VERMONT YANKEE NUCLEAR POWER CORPORATION

SEVENTY SEVEN GROVE STREET

RUTLAND, VERMONT 05701

2.C.2.1
FVY 81-134

REPLY TO:
ENGINEERING OFFICE
1671 WORCESTER ROAD
FRAMINGHAM, MASSACHUSETTS 01701
TELEPHONE 617-872-8100

September 11, 1981

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing

References:
(a) License No. DPR-28 (Docket No. 50-271)
(b) Letter, USNRC to VYNPC, dated February 3, 1981
(c) Letter, VYNPC to USNRC, FVY 81-91, dated June 1[illegible] 1981
(d) Letter, VYNPC to USNRC, dated December 30, 1975
(e) Letter, VYNPC to USNRC, dated June 2, 1976
(f) Letter, USNRC to VYNPC, dated January 28, 1977

Dear Sir:

Subject: Control of Heavy Loads

Reference (b) requested a review of the controls for handling heavy loads at Vermont Yankee, the implementation of certain recommendations regarding these controls, and the submittal of information to demonstrate that those recommendations have been implemented.

Vermont Yankee has completed the first phase of the requested review of our facility. The enclosed information describes the results of this review, the actions that will be taken, and the additional measures taken to meet the intent of the general guidelines of Section 5.1.1, NUREG 0612. The information is presented in Attachment 1 as responses to the items in Section 2.1 of Enclosure 3 to your December 22, 1980 letter.

With regard to the implementation of actions determined to be necessary as a result of our review, all procedure revisions will be completed prior to the end of the first quarter of 1982.

As a result of our review, we have determined that the only overhead load handling system at Vermont Yankee requiring detailed consideration with regard to Reference (b) is the reactor building crane. The basis for this determination is presented in Attachment 1. In addition to the considerations presented in this attachment, the reactor building

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crane and its operation has been previously subjected to close scrutiny by both Vermont Yankee and the NRC. References (d) and (e) submitted detailed information concerning modifications to this crane to make it fully redundant and single-failure proof. The NRC's review and approval of these modifications is documented in the safety evaluation report transmitted by Reference (f).

In light of the results of our review of the overhead handling systems at Vermont Yankee, together with previously documented information regarding the reactor building crane, Vermont Yankee concludes that the actions described in this letter and its attachment are adequate to address all the concerns of Reference (b). Vermont Yankee believes that no further action in this area is warranted.

We trust the information presented above is satisfactory; however, should you have further questions, please contact us.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

E.W. Jackson
Manager of Operations

EWJ/dm

RESPONSES TO REQUESTS
FOR
INFORMATION IN SECTION 2.1
OF ENCLOSURE 3 TO DECEMBER 22, 1980
LETTER FROM D. EISENHUT

ITEM 1: Report the results of your review of plant arrangements to identify all overhead handling systems from which a load drop may result in damage to any system required for plant shutdown or decay heat removal (taking no credit for any interlocks, technical specifications, operating procedures, or detailed structural analysis).

RESPONSE: A review of plant arrangement drawings and an area survey were conducted to determine handling systems of concern; i.e., those handling systems that could carry heavy loads over irradiated fuel in the core, over spent fuel, or over components in systems required for plant shutdown or decay heat removal. The location of such components was determined from reviews of plant arrangement drawings as well as from information contained in the plant fire hazards analysis (which shows location of safe shutdown components). Based on this review, we have found that the only handling system at the Vermont Yankee facility that must be addressed within the scope of NUREG-0612 is the Reactor Building Crane.

Reactor Building Crane. This crane, designed and fabricated by Whiting Corporation, has a main hoist capacity of 110 tons and an auxiliary hoist of 7 tons. The heavy loads that are handled by the Reactor Building Crane are listed in Table 2. The crane was modified in 1976 by replacing the original trolley with one that has a dual load path on the main hoist when used for shipping cask handling operations. When using the hoist for operations other than cask handling, the dual load path hook is replaced with the original sister hook and is used with original lifting devices that are not of dual load path design. However, all other dual load paths remain in effect for all main hoist lifts.

The design of the new trolley has been reviewed and approved by the NRC as satisfying the staff's criteria for dual load path or "single-failure-proof" cranes. The staff's SER on evaluation of this crane with a new trolley was transmitted to Vermont Yankee by letter of January 28, 1977 that included License Amendment No. 29. This SER required that prior to cask handling operations, details should be provided to the staff concerning the design of the lifting device to be used in order to verify that this met dual load path criteria. However, for the handling of heavy loads other than a shipping cask with the main hoist, provisions have not been made for the use of dual load path or high safety factors for the lifting devices that would be used. Additionally, certain heavy loads are handled by the auxiliary hoist which is not of dual load path design.

