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REPLY TO
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December 7, 1992
BVY 92-136

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

References:
a) License No. DPR-28 (Docket No. 50-271)
b) Letter, USNRC to VYNPC, Electrical Distribution System Functional Inspection of Vermont Yankee, Report No. 50-271/92-81, dated September 30, 1992
c) NUMARC 90-12, "Design Basis Program Guidelines", dated October 1990
d) Letter VYNPC to USNRC, BVY 92-124, Response to NRC Electrical Distribution System Functional Inspection of Vermont Yankee, Report No. 50-271/92-81, Reply to Apparent Violations, dated October 30, 1992
e) Letter VYNPC to USNRC, BVY 91-88, Station Blackout (SBO) Supplemental Information on Coping Assessment, dated September 30, 1991

Subject: Response to NRC Electrical Distribution System Function Inspection of Vermont Yankee, Report No. 50-271/92-81, Unresolved Items and Other Issues

Dear Sir:

This letter provides information requested by Reference b) to:

1) Provide our resolution and conclusions on unresolved items pertaining to degraded grid relay settings and diesel generator fuel oil transfer,

2) Provide our schedule for resolution of the other issues identified at the exit meeting.

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IE01

The degraded grid and fuel oil transfer unresolved items are addressed in Attachments A and B respectively. Attachment C to this letter provides our current schedule for resolution of all the items. If you have any further questions regarding these items, please contact Mike Metell (802-257-5271, Ext. 218) in my office.

Very truly yours,

Vermont Yankee Nuclear Power Corporation

James P. Pelletier
Vice President, Engineering

cc: USNRC Region I Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS

ATTACHMENT A

DEGRADED GRID RELAYS

Section 3.3 - Separation from Preferred Power Source - Item 92-81-04

.... In response to the NRC concerns, the licensee stated that they were now reassessing the degraded grid relay setpoint bases. This reassessment emerged as a scheduled work activity as a result of surveillance testing performed during the March 1992 plant outage when these setpoints were observed to have drifted outside the technical specification limits. The licensee also indicated that completion of a new voltage regulation analysis was expected by the end of 1992.

In view of the above, the acceptability of voltage regulation is unresolved pending the licensee's preparation of appropriate analyses addressing the potential spurious grid separations described above (50-271/92-81-04).

RESPONSE

We agree with the EDSFI inspection team that for 110KV/340KV minimum design line voltage in combination with maximum 4KV bus loading and concurrent accident signal, Vermont Yankee could be disconnected from the preferred power source and could be subject to an out of phase closure of a diesel generator breaker.

To address the postulated condition, Vermont Yankee has taken the following immediate actions:

- Vermont Yankee has examined worst case plant loadings and determined these loadings can only occur when the cooling towers are on line. Vermont Yankee has determined that without this cooling tower load, the postulated event should not occur.

  Additionally, we have examined actual minimum/maximum voltages currently supplied by NEPEX (New England Power Exchange) and compared this data to those values used in our voltage regulation analysis. We have determined that the original voltage values used in our analysis were based on very conservative historical limits. We estimate that our actual minimum line voltages are about 115KV and 345KV respectively (versus 110KV and 340KV used in our original analysis). We estimate that our normal line voltages are typically greater than 117KV and 354KV respectively. Based on these more realistic values, Vermont Yankee has not, and does not anticipate being subject to the grid separation event as postulated in Reference b).

Our short and long term actions are as follows:

- Short term actions - Vermont Yankee has contacted NEPEX and has initiated discussions on changing NEPEX procedures to ensure that minimum supplied line voltages are specified/maintained at 115KV/345KV levels. Other New England nuclear stations have pursued and secured similar requested changes. We will also complete the in-house voltage regulation study using the new limits. We anticipate that these changes can be accomplished by Spring 1993.

- Long term actions - Vermont Yankee plans to investigate other potential improvements which could further ensure preferred power source availability. These include a) limited shedding of nonessential loads such as the cooling towers; b) replacement of the degraded grid relays with models that have narrower reset tolerances; c) modification of the initiation logic of the degraded grid relays. The need for any improvements beyond the short term actions to be taken will also be considered. These investigations are scheduled to be completed by the Fall of 1994.

