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DOCDATE: 05/26/78
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DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:

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LTR 1 ENCL 40

FURNISHING REQUEST THAT NRC STAFF RECONSIDER ITS REQUIREMENT THAT SUBJECT FACILITY"S CRANE SYSTEMS BE QUALIFIED WITH LOAD FOR THE POSTULATED HOSGRI EVENT...W/ATT SUPPORTING INFO RE SUBJECT.

PLANT NAME: DIABLO CANYON - UNIT 1
DIABLO CANYON - UNIT 2

REVIEWER INITIAL: XJM
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MA/4

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********** THE END **********

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May 26, 1978

Mr. John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-275-OL
Docket No. 50-323-OL
Diablo Canyon - Units 1 and 2

Dear Mr. Stolz:

As Mr. Allison requested during the February 28, 1978, meeting in Bethesda, we are performing a seismic re-analysis of the Diablo Canyon cranes. The purpose of this re-analysis is to comply with the new Staff requirement to qualify the cranes in both an unloaded and loaded condition for the postulated Hosgri seismic event. The re-analysis is in progress following the guidelines specified during the February 28 meeting. Our understanding of these guidelines is presented in Table 1 which accompanies this letter. We expect to submit complete results by July 1, 1978. We believe the cranes can be qualified without load, but in order to qualify with load, major modifications and/or severe operating restrictions may be necessary. We would expect to implement these before start-up of the plant.

It is our understanding that the seismic safety of cranes will appear as an open item in SER Supplement 7, and that your evaluation of this issue would be presented in a future SER supplement.

The purpose of this letter is to request that the Staff reconsider its requirement that Diablo Canyon crane systems be qualified with load for the postulated Hosgri event. (The seismic analysis discussed above is continuing in spite of this request for Staff reconsideration because of the urgent need to license the Diablo Canyon plant.) We believe the requirement that cranes

be qualified with load is unreasonably conservative, and we are not aware of any other plants on which the Staff has imposed this requirement.

Furthermore, in spite of being told at the February 28 meeting that the Staff would not consider probabilistic reasoning for the purpose of demonstrating the seismic safety of cranes, we believe that the issue of crane safety is particularly well suited to probabilistic reasoning. We request that the Staff also reconsider its position on the acceptability of a probabilistic approach.

We have included some descriptive information about the cranes with this submittal. Table 2 identifies the various cranes and gives a brief description of each crane system. Table 3 identifies safety related equipment that may be damaged in the event of crane failure and identifies protective structures that surround the safety related equipment. We have also included in Table 4 a detailed description of crane operation which lists equipment that is lifted, lift weights, lift paths, lift frequencies, etc. This information clearly shows that safety related equipment is exposed to crane failure only a small fraction of the time. The small likelihood that safety related equipment is exposed to crane failure along with the small likelihood of a large seismic event, supports the conclusion that the risk to the health and safety of the public from crane failure is very small.

To summarize, it is our belief that (1) the requirement that cranes be qualified with load is unreasonably conservative and that (2) even a cursory survey of crane operating modes demonstrates that the small probability of crane failure poses no significant risk to the health and safety of the public. We urge you to reconsider the requirement that cranes be qualified with load. Please inform us of your decision as soon as possible.

Very truly yours,

Philip A. Crane, Jr.

MVWilliamson: em

Attachments

CC: Service List

TABLE I

SEISMIC ANALYSIS GUIDELINES FOR DIABLO CANYON CRANES

CRANE	GUIDELINES
1. Polar Crane	a. Demonstrate using stress and stability analyses that the crane in a locked (and unloaded) position will not fail as a result of the postulated Hosgri seismic event.
	b. If the analyses cannot demonstrate that the crane in the locked position would not fail, then modify the crane.
	c. Demonstrate using stress and stability analyses that the crane in an unlocked position and either loaded or unloaded will not fail as a result of the postulated Hosgri seismic event.
	d. If the analyses cannot demonstrate that the crane in an unlocked position and either loaded or unloaded would not fail, then determine the effect that crane failure has on the risk to the public. If this risk is significant, then make modifications and/or operating procedure changes that will lower the risk to acceptable levels.
2. Dome access crane, manipulator crane, spent fuel bridge crane, intake structure crane, and reactor cavity service crane	a. Demonstrate using stress and stability analyses that the cranes either loaded or unloaded will not fail as a result of the postulated Hosgri event.
	b. If the analyses cannot demonstrate that the cranes would not fail, then make modifications such that safety of the cranes can be demonstrated.
3. Fuel Handling Building Crane	a. Demonstrate using stress and stability analyses that the crane either lightly loaded (i.e. without spent fuel cask) or unloaded will not fail as a result of the postulated Hosgri seismic event.
	b. If the analyses cannot demonstrate that the crane would not fail, then make modifications and/or operating procedure changes such that safety of the crane can be demonstrated.
4. Turbine Building Crane	a. Demonstrate using stress and stability analyses that the crane unloaded and with the trolley in any position will not fail as a result of the postulated Hosgri seismic event.