The safety concern when handling loads with the Reactor Building Crane is the movement of loads over or in proximity to irradiated fuel in the core when the vessel head is removed, irradiated fuel in the spent fuel pool, the reactor vessel (effects due to a vessl head drop), and safe shutdown equipment at lower elevations (primarily the suppression pool, equipment in the southeast corner room below the reactor building equipment hatch, and equipment below the vessel head laydown area such as uninterruptible power supply batteries and inverters-- UPS-1A and UPS-1B).

The responses to the following items describe how the handling of heavy loads by the Reactor Building Crane satisfies the general guidelines (Section 5.1.1) of NUREG 0612.

ITEM 2: Justify the exclusion of any overhead handling system from the above category by verifying that there is sufficient physical separation from any load-impact point and any safety-related component to permit a determination by inspection that no heavy load drop can result in damage to any system or component required for plant shutdown or core decay heat removal.

RESPONSE: Table I lists the cranes, hoists, and monorails that have been excluded from consideration within the scope of NUREG 0612. The following provides the bases for excluding these handling systems.

1. Reactor Feedwater Pump Monrails.

   Separate 16-ton monorails are located over each feedwater pump for servicing this equipment. There is no safety-related equipment in the feedwater pump area.

2. Condensate Demineralizer Monorail.

   This monorail is located in the Turbine Building. There is no safety related equipment in the area served by this monorail.

3. Diesel Geneator Monorails (2).

   Each diesel generator unit is located in a separate room. The only equipment in each room is associated with that diesel generator. Separate monorails are located over each diesel generator unit to assist removal and replacement of small components. These monorails may be excluded because a load drop would not cause loss of safe shutdown functions.

4. CRD Storage and Repair Monorail, and

5. CRD Storage and Repair Jib Crane

These handling systems are located in the CRD repair room. This room contains certain cable trays and conduit designated as safety related; however, these are located above the monorail and jib crane so that the cabling could not be impacted during load handling operations or due to a load drop.

6. HPCI Equipment Monorail (4 ton).

This 4-ton monorail is located above the HPCI pump and motor, and continues over to the doorway into the southwest corner room, but ends before the doorway. The only equipment in this room is associated with the HPCI pump. Based on the above, a load drop from this monorail will not cause loss of safe shutdown functions.

7. HPCI/CRD Pump Room Access Hatch Hoists (2)

There are two 2-ton hoists located at this hatchway at elevation 252 feet. One hoist is an electric driven Peerless/Harrington chain hoist. The other is a pneumatic cable hoist by Chicago Pneumatic. These hoists are used for lowering or hoisting equipment between this elevation and elevations 232 feet and 213 feet in the southwest corner room. There is no cabling or equipment in proximity to this hatchway that could be impacted by a load drop from either of these hoists. The 213 foot elevation is the lowest level in the Reactor Building. Because of the above, these hoists may be eliminated from consideration under NUREG 0612.

8. RCIC Equipment Monorail

This 2-ton monorail is located directly over the RCIC pump and turbine and extends for approximately 8 feet beyond the RCIC turbine. The only equipment and cabling in this area is associated with the RCIC system. Based on the above, a load drop from this monorail would not cause loss of safe shutdown functions.

9. Reactor Recirc. Pump Monorail

The 16-ton monorail in the drywell is located over the recirculation pumps and motors and connects these areas with the equipment access lock area. This monorail can be used only when the plant is shut down and already on decay heat removal. The monorail would only be used for removing and reinstalling recirculation pump motors or pump parts. When on decay heat removal, the equipment in the drywell that is being used is piping for RHR suction and return, and instrument lines associated with vessel level instrumentation. All instrument lines are located above the elevation of the monorail. Electrical cabling is located along the wall or above the monorail. RHR lines cross over the monorail and then drop down to connect to recirc loop piping. These lines are located such that they would not be impacted when handling a load with this monorail or if the load were to be dropped. Based on the above, handling of loads or a load drop would not result in loss of safe shutdown or decay heat removal equipment.

10. Recirc. Motor Generator Sets Monorail

This monorail extends for approximately 90 feet over the two motor generator sets. There is no safe shutdown or decay heat

removal equipment located in this area. Since a load drop from this monorail would have no effect on safe shutdown decay heat removal functions, this monorail may be excluded from the scope of the NUREG 0612 criteria.

11. Capping and Decon Station Monorail

12. Waste Demin. and Filter Monorail

13. Fuel Pool Filter Demin. Monorail

14. Centrifuge CF-1-1A Monorail

15. Centrifuge CF-1-1B Monorail

These monorails are all located in the Radwaste Building. There is no safe shutdown equipment in the Radwaste Building, and damage to equipment due to a load drop would not result in releases that approached Part 100 limits.

16. Main Steam and Feedwater Valve Monorail

This 3-ton monorail is located in the main steam tunnel within the Reactor Building at elevation 252 feet. The monorail is used during shutdown conditions to service MSIVs and feedwater valves in this tunnel. The steam and feedwater lines would not be required for decay heat removal. The only safe shutdown equipment in this area is a cable tray passing through that is routed parallel to the monorail track, but at least 10 feet away at approximately the same elevation.

