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REGION I

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Licensee No. DPR-28  
Licensee: Vermont Yankee Nuclear Power Corporation  
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Facility: Vermont Yankee Nuclear Power Station  
Vernon, Vermont  
Inspection Period: October 16 - November 25, 1991  
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Approved by:   
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Date 12/4/91

Inspection Summary: This inspection report documents routine resident safety inspections conducted between October 16 and November 25, 1991. Station activities inspected during this period included: plant operations; radiological controls; maintenance and surveillance; emergency preparedness; security; and safety assessment and quality verification.

Results: Inspection results and conclusions are summarized in the attached Executive Summary.

## EXECUTIVE SUMMARY

Vermont Yankee Nuclear Power Station  
Report No. 50-271/91-28

### Plant Operations

The conduct of the Engineered Safety Features walkdown of the "B" emergency diesel generator (EDG) and standby liquid control system identified no conditions that would affect system operability. Plant operation activities, that were part of the one week Limiting Condition for Operation (LCO) maintenance on the "B" EDG, were well controlled and operator performance was commendable. Professional control room operations were observed during "B" EDG post-maintenance testing and surveillance.

### Radiological Controls

Improvements to the reactor building and turbine building Radiation Protection control point were implemented to better control contamination and control point access. Two non-cited violations were identified this period. The first (NCV 91-28-01) dealt with the control of items stored in the spent fuel pool and the second (NCV 91-28-02) involved procedural adherence with regard to personal contamination monitoring. Appropriate and timely corrective actions were implemented.

### Maintenance and Surveillance

A planned maintenance reorganization and improvements to the maintenance planning and control program were initiated this inspection period. A review of maintenance activities associated with the "B" EDG LCO maintenance identified a weakness in the control of administratively established setpoints. This weakness was associated with VY's implementation of their LCO maintenance guidelines and checklists. Strong performance was observed in the planning of emerging work. The control of contractors and maintenance during the diesel work was effective; however, the procedures governing the maintenance were general in nature. Two situations of concern were identified where a more detailed procedure would have improved the conduct of the activity. Evaluation of the adequacy of design control regarding the failure of a motor operated valve anti-rotation device was identified as an unresolved item (UNR 91-28-03).

### Emergency Preparedness

A full participation emergency preparedness exercise was conducted on November 6. Details of the NRC inspection in this area will be documented in NRC Inspection Report 91-26.

## Executive Summary

### Security

Security program enhancements were implemented, including improvements in the performance of security system assessment equipment.

### Safety Assessment and Quality Verification

The Nuclear Safety Audit and Review Committee activities were reviewed. The committee encouraged the identification and ensured the resolution of potential safety issues.

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## DETAILS

### 1.0 SUMMARY OF FACILITY ACTIVITIES

Vermont Yankee Nuclear Power Station (VY) operated at full power throughout most of this inspection period. Power was reduced to approximately 70 percent on November 2 for condenser water box cleaning and minor maintenance activities in the turbine building heater bay area. On November 24, power was again reduced for condenser water box cleaning and a rod pattern exchange. During the week of October 20, a major overhaul of the "B" emergency diesel generator (EDG) was performed. The diesel was declared inoperable and the plant entered its Technical Specification (TS) limiting conditions for operations (LCO) for an allowed outage period of up to seven days to conduct preventive maintenance activities. During this inspection period, offgas activity levels elevated from fuel defects ranged in values between 36,300  $\mu\text{Ci}/\text{sec}$  and 54,000  $\mu\text{Ci}/\text{sec}$ , and at the end of the inspection period the level was approximately 47,000  $\mu\text{Ci}/\text{sec}$ .

### 2.0 PLANT OPERATIONS (71707)

#### 2.1 Plant Operations Review

The inspectors observed plant operations during regular and backshift tours of the following areas:

Control Room	Security Vital Areas
Diesel Generator Room	Protected Area
4 KV Switchgear Room	Reactor Building
Refuel Floor	

The following items were checked during daily routine facility tours: control room logs, operating orders, control room annunciators, recorder traces, protection systems, area radiation and process monitors, and emergency power sources. On a biweekly basis, selected Engineering Safety Feature (ESF) trains were verified to be operable. Tours were performed of accessible plant areas that included general plant and equipment conditions, ignition sources and flammable materials, plant housekeeping, and radiation protection controls.

Shift personnel were knowledgeable of plant conditions, maintenance, and surveillance activities. Effective control was exercised over control room activities. Operators were professional and adequately documented plant operations in control room logs.