TABLE I (CONTINUED)

SEISMIC ANALYSIS GUIDELINES FOR DIABLO CANYON CRANES

Turbine Building Crane (Continued)	b. If the analyses cannot demonstrate that the crane unloaded and with the trolley in any position would not fail, then make modifications.
	c. Demonstrate using stress and stability analyses that the loaded crane would not fail as a result of the postulated Hosgri seismic event.
	d. If the analyses cannot demonstrate that the loaded crane would not fail, then perform impact analyses to determine whether safety related equipment would not be damaged in the event of a crane failure.
	e. If impact analyses cannot demonstrate that safety related equipment would not be damaged, then determine the effect that loss of the safety related equipment has on the risk to the public.
	f. If risk is significant, then make modifications and/or operating procedure changes.
5. Auxiliary Building Monorail Hoists	a. Demonstrate using stress and stability analyses that the monorails either loaded or unloaded will not fail as a result of the postulated Hosgri event.
	b. If the analyses cannot demonstrate that the mono- would not fail, then show by analysis that the maximum load would not be heavy enough to penetrate the two-foot thick reinforced concrete floor and thereby threaten any safety related equipment.
6. Containment Equipment Crane, Machine Shop Crane	These do not operate over any safety related equipment and as such their failure cannot compromise the safety of the plant.

TABLE 2

DIABLO CANYON CRANES

Building	Crane	Number	Type	Design Class	Design Load	Purpose
Containment, Unit 1 & 2	Polar Crane	2	Gantry w/Trolley	I	200 Ton w/ 35 Ton Aux.	Reactor Head and Equipment Movement
	Dome Access Crane	2	Boom	I	½ Ton	Spray System Inspection
	Manipulator Crane	2	Bridge w/Trolley	II	1 Ton w/ 1 Ton Aux.	Fuel Movement
	Containment Equipment Crane	2	JIB Arm	II	1 Ton	Equipment Movement
	Reactor Cavity Service Crane	2	JIB Arm	II	1 Ton	Equipment Movement
Fuel Handling Building	Fuel Handling Bldg. Crane	1	Bridge w/ Trolley	I	125 Ton w/ 15 Ton Aux.	Cask, Fuel, and Equipment Movement
	Spent Fuel Bridge Crane	2	Gantry w/Trolley	I	1 Ton	Fuel Movement
Auxiliary Building	Miscellaneous Monorail Hoists	Several	Monorail w/ Hoist	II	less than 1 Ton	Equipment Movement
Turbine Building	Turbine Bldg. Crane w/ Lifting Beam	2	Bridge w/Trolley	II	North: 115 w/15&5 Ton Aux. South: 115 Ton w/50&5 Ton Aux.	Equipment Movement
	Mobile Crane	1	Boom Crane	II	15 Tons	Small Equipment Movement
	Machine Shop Crane	1	Bridge w/ Trolley	II	20 Tons	Equipment Movement
Intake Structure	Intake Structure Crane	1	Gantry w/Trolley	II	50 Ton	Equipment Movement

TABLE 3 (continued)
LISTING OF SAFETY RELATED EQUIPMENT THAT COULD BE
DAMAGED BY CRANE FAILURE AND ASSOCIATED PROTECTIVE STRUCTURE