17. Suppression Pool Chamber Access Hatch Monorail

This 3-ton monorail is a short length (approximately 4 foot long track) located in a stairwell area at elevation 252 feet in the Reactor Building. This monorail is only used for removal of the suppression pool access hatch and for raising or lowering tools and equipment for suppression pool maintenance. Such handling operations would normally take place when the reactor is already shut down.

18. CRD Pump Monorails (2)

Separate monorails are located over each CRD pump at elevation 232 feet and would only be used to service a CRD pump when that pump has already been removed from service. The CRD pumps are separated by approximately 6 feet of open floor space, so that a load drop from one monorail would not affect the adjacent pump. There is no other safe shutdown cabling or equipment in close proximity to the CRD pumps. Based on the above, these monorails may be excluded from the scope of NUREG 0612 criteria.

19. Miscellaneous Portable Hoists Used for Access to Corner Rooms

There are several portable hoists that would be attached to padeyes or special rigging and used for removal of hatches providing access to RHR corner rooms in the Reactor Building and for removal/replacement or servicing of equipment. Equipment serviced could include RHR heat exchangers (tube bundle cleaning or replacement) or removal/replacement of RHR pumps, RHR Service Water pumps, or RCIC components. Loads

would only be handled in the hatchways by these hoists, and then transported on carts. With the exception of the hatches providing access to the RHR heat exchangers, there is no equipment directly below or in proximity to the hatchways that could be impacted by a load drop. When servicing an RHR heat exchanger, a load drop would only impact that heat exchanger that is already out of service for repairs. The only credible load drop for these heat exchangers would be a drop of the tube bundles back into the heat exchanger shell. Based on the above, these hoists may be excluded from the scope of NUREG 0612 criteria.

20. Turbine Building Bridge Crane

This crane has a 140 ton main hoist and 25 ton auxiliary hoist and is used for handling heavy loads in the Turbine Building, primarily for moving large turbine generator components during maintenance or overhaul. It may also be used to handle plant components in the Turbine Building if these are being replaced. There is no safety-related equipment within the travel limits of this crane, with the exception of a portion of one diesel generator room located adjacent to the Turbine Building truck loading area. However, in the Turbine Building, this region is designated as a storage area that has a chain link fence around it, and contains small electrical gear. No heavy loads would be carried over this area. Based on the above, this crane may be eliminated from the scope of the NUREG 0612 criteria.

21. Drywell Relief and Safety Valve Monorail

This monorail is located at an elevation of approximately 272 feet in the drywell and is used for servicing safety

and relief valves mounted on steam line headers. These hoists would only be used when the reactor is shut down and on RHR cooling. There is no equipment required for decay heat removal in proximity to these jib cranes. Based on this, the monorail in the drywell may be eliminated from the scope of NUREG 0612 criteria.

22. Refueling Floor Jib Crane

23. Refueling Platform Hoist

Both of these handling systems are located at the 345 foot elevation of the Reactor Building and are used for handling various loads over the spent fuel pool or over the reactor. These may be used to handle fuel channels, control rod blades, LPRMs, or various tools such as LPRM cutters or the G.E. "CHAMS" channel inspection tool. No loads greater than the weight of a fuel assembly were identified that are routinely handled by these hoists. However, since these hoists are rated at 1,000 lbs., they could be allowed to handle loads greater than the weight of a fuel assembly which is approximaely 700 lbs. Because of this, these hoists are being derated so that they are clearly marked to not handle loads greater than 700 lbs. If it becomes necessary to lift a load greater than 700 lbs, but less than 1,000 lbs., a safety evaluation will be prepared to assure that the criteria of NUREG 0612 are satisfied for the lift. This is not expected to be necessary, however, since the Reactor Building Crane auxiliary hook could be used for such a lift. These hoists may be excluded from the NUREG 0612 criteria since they will not be allowed to handle loads greater than 700 lbs.

TABLE I

HANDLING SYSTEMS EXCLUDED
FROM NUREG 0612 CRITERIA

	Handling System	Location
1.	Reactor Feedwater Pump Monorails (16 ton)	Turbine Building
2.	Condensate Demineralizer Monorail	Turbine Building
3.	Diesel Generator Monorails - 2	Turbine Building
4.	CRD Storage and Repair Monorail	Reactor Building
5.	CRD Storge and Repair Jib Hoist	Reactor Building
6.	HPCI Equipment Monorail (4 ton)	HPCI Equipment Room
7.	HPCI/CRD Pump Room Access Hatch Hoists - (2 ton)	Reactor Building
8.	RCIC Equipment Monorail (2 ton)	Reactor Building
9.	Reactor Recirc. Pump Monorail (16 ton)	Drywell
10.	Recirc. Motor Generator Sets Monorail	Reactor Building
11.	Capping and Decontamination Station Monorail (5 ton)	Radwaste Building
12.	Waste Demineralizer and Filter Monorail	Radwaste Building
13.	Fuel Pool Filter Demineralizer Monorail	Radwaste Building
14.	Centrifuge CF-1-1A Monorail (3 ton)	Radwaste Building
15.	Centrifuge CF-1-1B Monorail (3 ton)	Radwaste Building
16.	Main Steam and Feedwater Valve Monorail (3 ton)	Reactor Building
17.	Suppression Pool Chamber Access Hatch Monorail (3 ton)	Reactor Building
18.	CRD Pump Monorails - 2 (4 ton)	Reactor Building

