

ENCLOSURE 1

SALP REPORT - VERMONT YANKEE NUCLEAR POWER STATION

50-271/97-99

I. BACKGROUND

The SALP Board convened on January 30, 1997, to assess the nuclear safety performance of the Vermont Yankee Nuclear Power Station for the period July 16, 1995, through January 18, 1997. The Board was conducted pursuant to NRC Management Directive (MD) 8.6 (see NRC Administrative Letter 93-20). Board members were: James T. Wiggins (Board Chairman), Director, Division of Reactor Safety, NRC Region I (RI); Richard W. Cooper, Director, Division of Reactor Projects, RI; and, S. Singh Bajwa, Acting Director, Project Directorate I-1, NRC Office of Nuclear Reactor Regulation. The Board developed this assessment for the approval of the Region I Administrator.

The performance ratings and the functional areas used below are described in NRC MD 8.6, "Systematic Assessment of Licensee Performance (SALP)."

II. PERFORMANCE ANALYSIS - OPERATIONS

Operations management and staff performance was generally good as reflected by good day-to-day safety focus and oversight of plant activities by management, and excellent operator response to planned and unplanned plant transients reflecting a performance based training program. However, a few of the unplanned transients were caused by inadequate or weak review by the Operations staff of the impact of planned maintenance or modification activities on the plant, prior to performing the work. A notable example that resulted in an unnecessary operator challenge, and reflected the insufficiency in the conduct of a plant impact assessment, was the unanticipated plant response to the feedwater regulating valve down-power troubleshooting evolution that resulted in a plant trip. Day-to-day operator performance was good, but occasional inattentiveness or procedural adherence lapses occurred such as those involving the failed emergency diesel generator start, inadvertent single rod scram, breaker protective tagging near misses, and a reactor vessel overfill event during integrated emergency core cooling systems (ECCS) testing. Control room operator response to an instrument air system pressure drop transient and a recirculation pump trip, due to poor control of a non-safety related transformer ammeter calibration, was excellent and demonstrated good plant monitoring and excellent operator training in reacting to operational transients.

Operations problem identification and corrective action performance was generally good. Operations staff monitoring and preventive measures to minimize river water debris from building up on the intake structure and their identification of pinhole leaks in the service water system reflected good plant systems monitoring and operator acuity to changing plant conditions. In contrast, recent events reflected cold weather preparations that were not comprehensive. Further, in lieu of obtaining a Technical Specifications (TS) amendment, Vermont Yankee had issued an "interpretation" that could have resulted in the plant operating in conflict with the TS definition of cold shutdown conditions and the mode switch position.

On-site and off-site review committees were typically effective. The Plant Operations Review Committee (PORC) exhibited a clear and well-defined safety focus during their examination of Inservice Testing and Appendix J program deficiencies. In addition, the PORC provided good recommendations for the postponement of scheduled on-line maintenance when the battery room block wall seismic qualification questions were surfaced. The Nuclear Safety and Audit Review Committee was observed to be critical and probing in its review of plant activities and in identifying potential safety issues. While audits, self-assessments, and oversight committee activities have been generally effective in identifying problems, the licensee did not fully use the results of those reviews to effect improvements in the areas of procedural quality and human performance.

In summary, performance in the Operations functional area was good overall. Management and staff conduct of day-to-day plant activities was generally good and properly focused on plant safety. Operator training was effective and contributed to excellent operator response to plant transients. Inadequate or weak reviews by Operations staff on the impact of maintenance and modification activities have, on a few occasions, resulted in an unplanned transients. Operations department problem identification and corrective action performance was generally good. While audits, self-assessments, and oversight committee activities have been generally effective in identifying problems, the licensee was not fully effective in using the results of those reviews to achieve necessary improvements in the areas of procedural quality and human performance.

The Operations Area was rated **Category 2**.

III. PERFORMANCE ANALYSIS - MAINTENANCE

During this SALP period, the quality of work performed by the maintenance and testing staffs reflected excellent plant knowledge and technical expertise. However, several on-line maintenance activities performed on balance of plant equipment resulted in unnecessary plant challenges. Poor communications and coordination among the maintenance, operations and engineering staffs resulted in an unanticipated condensate system transient during an on-line preventive maintenance activity on a balance of plant electrical bus. Also, a recirculation pump trip occurred during performance of an on-line calibration of a transformer ammeter as a result of procedural adequacy and adherence weaknesses and a failure to adequately assess the potential impact of this work activity on the plant. In contrast, on-line maintenance activities performed on safety related systems were well planned and executed. In addition, safety significant emergent work, such as the replacement of the scram solenoid pilot valve (SSPV) diaphragm was performed well.

