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September 16, 1983

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

Subject: LaSalle County Station Units 1 and 2
Control of Heavy Loads - Phase II
NRC Docket Nos. 50-373 and 50-374

Reference (a): EG&G Idaho, Inc., Draft TER for Control of Heavy Loads at LaSalle Units 1 and 2 (Phase II) dated May, 1983.

Dear Mr. Denton:

Reference (a) was provided to Commonwealth Edison Company for review. The Phase II reports contains EG&G's evaluation and recommendations for the requirements of Sections 5.1.4, 5.1.5, and 5.1.6 of NUREG-0612.

Reference (a) contains two areas of concern that were subsequently discussed with the NRC Staff and their Consultants during a conference call on August 3, 1983. As a result of our reivew, and to document our conference call discussions, enclosed is the Commonwealth Edison Company response to these two areas of concern.

To the best of my knowledge and belief the statements contained in the Enclosure are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Please address any questions that you may have concerning this matter to this office.

One signed original and forty (40) copies of this letter with enclosure are provided for your use.

Respectfully,

P. L. Barnes

P. L. Barnes
Nuclear Licensing Administrator

lm

Enclosure

cc: J. G. Keppler - Region III
A. Bournia - LB2
Region III Inspector - LaSalle

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ENCLOSURE

COMMONWEALTH EDISON COMPANY

LASALLE COUNTY STATION UNITS 1 and 2

Control of Heavy Loads

Response to EG&G Idaho DRAFT TER (Phase II)

7319N

2.3.1.B EG&G Evaluation

...The applicant states that dependence for meeting the criteria is placed on limit switches and upon site-specific considerations. However, no information is provided of the details of these considerations or on how the limit switches can or may be removed or bypassed...

Response 1

In response to the above question and to the clarifying remarks of the August 3, 1983 telecon between the NRC, EG&G, CECo and S&L, a technical description "CN-24500 Critical 'L' Path Devices and Electrical Operating Procedure for Handling Fuel Cask" is attached (Attachment 1). As can be seen on page 3 of Attachment 1, the control switch is key operated. In addition, technical specification 3.9.7.a requires the control system be used for all cask movements. And finally a LaSalle specific operating procedure will be developed when a cask and lifting yoke (if required) are procured for the LaSalle County Station.

2.3.1.B EG&G Evaluation

...Detailed information on proposed or present technical specifications was not given...

Response 2

Current Unit 1 technical specifications 3/4.9.6 Crane and Hoist and 3/4.9.7 Crane Travel are submitted as Attachment 2. Unit 2 technical specifications are expected to be the same when they are issued.

2.3.1.B EG&G Evaluation

...Administrative or physical controls are indicated but no detailed information was given on how they will meet the specific requirements on NUREG-0612, Section 5.1.

Response 3

The intent of NUREG 0612 is met for the Reactor Building Crane by the use of "Critical 'L' Path Devices" as previously discussed and by the implementation of the technical specifications (Attachment 2). These insure that heavy loads are never moved above the spent fuel pool and that the only heavy loads moved above the reactor vessel are those that are installed above the reactor vessel. The safe handling of these heavy loads is insured by adherence to specific handling procedures such as:

LMP-PC1 Drywell Head Removal
LMP-PC2 Drywell Head Installation
LMP-NB11 Reactor Head Removal
LMP-NB10 Reactor Head Installation
LMP-NB6 Steam Dryer Removal
LMP-NB5 Steam Dryer Installation
LMP-NB8 Steam Separator and Shroud Removal
LMP-NB7 Steam Separator and Shroud Installation

These procedures also insure that the safe load paths (Drawing SK-5A, previously submitted) will be followed.

2.3.1.B EG&G Evaluation

...However, the proposed administrative procedure should be available for review by the NRC.

Response 4

All administrative procedures are available on site. The NRC has access to all these procedures.

2.3.2.B EG&G Evaluation

...For instance, a load drop by Crane System 22 and 23 could result in a steam release, but no indication as to the related consequence of such a release were included in the applicant's statements...

Response 1

This type of an accident is bounded by a complete break of a main steam line which is analyzed in Section 15.6.4 of the LaSalle FSAR. This analysis shows that the radiation doses resulting from the worst case are much less than 1% of the 10 CFR 100 limits.

2.3.2.B EG&G Evaluation

...In other cases crane systems operate near or over several safety-related systems, but no information is provided to show that a load drop damaging one system will not damage other systems. Statements about separate rooms are made but the possibility of a load drop damaging more than one piece of equipment in the same room is not precluded...