TABLE I

(continued)

	Handling System	Location
19.	Miscellaneous Portable Hoists for Corner Rooms Access and Servicing	Reactor Building
20.	Turbine Building Bridge Crane (140/25 ton)	Turbine Building
21.	Drywell Relief and Safety Valve Monorail	Drywell
22.	Refueling Floor Jib Crane	Reactor Building
23.	Refueling Platform Hoist (½ ton)	Reactor Building

ITEM 3: With respect to the design and operation of heavy load-handling systems in the containment and spent-fuel-pool area and those load-handling systems identified in 1, above, provide your evaluation concerning compliance with the guidelines of NUREG 0612, Section 5.1.1. The following specific information should be included in your reply:

ITEM 3.a Drawings and sketches sufficient to clearly identify the location of safe load paths, spent fuel, and safety-related equipment.

RESPONSE: It is Vermont Yankee's position that our present plant policy of handling heavy loads with the Reactor Building Crane is sufficient. Loads are lifted and moved directly to their intended destinations carefully and expeditiously so as to minimize handling time. In addition, pick heights are kept within reasonable limits. See Figure 1 for lay down areas of major components.

ITEM 3.b A discussion of measures taken to ensure that load-handling operations remain within safe load paths, including procedures, if any, for deviation from these paths.

RESPONSE: It is Vermont Yankee's position that our present plant policy of handling heavy loads with the Reactor Building Crane is sufficient. Loads are lifted and moved directly to their intended destinations carefully and expeditiously so as to minimize handling time. In addition, pick heights are kept within reasonable limits. See Figure 1 for lay down areas of major components.