Problem identification and resolution in the maintenance area was mixed. Licensee actions following the transformer ammeter calibration event included a thorough root cause evaluation and comprehensive corrective actions. However, Vermont Yankee staff follow-up of a few items, such as the lack of suppression chamber spray and cooling system testing and main steam line isolation valve actuator water intrusion, reflected shallow root cause and corrective action efforts.

When compared to the last SALP, some improvement was noted in reducing the number of plant transients due to equipment problems. Use of industry operating experience and

routine surveillance testing results identified a degrading SSPV diaphragm condition. The plant staff was aggressive in monitoring safety system operability and was effective in identifying a more reliable replacement valve. Similarly, prompt maintenance staff action minimized the impact of a loose bolting condition on residual heat removal service water isolation valves. In contrast, the maintenance staff actions to contain and control the body-to-bonnet steam leak on MS-V77 were slow; as a result leaking steam caused numerous nuisance fire detector alarms and contaminated water was not promptly channeled to the floor drains. Vermont Yankee management of the work order backlog was appropriate with routine tracking and trending reports being reviewed and used to prioritize work orders and allocate available resources.

Although surveillance testing was generally conducted well and unsatisfactory test results appropriately resolved, test procedure adequacy and adherence problems persisted throughout the SALP period. These surveillance testing discrepancies included: inconsistencies between the advanced off-gas system hydrogen monitors' operating and test procedures; conflicting station battery design specifications and periodic test procedure acceptance criteria; unapproved use of switch-type jumpers for testing and improper emergency diesel generator load limits adjustments representing procedural adherence concerns; and a failed attempt to conduct turbine over-speed trip testing immediately prior to commencement of the refuel outage due to poor procedural review and preparation. Although these test procedure discrepancies represented a small fraction of the total population of periodic tests routinely performed without incident or personnel error, they reflect a need for continued emphasis on thorough, periodic procedure reviews and strict adherence to procedures.

In summary, performance by the VY staff of maintenance and surveillance testing activities was good with some persistent problems due to human performance problems. Equipment performance and material condition of the plant was good with a few exceptions. The maintenance staff's problem identification and resolution process was generally good. Further, surveillance testing procedure adequacy and adherence problems point to weaknesses in the periodic review process and in human performance.

Maintenance was rated **Category 2**.

IV. PERFORMANCE ANALYSIS - ENGINEERING

During this SALP period, management oversight and involvement in the resolution of Appendix R, Appendix J, Inservice Testing (IST), and MOV issues resulted in improved performance in those programs. The quality and depth of self-assessments demonstrated improvement in identifying problems associated with program scope and implementation. However, while significant, high quality technical efforts were applied to address Appendix R deficiencies, management's intent to restart the plant from an outage with reliance on unapproved exemptions associated with safe shutdown strategies indicated an incomplete understanding of the regulatory process.

The quality of technical work and engineering products was mixed. Engineering evaluations and plant modifications associated with the new reactor water cleanup system bypass line and with efforts to improve control rod scram response times were found to be

technically accurate, thorough and of very good quality. In addition, the licensee performed consistently high quality engineering evaluations of core shroud inspection results and inservice inspection indications. However, the engineering staff did not appropriately react to a seismic qualification concern associated with a battery room block wall. In this case, the engineering evaluation misapplied an analysis model resulting in an inappropriate decision to defer completion of a permanent solution to the problem. Also, the initial safety evaluation for the residual heat removal (RHR) minimum flow valve issue was narrowly focused and a prompt safety evaluation for the absence of emergency diesel generator (EDG) room tornado protection was not performed.

Revisions to procedures and programs for conduct of engineering work resulted in improved performance; particularly with respect to Appendix R, Appendix J, IST, and MOV activities. Also, the licensee continued benchmarking efforts in the area of operating experience review and participated in a quality assurance audit exchange program to improve overall engineering performance. Staff performing engineering activities exhibited an improved questioning attitude regarding engineering problems and a heightened sensitivity to the need to perform thorough evaluations. However, the licensee made little progress over the SALP cycle in establishing a system engineering function. In addition, the licensee began implementing a design basis documentation effort during this period. Given the problems the licensee identified in its reviews of engineering programs, and given the design basis issues apparent from the RHR minimum flow valve, the battery room block wall, and the EDG room tornado protection issues, continued progress is needed in those activities intended to identify, recover, and maintain licensing and design bases documentation.

In summary, management oversight of engineering activities and corrective action efforts was generally good. Engineering staff was generally effective in responding to emergent technical issues. Management initiatives taken to address engineering program deficiencies reflected improvement in problem identification. However, the quality of technical design engineering work varied. Further, little progress was made in establishing a system engineering function. While problem identification activities found a number of licensing and design bases deficiencies, the nature of the issues found strongly suggests the need for continued emphasis in this area.

