

# VERMONT YANKEE NUCLEAR POWER CORPORATION

185 OLD FERRY ROAD, PO BOX 7002, BRATTLEBORO, VT 05302-7002  
(802) 257-5271

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BVY 00-45

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

References: (a) Letter, USNRC to VYNPC, "TMI Action Plan Item II.K.3.3, Reporting of Relief Valve and Safety Valve Failures and Challenges," NVEY 82-44, dated March 30, 1982

**Subject: Vermont Yankee Nuclear Power Station  
License No. DPR-28 (Docket No. 50-271)  
Vermont Yankee Cycle 20 10CFR50.59 Report**

In accordance with 10CFR50.59(b)(2), attached is a copy of the Vermont Yankee (VY) Cycle 20 Operating Report. This report contains a brief description of the safety evaluations that supported changes, tests and experiments made between June 2, 1998 and December 3, 1999.

Additionally, in accordance with Reference (a), VY reports that Relief Valve (RV) operation occurred during the cycle when VY experienced a scram. The RVs were manually cycled for pressure control and no failures were experienced. There were no Safety Valve failures or challenges during this period.

This submittal is being made concurrent with a revision to the Vermont Yankee Final Safety Analysis Report, that is being submitted under separate cover. There are no commitments made in this letter.

We trust that the information provided is adequate; however, should you have questions or require additional information, please contact Mr. Jim DeVincentis at (802) 258-4236.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

  
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Gautam Sen  
Licensing Manager

**Attachment**

cc: USNRC Region 1 Administrator  
USNRC Resident Inspector – VYNPS  
USNRC Project Manager – VYNPS  
Vermont Department of Public Service

IE47

Docket No. 50-271  
BVY 00-45

Attachment 1

Vermont Yankee Nuclear Power Corporation

Cycle 20 10CFR50.59 Report - 10CFR50.59(a)(2) Evaluation Summaries

## **VERMONT YANKEE CYCLE 20 10CFR50.59 REPORT**

Between June 2, 1998 and December 3, 1999, Vermont Yankee implemented a number of changes requiring evaluation in accordance with 10CFR50.59(a)(2). This report includes the safety evaluation summaries for thirteen Engineering Design Change Requests (EDCRs), three Vermont Yankee Design Change Requests (VYDCs), nine Minor Modifications (MM's), seven Temporary Modifications (TMs), one Installation and Test Procedure (I&T), three Basis for Maintaining Operability (BMOs), three Special Test Procedures (STPs), two procedure changes, two set-point changes, eight Final Safety Analysis Report (FSAR) changes, two Technical Requirements Manual changes, four Document Change Requests (DCRs), three Safety Classification Changes, one Technical Specification Bases change and the following additional subjects: Evaluation for radioactive Materials in Storm Drains, Hydrogen Concentration on Loss of Battery Room Ventilation, Substituting Reactor building Closed Cooling Water monitoring for Reactor Building Closed Cooling Water IST Testing, and Using Uchida Correlation to Calculate Equipment Qualification Profiles for HELBs in the Reactor Building.

The following changes did not require Commission approval. They were reviewed by the Plant Operations Review Committee and approved by the Plant Manager. It was determined that these changes did not involve un-reviewed safety questions as defined in 10CFR50.59(a)(2).

### **Engineering Design Change Request (EDCR) 98-403, "Torus Narrow Range Water Level Instrumentation Upgrade"**

#### **General Summary**

The purpose of this design change was to improve the accuracy of the Torus narrow range level instruments. An instrument accuracy calculation showed that the existing instrumentation could not reliably provide the accuracy of the indication required.

The largest contributor to existing instrument inaccuracies is the error introduced, from a change in temperature of the environment, where a sealed system is used for the sensing lines. This design change replaced the existing seals with pressure sensing lines that are "wet" or water filled for the variable leg of the differential pressure transmitter with a "dry" or gas filled for the reference leg. The new transmitters are digital and can be calibrated remotely.

Safety Evaluation Summary (SE 98-049)

The Torus narrow range level instrument loops are not initiators of any analyzed accidents nor are they initiators of any analyzed abnormal operational transients. The limit for the Torus volume, as defined in the Technical Specifications is between 68,000 and 70,000 cubic feet of water during normal plant operation. This function is supported by the implementation of this design change.