Area	Crane	Safety Related Equipment Needed for Operational Modes 1-4 (Power Operation - Cold Shutdown)	Safety Related Equipment Needed for Operational Mode 5 (Refueling)	Structures which could provide protection for Safety Related Equipment in the Event of Crane Failure
Containment	Polar Crane and Dome Access Crane	Control Rod Drive Mechanisms		Reactor missle shield and shield walls
		Containment Spray System Header		Containment wall and shield walls (partial protection)
		Fan Coolers		Containment wall and shield walls (partial protection)
		Primary System Loop Piping	Primary System Loop Piping	Shield walls, concrete slabs, and pipe restraints
		Safety Injection Piping	Safety Injection Piping (RHR Lines)	Shield walls, concrete slabs and pipe restraints
		Pressurizer		Shield walls (partial protection)
		Steam Generators		Shield walls (partial protection)
		Secondary System Piping		Shield walls (partial protection), slabs and piping restraints
		Equipment Hatch	Equipment Hatch	Shield walls (partial protection)
			Fuel	Upper Internals Package (until removed)
	Containment Equipment Crane	None	None	-
	Manipulator Crane	None, parked at East end of it's travel during this mode.	Fuel	None
	Reactor Cavity Service Crane	Control Rod Drive Mechanisms	-	Reactor missile shield and shi walls.
		Primary System Loop Piping	Primary System Loop Piping	Shield walls, concrete slabs, and Pipe Restraints
		Safety Injection Piping	Safety Injection Piping (RHR lines)	Shield walls, concrete slabs and pipe restraints

TABLE 3 (continued)
LISTING OF SAFETY RELATED EQUIPMENT THAT COULD BE
DAMAGED BY CRANE FAILURE AND ASSOCIATED PROTECTIVE STRUCTURE

Area	Crane	Safety Related Equipment Needed for Operational Modes 1-4 (Power Operation - Cold Shutdown)	Safety Related Equipment Needed for Operational Mode 5 (Refueling)	Structures which could provide protection for Safety Related Equipment in the Event of Crane Failure.
Fuel Handling Building	Fuel Handling Building Crane	Fuel	Fuel	None for spent fuel and steel covers for new fuel
		Spent Fuel Pool Heat Exchanger	Spent Fuel Pool Heat Exchangers	1 reinforced concrete floor and walls
		Auxiliary Feedwater Pumps		3 reinforced concrete floors and walls
		Fire Water Pumps	Fire Water Pumps	1 reinforced concrete floor and walls
		Liquid Holdup Tanks	Liquid Holdup Tanks	2 reinforced concrete floors and walls
	Spent Fuel Bridge Crane	Fuel	Fuel	None for spent fuel and steel covers for new fuel
		Spent Fuel Pool Heat Exchanger	Spent Fuel Pool Heat Exchanger	1 reinforced concrete floor and walls
		Auxiliary Feedwater Pumps		3 reinforced concrete floors and walls
		Fire Water Pumps	Fire Water Pumps	1 reinforced concrete floor and walls
Auxiliary Building	Misc. Small Monorail and Hoists Systems Less than 4 Tons Capacity	Liquid Hold Up Tanks	Liquid Hold Up Tanks	1 reinforced concrete floor and walls.
Turbine Building	Turbine Building Crane	Component Cooling Water Heat Exchanger	Component Cooling Water Heat Exchanger	2 reinforced concrete floors, walls, steel barrier and piping restraints.
		Diesel Generators	Diesel Generators	2 reinforced concrete floors and walls
		4 KV Switch Gear	4 KV Switch Gear	1 reinforced concrete floor and walls
	Mobile Crane	Component Cooling Water Heat Exchanger	Component Cooling Water Heat Exchangers	2 reinforced concrete floors, walls steel hard hat and piping restraints
		Diesel Generator	Diesel Generators	2 reinforced concrete floors and walls
		4 KV Switch Gear	4 KV Switch Gear	1 reinforced concrete floor and walls
	Machine Shop Crane	None	None	-
Intake Structure	Intake Structure Crane	Auxiliary Salt Water Pumps	Auxiliary Salt Water Pumps	Reinforced concrete deck and hatch covers