Engineering was rated **Category 2**.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

During the current assessment period, the radiation protection program continued to be effective in protecting the public and workers from radiation hazards, including a very good program for radioactive waste management. The revised regulations for shipping radioactive materials and radwaste were effectively implemented, including the appropriate training for personnel. The radiation protection staff was successful in identification and correction of program deficiencies. The licensee implemented very good programs for internal and external dosimetry, contamination controls, personnel training, and implementation of the program to maintain occupational radiation exposures as low as reasonably achievable (ALARA). A significant reduction in problems with high radiation areas was noted; however, minor problems continued to be observed. A minor program

weakness was identified by the Vermont Yankee staff with a difference in personnel dose assignments that would result from using real-time electronic dosimeters in lieu of batch-processed thermoluminescent dosimeters. The radioactive liquid and gaseous effluent control programs, radiological environmental monitoring program, and the meteorological monitoring program continued to be implemented in an overall effective manner. Improvements to the meteorological monitoring system were noted and the system upgrades were very good.

The emergency preparedness program continued to be well maintained and implemented. Emergency response organization qualifications were maintained current. The licensee continued to maintain very good rapport with offsite agencies and support organizations. Very good performance was noted during the annual emergency preparedness exercise and the annual PASS system drill. Emergency response personnel were appropriately trained. Facilities, equipment, instruments, and supplies were maintained in a state of readiness. However, the repetitive problems with equipment at the Ames Hill transmitter location and problems with NRC notification of the equipment out of service, have indicated a weakness with timely tracking and trending of equipment problems to prevent recurrence. This weakness was also observed with the failure to review emergency locker inventories for adverse trends.

The security program continued to be effectively implemented. Management support was ongoing and management controls for identifying, resolving, and preventing programmatic problems were effective. Security system upgrades included vehicle barrier installation, firing range improvements, and enhancement of tactical response training. The overall performance of security force members was excellent, indicating a good sense of responsibility and effective training.

The fire brigade and plant staff response to detection equipment and alarms was very good. Significant improvement was noted during the assessment period regarding instructions to fire watch personnel; those instructions provided more detailed guidance to those personnel serving as compensatory measures. Several minor problems at the beginning of the assessment period were caused by poor communications involving fire watch personnel; later in the period, evidence of improved performance was demonstrated associated with those measures put in place to address Appendix R problems. General plant housekeeping was very good and combustible loading controls were very effective.

In summary, the Plant Support functions continued to contribute to safe plant performance. Performance in the radiation protection program, the effluent and environmental monitoring program, the emergency preparedness program, and the security program continued to be excellent. Improvement was noted over the assessment period in the area of fire protection. Personnel implementing Plant Support activities were well trained, resulting in very few human performance errors. Equipment performed well. Plant Support personnel responded well, in general, to program, process, and equipment problems, but those activities were also hampered by poor trending of issues, as indicated by the repeated problems with the Ames Hill notification equipment and with emergency locker inventories and calibration.

Plant support was rated **Category 1**.

ENCLOSURE 2
12 MONTH INSPECTION PLAN FOR VERMONT YANKEE

IP - Inspection Procedure
 TI - Temporary Instruction
 CO - Core Inspection - Minimum NRC Inspection Program (mandatory all plants)
 RI - Regional Initiative Inspection
 CQ - Calendar Quarter

INSPECTION	TITLE/ PROGRAM AREA	NUMBER OF INSPECTORS	INSPECTION START DATES
IP 82301 & IP 92904	Evaluation of Exercises for Power Reactors Followup - Plant Support	3	3/17/97
IP 92903	Followup-Engineering	1	3/24-4/11/97
IP 93801	Safety System Functional Inspection/Evaluation (SSFI/SSFE)	4	5/5-16/97
IP 81700 (First)	Physical Security Program for Power Reactors	1	5/27/97
IP 37550 (First)	Engineering	1	6/2/97
IP 42001	Emergency Operating Procedures	1	6/23/97
IP 62706	Maintenance Rule Inspection	4	8/4/97
IP 84750	Radioactive Treatment & Effluent	1	CQ 97-3
TI 2515-109	Inspection Requirements for Generic Letter 89-10; S/R MOV Valve Testing and Surveillance; Rev. 1 (Part 2)	1	CQ97-3
IP 34750	Radioactive Treatment & Effluents	1	9/22/97
IP 64150	Post Safe Shutdown Capability	1	9/22/97
IP 64704	Fire Protection Program	1	10/6/97
IP 37550 (Second)	Engineering	2	12/1/97