Operations continued to track and trend recirculation pump inner and outer seal pressures. This commendable initiative was intended to contribute to the long-term performance assessment of the rebuilt recirculation pump seals. NRC Inspection Report 91-24 documents the historical performance of these seals and the corrective maintenance required to improve seal performance. Operations is also monitoring condenser water box differential pressures for its effect on main condenser vacuum and plant performance. The trend this year has

been similar to last year and has been attributed to increased river water debris making it past the traveling screens. VY has placed a floating boom near the intake structure to deflect river debris. VY continues to assess this condition.

Backshift and deep backshift inspections were conducted during this inspection period. Control room operators were alert, attentive, and responded accordingly to annunciators and plant conditions.

## **2.2 Inspection Findings and Significant Plant Events**

### **2.2.1 "B" Emergency Diesel Generator System Walkdown**

The inspector performed a complete walkdown of the accessible portions of the "B" EDG. The inspector also visually inspected normally inaccessible portions of this system such as internal diesel components, the generator relay and breaker cabinet, and bus bar connections. Prior to the "B" diesel being declared operable by VY, the inspector checked key functional parameters (i.e. air pressure, fuel, lube oil), confirmed that power supplies and breakers were properly aligned, and visually inspected major components for any general conditions that might prevent system operation. No conditions adverse to EDG performance or operability were noted.

### **2.2.2 Standby Liquid Control System Walkdown**

The inspector walked down the accessible portions of the standby liquid control (SLC) system to verify system operability. Area cleanliness, power supplies and overall material conditions of the system were also verified. All valves were properly positioned and appropriate flow paths were aligned. Piping was properly supported and heat tracing circuitry was observed to be functioning properly. Overall, no conditions were noted which would adversely affect the operability of the SLC system.

## **3.0 RADIOLGGICAL CONTROLS (71707)**

### **3.1 Inspection Activities**

Compliance with the RP program was verified on a periodic basis. This included observations to verify operability of radiation protection equipment, adherence to radiological control procedures, and program implementation during selected work evolutions.

VY recently changed the access route through the RP control point to enter and exit the reactor and turbine buildings radiological control area (RCA). In addition, by defining clean versus potentially contaminated areas and by using personal radiation monitors at the RCA egress point, the control over potential contamination passing through the check point has improved. Minimal training of plant personnel was required to fully implement what appears to be an effective and positive change.

## Inspection Findings and Review of Events

### Spent Fuel Pool Activities (NCV 91-28-01)

During this inspection period, VY continued to remove radioactive material from the spent fuel pool (SFP) for off-site disposal. This program involved the crushing and cutting of used control rod blades, local power range monitor (LPRM) strings, and other radioactive material in an effort to reduce the volume of radiological waste stored and shipped. The actual work was completed; however, VY Radiation Protection (RP) Department technicians monitor radiological practices, personnel exposure, packaging, and transportation. VY has shown good initiative to increase the periodicity of SFP inventory to better control items in the SFP.

The inspector observed activities on the refuel floor during this evolution and performed a SFP inventory inspection. NRC Region I Temporary Instruction 91-01, "Item Survey for Spent Fuel Pools," was used to assess the types of programs and controls that VY has in place for storage of items in SFP. VY procedures DP 0545, Rev. 2, "Fuel Pool Storage Requirements," OP 0044, Rev. 0, "Volume Reduction, Packaging and Shipping of Irradiated Hardware from the Spent Fuel Pool," and OP 0400, Rev. 23, "Special Nuclear Material Inventory and Accountability Procedure" were reviewed as part of this inspection. The most recent revisions were verified to be in use. Radiological controls and practices were observed to be excellent based on the minimal number of hot particle events and control of contamination.

During this SFP inspection, the inspector identified that the administrative weight limit of two spent fuel pool handrails was exceeded. VY procedure DP 0545 controls the practice of hanging items off the SFP handrails and requires that, "Items attached to any one railing shall not exceed a combined weight of 500 pounds." Contrary to this, SFP rails 24 and 25 supported approximately 540 pounds each. The items supported by the rail were control rod blade guides. They were suspended above the SFP wall above and relatively close to stored spent fuel. This condition was identified by the inspector after verifying component weights with Reactor and Computer Engineering Department personnel. Immediate corrective action was to remove two of six control rod blade guides from each rail.