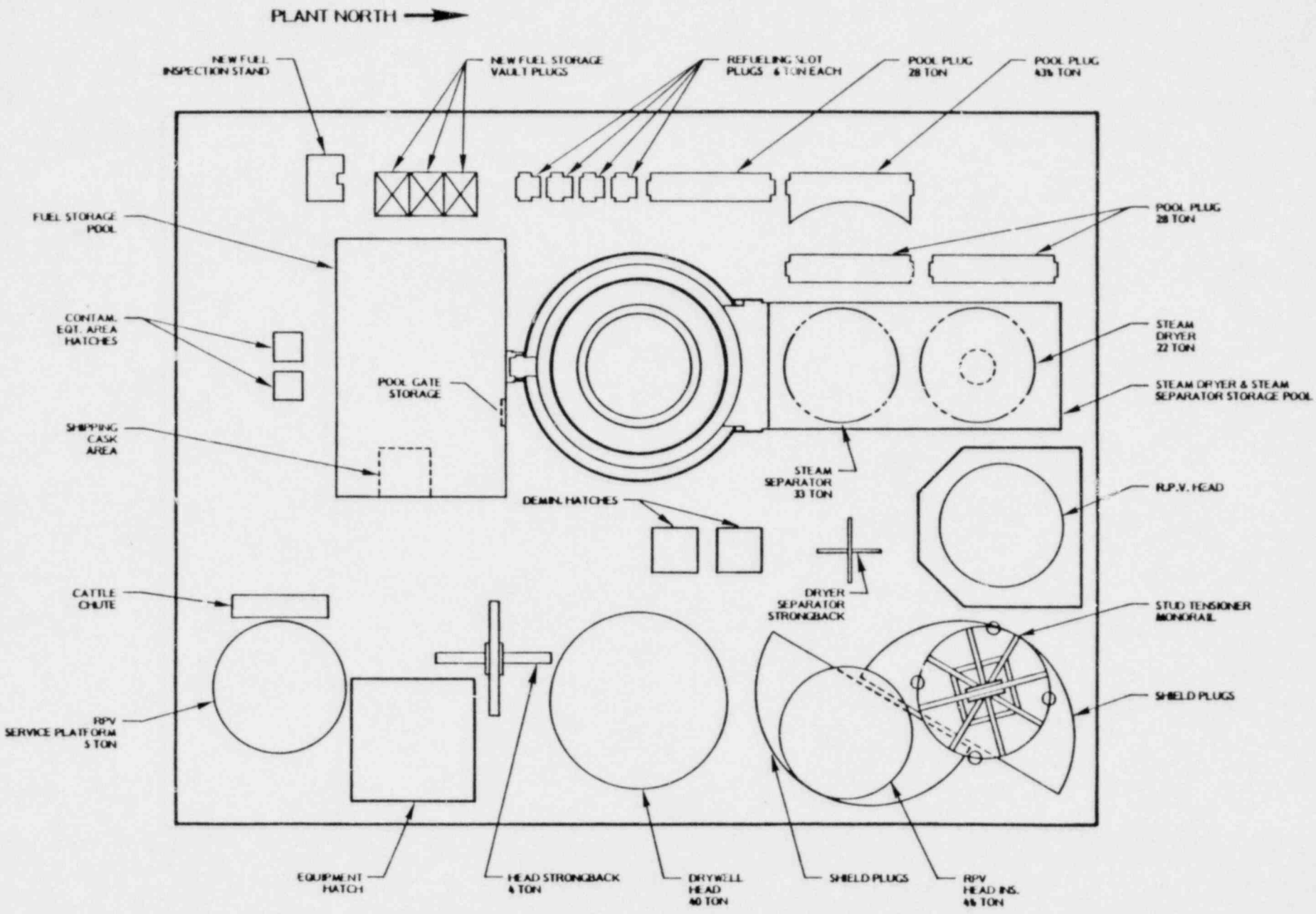

FIGURE 1

LAYDOWN AREAS FOR MAJOR COMPONENTS

ITEM 3.c. A tabulation of heavy loads to be handled by each crane which includes the load identification, load weights, its designated lifting device, and verification that the handling of such loads is governed by a written procedure containing, as a minimum, the information identified in NUREG 0612, Section 5.1.1(2).

RESPONSE: The requested information is provided in Table 2. Handling Procedures O.P. 1200, O.P. 1201, and O.P. 2200 at present include precautions; prerequisites; identification of proper handling equipment; training and qualification requirements for crane operators; sling selection criteria; required crane inspection by operator prior to load handling; supervision of lift by a designated individual; and steps in order to perform the lift. Vermont Yankee's position on defined load paths is stated in Item 3A. However, with regards to NUREG 0612, Section 5.1.1(2), we feel it is prudent to incorporate verification that inspections have been performed into the appropriate procedures. Furthermore, we will revise other procedures such that the particular items mentioned above are more explicit.

TABLE 2

REACTOR BUILDING CRANE HEAVY LOADS[1]

LOAD	WEIGHT (TONS)	APPLICABLE OPERATING PROCEDURES	LIFTING EQUIPMENT/ HOIST[5]
Reactor Vessel Head	54	O.P. 1200/3 O.P. 1201	Head Strongback/M
Drywell Head	44	O.P. 1200/3 O.P. 1201	Head Strongback/M
Dryer	22	O.P. 1200/3 O.P. 1201	Dryer & Separator Sling/M
Shroud Head/Steam Separator	33	O.P. 1200/3 O.P. 1201	Dryer & Separator Sling/M

TABLE 2

(continued)

LOAD	WEIGHT (TONS)	APPLICABLE OPERATING PROCEDURES	LIFTING EQUIPMENT/ HOIST[5]
Shield Blocks (6)	64-71.5[4]	O.P. 1200/3 O.P. 1201	Slings and Shackles/M
Vessel Service Platform	5	R.P. 2200[6]	Service Platform
New Fuel Storage Vault Plugs (3)	3 ea.	R.P. 2200[6]	Slings/A
Fuel Pool Gate	1	O.P. 1200/3 O.P. 1200	Slings/A
Refueling Slot Plugs (4)	6 ea.	O.P. 1200/3 O.P. 1201	Slings and Shackles/A
Vessel Head Insulation	4.5	O.P. 1200/3 O.P. 1201	Slings/A
Spent Fuel Shipping Cask	35 to 110	R.P. 2200[6]	Associated Cask Yoke/M
Filter-Demineralizer Hatch RWCU (2)	8 ea.	R.P. 2200[6]	Slings/M
Contam. Equipment Storage Area Hatches (2)	2.5 ea.	R.P. 2200[6]	Slings/A
Head Strongback	4	O.P. 1200/3 O.P. 1201	Main Hook/M
Dryer/Separator Sling Assembly	1.5	O.P. 1200/3 O.P. 1201	Main Hook/M
Stud Tensioner Monorail	3.5	O.P. 1200/3 O.P. 1201	Aux. Hook/A
Cattle Chute	14	O.P. 1200/3 O.P. 1201	4-Part Sling/M

TABLE 2

(continued)

LOAD	WEIGHT (TONS)	APPLICABLE OPERATING PROCEDURES	LIFTING EQUIPMENT/ HOIST[5]
Dryer/Separator Storage Pool Plugs (4)	28/43.5[2]	O.P. 1200/3 O.P. 1201	?/M
Load Block & Hook	6	R.P. 2200[6]	Main Hoist/M
High-Pressure Water Blaster (Decon. Machine)	2.5	R.P. 2200[6]	Slings/A
Misc. Plant Equipment	(less than) 20	R.P. 2200[6]	Slings/A

1 NUREG 0612 defines a heavy load as one that weighs more than the combined weight of a single spent fuel assembly and its associated handling tool. For reference, the weight of a spent fuel assembly and its handling tool at Vermont Yankee is approximately 800 lbs.