TABLE 4
CRANE OPERATION

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT WEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Polar Cranes	1. Reactor Head W/CRDM	2	166 Tons	4 times per yr. during outage	4 Hrs.	28 ft. WNW to laydown on 140 ft. level	Fuel, Primary System loop piping	12 Hrs.
	2. Upper Internals w/handling tool	2	68 Tons	4 times per yr. during outage	2 Hrs.	19 ft. West to laydown on 115 ft. level	Fuel, Primary System loop piping, RHR piping	6 Hrs.
	3. Lower Internals w/handling tool	2	157.5 Tons	4 times in 10 yrs.	2 Hrs.	24 ft. East to laydown on 115 ft. level	Primary System loop piping, RHR piping	0.4 Hr.
	4. Missile Shield	2	15 Tons	4 times per yr. during outage	0.5 Hr.	Near 1-1 or 2-1 steam generator	Fuel, Primary System loop piping, RHR piping	1.5 Hr.
	5. Internals Handling Tool	2	7.5 Tons	4 times per yr. during outage, 8 times during 10th yr.	0.5 Hr.	West to 140 ft. level over 1-4 R.C.P. Hatch	Fuel, Primary System loop piping, RHR piping	1.5 Hr.
	6. Head Handling Tool	2	4.5 Tons	4 times per yr. during outage	0.5 Hr.	28 ft. WNW to laydown on 140 ft. level	Fuel, Primary System loop piping, RHR piping	1.5 Hr.
	7. Inner Shroud for cooling CRDM's	8	0.25 Ton	4 times per yr.	0.5 Hr.	West to rack on top containment fan coolers	Fuel, Primary System loop piping, RHR piping.	1.5 Hr.
	8. Reactor Coolant Pump Internals	8	3.8 Tons	As needed, about 4 times in 10 yrs.	2 Hrs.	Vertical lift passing over reactor cavity & then out through equipment hatch	Primary system loop piping, RHR piping	0.3 Hr.
	9. Reactor Coolant Pump Motor	8	45.8 Tons	4 times per yr. during outage	2 Hrs.	Vertical lift passing over reactor cavity & then out through equipment hatch	Primary System loop piping, RHR piping	2 Hrs.
	10. Reactor Coolant Pump Hatch	8	1.5 Tons	4 times per yr. during outage	0.25 Hr.	Just slides back on monorail	None	0
	11. Containment Fan Cooler Motor	10	2 Tons	2 times per yr. during outage	0.5 Hr.	Vertical lift passing over reactor cavity & then out through equipment hatch	None	0
	12. Head Bolts & Nuts	108	5.4 Tons w/cart	24 times (once each cart load) each yr.	0.25 Hr.	Vertical lift passing over reactor cavity & then out through equipment hatch	Primary System loop piping, RHR piping	2 Hrs.

TABLE 4
CRANE OPERATION (continued)

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT WEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Polar Cranes (continued)	13. Ventilation Fans	8	0.5 Tons	16 times per year	0.5 Hr.	West to outside of crane track.	Primary System loop piping, RHR piping	4 Hrs.
	14. Crane with no Load, unlocked	-	0	-	-	Fuel, Primary System loop piping, RHR piping		636.6 Hrs. *
	15. Crane with no Load, locked	-	0	-	-	Primary System loop piping, RHR piping, Fan coolers, CRDM, safety injection piping, pressurizers, secondary system piping and steam generators		8094. Hrs.
Manipulator Cranes	1. Fuel	252	0.85 lbs.	252 lifts per year	0.5 Hr.	From core to fuel transfer tube & into spent fuel pool or vice versa with new fuel	Fuel	63 Hrs.
Dome Access Cranes	1. Two Men	2	0.25 Tons	Once Every 5 years	15 Hrs. Total	From Top of Polar Crane to containment Spray Piping	Fan Cooler, containment spray loops	3 Hrs
Containment Equipment Cranes	1. Small equipment and instrumentation	Large	0.4 Tons	Continuous, but just during an outage.	0.5 Hr.	To and from 91 ft. to 140 ft. level of containment	None	0
Reactor Cavity Service Cranes	1. Reactor Head Nuts, Bolts & Tensioners	228	0.4 Tons	At beginning & end of an outage	0.3 Hr.	Within 10 feet arc of crane on cavity floor	Primary System loop piping, RHR piping	64 Hrs.

* The Polar Crane is locked in North-South position during reactor operation and is not used.