The SFP handrails were designed as safety features to prevent personnel from falling into the spent fuel pool. They are not safety grade nor were they seismically evaluated for maximum weight loading. Historically however, the SFP handrails at VY have been used to hang radioactive material from the rail into the pool. The inspector noted that VY does not weigh items stored in the SFP and that the loading on the SFP handrails was determined by operator judgement. The 500 pound limit was also determined to be ambiguous such that various RP technicians and supervisors were unsure whether the 500 pounds applied to the submerged weight of the item or the airborne weight. VY procedure DP 0545 does not require items to be weighed. The inspector noted that the SFP inventory did not sufficiently describe the material stored on the various rails that surround the SFP in order for SFP inventory reviewers to assess handrail loading.



The failure of VY to suspend items from the SFP handrails into the SFP within the 500 pound administrative weight limit specified in procedure DP 0545 was identified as a violation of TS 6.5.B, which requires radiation control standards and procedures to be followed. This condition was identified by the inspector and was considered to be of minor safety significance. The SFP handrails were structurally sound, the 540 pounds would not have impacted the spent fuel as a point force if the supporting cable sheared, and the free fall distance was minimal thereby minimizing impact force. The possibility of spent fuel damage or rupture was considered small. Actions taken by VY to prevent recurrence included a procedure review to clarify the 500 pound administrative requirement, an initiative to remove heavy items from the SFP handrails, and improvements to the SFP inventory process. RP Department training was planned. For these reasons discussed, this violation is not being cited because the criteria specified in Section V.A of the Enforcement Policy were satisfied (NCV 91-28-01).

Inconsistent use of radioactive material locking devices for items stored in the SFP was also identified during this inspection. A previous concern regarding this issue at VY was documented in NRC Inspection Report 90-06. Procedure DP 0545 specifies that "Items greater than 500 R/hr, but less than 100,000 R/hr may be suspended from the side of the pool when fastened with a rigid locking device designed to prevent inadvertent removal of the material." Specifically, one item stored in the SFP was identified on the SFP inventory and radioactive material tag as having a dose rate of 500 R/hr. This item was not locked. However, other items surveyed at 500 R/hr were locked, and one item at 450 R/hr was also locked. This condition was identified to the on-shift RP technician whom initiated actions to lock the material. The inspector considered this action appropriately conservative.

### 3.2.2 Failure to Frisk After Crossing Radiation Control Boundaries (NCV 91-28-02)

On October 29, a security officer on tour in the heating ventilation air conditioning (HVAC) room within the administrative building was observed by the inspector to have exited from the RCA boundary without performing a whole body frisk. The individual informed the inspector that (1) the area within the RCA was part of the prescribed security rounds, (2) the Security Shift Supervisor and control room were aware that officers were not frisking upon exiting this particular RCA boundary, and (3) that an RP technician on a previous shift said that the area was clean and security officers did not have to frisk out. Based on radiological postings, there was no immediate radiological concern regarding contamination. The security officer performed a whole body frisk at the nearest personnel contamination monitoring station (PCM-1B).

The practice of allowing personnel to exit an RCA without performing a whole body frisk was not in accordance with procedure RP 4532, Rev. 18, "Personnel Monitoring Prior to Exiting the Radioactive Control Area (RCA)." This procedure requires "Each individual exiting the RCA, where PCM-1Bs are stationed shall use them to perform a whole body frisk.

A whole body frisk with an RM-14 is required prior to exiting all other RCA exits." This was identified as a violation of TS 6.5.B which requires that radiological control standards and procedures shall be followed.

Although identified by the inspector, this event was considered to be of minor safety significance. Area radiation surveys identified no surface contamination in the area of concern. The RCA boundary, crossed by the security officer, was an extension of the turbine building RCA that allowed the use of internally contaminated equipment in an area that was normally not radiologically controlled. The whole body frisk performed by the security officer did not identify any contamination. The on-shift RP supervisor acknowledged the inspector's concerns and promptly initiated a radiological incident report. In addition, this event was considered to be an isolated event, due to poor judgement on the part of the backshift RP technician. This individual was subject to personnel corrective action. Procedure 4532 is being reviewed to assess RCA frisking requirements and RP training has been conducted and will be continued in this area. These actions appear appropriate to preclude recurrence. For these reasons discussed, this violation is not being cited because the criteria specified in Section V.A of the Enforcement Policy were satisfied (NCV 91-78-02).