The Torus narrow range level instruments loops do not interface with any Safety Class Electrical (SCE) system at Vermont Yankee. These transmitters are seismically qualified, are separate and diverse from the wide range instruments, and are installed to meet Safety Class 2 requirements. Consequently, implementation of this design change did not reduce the margin of safety as defined in the bases any Technical Specifications

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 98-401, "Upgrade of Residual Heat Removal Service Water (RHRSW) Flow Loop Instruments"**

General Summary

The purpose of this design change was to upgrade the RHRSW flow instrument loops. This upgrade satisfies the Regulatory Guide 1.97 Category 1 criteria. This change is based on the fact that operator actions may be needed to limit Service Water (SW) flow to the RHRSW system such that other safety related systems have adequate cooling flow, if required. In order to support the potential operator actions, the RHRSW flow indication must be qualified for long term Post-LOCA operation.

Safety Evaluation Summary (SE 99-06)

The RHRSW instrument loops are not initiators of any analyzed accidents nor are they initiators of any analyzed abnormal operational transients. These instruments provide indication only and are remote from any equipment that can initiate an accident. The installation is electrically isolated from the Non-Nuclear Safety (NNS) computer such that any failure of the computer will not affect the instrument circuit.

The flow elements installed by this change are SC-3 components, have the same orifice size and will develop the same differential pressure as the original elements. Therefore, the existing RHRSW hydraulic calculations remain valid.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 98-408, “USI A-46 Outliers Related to Electrical Equipment Assemblies”**

**General Summary**

The purpose of this design change was to implement hardware modifications to electrical equipment to address Unresolved Safety Issue (USI) A-46 and seismic Individual Plant Examinations for External Events (IPEEE) evaluations for Vermont Yankee. The modifications are designed such that the seismic capacity of the equipment meet or exceeds its seismic requirements.

These modifications are comprised of structural hardware modifications which interface with equipment and building structural elements but do not physically interfere with active features of the equipment to which they are installed.

**Safety Evaluation Summary (SE 99-07)**

Modifications made to equipment by this design change do not affect accident initiators as described in the FSAR. Any malfunctions evaluated in the FSAR for equipment being modified by this design remain unaffected.

There are no new failure mechanisms associated with these modifications which affect the capability of equipment to perform their safety functions. Therefore, the margin of safety as defined in the bases any Technical Specifications is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 98-405 “Drywell Nitrogen Supply Modifications”**

**General Summary**

The purpose of this design change was to modify portions of the Containment Air System that provide a pneumatic supply to the Main Steam System Relief Valves. The modifications consist of a dedicated safety class supply line inside the Drywell that will attach to the existing system at the accumulator check valves. Outside of the Primary Containment, the supply line tees into the normal supply coming from a tie-in to the existing Containment Air System which is Non-Nuclear Safety (NNS). A Safety Class backup supply is provided in the form of two compressed gas cylinders with individual regulators.

EDCR 98-405, Revision 1

This revision added statements regarding the fact that the Maximum Operating Differential Pressure (MOPD) was evaluated with respect to exceeding the MOPD ratings of the solenoids and determined that there would be no adverse effects.

Safety Evaluation Summary (SE 99-10 and SE 99-10, Rev. 1)

These modifications effect the pneumatic supply to the Safety Relief Valves (SRVs). The SRVs are used for accident mitigation in two ways; overpressure protection of the Reactor Pressure Vessel (RPV) and depressurizing the RPV to allow low-pressure injection/shutdown cooling.

The SRVs are self-acting in protecting the RPV from overpressure. The pneumatic supply and Automatic Depressurization System (ADS) are not required to actuate the valve. If an SRV were to stick open, it could become an accident initiator as a result of a decrease in RPV inventory, however, the modifications implemented by this design change does not change how the valve operates. Therefore, there is no increase in the probability of an accident as analyzed in the FSAR.

As this modification only affects the pneumatic supply system and the valve acts independent of that system on an overpressure condition, it could not initiate an abnormal operational transient as analyzed in the FSAR.

The margin of safety is not reduced as there are no limits specified for the air system in the Technical Specifications. The modification replaces existing compressed gas supply which includes a SC-3 backup which effectively increases the margin of safety. There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 97-405, Engineering Change Notice (ECN) 1, "Chemical Containment Area Modifications"**

General Summary

This design change consisted of replacing the sulfuric acid bulk storage tank, replacing/repairing/testing the three secondary containment berms, replacing the level indicators for all three bulk storage tanks, and modifying one of the auxiliary chemical pumps to reduce the pump flowrate. The chemical stored and pumped by the systems are preservation chemicals used to aid in the long-term reliability of the Service and Circulating Water systems and are not directly tied to their operability.