TABLE 4
CRANE OPERATION (continued)

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT WEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Fuel handling building crane	New fuel in shipping containers	3	3 Tons	126 per year	0.25 Hr.	Within fuel delivery area on 115 ft. level	Fuel in shipping containers, spent fuel pool heat exchangers, auxiliary feedwater pumps & fire water pumps	32 Hrs.
	Primary source in cask **	2	15 Tons	2 times in 30 years	0.5 Hr.	Within fuel delivery area on 115 ft. level	Spent fuel pool heat exchangers, auxiliary feedwater pumps fire water pumps	0.03 Hr.
	Miscellaneous pumps and equipment	Large	3 Tons	Continuous as required	1 Hr.	Throughout Hot Shop area of auxiliary building	Liquid hold up tanks, fuel in shipping containers, spent fuel pool heat exchangers, auxiliary feedwater pumps, & fire water pumps	2080 Hrs.
Spent fuel bridge crane	fuel	252	.85 Ton	504 per year	0.25 Hr.	Between fuel transfer canal, spent fuel pool, & delivery area at 115 ft. level	fuel, spent fuel pool heat exchangers, auxiliary feedwater pumps, & fire water pumps	63 Hrs.
Mobile crane	Miscellaneous equipment	Large	15 Tons	10 per year	0.5 Hr.	Throughout auxiliary building on 140 feet level	Liquid hold up tank***	[illegible] Hrs.

*Spent fuel in casks are expected to be on site for 10 or 15 years.
**Just for initial start-up of each unit.
*** While in auxiliary building.

TABLE 4
CRANE OPERATION (continued)

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT WEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Turbine building bridge cranes	1. H.P. turbine rotor	2	55 Tons	4 lifts every 4 years	0.5 Hr.	40 ft. west & 60 ft. south	None	0
	2. H.P. blade rings	6	15 Tons	12 lifts every 4 years	0.5 Hr.	60 ft. south	None	0
	3. H.P. outer cover	2	85 Tons	4 lifts every 4 years	0.5 Hr.	30 ft. east & 165 ft. north	Component cooling water heat exchangers	0.2 Hr.
	4. L.P. rotors	6	100 Tons	12 lifts in 4 years	0.5 Hr.	1 lift moves 50 ft. east & 50 ft. south 2 lifts move 50 ft. east & 100 ft. to 170 ft. north	Component cooling water heat exchangers, & 4kv switch gear	.8 Hr.
	5. L.P. outer cover	6	57.5 Tons	12 lifts in 4 years	0.5 Hr.	0 to 50 ft. east & 0 to 200 ft. south	Component cooling water heat exchangers	.8 Hr.
	6. L.P. cylinder cover #1	6	27.5 Tons	12 lifts in 4 years	0.5 Hr.	30 ft. east & 85 ft. to 170 ft. south	Component cooling water heat exchangers	.8 Hr.
	7. L.P. cylinder cover #2	6	57.5 Tons	12 lifts in 4 years	0.5 Hr.	2 lifts move 50 ft. east & 100 ft. to 170 ft. north	4kv switch gear	.8 Hr.
						1 lift moves 50 ft. east & 0 to 80 ft. south	None	0
	8. Excitor housing	2	8.5 Tons	4 lifts every 3rd year	0.5 Hr.	50 ft. east & 40 ft. south	None	0
	9. Generator rotor & excitor	2	200 Tons	4 lifts every 3rd yr. The only 2 crane lift.	3 Hrs.	90 ft. north	None	0
	10. Mobile crane	1	20 Tons	20 lifts per year	0.5 Hr.	To & from 85 ft. level to 140 ft. level	None	0
	11. Crane with no load	-	0	-	-	A few times a yr. while a unit is in operation the crane will be moved from parked position.	Component cooling water heat exchanger diesel generators, & 4kv switch gear	0.5 Hr.

NOTE: While the load is being transferred from one location to another, it is necessary to keep the load about 6 feet off the floor to clear obstacles. The crane operator will keep the load as close to the floor as practical.