Response 2

It is highly unlikely that a load drop could damage more than one safety-related system in one room because most rooms only contain one safety-related system. In addition, if there is more than one safety-related systems there is always some physical separation between them just to allow for normal maintenance. And finally if more than one safety-related system are in one room they are not redundant to each other. Therefore, even if two safety-related systems were damaged, they both would have redundant systems in other rooms. This can be verified by reviewing Appendix H of the FSAR.

2.3.2.B EG&G Evaluation

...Another problem that is not addressed is the possibility of safety-related equipment being damaged by a load drop related to the servicing of redundant equipment.

Response 3

As stated previously, redundant systems are not located in the same room or area. Servicing of redundant pieces of equipment are done by different track crane systems, so this type of accident is precluded.

CM-24500 Critical "L" Path Devices and Electrical Operating Procedure for Handling Fuel Cask

Physical Data: Ref. 105A3668 Trolley, 105A3679 Bridge

Fuel Cask: 17' 8 1/2" high 6 ft. diameter

Bridge: Span 124'8", height rail to rail 6 ft. 4 inches

Trolley: Spread 22', height rail to highest object 6'6"

Center line of double hook to top of sheave block = 5 1/2'

Building: Ground to operating floor 843'6"*

Operating floor to bridge runway rail 871* feet, which equals 27'6"

Bridge runway rail to ceiling 891'6"* or 20'6"

Top of trolley to ceiling (20'6" - 12'10") is 7'8"

Fuel cask to travel 6" off the floor. Therefore, from the bridge runway rail to top of cask will be 9' 3 1/2".

Top of sheave block to runway rail approximately 3' 9 1/2".

L-Shaped path trolley travel 31 feet. Bridge travel 35' 4 1/2".

Crane Controls: Reference Catalog 213

Operating Speeds:

Hoist 5.2 ft./min.

Bridge 75 ft./min.

Trolley 75 ft./min.

Crane Mechanical Drift: Bridge 1 1/2" total, trolley 3/4"

* Elevation from ground.

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DATE 5-28-75 DR BY E.R.T

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SEE SHT. 5,6,8,10

REWRITTEN PER SHT. 10 OF 11 "L" PATH ORIENTATION. SHEETS 2 THRU 11 REWRITTEN

Proposed Control System:

The primary system will consist of photoelectric reflex sensors. The photoelectric system to be employed will be that used by the Harnischfeger Powermast and Stacker Crane Division. Hence, a proven and reliable system of the Harnischfeger Corporation will be utilized.

The secondary system will consist of electromechanical cam actuated switches and vane operated proximity switches. The above devices are ones which have been previously employed by Harnischfeger Engineering Groups.

Control System Description:

The crane control must be capable of accelerating and decelerating the load within the plus or minus six (6) inches of the L-shaped path. The L-shaped path will be ceiling mounted.

The total control path is six (6) inches minus 3/4 inches or 5 1/4" for trolley path and six (6) inches minus 3/8 inch or 5 5/8 inch for bridge path. The 5 1/4 inch for trolley is due to a total of 1 1/2 inch mechanical bridge float. The 5 5/8" is due to 3/4 inch total trolley float. It is also desirable to reduce the top speed from 75 feet per minute to one quarter of that or 18.5 feet per minute. The travel time for the 35' 4 1/2" distance would be approximately 2 minutes. The on-quarter speed was arbitrarily taken. However, the acceleration rate and the deceleration rate will be decreased mitigating load swing. The result would be to achieve a L-shaped path of plus or minus three (3) inches.

The traverse photoelectric system will consist of two (2) type incandescent coaxial scanners for retroreflection and reflected light, with lamp burn-out relay control. The retroreflective target will be a type crystal reflective foil sealed, similar to P&H part number 892336, attached to ceiling mounted unistrut and forming the L-shaped path. The two (2) photo retroreflective devices would be used in conjunction with auxiliary control relays and lights. The lights are used to indicate the movement, and position of the bridge or trolley, and the state of the sensing devices.

The control logic for the mechanical limit switches will be mounted on the bridge and trolley. The bridge mounted devices will determine the 35' 4 1/2" travel distance. The trolley mechanical devices will determine the 31 feet trolley travel. The mechanical and electrical control logic shall be in series with the photo control to form the complete logic.