#### 4.0 MAINTENANCE AND SURVEILLANCE (62703, 61726, 92700)

##### 4.1 Maintenance Inspection Activity

The inspector observed selected maintenance activities on safety related equipment to ascertain that these activities were conducted in accordance with approved procedures, TS, and appropriate industry codes and standards.

##### 4.2 Maintenance Reorganization

On October 9, VY reorganized the maintenance department in order to provide flexibility for long and short term projects, enhance team concepts, and to improve maintenance responsiveness and capabilities. The reorganization divided the maintenance department into four distinct functional areas of responsibility; projects/scheduling, electrical, mechanical, and facilities. Within the electrical and mechanical areas, the formation of a supervisor/foreman/engineer team was intended to more appropriately divide responsibilities and increase supervision of field work. In addition, VY expects that the reorganization will improve the programmatic aspects of plant maintenance and better promote career development for foreman and craft personnel. The reorganization of VY's maintenance department was considered to be an enhancement to the maintenance program.

### 4.3 Maintenance Observations

#### 4.3.1 "B" Emergency Diesel Generator LCO Maintenance - 18 Month Overhaul

During the period of October 20 - 26, LCO maintenance was performed on the "B" EDG while the plant was at 100 percent of rated power. This preventive maintenance, scheduled every 18 months, involved a detailed inspection of the diesel to determine material conditions and to overhaul various support systems. As described in VY procedures OP 5223 "Emergency Diesel Generator Maintenance," and OP 5225, "Emergency Diesel Generator Electrical Maintenance," specific maintenance items included: visual inspections of air receivers, ejectors, blowers, and heat exchangers; rebuild of air start check valves and injectors; and, various engine clearance checks. Electrical maintenance activities included visual and electrical checks of the generator, electrical buses, the breaker/relay panel, and time delay relay checks for safety circuits.

VY demonstrated a conservative safety approach prior to declaring the "B" EDG inoperable. Actions performed prior to making the "B" EDG inoperable included: TS Section 4.5.H.1 testing of the "A" EDG; clearing of floor drains that had previously overflowed and caused a ground on the battery for the "A" EDG; surveillances and maintenance affecting the "A" EDG reliability were reviewed and rescheduled outside the LCO time frame; communications with Vernon Hydro assured the continuity of the non-safety grade 4 KV electrical supply; and, the low pressure core spray system and containment spray systems were verified to be operable in accordance with TS 3.5.H.1. In addition, the Plant Operational Review Committee (PORC) reviewed the maintenance package, schedule, and outstanding maintenance and determined that the work would not affect safe plant operation.

Regarding pre-job planning and review however, the failure of VY to identify that a PORC follow-up item affecting the "B" EDG was not fully resolved or effectively incorporated into the LCO maintenance package was a weakness. This contributed to subsequent LCO maintenance conducted on November 14, which is described in Section 4.3.2 of this report. The inability to identify all related items (PMs, CMs, tests, inspections, etc.,) prior to conducting this LCO maintenance was not in accordance with VY's LCO preventive maintenance guidelines and checklist. The Operations Superintendent recognized this weakness and is investigating this issue for lessons learned and corrective actions.

The inspector noted that the control of contractors and maintenance was effective (except as noted in Section 4.3.2); however, the procedures governing the maintenance were general and relied heavily on the skill of the craft, supervisory oversight, and vendor representation. This observation was based on two situations noted during the 50 pound coolant system pressure test on the diesel. The test, as performed, did not isolate the water cooling piping from the engine as indicated in the technical manual. This was considered by VY to be within the scope of the test; however, the resulting change in the pressure boundary caused a relief valve to lift. The retest was accomplished at a lower, vendor recommended, pressure with the relief gagged. A delay of approximately 2.5 hours to this specified portion of LCO

maintenance was experienced. In addition, when VY representatives were questioned by the inspector as to what was the pressure band during this test, the representative was unsure. Neither the procedure nor the technical manual indicated a pressure band.

The second observation involved a general and non-specific procedural step that challenged both VY and vendor representative knowledge. When the inspector questioned cognizant workers they were: (1) unsure of the acceptance criteria for water leakage at 50 pounds, and (2) unsure of the actual internal inspection point required for this test by the vendor technical manual. In fact, one of the two vendor representatives on-shift could not relate the technical manual inspection point to an actual position on the diesel. The 50 pound test, as performed, met the intent of the procedure and satisfactorily tested the diesel coolant system. These observations were acknowledged by the maintenance personnel, resolved prior to the performance of the test, and indicated that more detailed procedural content for this activity was warranted.