Safety Evaluation Summary (SE 99-12)

These systems, modified under this design change are not accident initiators nor does the installation of these modifications increase the probability of any malfunction analyzed in the FSAR. The systems interface with the Service Water System remains unchanged. These modifications therefore, do not reduce the margin of safety as defined in the bases any Technical Specifications.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering design Change Request (EDCR) 98-407, “Generator Runback Circuit Design Change”**

General Summary

This design change improved the reliability for detecting a Loss of Stator Cooling (LOSC) water and replaced a more limiting transient (LOSC Runback) with a less limiting transient (turbine trip). The changes were: the conversion of the Stator Winding Cooling Water System (SWCWS) from a variable flow to a constant flow system; removal of the automatic signals from the generator runback circuit; a change in the turbine trip delay from three minutes to one minute, and improving the logic of the time delayed turbine trip signal by adding a low flow signal as one of the initiating signals.

Safety Evaluation Summary (SE 99-14)

The SWCWS is not an accident initiator and these changes will not initiate or contribute to any accidents discussed in the FSAR. Additionally, these changes will not produce any new failures or malfunctions that would initiate an abnormal operational transient.

This design change does not involve any safety-related systems and has no affect on any system failure or accepted safety limits. Therefore, the margin of safety is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 98-409, “HCPI/RCIC Turbine Exhaust Check Valve Replacement”**

**General Summary**

The purpose of this design change was to replace the existing exhaust line swing check valves with nozzle check valves, add a manual blocking valve and not affect the ability of the High pressure Coolant Injection (HPCI) turbine to achieve the systems safety function. Design evaluations show that turbine backpressure will be slightly lower for all modes of operation. This change in backpressure does not adversely affect turbine operation. Original design requirements were maintained with the exception of the closing mechanism of the nozzle check valves.

**Safety Evaluation Summary (SE 99-16)**

The turbine and exhaust piping of the HPCI system, as well as Primary Containment is not defined as an accident initiator in the FSAR, they are considered accident mitigation systems. This change involves replacement of one style of check valve with another, the addition of a block valve and two test connections. As there are no new credible failures modes, the installation of this equipment does not increase the probability of a malfunction which initiates an abnormal operational transient.

The Technical Specifications Bases for Sections 3.5.E and 4.5.E do not define any system failure points, accepted safety limits, or margin of safety for the HPCI system, therefore, the margin of safety has not been reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Safety Evaluation Summary (SE 99-16, Rev. 1)**

This revision added additional information to clarify the original safety evaluation. It noted that the new valves were located as close to the containment as possible; specified which subsystems would use the water stored in the Torus, added information further explaining why condensation will have no adverse affects on the nozzle check valve or piping, added information regarding the new increased pipe volume and that it had no adverse affects on exhaust line vacuum breaker operation, noted that there are two more test connections and made minor editorial changes.

**Engineering Design Change Request (EDCR) 98-409, "HCPI/RCIC Turbine Exhaust Check Valve Replacement," ECN-1**

**General Summary**

This Engineering Change Notice (ECN-1) for EDCR 98-409 added the installation of exhaust line nozzle check valves and blocking valve to the Reactor Core Isolation Cooling (RCIC) system as part of the EDCR. This then included both the HPCI and RCIC Systems. Evaluations for the RCIC installation were similar as those for the HPCI systems and concluded that the only change would be to the slight decreased backpressure which would not affect RCIC operation.

**Safety Evaluation Summary (SE 99-23)**

This safety evaluation includes the RCIC system and states that unlike the HPCI system, the RCIC system does not function as an accident mitigator nor is it an accident initiator. As it is essentially the same installation as for the HPCI, it does not increase the probability of a malfunction that initiates an abnormal operational transient or decreases the margin of safety as defined in the bases any Technical Specifications.

This change involves replacement of one style of check valve with another, the addition of a block valve and two test connections. As there are no new credible failures modes the installation of this equipment does not increase the probability of a malfunction that initiates an abnormal operational transient.

The Technical Specifications Bases for Sections 3.5.E, 3.7A & D, 4.5.E and 4.7A & D do not define any system failure points, accepted safety limits, or margin of safety for the RCIC system, therefore, the margin of safety has not been reduced.

There are no Technical Specifications that define the margin of safety for the RCIC system; therefore, the margin of safety has not been reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 99-402, "Recirculation Pump Discharge Valve Modifications"**

**General Summary**

Vermont Yankee's LOCA analysis presently does not take credit for closure of the Recirculation Pump Discharge Valves in the broken loop during or after a postulated recirculation suction line LOCA, even though these valves receive a signal to close. This

results in an assumption that approximately 5000 gpm is lost through an unisolated break during LPCI injection.