The height of the cask shall be controlled by a contact of the geared limit switch in conjunction with a photo retroreflective scanner. An incandescent coaxial reflected light scanner will be mounted on the underside of the trolley and focused on a retroreflective target mounted on top of the bottom block sheave housing. The scanner and reflector arrangement will give hook swing indication, if any, beyond the six(6) inch path. The above will also be used to indicate cask height.

Hence, the electromechanical and photo scanning system for critical path operation is now complete, with the exception of a permissive control switch. The permissive control switch shall be a key operated selector switch labelled, crane control normal - cask. The switch when in the cask position will activate relays to automatically limit the bridge and trolley speed to 18.5 feet per minute. The photo electric sensors will also be energized with the switch in the cask position.

The following drawings and sketches are required:

General Arrangement: 979F702

Photo system for hook swing and limit switch: 979F702

"L"-shaped path limit switch arrangement: 10 sheet of 11

Logic Table: Sheets 7, 8, and 9

Hoist Control Schematic: 101A8095 Sht. 1 of 2

Bridge Control Schematic: 101A8095 Sht. 2 of 2

Trolley Control Schematic: 101A8095 Sht.2 of 2

<u>Operation Per Logic Table and "L" Path Sketch:</u>

Cask at washdown pit.

Selector switch placed on cask.

The following devices state do not change during the cask handling:

Hoist H.B upper limit switch

The normal geared upper limit switch

The normal geared lower limit switch

The bridge forward and reverse track limit switches

The trolley left and right track limit switches

The cask control relays C, CH, CB, and CT

During the cask movement, the bridge and trolley may not be operated simultaneously. The cask must be raised six (6) inches off the floor to traverse the "L"-shaped path.

The bridge motion is from north to south.

The trolley motion is from east to west.

The bridge and trolley controllers are marked as follows:

	CAB	PENDANT
Bridge North	Bridge Right	Bridge Reverse
Bridge South	Bridge Left	Bridge Forward
Trolley East	Trolley Reverse	Trolley Left
Trolley West	Trolley Forward	Trolley Right

The motor reversing contactors are marked per the pendant controllers. The description of operation is per the pendant controllers designation.

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SEE SHEET 1
SEE SHT. 1

Travel from Cask Washdown Pit to Cask Storage Well:

Start operation with cask at the washdown pit. Note that each motion (hoist, bridge, trolley) may be energized if required. This allows for hook centering and cask manipulation. To place cask on "L"-shaped path, raise cask slightly off the floor. Position trolley to center line of "L"-shaped path to energize relay TPIR. Then completely raise cask until the upper limit switch relays ULR and PSR are energized.

Energize the bridge motion reverse contactor. As the bridge moves from CWP zone, the photo sensing system relays P1R and P2R will be energized. The bridge CWP zone limit switch BPIR is energized prior to the P1R and P2R relays. The BPIR limit switch is used as the redundant backup switch.

The hoist circuit is now locked out by the two (2) zone relays CSWR and CWPR when traversing the "L"-shaped path.

There is also a trolley path correction circuit when traversing the bridge portion of the "L"-shaped path.

When the bridge reaches the CSW zone, the photo sensing devices remain energized and the BP2R bridge limit switch is de-energized.

The photo sensing relays are used as redundant system and remain energized.

To trolley from the CWP zone to the cask storage well:
The BP2R relay is de-energized and allows the trolley right contactor to be energized. The right contactor remains energized with the photo sensing system remaining energized. The trolley will continue to traverse the cask to the cask storage well until the photo system becomes de-energized. The trolley vane limit switch (TT2) is used as the back-up. The cask must be slightly lowered to allow the CSWR to remain energized. The bridge may also be moved to allow full positioning of the cask in the CSW zone, if required.

To remove cask from cask storage well and travel to the cask washdown pit:

The hook must be relowered which will allow the CSWR relay to remain energized. The bridge and trolley may now be manipulated to allow hook engagement of the cask. The cask must then be slightly raised off the cask storage well pit floor. The bridge must then be moved until the bridge vane switch BP2R relay is de-energized. The cask may now be fully raised and moved to the trolley "L" path position. A bridge correction circuit has been inserted to allow for bridge correction, if required.

The cask may now be moved from the cask storage well using the trolley. The trolley left contactor will remain energized until the trolley vane relay TPIR is energized. The bridge forward contactor may now be energized, traversing the cask from the CSW zone to the CWP zone. The photo system will de-energize at the cask washdown pit. The bridge forward contactor will de-energize. The bridge master must be placed in the OFF position. The CWP relay will now be energized. The cask must be slightly lowered to de-energize the ULR relay. The bridge and trolley may now be energized to manipulate the cask into position.