The maintenance schedule as implemented was generally effective and contributed to proper planning and control of emerging work. Operations and maintenance personnel exhibited notable management oversight during maintenance and testing activities. Senior maintenance supervisors and a spare shift supervisor witnessed various testing and maintenance activities. Workers exhibited good knowledge and initiative during this maintenance. The maintenance conducted resulted in the identification of three deficiencies: a slightly cracked piston insert, and clearance deficiencies in the scavenging air blower and vertical drive mechanism. These conditions were judged to not have immediately effected diesel performance; however, repair was necessary to ensure continued long term diesel operability and a proper level of reliability. In this regard, the maintenance conducted appears to have served to increase equipment reliability and was consistent with established VY philosophy for conducting LCO maintenance.

Commendable performance was observed during the initial diesel startup following the overhaul. On numerous occasions, the inspector observed operations personnel reviewing diesel operating procedures and communicating to determine system and testing status. Operations control of system testing was also particularly noteworthy and demonstrated system ownership. For example, the inspector noted that the on-shift Auxiliary Operator (AO) temporarily suspended initial diesel startup to review the procedure, verify initial conditions, and confer with the control room. The AO also performed a detailed system walkdown and stayed overtime to assist the on-coming AO. These actions demonstrated strong watchstanding performance, professionalism, and responsibility.

Overall, the "B" EDG LCO maintenance was well controlled and planned, except as documented in Section 4.3.2. This activity generally followed VY's LCO preventive maintenance guideline and identified various deficient conditions. Excellent watchstanding attributes were observed. While unexpected maintenance extended the actual planned outage time, effective planning, parts availability, and worker knowledge contributed to the success of this major diesel overhaul. The inspector noted, however, that general and non-specific procedural guidance placed maintenance workers in a position to rely heavily on vendor representatives.

#### 4.3.2 "B" Emergency Diesel Generator LCO Maintenance - Relief Valve Adjustment

On November 12, LCO corrective maintenance was performed to adjust the diesel fuel oil pump discharge relief valve setting on the "B" EDG from 17 pounds to 30 pounds. This maintenance was performed 17 days after the diesel overhaul LCO preventive maintenance, documented in Section 4.3.1, and was intended to remove concerns regarding diesel start time.

VY had originally changed the desired relief valve setting to approximately 30 pounds as a result of their review of an event involving the "B" EDG's failure to start on July 26. NRC Inspection Report 91-19 documented this event and the NRC review. As a result of a PORC follow item issued August 1, the Maintenance Department reviewed this event and the diesel generator fuel line relief valve settings. The Maintenance Department determined that the cause of the failure to start was excessive seat leakage of the fuel oil pump discharge relief valve. In addition, VY determined that the relief valve must be adjusted during full load diesel operation and that valve performance may effect diesel start time by  $\pm 1/2$  second. VY determined that setting the fuel oil relief valve at approximately 30 pounds was appropriate to correct the diesel start problem.

VY's actions to reset the relief did identify a fuel oil leak in the fuel oil piping supply to the fuel injectors. This deficient condition, which may have caused air binding of the fuel oil system during diesel start, was promptly recognized as to its effect on diesel operation. Repair was immediately initiated and completed within four hours. The decision to repair the fuel oil leak was appropriate and reflected the normally conservative safety philosophy exhibited at VY.

The inspector considered the corrective actions identified by PORC to resolve the diesel start issue to be appropriate. In addition, the decision to declare the "B" EDG inoperable to readjust the relief valve setpoint was conservative and proactive. However, the failure of VY maintenance organization to implement the relief setting change during the diesel overhaul, documented in Section 4.3.1, was considered a weakness.

#### 4.3.3 (Open) UNR 91-28-03: Adequacy of Design Control Regarding the Failure of a Motor Operated Valve Anti-Rotation Device

On November 14, during quarterly surveillance testing on the "A" Residual Heat Removal (RHR) system, an anti-rotation device (i.e., a key), failed in motor operated valve RHR-89A. This prevented local and remote operation of the valve and effected various modes of RHR operation. The "A" RHR system was declared inoperable at 11:25 a.m. and the plant entered TS 3.5.C.

RHR-89A is a 12" motor operated globe valve used to throttle service water flow through the RHR service water (RHRSW) heat exchanger. This valve is used to control reactor plant cooling and shutdown cooling, suppression pool cooling, fuel pool cooling and RHRSW heat

exchanger differential pressure. The key mounts to the yoke of the valve and the tang portion of the key rides in a groove cut in the valve stem to prevent the stem from rotating. This allows the motor operator to move the valve stem only in the axial direction; hence opening and shutting the valve.