2 Three Storage Pool Plugs weigh 28 tons each; one weighs 43.5 tons.

3 O.P. 1200, "Preparation of the Reactor Vessel for Refueling"
O.P. 1201, "Assembly of the Reactor and Drywell Systems"

4 Two Shield Blocks are 71.5 tons each; two are 67 tons each, and two are 64 tons each.

5 M - Reactor Building Crane main hoist, 110 ton capacity.
A - Reactor Building Crane auxiliary hoist, 7 ton capacity.

6 R.P. 2200, "Operation of the Reactor Building and Turbine Building Bridge Cranes."

ITEM 3.d Verification that lifting devices identified in 2.1.3-3, above, comply with the requirements of ANSI N14.6-1978 or ANSI B30.9-1971 as appropriate. For lifting devices where these standards, as supplemented by NUREG 0612, Section 5.1.1(4) or 5.1.1(5), are not met, describe any proposed alternatives and demonstrate their equivalency in terms of load-handling reliability.

RESPONSE: With regard to special lifting devices, there are three identified in Item 3.c above that are used in lifts over an open reactor vessel. These special lifting devices are:

1) Dryer and Separator Sling Assembly
2) Head Strongback
3) Service Platform Sling

The only other special lifting device of concern are lifting yokes for spent fuel shipping casks. As required by license amendment 29, Vermont Yankee must submit to the NRC details on cask yoke lifting device design prior to any cask handling operations.

Description of Dryer and Separator Sling

The dryer and separator sling is used to remove and install the dryer and the steam separator assembly. The device is a cruciform steel frame attached to a hook box by four wire ropes with turnbuckles. The four ends of the cruciform frame are each fitted into a bell-shaped housing which is open and flared at the bottom. A hole passes through two sides of the housing for the lifting pin travel. Each lifting pin is actuated by a double-acting air piston. The lifting pin, in turn, actuates an air valve at the end of the pin's travel. This air valve gives positive indication by way of a pressure gauge

that the lifting pin is fully inserted into the dryer and separator lifting lug. A lifting eye, located on top of each I-beam, is connected to a turnbuckle and a wire rope. The wire ropes are attached to the hook box by spelter sockets and pins. The hook box contains a slot at the top which is sized to accommodate the double hook of the crane. Two hook pins pass through the hook box to engage the double hook of the crane.

Description of the Head Strongback

The head strongback is used to hoist the drywell head and the reactor vessel head. The device consists of four lifting arms mounted at right angels between top and bottom four-point star plates. The top plate has a slot through which the double hook of the crane passes to engage the two hook pins. The strongback is attached to lifting lugs on the drywell head and reactor vessel head, and to lifting lugs at the end of each arm of the strongback, by turnbuckles and anchor shackles.

Description of the Service Platform Sling

The service platform sling is used to hoist the service platform into place over the reactor vessel flange. The sling is a three-leg wire rope sling with a turnbuckle in one of the legs. The three legs are gathered to a master link. A load hook is fastened to each end of the three legs for attachment to three lifting brackets on the service platform.

The dryer/separator sling assembly and the head strongback were evaluated against ANSI N14.6. The service platform sling was compared to ANSI B30.9.

Other special and general purpose slings are covered by criteria added to load handling procedures that meet the intent of ANSI B30.9 for sling selection and use as well as inspection and maintenance. The evaluation of the service platform sling design, inspection, and maintenance found that it complied with ANSI B30.9 with no deviations or exceptions.

For the reasons listed below, the detailed comparison of the dryer/separator sling assembly and the head strongback to ANSI N14.6-1978 was limited to Sections 3.2 and 5 of the standard.

1) These devices were designed by General Electric Company prior to the existence of ANSI N14.6-1978. In this regard, there are a number of sections in the standard that are difficult to apply in retrospect. These are the sections entitled, Designer's Responsibilities (Section 3.1); Design Considerations (Section 3.3); Fabricator's Responsibilities (Section 4.1); Inspector's Responsibilities (Section 4.2); and Fabrication Considerations (Section 4.3). Because documentation is not available to assure that all of the subparts of these sections were met, they have not been addressed item by item for the purpose of identifying and justifying exceptions. However, information on the drawings indicate that sound engineering practices were placed on the fabricator and inspector by the designer for the purpose of assuring that the designer's intent was accomplished. On this basis, there is reasonable assurance that the intent of the sections of the standard listed above was, in fact, accomplished in the design, fabrication, inspection, and testing of these devices.

2) Section 1.0, Scope; Section 2.0, Definitions; Section 3.4, Design Considerations to Minimize Decontamination

Effects in Special Lifting Device Use; Section 3.5, Coatings; and Section 3.6, Lubricants are not pertinent to load handling reliability of the devices and, therefore, have not been addressed for the purpose of identifying and justifying exceptions.