To lower cask from refueling floor to load rail car or truck on ground floor:

Move along the critical "L"-shaped path until the BAHR relay is energized. The cask may now be lowered through the equipment access hatch to the ground floor. When lowered far enough to de-energize the ULR and PSR relays the bridge and trolley circuits are locked out.

Lower the cask until the GLAHR relay is energized. Note that each motion (Hoist, Bridge, Trolley) may now be energized as long as GLAHR remains energized. This allows full manipulation to load the cask on a rail car or truck.

To unload cask from rail car on truck and raise to refueling floor:

With the hook lowered far enough to energize the GLAHR relay, manipulate to allow hook engagement of the cask and raise it off the rail car or truck. Move the trolley until the P1R and P2R relays are energized after which the bridge can be positioned to energize the BAHR relay.

Note, that if the hook is raised far enough to de-energize the GLAHR relay "HOIST RAISE", bridge, and trolley motions are no longer possible if BAHR is de-energized. However, the LUR relay should remain energized allowing the hook to be lowered to reactivate GLAHR.

With the BAHR relay energized the cask can now be raised to the refueling floor. When the cask reaches the 740' elevation floor, the GLAHR relay de-energizes and bridge and trolley motions are locked out. Continue hoisting until the ULR relay is energized at which point movement of the cask along the "L"-shaped path can be resumed.

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B SEE SHEET 1

CSWR WAS CWPR

LOGIC TABLE

LEGEND:

- ⊙ RELAYS AND CONTACTORS ENERGIZED
- ⊘ IMPORTANT LOGIC STEP DEVICE ENERGIZED.
- ⊘ IMPORTANT LOGIC STEP DEVICE DE-ENERGIZED.
- ☐ LIMIT SWITCH CLOSED
- ⊐ LIMIT SWITCH IMPORTANT LOGIC STEP DEVICE CLOSED.
- ⊐ LIMIT SWITCH IMPORTANT LOGIC STEP DEVICE OPEN.
- × DEVICE MAY BE ACTIVATED

	RELAYS CONTACTORS LIMIT SWITCHES	SCHEMATIC SYMBOL	CASK AT CWP ZONE	CASK FROM CWP ZONE TO "L" PATH	CASK ON "L" PATH TO CSW ZONE	CASK AT EQUIPMENT ACCESS HATCH: CASK ON "L" PATH 16' ABOVE OPERATING FLOOR	CASK AT EQUIPMENT ACCESS HATCH: CASK FROM OPERATING TO GROUND FLOOR	CASK AT EQUIPMENT ACCESS HATCH: CASK AT GROUND FLOOR	CASK AT "L" JUNCTION	CASK TO CSW "L" PATH	CASK AT CSW
STANDARD HOIST CONTROLS	H.B. LIMIT SW.	HB	☐	☐	☐	☐	☐	☐	☐	☐	☐
	GEARED UP. LIM SW.	GU	☐	☐	☐	☐	☐	☐	☐	☐	☐
	GEARED UP. LIM. SW	UL	×	⊐	☐	☐	⊐	⊐	☐	☐	⊐
	GEARED LWR. LIM. SW.	GL	☐	☐	☐	☐	☐	☐	☐	☐	☐
	HOIST CONTACTOR	HI	×	⊙	○	○	×	×	○	○	×
	LOWER CONTACTOR	HL	×	○	○	○	×	×	○	○	×
	GEARED LWR. LIM. SW.	GLAH	☐	☐	☐	☐	☐	⊐	☐	☐	☐
ACCESS HATCH RELAYS	ACCESS HATCH RELAY	BAHR	○	○	○	⊘	⊙	×	○	○	○
	GROUND FLOOR RELAY	GLAHR	○	○	○	○	○	⊘	○	○	○
	GROUND FLOOR LATCH-UP RELAY	LUR	○	○	○	○	○	×	○	○	○