VY initiated prompt actions to correct this material condition. A task team was assembled to identify the apparent root cause of failure, perform a Basis for Maintaining Operability (BMO) determination, and determine corrective action. Reviews were conducted to evaluate the performance of the key and to identify other valves of similar design. VY also contacted the valve manufacturer.

VY determined that in October of 1989 the keys associated with valves RHR-89A and RHR-89B were replaced. Only these two valves were identified as having similar keys. The 1989 key replacements were made, in part, to correct poor valve throttling characteristics. Excessive galling of the tang to valve stem groove was determined to have contributed to poor flow control. Apparently, new keys and valve stem grooves were manufactured on-site from dimensions obtained from the original parts and installed to improve valve performance.

The failure review determined that the on-site manufactured keys for RHR-89A and RHR-89B were dimensionally different than the originally supplied keys. The RHR-89B valve was examined and identified to be dimensionally different. The "A" key was installed without a radius transition between the tang and the key base. Apparently a pre-installation machining process on the "A" key to correct key-stem alignment may have undercut the tang base. A preliminary determination was that the key failure may have been attributed to the lack of the radius transition, the undercut at the tang base, and higher than normal cycling loading on the key. The key has been sent off-site for examination to confirm and/or expand on VY's understanding of the failure mechanism. The inspector questioned whether inadequate design control, during the manufacturing and design of the 1989 key may have led to the 1991 failure.

Plant response to this event was prompt and aggressive. The Maintenance Supervisor has indicated that an in-depth root cause determination in accordance with procedure AP 0007 will be performed to completely assess the key failure. The cause of the RHR-89A valve key failure is an Unresolved Item (UNR 91-28-03).

#### 4.4 Maintenance Planning and Control Program

On September 23, VY placed into service a new maintenance planning and control system (MPAC) that provides real time information to users. This computerized maintenance system was intended to consolidate and expedite the maintenance process. MPAC centralizes the maintenance process by allowing users to access a data base that includes various instrument and equipment lists and a variety of other reference files such as surveillance information and stores. The system allows the user, among other things, to

initiate work orders, track and trend component attributes, represent historical failure information, search equipment and component history, determine parts availability, and access accounting information.

Prior to system implementation, a group of senior engineers and representatives from various site organizations reviewed MPAC and adapted the system for site use. The resulting changes and augmentations conformed MPAC to the site maintenance program. This allowed the implementation of MPAC with only minor changes to the existing maintenance program and procedures. Maintenance procedures that were significantly effected were revised prior to system implementation. Biennial procedure reviews are intended to update the remaining procedures. VY employees were provided class room and hands-on training on the use of MPAC. Supervisors, engineers, control room operators, and clerical staff all have access to this system. This process should increase the involvement of cognizant individuals, reduce redundant reviews, and improve the planning and scheduling of maintenance. A group of VY representatives were delegated to respond to user questions and suggested system improvements after MPAC was placed on line.

During the first week of MPAC operation, the system operated in parallel with the old maintenance system. This allowed VY to audit MPAC performance, assess system use, and initiate improvements. Minor problems associated with users not being familiar with the system, duplication of work requests, and scheduling have been identified. These problems have neither affected plant operations nor the conduct of maintenance.

The impact of this system on control room personnel has been minimal. Specifically tasked with the release and closure of work, control room operators have demonstrated proficiency and competence on the system. Operator attentiveness to plant operations has not appeared to be adversely effected by the use of this system in the control room.

Overall, the implementation of MPAC was considered to be a positive contributor to the planning and control of maintenance. Adequate training, detailed system reviews and changes, and exceptional management oversight during the implementation of this system contributed to the smooth transition to this new system.

#### 4.5 Surveillance Inspection Activity

The inspector performed detailed procedure reviews, witnessed in-progress surveillance testing, and reviewed completed surveillance packages. The inspector verified that the surveillance tests were performed in accordance with TS, approved procedures, and NRC regulations.

The surveillance testing activities inspected were effective with respect to meeting the safety objectives of the surveillance testing program.

#### 4.5.1 Surveillances

The inspector observed the following surveillance tests in the control room and/or at the location of the equipment tested:

- OP 4195, Rev. 17, "Fuel Oil Transfer System Surveillance."
- OP 4126, Rev. 26, "Diesel Generators Surveillance."