TABLE 4
CRANE OPERATION (continued),

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT WEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Mobile crane	Miscellaneous equipment	Large	15 Tons maximum	Continuous	1/2 Hr.	Throughout 140 ft. level. See Note (2)	Diesel generators, Component cooling water heat exchangers, 4 KV switch gear	44 Hrs.
Machine shop crane	Miscellaneous equipment	Large	20 Tons maximum	Continuous	1/2 Hr.	Throughout machine shop on 85 ft. level	None	0

NOTE: * Mobile crane is on 140 foot level of turbine building 14 to 20 days/years, in use 30% of the time, and critical areas 15% of the time. It has 15 Tons capacity, but expected lifts are between 1 to 10 Tons. The crane is mobile with lifts less than 5 Tons, otherwise while lifting greater loads it is stationary because outriggers are required.

TABLE 4
CRANE OPERATION (continued)

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT WEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Intake Structure Crane	1. Circulating Water Pump Motor's Rotor & Shaft	4	41 Ton	2 per 4 years	0.5 Hr.	20 ft. West	None	0
	2. Circulating Water Pump Motor's Stator & Winding.	4	32.5 Ton	None	0	Not lifted	None	0
	3. Circulating Water Pump Shaft & Impeller	4	24.5 Ton	2 per 4 years	1 Hr.	20 ft. West and 20 ft. North or South	None	0
	4. Circulating Water Pump Hatch Cover	4	7 Ton	2 per 4 years	0.25 Hr.	20 ft. West and 40 ft. North or South	None	0
	5. Circulating Water Discharge Valve	4	8.5 Ton	2 per 10 years	0.25 Hr.	40 ft. West	None	0
	6. Auxiliary Salt Water Pump Motor	4	2.6 Ton	2 every 5 years	0.5 Hr.	20 ft. West	Auxiliary Salt Water Pump	0.1 Hr.
	7. Auxiliary Salt Water Pump	4	2.6 Ton	2 every 5 years	0.5 Hr.	20 ft. West and 15 ft. South or North	Auxiliary Salt Water Pump	0.1 Hr.
	8. Auxiliary Salt Water Hatch Cover	4	3 Ton	2 every 5 years	0.25 Hr.	20 ft. West and 25 ft. North or South	Auxiliary Salt Water Pump	0.05 Hr
	9. Auxiliary Salt Water Discharge Valve	4	0.25 Ton	2 per 10 years	0.25 Hr.	30 ft. West	Auxiliary Salt Water Pump	0.03 Hr
	10. Bar Racks	16	4.5 Ton	4 per year	0.5 Hr.	45 ft. East	None	0
	11. Traveling Screens	12	23 Tons	4 per year	1 Hr.	20 ft. East	None	0
	12. Screen Gates	16	6 Tons	4 per year	0.5 Hr.	40 ft. East	None	0
	13. Gate Operators	16	3 Tons	4 per year	0.25 Hr.	40 ft. East	None	0
	14. Auxiliary Salt Water Pump Screens	2	10 Tons	4 in 5 years	1 Hr.	North or South As Necessary	None	0
	15. Auxiliary Salt Water Pump Gates	4	3 Tons	2 in 2 years	0.25 Hr.	North or South As Necessary	None	0

CRANE	LIFTS	NUMBER OF COMPONENTS	LIFT HEIGHT	LIFT FREQUENCY	LIFT DURATION	LIFT PATH	SAFETY RELATED EQUIPMENT PASSED OVER	TIME PER YR. COMPONENT IS SUSPENDED OVER SAFETY RELATED EQUIPMENT
Intake Structure Crane (continued)	16. Auxiliary Salt Water Cate Operators	4	1 Ton	2 in 2 years	0.5 Hr.	North or South As Necessary	None	0
	17. Screen Wash Pump Motor	3	1.2 Ton	2 per 2 years	0.5 Hr.	North or South As Necessary	None	0
	18. Screen Wash Pump	3	1.8 Ton	2 per 4 years	0.5 Hr.	North or South As Necessary	None	0
	19. Screen Wash Pump Hatch Cover	3	1 Ton	2 per 2 years	0.25 Hr.	North or South As Necessary	None	0
	20. Dewatering Pumps	2	1 Ton	8 times per year	0.5 Hr.	Just minus 2 ft. Elevation	None	0
	21. Screen Refuse Pumps	2	1 Ton	2 per 5 years	0.5 Hr.	25 ft. East	None	0
	22. Crane Without Load	-	0.	-	-	The crane is frequently used throughout its range of travel. It is parked and locked at either end of travel not over the Salt Water Pumps	Auxiliary Salt Water Pump	583 Hrs.