(3) SEE SHEET 1
(4) SEE SHT. 1
(5) ADDED CASK AT EQUIP ACCESS HATCH

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STANDARD BRIDGE CONTROLS										
FWD. TRACK LIM. SW.	FWD LIM. SW	■	■	■	■	■	■	■	■	■
REV. TRACK LIM. SW.	REV LIM. SW	■	■	■	■	■	■	■	■	■
FORWARD CONTACTOR	FWD	×	×	×	×	○	×	○	○	×
FORWARD RELAY	BF	×	×	×	×	○	×	○	○	×
REVERSE CONTACTOR	REV	×	×	●	×	○	×	○	○	×
REVERSE RELAY	BR	×	×	●	×	○	×	○	○	×
STANDARD TROLLEY CONTROLS										
LEFT TRACK LIM. SW.	L LIM. SW	■	■	■	■	■	■	■	■	■
RIGHT TRACK LIM. SW.	R LIM. SW	■	■	■	■	■	■	■	■	■
LEFT CONTACTOR	L	×	×	○	○	○	×	○	×	×
LEFT RELAY	TL	×	×	○	○	○	×	○	×	×
RIGHT CONTACTOR	R	×	×	○	○	○	×	×	●	×
RIGHT RELAY	TR	×	×	○	○	○	×	::	●	×

SEE SHEET 1
SEE SHT. 1
SEE SHT 1 1 7

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"L"-SHAPED PATH RELAYS

CASK CONTROL	C	●	●	●	●	●	●	●	●	●
CASK HOIST CONTROL	CH	●	●	●	●	●	●	●	●	●
CASK BRIDGE CONTROL	CB	●	●	●	●	●	●	●	●	●
CASK TROLLEY CONTROL	CT	●	●	●	●	●	●	●	●	●
CASK UP RELAY	ULR	×	⌀	●	●	⌀	○	●	●	×
CASK UP & NO SWING PHOTO RELAY	PSR	×	⌀	●	●	○	○	●	●	×
PHOTO SW. NO. 1 RELAY	P1R	○	⌀	●	●	●	×	●	●	⌀
PHOTO SW. NO. 2 RELAY	P2R	○	⌀	●	●	●	×	●	●	⌀
CASK WASHDOWN BRIDGE RELAY	BP1R	○	⌀	●	●	●	●	●	●	●
CASK STORAGE WELL BRIDGE RELAY	BP2R	●	●	●	●	●	●	⌀	○	○
TROLLEY PROXIMITY LIM. SW. RELAY #1	TP1R	×	⌀	●	●	●	×	●	⌀	○
TROLLEY PROXIMITY LIM. SW. RELAY #2	TP2R	●	●	●	●	●	●	●	●	×
HOOK AT CASK WASHDOWN PIT	CWPR	●	●	⌀	○	○	○	○	○	×
HOOK AT CASK STORAGE WELL	CSWR	×	○	○	○	○	○	○	○	⌀

(B) SEE SHEET 1

(C) SEE SHT. 1

(D) SEE SHT 1 &7

DRAWN BY [illegible] DATE 6-9-15

APPROVED BY [illegible] DRAWING NO. [illegible]

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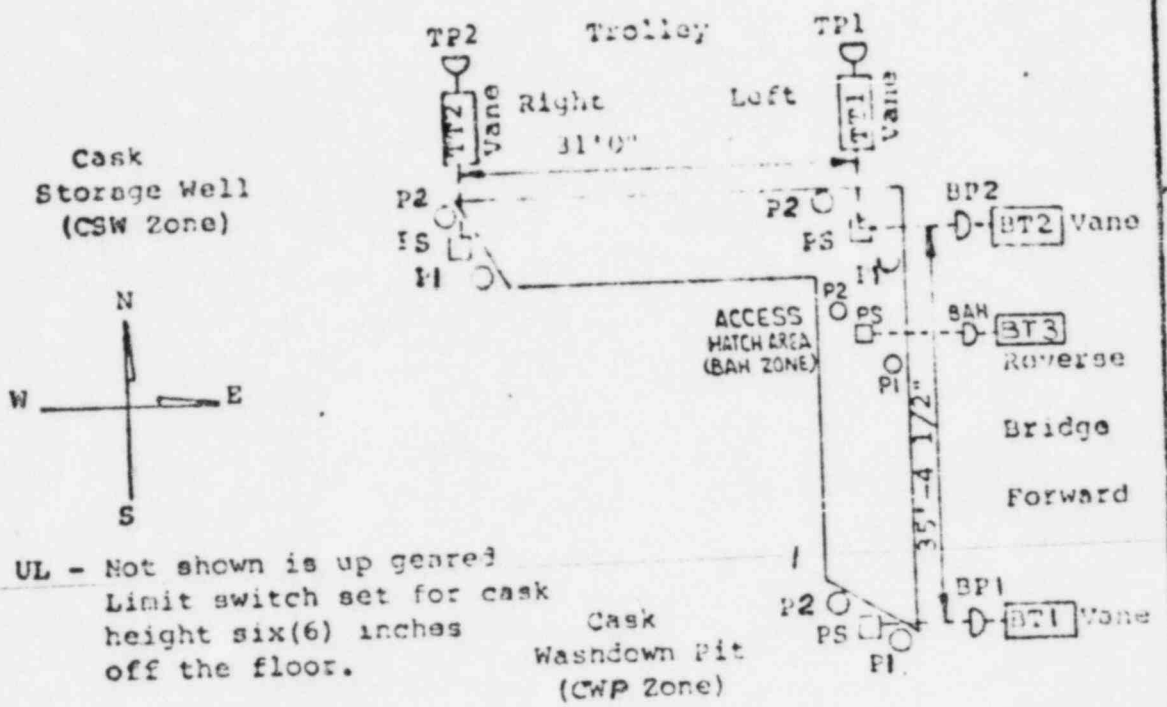
CN-24500 "L" Shaped Path Limit Switch
Arrangement Path in Ceiling