The purpose of this design change was to improve the functional margin of the valves to ensure that they close under postulated accident conditions. Subsequently, the closing thrust and cable routing for these valves was modified to accommodate this change. Larger motors were installed on the valves and the power and control cables were re-routed to protect them from postulated jet impingement forces. Additionally, this design change corrected some cable separation concerns discovered during preparation of this change.

#### Safety Evaluation Summary (SE 99-24)

The Recirculation Pump Discharge Valves safety function is not changed as a result of this design change. These valves are not accident initiators for any of the accidents analyzed in the FSAR. Any FSAR analyzed transients associated with core coolant flow decrease, similar to a recirculation pump trip, could be affected by inadvertent closure of these valves, however, the changes made by this EDCR are not initiators of any abnormal operational transients because there were no changes made to the controls for these valves.

The changes made by this EDCR do not change any valve closure times and do not affect any system operational requirements; therefore, the margin of safety was not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

#### **Engineering Design Change Request (EDCR) 99-401, "Cycle 21 Reload"**

##### General Summary

This design change provides descriptions and analysis results pertaining to the mechanical, thermal-hydraulic and reactor physics analyses to support Cycle 21. The Cycle 20/21 refueling involved the discharge of 108 irradiated fuel assemblies and the insertion of 108 new fuel assemblies. Several control rods were also replaced. All systems affected by this EDCR are safety Class 2.

Engineering Change Notice 1 to this EDCR will provide information that supports operation through Cycle 21.

Safety Evaluation Summary (SE 99-26)

This safety evaluation addresses the refueling operations associated with fuel shuffling and control rod replacements prior to Cycle 21. The safety evaluation for the operation of Cycle 21 itself through End-of-Life will be addressed in ECN 1 to this EDCR.

The only Design Basis Accident that applies during refueling operations is a Refueling Accident. The probability of dropping a fuel bundle during fuel handling maneuvers is not increased relative to previous cycles because: the bail handle design has not changed; all fuel handling tools are compatible with all the fuel; and the weight of the new GE-13 bundle is less than the previous GE-9 bundles. Therefore, the probability of occurrence of the design basis Refueling Accident is not increased by the introduction of the new GE-13 fuel bundle.

Abnormal operational transients are not postulated to occur during refueling; therefore, no equipment could malfunction and cause an abnormal operational transient.

The new fuel and control rods are mechanically equivalent to those used in previous cycles, therefore the failure points for the fuel and control rods are unchanged and there is no decrease in the margin of safety as defined in the bases any Technical Specifications.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This EDCR did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 99-401, ECN 1, " Cycle 21 Reload"**

General Summary

This design change provides descriptions and analysis results pertaining to the mechanical, thermal-hydraulic, reactor physics analyses and cycle thermal limits to support Cycle 21 operation. The Cycle 20/21 refueling involved the discharge of 108 irradiated fuel assemblies and the insertion of 108 new fuel assemblies. Several control rods were also replaced. All systems affected by this EDCR are safety Class 2.

Safety Evaluation Summary (SE 99-26, Rev. 1)

This safety evaluation addresses Cycle 21 operation whereas the original safety evaluation addressed fuel and component shuffling.

As the replacement control rods are mechanically equivalent to those previously used in the core and given that the thermal-hydraulic operating characteristics that could contribute to either fuel bundle or control rod deformation are not changed, the probability of occurrence of the design basis Control Rod Drop Accident is not increased. The fuel and component loading and the core design are not initiators of any LOCA or

Main Steam Line Break accident and due to the mechanically equivalent fuel bundles; there is no increase in the probability of a Refueling Accident.

The probability of a malfunction is not increased for any of the analyzed transients or events as this design change did not alter plant equipment or components that rendered them different in form or function from previously installed plant equipment or components.

The margin of safety is not reduced for the operation of this core reload, as the limits imposed by the Technical Specifications will maintain operations within the applicable analysis.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This EDCR did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Engineering Design Change Request (EDCR) 98-406, “ Increased Core Flow Modifications”**

#### **General Summary**

This EDCR provides information that supports the operation of the Vermont Yankee Nuclear Power Station up to an increased core flow of 107% of rated condition. The actual maximum increased core flow will be defined by the maximum output of the Motor Generator Sets while operating within their design parameters. This EDCR provides the bases for the setpoint modifications to the Motor Generator Set Scoop Tube positioners to allow the recirculation system to increase the core flow.

