year is used to allow for outage activity scheduling uncertainties and potential changes in the duration of operating cycles. The total number of 125% load test versus calendar years of plant service will be the following:

Total # of 125% load tests	1	2	3	4	5	6	7	8
Years of plant service	5+1	10+1	15+1	20+1	25+1	30+1	35+1	40+1

The one year schedule tolerance based for a five year interval is conservative compared to surveillance interval scheduling requirement in the ASME Code. Similarly, the complete NDE will be performed on the five plus or minus one year or ASME Code Section XI schedule.

SCE considers that the prior to use inspections listed in Enclosure (1) combined with the periodic (five plus or minus one year) 125% load test and periodic (five plus or minus one year or ASME Code, Section XI schedule) complete visual, dimensional and NDE inspection, both discussed above, provide a program which is consistent with the intent of Guideline 4 of NUREG-0612 as indicated in the SER.

Guideline 5

Section 2.3.5 (Lifting Devices) of the SER correctly summarizes the information presented by SCE and concludes that San Onofre Units 2 and 3 are consistent with the intent of the criteria of Guideline 5. SCE currently has procedures which specify that, as a minimum, sling selection be based on 110% of the lifted load.

Guideline 6

Section 2.3.6 (Cranes) of the SER correctly summarizes the information presented by SCE regarding inspection, testing and maintenance of cranes and concludes that San Onofre Units 2 and 3 are consistent with the intent of the criteria of Guideline 6. SCE currently has procedures consistent with the intent of Guideline 6.

Guideline 7

Section 2.3.7 (Crane Design) of the SER correctly summarizes the information presented by SCE regarding crane design and, based on the information presented, concludes that the existing design is consistent with the intent of the criteria of Guideline 7.

Based on the above and also consistent with Section 3.4 of the NRC SER, SCE concludes that consistency with the seven NRC guidelines for heavy load handling has been demonstrated for San Onofre Units 2 and 3.

The above SCE evaluation of the August 27, 1984 SER and clarification of SCE's NUREG-0612 implementation plan has been discussed in telephone conversations between Mr. N. Wagner (NRC Auxiliary Systems Branch reviewer) and Mr. H. Rood (NRC Project Manager for San Onofre Units 2 and 3) with Mr. T. D. Mercurio of SCE. SCE is revising station procedures to conform with the above SCE evaluation and clarification and will implement the applicable parts of the heavy loads program during the upcoming refueling outage which is scheduled to begin on October 21, 1984.

As an editorial comment, it should also be noted that section 3.3 of the SER incorrectly indicates that San Onofre Units 2 and 3 are still under construction.

If you have any questions or comments concerning this subject, please let me know.

Very truly yours,



Enclosure

cc: Harry Rood, NRC (to be opened by addressee only)
Joseph O. Ward, California Department of Health Services
A. E. Chaffee, NRC Resident Inspector

ENCLOSURE (1)

INSPECTION OF SPECIAL LIFTING DEVICES

DESCRIPTION OF SAN ONOFRE UNITS 2 AND 3 INSPECTION PROGRAM FOR THE REACTOR VESSEL HEAD AND UPPER GUIDE STRUCTURE SPECIAL LIFTING DEVICES

Procedures provide for the following inspections to be performed prior-to-use, if not performed within the last 12 months. These inspections will also be performed following the initial lift in each inspection cycle.

- (1) Critical load bearing components, including lifting pins, bars, turnbuckles, support plates and cross bracings will be subjected to a thorough visual inspection for deterioration, corrosion, and deformation. The visual inspections will be performed as described in SCE's previous submittals without disassembly of components not normally disassembled and without removing protective coatings.
- (2) Dimensional checks will be made of the reactor vessel head lifting rig tripods, lifting lugs, eyes, clevises and pins for warpage, circularity of pin holes, and reduction in cross-sectional areas, as appropriate.
- (3) Prior-to-use only, nondestructive examinations of the reactor head lifting rig upper tripod pins will be performed.