3) Section 6, Special Lifted Devices for Critical Loads, is applicable to critical loads. A critical load is defined in the standard as:

> "Any lifted load whose uncontrolled movement or release could adversely affect any safety related system when such system is required for unit safety or could result in potential offsite exposures comparable to the guideline exposures outlined in Code of Federal Regulations, Title 10, Part 100."

None of the loads lifted by the devices identified above have as yet been determined to be a critical load. Such a determination would require an analysis of the consequences of various load drop scenarios. Since such analyses have not been performed, this information cannot be provided, and, accordingly, applied to Section 6 of ANSI 14.6-1978 of their designated lifting devices.

The detailed comparison of the dryer/separator sling and head strongback to Section 5 of ANSI N14.6-1978, as supplemented by NUREG 0612, Section 5.1.1(4), has been completed. This comparison found that certain changes to Vermont Yankee procedures were required in order to meet the intent of the inspection and test requirements of ANSI N14.6.

With regard to verifying continuing compliance, Section 5.3 of ANSI N14.6-1978 requires load testing to 150% of the maximum load followed by a visual

examination for defects and an inspection for permanent deformation; or, as an alternative, the load testing may be omitted, and dimensional testing, visual inspection, and nondestructive inspection and major load-carrying welds and critical areas shall suffice.

Load testing to 150% of the maximum load may not be practical for an operating plant. Therefore, a detailed program of inspections and examinations has been prepared. The component parts, including weldments, that will be inspected or examined are shown on Tables 3 through 5. These examinations and inspections will be conducted on a one-time basis prior to our 1983 refueling outage. Following that inspection, our program will be adjusted accordingly. In addition, operating personnel shall conduct a thorough visual examination of the devices prior to each use for indications for damage or deformation.

If major repairs or alterations are performed, then the device will be subjected to the 150% load test followed by visual examinations for defects and an inspection for permanent deformation as specified in Section 5.3.2 of ANSI N14.6-1978.

TABLE 3

TESTING TO VERIFY CONTINUING COMPLIANCE
DRYER AND SEPARATOR SLING

Part	Type of Examination
1. Hook Box	1 Visual examination of parts and welds. 2. MT of welds, sling attachment lugs, and area around hook pin holes. 3. Visual examination of pin holes and plate area around pin holes.
2. Hook Pins	1. Visual examination. 2. UT
3. Wire Rope Slings	1. Visual examination (see Note 4 below for acceptance criteria). 2. MT of open spelter sockets and socket pins, and M.T. of tapered sleeve end and end thimble. 3. Visual examination of socket.
4. Turnbuckles	1. Visual examination. 2. MT of turnbuckle body, threaded jaw end fittings, and bolts. 3. Visual examination of jaw ends, bolts, and body of turnbuckle.
5. Cross I-Beams	1. Visual examination, including all welds. 2. MT of welds. 3. Visual examination of spacing between lifting lugs, center to center.
6. Lifting Eye at End of Each I-Beam	1. Visual examination, including weldment to I-Beam. 2. MT of lifting eye and welds.

TABLE 3

(continued)

Part	Type of Examination
7. Bell-Shaped Housing	1. Visual examination, including welds. 2. MT of welds of lifting pin plates. 3. Visual examination of pin plates.
8. Lifting Pins	1. Visual examination. 2. UT (or MT). 3. Functional test of entire air-operated mechanisms.
9. Litting Bar on Steam Dryer/Separator	1. Visual examination.

NOTES:

1. Visual examination shall be a thorough inspection for deterioration, corrosion, or deformation.

2. Visual examination of pins shall be for warpage.

3. Visual examination of plates, socket ends, lugs, eyes, and turnbuckles shall be for circularity of pin holes and for reduction in cross-sectional area around pin holes.

4. Visual examination of wire rope slings shall be made to determine if there are any broken wires; worn or scraped outside wires; evidence of heat damage, corrosion of rope or end attachments; deformed or twisted hooks; kinking, crushing, bird caging, or other damage resulting in distortion of the rope structure.

5. Functional test of lifting pins shall be made to verify full travel of pins and operation of air relay valve and pressure gauge.

TABLE 4

TESTING TO VERIFY CONTINUING COMPLIANCE
HEAD STRONGBACK

Part	Type of Examination
1. Hook Box	1. Visual examination of parts, including welds. 2. MT of centerplates and weldments to lifting arms. 3. Visual examination of plates and pin holes.
2. Hook Pins	1. Visual examination. 2. UT.
3. Lifting Arms	1. Visual examination, including all weldments. 2. MT of all weldments of top, bottom, and center plates; also, MT of entire surface of lifting lugs. 3. Visual examination of lifting lugs and pin holes in lugs.
4. Anchor Shackles	1. Visual examination. 2. MT. 3. Visual examination of shackle pin hole and cross-sectional area around the pin hole.
5. Turnbuckles	1. Visual examination. 2. MT, including body of turnbuckle and threaded jaw ends. 3. Visual examination of pin holes in jaw end, body of turnbuckle, and threaded shanks.
6. Shackle Pins (all) or Bolts	1. Visual examination. 2. UT.