#### **Safety Evaluation Summary (SE 99-27)**

The increase in recirculation and core flow does not affect initiators of the Control Rod Drop or the Main Steam Line Break accidents. Refueling accidents are not affected, as there is no increased core flow during refueling maneuvers. Loss of coolant accidents are also not affected by the flow increase.

The reliability of the equipment was not changed with this design; therefore, increased core flow does not affect the initiators of abnormal operational transients.

For upset conditions, resulting in an abnormal operational transient, acceptable consequences have been demonstrated provided Minimum Critical Power Ratio (MCPR) operating limits specific to increase core flow are followed. With the application of the operating limits for increased core flow, the same margin of safety to all safety limits is provided.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This EDCR did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Engineering Design Change Request (EDCR) 99-404, “Emergency Response Facility Information System (ERFIS) Data Acquisition System (DAS) B Replacement”**

**General Summary**

This design change replaced the Non Nuclear Safety (NNS) ERFIS Analogic DAS “B” equipment with NNS DAS equipment manufactured by a different vendor, and the NNS interconnecting wiring. This replacement is downstream of all Safety Class Electrical/ NNS isolation devices. Although the DAS “B” wiring is classified as NNS, it is installed in accordance with the Vermont Yankee separation Criteria for NNS cabling, and is flame retardant.

**Safety Evaluation Summary (SE 99-29)**

The ERFIS computer and associated DAS wiring as well as the associated instrument loops are not initiators of any accident or any abnormal operational transient listed in the FSAR. Although a malfunction of some of the instrumentation that provides inputs to the ERFIS DAS equipment could potentially initiate an abnormal operational transient, isolation devices were previously installed as necessary on all Safety Class Electrical (SCE) instrumentation during the original ERFIS installation.

Although the ERFIS computer and associated DAS equipment is not specifically listed in the Vermont Yankee Technical Specifications, some of the instrument loops that provide inputs to are listed in the Technical Specifications. Consequently, to preclude the introduction of unacceptable errors, post installation validation and verification testing verified that the ERFIS indications and displays remain unchanged.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Vermont Yankee Design Change (VYDC) 99-004, “Control Rod Drive (CRD) Pump Minimum Flow Upgrade”**

**General Summary**

This modification installed two 20 gpm capacity, bypass flow lines in parallel with the existing two CRD pumps minimum flow bypass lines. These new lines will provide increased flow to prevent CRD pump failures when the CRD system is placed in isolated

return. The CRD return line normally exhausts back through the Reactor Water Cleanup System and subsequently through other systems to the reactor vessel. If a problem in one of these systems necessitates isolation of the exhaust line, then the new minimum flow line will ensure that the pumps are adequately cooled.

#### Safety Evaluation Summary (SE 99-28)

The CRD pumps, discharge lines and original bypass lines are not initiators of accidents previously evaluated in the FSAR. Likewise, the additional bypass lines connected to the CRD pump discharge and minimum flow lines are not accident initiators. The installation of these new bypass lines will also not result in the increase in probability of a malfunction of equipment important to safety or initiate any abnormal operational transient discussed in the FSAR.

Neither the CRD pumps or the bypass lines form the bases for any existing Technical Specifications and therefore this installation does not reduce the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Vermont Yankee Design Change (VYDC) 99-002, – “Re-Establish Refuel Platform Design Basis”**

#### General Summary

This design change returned the overall safety classification of the Refuel Platform and Instrumentation system back to its original Safety Class 3 designation. It had been reclassified as Non Nuclear Safety (NNS) with Other Quality Assurance (OQA) requirements. It also identified that equipment fasteners and the Refueling Platform structure are qualified to seismically resist failure.

#### Safety Evaluation Summary (SE 99-35)

The Refueling Platform and Instrumentation system is independent of the accidents analyzed in the FSAR with the exception of the Refueling Accident. Other than the Refueling Accident, the Refueling Platform is not an initiator of any of the other accidents. Although the Refueling Platform is directly related to the Refueling Accident, this upgrade does not make any physical, material, or operational changes in the design, therefore, there are no changes being made that can initiate an accident.

This change does not increase the probability of a malfunction for any of the analyzed transients because the Refuel Platform and Instrument system is not part of any of the equipment involved in the analyzed transients.