(Information per Sargent & Lundy Dwg. No. M-5)



UL - Not shown is up geared Limit switch set for cask height six(6) inches off the floor.

Devices: P1 and P2 are photo electric incandescent coxial reflex scanners.

PS - is the same as 1 & 2 used for hook swing & elevation.

BP1, 2, BAH, & TP1, 2, are vane operated proximity switches mounted on bridge.

BT1, BT2 & BT3 are bridge vane targets mounted on building.

TT1 and TT2 are trolley vane targets mounted on the trolley.

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Hunkeler
PSH
ADDED BAH-ZONE
SEE SHEET 1
P1 CHANGED TO P2 DLR 10-3-77
P1 CHANGED TO P2

3/4.9.6 CRANE AND HOIST

LIMITING CONDITION FOR OPERATION

3.9.6 All cranes and hoists used for handling fuel assemblies or control rods within the reactor pressure vessel shall be OPERABLE.

APPLICABILITY: During handling of fuel assemblies or control rods within the reactor pressure vessel.

ACTION:

With the requirements for crane and hoist OPERABILITY not satisfied, suspend use of any inoperable crane or hoist from operations involving the handling of control rods and fuel assemblies within the reactor pressure vessel after placing the load in a safe condition.

SURVEILLANCE REQUIREMENTS

4.9.6 Each crane or hoist used for handling of control rods or fuel assemblies within the reactor pressure vessel shall be demonstrated OPERABLE within 7 days prior to the start of such operations with that crane or hoist by:

a. Demonstrating operation of the overload cutoff when the load exceeds:

   1. 1200 ± 50 pounds for the fuel hoist.
   2. 1000 ± 50 pounds for the auxiliary hoist.

b. Demonstrating operation of the loaded interlock when the load exceeds:

   1. 485 ± 50 pounds and 550 ± 50 pounds for the fuel hoist.
   2. 400 ± 50 pounds for the auxiliary hoist.

c. Demonstrating operation of the fuel hoist downtravel stop when downtravel exceeds 54 feet below the platform rails.

d. Demonstrating operation of the fuel hoist and auxiliary hoist up-travel stops when the grapple is lower than or equal to 8 feet below the platform rails.

e. Demonstrating operation of the fuel hoist slack cable cutoff when the hoist is unloaded.

3/4.9.7 CRANE TRAVEL

LIMITING CONDITION FOR OPERATION

3.9.7 Loads over the refueling floor, and over the spent fuel storage pool racks when fuel assemblies are in the racks, shall be restricted as follows:

a. All movements of a spent fuel shipping cask shall be controlled by the critical "L" path control system of the Reactor Building crane.

b. Loads in excess of 1290 pounds shall not travel over the spent fuel storage pool racks.

c. One fuel assembly may be moved over the spent fuel storage pool racks provided that it is not raised above 2 foot clearance over the racks.

APPLICABILITY: At all times.

ACTION:

With the requirements of the above specification not satisfied, place the crane load in a safe condition. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.7 The spent fuel shipping cask critical "L" path control system of the Reactor Building crane shall be demonstrated OPERABLE within 7 days prior to and at least once per 7 days during spent fuel shipping cask movement over the refueling floor.