ATTACHMENT B

DIESEL GENERATOR FUEL OIL TRANSFER SYSTEM

Section 4.2.1 - Fuel Oil Transfer Pump Submersion - Item 92-81-09

During a walkdown of the fuel oil transfer pump house, the team noted that the pumps were located in a single pit adjacent to the storage tank pit. They also observed that a conduit penetrating the wall between the two pits had not been sealed. Because of the pumps vulnerability to common mode failure due to flooding, the team asked the licensee to address maximum flood level, tank rupture resulting from a design basis missile, and qualification of pump motors for submersion. The licensee's preliminary review indicated that the maximum flood level was several inches below the pump house access door and the rim around the tank pit. However, if the tank contained more than 68,000 gallons, a rupture of the tank at or below ground level could flood the tank pit above the 8' 4" level of the conduit penetration and hence the pump room. The pump motors were not qualified for submersion.

In view of the above, the capability of the transfer pumps to operate in the event of the postulated tank rupture is an unresolved item pending the licensee's further evaluation of the issue and NRC review (50-271/92-81-09).

RESPONSE

Vermont Yankee has determined that the only design purpose for the above mentioned wall penetration is to provide access for the subject conduit. To enhance the existing berm oil retention capability, the subject conduit is scheduled to be sealed by December 15, 1992. We conclude that this enhancement addresses all flooding/pump submersion items.

Section 3.2.1 - Fuel Oil Temperature Control - Item 92-81-10

.... Although, on the basis of the temperature specified in Section 10.12.3 of the FSAR, the requirements of the fuel oil procurement specification met those of the ASTM Standard and, hence, those of the Technical Specification, the team expressed concern for those times when the temperature fell below the pour point of the oil. Extended severe weather conditions could cause gelling of the fuel oil and clogging of both transfer pump strainers. Vermont Yankee's cold weather procedure, OP 2196 required that the temperature of fuel oil at the pump suction be noted once each shift. However, the primary purpose of the temperature reading was to ascertain the operability of the heat tracing.

.... The inspectors agreed that the mass of the oil would retard gelling, but noted that this and past experience with fuel analysis could not be used to ensure that a common mode failure of the fuel transfer system would not occur. Therefore fluidity of the fuel oil is unresolved pending appropriate analysis and corrective actions by the licensee (50-271/92-81-10).

RESPONSE

Vermont Yankee will enhance OP 3140 "Alarm Response" by December 15, 1992 to alert the operators of potential loss of fuel oil transfer capability for sub zero weather conditions. Specifically:

- We have analyzed fuel usage in sub zero weather, and have determined that fuel is transferred about once every two hours to meet house heating needs. Therefore by monitoring the house heating boiler day tank level (via level alarm switch LSL-108-6B), we effectively and automatically monitor fuel oil transfer. We will update OP 3140 to note that if alarm switch LSL-108-6B is alarmed, that fuel oil transfer/EDG operability may be impacted.

- To aid the operator in troubleshooting the LSL-108-6B alarm, we have also updated OP 3140 to compare the pump suction line temperature during transfer, to the fuel oil tank oil pour point (0 degree F specification, -10 to -20 degrees F typical actual values) if fuel oil transfer gelling is suspected. During fuel oil transfer, representative internal storage tank oil temperatures can be read at the fuel oil transfer pump suction line sensor.

We have also examined the potential for analytically predicting, under severe cold weather conditions, when the fuel oil gelling potential could be a problem. We have determined that:

- A pure analytical model may not give the desired accurracy, relative to the large number of variables to be considered, such as radiational cooling, air temperature, underground heat transfer, wind heat loss, precipitation, etc.

- Collecting data at the above mentioned conditions and tank oil temperature during transfer would allow evaluation of the potential for fuel oil gelling.