This change does not change the relationship between system failure points and the bases for any Technical Specification. Therefore, the margin of safety as defined in the bases any Technical Specifications has not been reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Vermont Yankee Design Change (VYDC) 99-002, #2 – “Re-Establish Refuel Platform Design Basis”**

#### **General Summary**

During a field walkdown for this design change, engineers identified that the Refuel Platform Restraint bar assembly was missing from the operators cab. This bar was a part of the original design and was provided to limit “swing if the fuel grapple comes in contact with the fuel pool wall”. During a recent event when the fuel grapple contacted the fuel preparation machine it was determine that if the restraint bar was in place during this event, the mast would have been seriously damaged and would have complicated safe positioning of the suspended fuel assembly. Subsequently, this result was deemed unacceptable and it was determined that the bar was no longer needed. This change addresses continued operation with the restraint bar removed and credited operator action and the computerized electronic barrier system on the Refuel Platform as a means of addressing the potential for mast contact with the Spent Fuel Pool wall.

#### **Safety Evaluation Summary (SE 99-36)**

The removal of the Refuel Platform Grapple restraint bar is independent of the accidents analyzed in the FSAR with the exception of the Refueling Accident. This change does not impact the occurrence of a Refueling Accident in that the restraining bar was a protective device designed to maintain needed vertical orientation of the mast and act as a stall in the unlikely event that the mast contacts the Spent Fuel Pool wall. This is now accomplished by additional operator controls, joystick controls and the electronic barrier system being credited to prevent mast/wall contact.

The Refueling Platform restraint bar does not impact any of the transients analyzed in the FSAR.

The restraint bar does not change any failure point or accepted safety limit, is not discussed in the Technical Specifications, and therefore does not reduce the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This design change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Minor Modification 98-071 – “Replacement of Scram Discharge Volume Drain Valve Actuators”**

#### **General Summary**

This Minor Modification replaced the existing Scram Discharge Volume (SDV) drain valve actuators with larger valve actuators. These new actuators provide more operating and closing torque to the associated valves, ensuring that the valves will operate when required. The original actuators only provided marginal torque at the end of the stroke when the valve was closed. The initial torque values required, were a part of the original specification. This installation does not change the overall system operation or associated valve operation.

#### **Safety evaluation Summary (SE 98-051)**

The Scram Discharge Volume (SDV) is not an accident initiator. The vent and drain valves provide an isolation function to contain the Control Rod Drive discharge following a SCRAM, thereby limiting the potential release of radiation and steam to the reactor building. The larger actuators will ensure that this function is completed.

The SDV is not an initiator of any abnormal operational transients. Replacing the actuators will not increase the probability of a malfunction occurring which initiates an abnormal operational transient previously evaluated. No safety limits are associated with the SDV drain valves and the margin of safety deals with the closure time of the valves. The CRD Design Basis Document (DBD) establishes the time as  $\leq 30$  seconds. As the valves close within this time frame there is no reduction in the margin of safety as defined in the bases any Technical Specifications.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This Minor Modification did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Minor Modification (MM) 98-062, “ Abandonment of Oil Transfer Line”**

**General Summary**

This MM was written to abandon in place the two-inch steel transfer line used to transfer oil from the 75,000 gallon Fuel Oil Storage Tank to the House Heating Boiler Oil Storage Tank. The line, identified as potentially having an underground leak, would be difficult to repair and was isolated in 1995. The line was cut, and capped in place.

**Safety Evaluation Summary (SE 98-50)**

Neither the House Heating Boilers nor the Fuel Oil Storage System are accident initiators. The abandonment of this line will also not affect any accident initiators. The transfer line only communicates between the two tanks and does not impact any equipment capable of causing a malfunction as analyzed in the FSAR.

The margin of safety is not reduced, as there are no Technical Specification limits associated with this transfer line.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This MM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Minor Modification (MM) 98-066, “Emergency Diesel Generators Fuel Oil Storage Tank Level Control Valves”**

**General Summary**

This MM permanently opens the existing fuel oil storage tanks level control valves and will provide a start/stop signal to the fuel oil transfer pumps from the high and low level sensors instead of from the level control valves. This MM eliminates the need for operator action on loss of instrument air which was previously a required action.