These inspections will be performed by a Level II NDE Inspector.

Specific details of the visual, dimensional, and nondestructive examinations are provided in the following Tables 1 and 2. This inspection program is consistent with SCE's NUREG-0612 submittals to the NRC and the NRC SER dated August 27, 1984. Tables 1 and 2 of this enclosure are revisions to Tables previously submitted in response to Item 10 in the August 3, 1984 submittal and provide clarification of which inspections are being performed taking credit for exceptions approved in the SER to not conduct certain inspections of components not normally disassembled or which would require removal of protective coatings.

ENCLOSURE (1)

TABLE I
REACTOR VESSEL HEAD LIFTING FRAME ASSEMBLY
(Ref: Dwg E-234-320)

Part #	ITEM	VISUAL	DIMEN.	NDE		
				PT	MT	UT
239-01	Lifting Frame Assembly consisting of:					
-03	Lug	x	x			
-04	Pipe & weldment to -03	x				
-05	Lifting eye & weldments	x	x			
-09	Lifting shackle	x	x			
-10	Clevis	x	x			
-11	Clevis	x	x			
-12	Lifting rod	x	x			
-13	Recessed pin w/nuts	x	x			x
-14	Pin w/head & cotter pin (Upper)	x	x			x
-15	Jam nut	x				
-16	Jam nut	x				

- NOTES: 1. Dimen. check of parts -03, -05, -10, and -11 is for circularity of pin holes.
2. Dimen. check of Part -09 is for deformation of dimensions given in drawing details of the part (Ref: Dwg E-234-320).
3. Dimen. check of parts -13 and -14 is for warpage.
4. Dimen. check of Part -12 is for thread deformation.

ENCLOSURE (1)

TABLE I
(CONTINUED)

ASSEMBLY OF RIG TO HEAD

(Ref: Dwg S023-901-83-1)

Part #	ITEM	VISUAL	DIMEN.	NDE		
				PT	MT	UT
239-14	Pin w/head & cotter pin (lower)	x				x
241-08	Link assembly	x				
243-06	Lifting lug & weldment to -244-01	x				
244-01	Support skirt assembly including weldment of Part 243-02 (skirt) to Part 243-04 (Flange) Ref: Section view and Detail H	x				
240-09	Socket head cap screw	x				
240-01	Box girder assembly & attachment to Part 241-08	x				
240-33	Platform support assembly and attachment to Part 241-08	x				
244-03	Instrument support ring & attachments to Part 244-01	x x				

ENCLOSURE (1)

TABLE 2
UPPER GUIDE STRUCTURE LIFT RIG TIE ROD ASSEMBLY
(Ref. Dwg S023-904-2-1)

Dw. # - Part #	Item	Visual	Dimen.	NDE		
				PT	MT	UT
E-STD-164-250-02	Plate	x				
-03	Clevis pin	x				x
-04	Soc hd cap screw	x				
-05	Plain washer	x				
-06	Lock plate	x				
-07	Pin	x		x		
-08	Spreader fitting assembly weldments	x				
-09	Pins (3 each)	x				x
-10	Upper yoke (3 each)	x				
-11	Heavy hex jam nut (3 each)	x				
-12	Tie rod (3 each)	x				
-13	Block (3 each) (lower end only)	x	x	x		
-14	Lock nut	x				
-15	Lock washer	x				
-16	Washer (3 each)	x				
-17	Cotter pin (3 each)	x				
-18	Heavy hex slotted nut (3 each)	x				
-23	Bushing	x				

- Notes: 1. Parts -19, -20, -21, and -22 are welded together to form Part -08. Inspection of Part -08 includes weldments as well as the individual parts.
2. Dimen. check of part: 13 is for circularity of clevis pin holes.

ENCLOSURE (1)

TABLE 2
(CONTINUED)

UPPER GUIDE STRUCTURE LIFT RIG SUPPORT STRUCTURE ASSEMBLY
(Ref. Dwg S023-904-9-4)

Visually inspect of all connections and connecting members for damage, deformation, integrity of lock welds, and missing parts or loose connections.