The inspector observed that the tests were well controlled by operators and by the instrumentation and controls technician. The surveillance tests were performed by qualified and knowledgeable personnel and were conducted using calibrated equipment. The overall conduct of testing was considered good.

#### 4.5.2 Missed Data During Quarterly Surveillance Testing of the "A" EDG

On November 1, the inspector witnessed the quarterly surveillance tests on the "A" EDG and identified to the on-shift Auxiliary Operator (AO) who was performing one of the required tests, that data required to be taken prior to the startup of the diesel was not documented. The AO acknowledged that the data should have been recorded, and informed the control room. The "A" EDG was shutdown, required data was taken, and the test was repeated.

The data was required for In-Service Testing (IST) of the diesel generator air receiver check valves and conducted to meet the requirements of ASME, Section II. The test, performed as a section of VY procedure OP 4126, Rev. 26, "Diesel Generators Surveillance," verified that various air check valves open correctly during diesel startup and during subsequent charging of the air receivers. The acceptance criterion, to show correct valve operation, was met when air receiver pressure changed by greater than 10 pounds.

The inspector considered the performance of this surveillance and the actions taken by the AO and the control room satisfactory. Conversations with operations personnel indicated that the decision to shut the diesel down, obtain the data, and restart the diesel to complete the test was appropriate. The actions taken by the AO indicated a proper attitude and a willingness to perform the test as required. The surveillance, as performed, met the intent of the procedure, contributed to ensuring diesel operability, and fulfilled check valve IST requirements.

### 5.0 EMERGENCY PREPAREDNESS (71707)

#### 5.1 Emergency Preparedness Exercise

On November 6, VY conducted a full participation Emergency Preparedness (EP) exercise. This exercise was intended to demonstrate VY's emergency response capabilities, and the effectiveness of local and state emergency response plans and facilities. In addition, the



exercise was to demonstrate the coordination by the States of Vermont and New Hampshire, and the Commonwealth of Massachusetts of the activation of the public notification system (local warning sirens, tone alert radios, and the Emergency Broadcast System). The Federal Emergency Management Agency observed and evaluated the VY News Media Center and state and local participation.

The inspectors participated in the review of the exercise, which included exercise preparation, exercise observance, review of the VY critique to the NRC, and presentation of NRC findings. Details of the NRC inspection in this area will be documented in NRC Inspection Report 91-26.

## **6.0 SECURITY (71707)**

### **6.1 Observations of Physical Security**

Compliance with the security program was verified on a periodic basis, including the adequacy of staffing, entry control, alarm stations, and physical boundaries. Operations of the Central and Secondary alarm stations were reviewed during backshift inspections. Security officers were alert and knowledgeable about current security conditions and issues.

In addition, the inspectors reviewed the security activities associated with compensatory measures necessary to support Gate 2 modification and, the relaxation of security requirements for the "B" EDG room to support diesel maintenance activities. No concerns in this area were identified by the inspector.

### **6.2 Security Program Enhancements**

VY has scheduled management training workshops for their contractor security officers and security shift supervisors. The training, to be conducted by a management consultant, will focus on developing supervisory skills that include problem solving, communications, and counseling. This training is considered by the NRC to be an enhancement.

Recently, VY has initiated on-site activities to improve the performance of security system assessment equipment. NRC observations noted that this activity was well planned and completed in a timely manner. Adequate compensatory measures were provided during these activities; and no security vulnerabilities were identified. These and additional improvements planned for the future are considered an important initiative in an area that has been of longstanding concern to the NRC.

## **7.0 SAFETY ASSESSMENT AND QUALITY VERIFICATION (40500)**

### **7.1 Plant Operations Review Committee (PORC)**

The inspector attended two PORC meetings, October 18 and November 15, and concluded that, for the topics discussed, appropriate plant nuclear safety oversight was provided to review the events and that there was exhibited a conservative safety ethic. The October 18 meeting reviewed the efforts to perform a major overhaul on the "B" emergency diesel

generator (EDG) prior to placing that safety-related system out-of-service for LCO maintenance. A PORC meeting was required on November 15 as a reactionary measure to assess the failure of a valve part and to determine whether common mode failure was possible in other systems.

During the October 18 PORC meeting, members systematically evaluated the job scope and sequence to perform a planned overhaul of the "B" EDG as part of LCO maintenance. Section 4.3.1 of this inspection report describes this maintenance. Justification for the diesel overhaul was primarily based on a Maintenance Department recommended 18 month diesel overhaul program. This program also took into account historical diesel performance and prior inspection results. PORC determined that there would be a net safety benefit to enter the applicable TS LCO to support this maintenance. The inspector identified no concerns regarding the PORC determination.