**Safety Evaluation Summary (SE 99-03)**

The Emergency Diesel Generators (EDG) Fuel Oil Storage Tank level control valves fail-safe position does not affect any systems, structures or components that initiate any design basis accidents. The EDG's or their support systems are not initiators of any of the analyzed abnormal operational transients. This modification will provide an increased margin of safety in the fuel oil transfer system, a support system for the EDG and therefore a corresponding increase in the reliability of the EDG

There are no Technical Specification values that are affected by this modification and, therefore, no margin to safety is reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This Minor Modification did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Minor Modification (MM) 99-002**

#### **General Summary**

This Minor Modification adds a mechanical delay to the initiation of the release of CO<sub>2</sub> in the Cable Vault and the Switchgear Rooms. Additionally, the second-shot feature to the Cable Vault is converted to a manually initiated system. This modification was a result of a potential for the system to immediately release CO<sub>2</sub> without any warning to plant personnel. The potential for release was due to power surges and other unexplained initiating events.

#### **Safety Evaluation Summary (SE 99-05)**

The Cable Vault and Switchgear Rooms CO<sub>2</sub> Systems are not accident initiators nor do they have any impact on accident initiators. No new credible failures are introduced by this change. This change does not affect Control Room Habitability, and reduces the possibility of an inadvertent actuation. Therefore, this modification does not increase the probability of a malfunction that would initiate an abnormal operational transient.

The Technical Specifications do not identify time limits to initiate CO<sub>2</sub> in the Switchgear Rooms or the Cable Vaults; therefore, this MM does not reduce the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This MM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Minor Modification (MM) 99-37, "Replacement of Standby Liquid Control (SLC) Heater Magnetic Breaker"**

#### **General Summary**

This MM replaces the existing, magnetic only, circuit breaker for the SLC tank electric heater with a thermal magnetic circuit breaker. The breaker was replaced due to its limited capabilities for protecting the associated power cable and to ensure that coordination between this breaker and the associated Motor Control center is appropriate.

Safety Evaluation Summary (SE 99-31)

The SLC heater is not an initiator of any of the accidents analyzed in the FSAR nor does it increase the probability of a malfunction which initiates an abnormal operational transient analyzed in the FSAR. The margin of safety is not reduced, as this change does not affect any Technical Specification bases or limits.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This MM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Minor Modification (MM) 98-070, "Turbine Building Relief Damper"**

General Summary

This MM installed a 20 square foot, 0.25 psig pressure relief damper in the Turbine Building to create a preferential pressure relief path in the event of a small pipe High Energy Line Break (HELB) in the Main Steam Tunnel. The pressure relief dampers will create a preferential relief path for this harsh air/steam mixture to the Turbine Building rather than from migrating through the Reactor Building.

Safety Evaluation Summary (SE 99-33)

These relief devices cannot initiate an accident evaluated in the FSAR . The relief dampers respond to an event to help mitigate the results of a HELB. They also do not increase the probability of a malfunction that could result in an abnormal operational transient, as they do not interface with any plant equipment.

There is no reduction in the margin of safety, as the installation of these dampers do not affect any Technical Specification limits.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This MM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Minor Modification (MM) 99-016, "Replacement of Stator Cooling Water Heat Exchanger Service Water Outlet Valves"**

General Summary

This MM replaces the existing Service Water (SW) outlet valves of the stator Cooling Water heat Exchangers with new 4" ANSI 150# Class, manually operated globe valves.

These valves were replaced to eliminate the vibration caused by cavitation due to excess throttling requirements of the original valves. The excess valve throttling was the source of maintenance problems such as packing leaks and valve stem failure. This portion of the SW system is classified as non-safety related and non-seismic.

Safety Evaluation Summary (SE 99-38)

The SW system does not function as an initiator of any of the accidents analyzed in the FSAR. This modification does not alter the mitigation capabilities of the SW system. This modification does not increase the probability of an accident or a malfunction as existing throttle valves were replaced with throttle valves of a different style with their failure modes the same as or enveloped by the existing configuration.

The Technical Specifications Bases do not define any system failure points, accepted safety limits, or margin of safety for the SW system, thus this modification does not reduce the difference between a system failure point and an accepted safety limit or reduce the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This MM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Minor Modification 99-017, "Replacement of Service Water (SW) Outlet Valves for the Recirculation Motor Generator (MG) Lube Oil Coolers"**

General Summary

This MM replaces the existing SW outlet valves, V70-22C and V70-22D, on the Recirculation MG lube oil coolers, with new 4" ANSI 150# Class manually operated globe valves and a pressure reducing orifice in each train. These valves were replaced to eliminate the vibration caused by cavitation due to excess throttling requirements of the original valves. This MM also removed the existing 3" bypass line and the respective temperature control valves, TCV-104-22A and B, which were installed by an earlier design change in an attempt to correct the valve problem. The piping and associated components were installed to ensure the safety and seismic classifications were maintained.