UPPER GUIDE STRUCTURE LIFT RIG SPREADER ASSEMBLY
(Ref. Dwg S023-904-17-0)

Dw. # - Part #	Item	Visual	Dimen.	NDE		
				PT	MT	UT
E-STD-164-257 -02	Special channel (welds)	x				
-03	Special channel (welds)	x				
-04	Special channel (welds)	x				
-05	Channel	x				
-06	Yoke & weldment to -02	x	x		x	
-07	Bar & weldment to -02	x				
-08	Butt hinge & weldments	x				
-09	Block & weldment to -02	x				
-10	Pin	x				

Notes: Dimen. check of Part -06 is for circularity of hole for pin and dimen. from center of yoke pin hole to center of spreader assembly (typical 62.750 inch at 3 places).

ENCLOSURE (1)

TABLE 2
(CONTINUED)

UPPER GUIDE STRUCTURE LIFT RIG ASSEMBLY DETAILS

(Ref. Dwg SO23-904-13-1)

Dw. # - Part #	Item	Visual	Dimen.	NDE		
				PT	MT	UT
E-STD-164-258	-03 Handle	x				
	-04 Hex head bolt	x				
	-05 Hook	x				
	-06 Lifting bolt	x	x			
	-07 Dowel pin	x				
	-08 Tube	x				
	-09 Tube	x				
	-10 Collar & weldment to -09	x		x		
	-11 Base	x				
	-12 Plate	x				
	-13 Plate	x				
	-14 Plate	x				
	-15 Plate & weldment to -09	x		x		
	-16 Pin	x	x			x
	-18 Plate	x				
	-19 Plate & weldment to -10	x		x		
	-20 Plate & weldment to -21	x				
	-21 Pipe	x				

NOTES: 1. Dimen. check of Part -06 is for deformation of threads, elongation of bolt shank and reduction in diameter of shank.

2. Dimen. check of Part -16 is for warpage.

ENCLOSURE (1)

TABLE 2
(CONTINUED)

UPPER GUIDE STRUCTURE LIFT RIG SLING ASSEMBLY
(Ref. Dwg SO23-904-10-2)

Dw. # - Part #	Item	Visual	Dimen.	NDE		
				PT	MT	UT
E-STD-164-259-06	Bolt	x	x			
-08	Shackle	x	x	x		
-10	Bar	x	x	x		
-11	Cable assembly	x	x	x		
-12	Bolt	x	x			

- Notes: 1. Dimen. inspection of parts -08, -10 and -11, is for circularity of pin holes in each of these parts.
2. Dimen. inspection of parts -06 and -12 are is for reduction in bolt shank diameter.
3. Inspection of Part -08 includes the shackle pin bolt (dimen. inspection of bolt for warpage).
4. Inspection of Part -11 shall be according to ANSI B30.9-1971, Slings, with added DT inspection of sling eyes and pins and dimen. inspection of sling eyes for circularity and pins for warpage.

ENCLOSURE (1)

TABLE 2
(CONTINUED)

UPPER GUIDE STRUCTURE LIFT RIG PICKUP ADAPTOR
(Ref. Dwg SO23-904-19-0)

Dwg. # - Part #	Item	Visual	Dimen.	NDE		
				PT	MT	UT
E-STD-164-261 -01	Pickup adapter assembly consisting of:					
-02	Bar	x	x	x		
-03	Bar	x		x		
-04	Gusset	x		x		
-05	Tube	x		x		
-06	Tube	x		x		
-08	Nut	x		x		
-11	Base	x		x		
-12	Pickup bolt	x				

- Notes: 1. Dimen. inspection of Part -02 includes the screw pin holes for attaching the sling assemblies. Dimen. check of pin holes for circularity.
2. DT inspection of all part weldments to matching parts.

ENCLOSURE (1)