We have decided to collect and analyze this data during the 1992-1993 winter season. Please note that Vermont Yankee does not anticipate an oil transfer problem in that we have transferred fuel oil successfully without gelling for the past 20 years of operation, including severe sustained cold spells. We have concluded that these actions provide sufficient warning of a possible fuel oil gelling problem and address this issue.

Section 3.2.1 - Fuel Oil Transfer Piping Damage - Item 92-81-11

During a walkdown of the fuel oil transfer system, the team noted that approximately 15 feet of transfer piping downstream of each pump had been installed within inches from each other, outside the pump house. No protection had been provided against external damage from hazards in the area, e.g. backing up vehicle or missile during a tornado. The piping was in an exposed area adjacent to a roadway. The team was concerned that damage from such hazards might cause a common mode failure of both fuel oil supply lines and the shutdown of both EDGs upon depletion of the 3 hour supply of fuel oil stored in the day tanks.

The licensee was not able to satisfactorily address the issue during the inspection. Therefore this item is an unresolved item pending review by the licensee (50-271/92-81-11).

RESPONSE

We agree with the EDSFI Inspection Team that enhancing protection of these lines can improve their safety performance. On this basis, Vermont Yankee has completed the following actions:

- Fuel Oil Transfer Line Vehicle Protection - Vermont Yankee has determined that vehicle traffic could impact fuel oil transfer line performance. Therefore, during November 1992, Vermont Yankee completed installation of vehicle barrier protection for these fuel oil transfer lines.

- Tornado Impact on Fuel Oil Transfer Line Assessment - We have reviewed this concern relative to our Station Blackout response (Reference e). The probability of experiencing a tornado at Vermont Yankee is about 2 E-05 occurrence per year (i.e. 9.8 E-5 occurrence per year per square mile). We estimate that the probability of damage occurring at these lines (based on previous similar studies and Reference e), if Vermont Yankee experienced a tornado, would be less than 1 E-06. This is sufficiently small, such that further immediate action is not warranted at this time. Vermont Yankee will more formally address this item in our IPEEE Program.

Attachment C- Schedule for Addressing EDSFI Items

		Planned Completion Date
Separation from Preferred Power Source Analysis Unresolved Item 1 - (50-271/ 92-81-04)		Immediate - Complete Short term - Spring 93 Long term - Fall 94
Diesel Generator Loading Analysis Unresolved Item 2 - (50-271/ 92-81-05)		Summer 93
120 Vac Protective Devices Coordination Analysis Unresolved Item 3 - (50-271/ 92-81-06)		Winter 93/94
125 Vdc Protective Devices Coordination Analysis Unresolved Item 4 - (50-271/ 92-81-07)		Fall 93
DC Bus Cross Connections Analysis Unresolved Item 5 - (50-271/ 92-81-08)		Spring 93
Fuel Oil Transfer Pump Submersion - Hardware Upgrade Unresolved Item 6 (50-271/92-81-09)		Dec 15, 1992
Fuel Oil Temperature Control - Procedural Enhancement Unresolved Item 7 (50-271/92-81-10)		Dec 15, 1992
Fuel Oil Transfer Piping Damage Unresolved Item 8 - (50-271/ 92-81-11)	- Short term analysis - Hardware Upgrade - IPEEE calculation	Complete Complete Spring 95
Diesel Generator Room Temperature Calculation Unresolved Item 9 - (50-271/ 92-81-12)		Feb 93
Battery Room Ventilation Calculation Unresolved Item 10 - (50-271/ 92-81-13)		Spring 93
Cable Ampacity Calculation		Summer 94
120 Vac Control Circuit Analysis AC System Short Circuit Analysis		Winter 93/94 Spring 93
120 Vac Voltage Drop Study		Winter 93/94
125 Vdc Voltage Drop Study		Spring 94
Switchgear Room Ventilation Calculation		Feb 93

Note 1: In accordance with NUMARC 90-12 (Reference c) and noted in Reference b), Vermont Yankee had already scheduled many of the above enhancements.

Note 2: The above schedule is for Vermont Yankee planning purposes only. Vermont Yankee does not consider this schedule as a commitment. It may be adjusted based on arising priorities.