On November 15, PORC members reviewed the failure of an anti-rotation key on a motor operated valve and the possibility of whether common mode failure could effect other systems. The maintenance required for this issue was documented in Section 4.3.3 of this report. This PORC meeting was formal, succinct, and adequately reviewed this event. An engineering evaluation detailed the physical properties of the failed pin, compared the failed pin to a similar pin identified to be in use in the plant, and concluded that the pin in use would not be subject to common mode failure. PORC justified continued operations with this pin installed in the RHR-89B valve; however, they also required that the pin be replaced by December 31, 1991, or a position be drafted as to why an extension of service was acceptable. This type of conservative approach to assess common mode failure was considered a VY strength.

## 7.2 Nuclear Safety Audit and Review Committee (NSARC)

On November 21, the inspector attended a portion of the regularly scheduled NSARC meeting. Detailed presentations to the committee were observed to focus on past and current plant performance issues. The committee members discussions following the presentations focused the proper safety perspective on the issues and analyzed corrective actions and root cause. Suggestions to the committee and follow-up items generated adequately addressed the problems identified. Overall, the committee encouraged the identification and resolution of potential safety issues, and independently evaluated activities involving plant safety.

## 7.3 Licensee Event Reports

The inspector reviewed the Licensee Event Reports (LER) listed below and determined that, with respect to the general aspects of the event; (1) the report was submitted in a timely manner, (2) the description of the event was accurate, (3) a root cause analysis was performed, (4) safety implications were considered, and (5) corrective actions implemented or planned were sufficient to preclude recurrence of a similar event.

LER 91-12, Supplement 1: Reduced Cooling Water Flow to Diesel Generator Heat Exchangers and Station Service Air Compressors Due to High Service Water System Backpressure Caused by Weak Design.

This LER was previously reviewed in NRC Inspection Report 91-19, which documented VY's commitment to issue a supplemental LER based upon information contained in their finalized Corrective Action Report. The supplement to the LER provides the long-term corrective actions that resulted from analysis and testing and the completed Corrective Action Report. The inspector determined that the information contained in the supplement was acceptable. Additionally, several unresolved items identified by the Augmented Inspection Team (NRC Inspection Report 91-13) were subsequently reviewed during a follow-up inspection during the period of August 6-9 and documented in NRC Inspection Report 91-21 which is the subject of an enforcement conference to be held December 16, 1991.

#### 7.4 Periodic and Special Reports

The plant submitted the following periodic and special reports which were reviewed for accuracy and the adequacy of the evaluation:

- Monthly Statistical Report for September and October 1991.
- Monthly Feedwater Nozzle Temperature Monitoring
- Vermont Yankee Cycle 15 Core Operating Limit Report

#### 8.0 MANAGEMENT MEETINGS (30702)

##### 8.1 Preliminary Inspection Findings

At periodic intervals during this inspection, meetings were held with senior plant management to discuss preliminary inspection findings. A summary of findings for the report period was also discussed at the conclusion of the inspection and prior to report issuance. No proprietary information was identified as being included in the report.

An unresolved item is a matter about which more information is required to ascertain whether it is an acceptable item, a deviation or a violation. One unresolved item is discussed in Section 4.3.3.

##### 8.2 Region Based Inspection

Two Region based inspections were conducted during this inspection period. Inspection findings were discussed with senior plant management at the conclusion of the inspections.

<u>Date</u>	<u>Subject</u>	<u>Rpt. No.</u>	<u>Inspector</u>
10/21-25/91	Training Programs	91-31	H. Williams
11/5-7/91	EP Exercise	91-26	L. Eckert

### 8.3 Significant Meetings

- On November 9, the Senior Resident Inspector participated in a public meeting sponsored by the Federal Emergency Management Agency to provide an initial evaluation of VY's EP exercise conducted on November 6.
- On November 14, the Senior Resident Inspector attended a meeting between VY representatives and the NRC staff held at NRC headquarters. The purpose of the meeting was to discuss the shift engineer's collateral duties as the fire brigade leader. This issue is the subject of unresolved item 91-07-01.
- On December 3, Mr. J. Linville performed a site and corporate office tour, participated in the routine resident exit meeting, and discussed matters of mutual interest with senior plant and corporate management.