TABLE 4

(continued)

Part	Type of Examination
7. Drywell Head Lifting Lugs and Reactor Vessel Head Lifting Lugs	1. Visual examination, including welds. 2. MT of lugs and welds. 3. Visual examination of pin hole and area around pin hole.

NOTES:

1. Visual examination of parts shall be a thorough inspection for deterioration, corrosion, and deformation.
2. Visual examination of pins shall be for warpage.
3. Visual examination of plates, lugs, and shackles shall be for circularity of pin holes and reduction in cross-sectional area around pin holes.

TABLE 5

TESTING TO VERIFY CONTINUING COMPLIANCE
SERVICE PLATFORM LIFTING SLING

Part	Type of Examination
1. Service Platform	1. Visual examination of all attached parts such as guard rails, drive wheel assemblies, idler wheel, etc. for looseness.
2. Service Platform Sling	1. Visual examination. (See Note 3 below for acceptance criteria). 2. MT of end attachments, shackles, hooks, shackle pins, and turnbuckle. 3. Visual examination of end attachments, shackles, hooks, shackle pins, and turnbuckle.
3. Lifting Brackets on Service Platform	1. Visual examination. 2. MT of lifting brackets and weldment to platform beams. 3. Visual examination of brackets for deformation.

NOTES:

1. Visual examination shall be a thorough inspection of part(s) for deterioration, corrosion, and deformation.

2. Visual examination of pins shall be for warpage. Dimensional examination of shackles and hooks shall be for circularity of pin holes and for reduction of cross-sectional area around pin holes.

3. Visual examination of wire rope slings shall be made to determine if there are any broken wires; worn or scraped outside wires; evidence of heat damage; corrosion of rope or end attachments; deformed or twisted hooks; kinking, crushing, bird caging, or other damage resulting in distortion of the rope structure.

ITEM 3.e. Verification that ANSI B30.2-1976, Chapter 2-2, has been invoked with respect to crane inspection, testing, and maintenance. Where any exception is taken to this standard, sufficient information should be provided to demonstrate the equivalency of proposed alternatives.

RESPONSE: A new procedure for inspection, testing, and maintenance of the reactor building crane has been developed. This procedure is "Maintenance and Inspection Procedure for the Reactor Building Crane." In addition, minor modifications were made to the crane operation procedure, R.P. 2200, "Operation of the Reactor Building and Turbine Building Bridge Cranes," to include further appropriate operator inspections prior to load movement. With the revisions and modifications, the procedures meet the intent of the criteria in ANSI B30.2-1976, Chapter 2-2.

ITEM 3.f. Verification that crane design complies with the guidelines of CMAA Specification 70 and Chapter 2-1 of ANSI B30.2-1976, including the demonstration of equivalency of actual design requirements for instances where specific compliance with these standards is not provided.

RESPONSE: The Reactor Building Crane was modified in 1976 to satisfy the requirements of APCSB BTP 9-1 which subsequently became NUREG 0554. The modifications included replacement of the trolley with one that has dual load paths on the main hoist. The criteria in BTP 9-1 called for the crane to be designed and fabricated to a number of industry standards, including ANSI B30.2 and CMAA-70. On December 30 1975, Vermont Yankee submitted to the NRC a report entitled, "Reactor Building Crane Modification," that described how the criteria of BTP 9-1 were satisfied for this crane. This information was reviewed and approved by the NRC, as described in the staff's safety evaluation report transmitted by letter of January 28, 1977 from R. Reid (NRC) to R. Groce (Yankee Atomic). Based on this previous review, we believe that for the Vermont Yankee Reactor Building Crane it is not necessary to reevaluate the crane design since conformance with the criteria of ANSI B30.2, CMAA-70, and other provisions of BTP 9-1 was addressed in the previous review.

ITEM 3.g. Exceptions, if any, taken to ANSI B30.2-1976 with respect to operator training, qualification, and conduct.

RESPONSE: Certain general criteria for the qualification and training Reactor Building of crane operators are contained in R.P. 2200, "Operation of the Reactor Building and Turbine Building Bridge Cranes." These criteria are supplemented by guidance provided in an internal memorandum listing topics to be covered in the crane operator training course. These topics are essentially identical to the provisions of ANSI B30.2-1976, Chapter 2-3. This general directive is being implemented at Vermont Yankee, although it is not in the form of an approved porocedure. This training and examination of prospective operators is performed by the Maintenance Supervisor or his designated alternate.

The current procedures were reviewed against the provisions of ANSI B30.2-1976, Chapter 2-3, and a number of minor changes were found necessary in order for the current program to satisfy ANSI B30.2, Chapter 2-3 requirements. In addition, a new procedure with qualification records has been developed in order to formalize the program for crane operator training.