Safety Evaluation Summary (SE 99-39)

The SW system is not an accident initiator of any of the accidents analyzed in the FSAR. The probability of a design basis accident or a malfunction is not increased as this modification replaces existing equipment with equipment that is as good as the original. The new components and their failure modes are the same as or are enveloped by the existing configuration. This modification does not alter the mitigation capabilities of the SW system.

The Technical Specification Bases do not define any system failure points, accepted safety limits or margin of safety for the SW system; therefore, this MM does not reduce the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This MM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Minor Modification (MM) 99-029, “Control Room Heating Ventilation and Air Conditioning (HVAC)”**

#### **General Summary**

This MM converts Temporary Modification (TM) 96-043 to a permanent installation. The description of the installation is included in the summary for TM 96-043 which appears in this report. The conversion is strictly a paper conversion and did not change the installation performed under the TM.

#### **Safety Evaluation Summary (SE 99-45)**

The safety evaluation summary for this MM is included in the safety evaluation summary for TM 96-062 which appears in this report. This safety evaluation did not change for this conversion to a MM.

### **Temporary Modification (TM) 96-043, “Control Room Heating, Ventilation, and Air Conditioning”**

#### **General Summary**

This TM was written to bring the Control Room HVAC system into compliance with its intended function to provide heating and cooling. The bypass position of the chill water valve and closure of the HVAC dampers SAC-1A/1B on loss of instrument air was contrary to expected system performance. This TM installed a pneumatic reversing relay on the chill water valve allowing it to fully open on loss of air, installed an isolation and test valve in the supply to the chill water valve to allow for IST testing and fitted short lengths of chain to hold the dampers open on loss of instrument air. Additionally, a maintenance isolation valve was installed on the temperature control valve for the heating coil.

This modification requires the plant staff to operate the HVAC system from outside the Control Room during a loss of instrument air. This additional action for initiating Control Room HVAC would be bounded by the conservative evaluations for Control Room Operator dose bases on TMI type accidents centered around radiological concerns. A

worst case whole body gamma dose of less than 3 REM is projected for a one time 30 minute activity to open selected Control Room HVAC fan isolation dampers.

Safety Evaluation Summary (SE 96-062)

Temperature control of the Control Room is not associated with any accident initiator analyzed in the FSAR nor does it interface with any equipment associated with the initiation of any analyzed malfunction. This TM does not reduce the margin of safety as the Control Room HVAC system is not included in any Technical Specification.

The radiological dose consequences of taking manual action to establish Control Room cooling post LOCA has been evaluated and found to be enveloped by the post-LOCA Control Room dose analysis documented in calculation VYC-39, Rev. 2. This calculates the dose expected in the shielded Technical Support Center which lists a maximum dose of 4.7 REM total whole body dose over a 30 day period. The projected 3 REM, 30 minute dose to open selected Control Room dampers is considered acceptable.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Temporary Modification 98-046, "Removal of SRV-2-71D Bellows Pressure Switch from CRP 9-3 Annunciator"**

General Summary

The annunciator for the Relief Valve Bellows Leakage alarm is common to all four relief valves. One valve, RV-2-71D was declared out of service due to a bellows leak. This bellows leak caused the common annunciator to remain in the alarm state. This Temporary Modification removed the signal from the valve annunciation with the leaking bellows, and restored the ability to monitor the three remaining relief valves that use the bellows leak detection system.

During the time that RV-2-71D was out of service, the three remaining valves were operable and met the Technical Specifications requirements.

Safety Evaluation Summary (SE 98-046)

The pressure switch associated with this leak detection system has no effect on any of the analyzed accidents and does not affect any accident initiator. This change only affects the annunciator system for relief valve bellows leak detection system and therefore will not increase the probability of any analyzed malfunction.

The margin of safety has not been changed by this modification nor are any safety limits affected. The three remaining valves satisfy the Technical Specification requirements.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Temporary Modification (TM) 99-008**

#### **General Summary**

This TM was written to temporarily disable the odd numbers (ones) for control rod position indication for control rod 30-31. This was necessary as the rod indication for rod 30-31 was malfunctioning and gave a continual "Rod Drift Alarm" which also causes a common drift alarm for all control rods. This TM eliminated the rod drift alarm from control rod 30-31 "ones" position and subsequently allowed the common alarm to remain in service for all other control rods. Only the "ones" positions were disabled for this rod while all other positions of control rod 30-31 remained operable.

#### **Safety Evaluation Summary (SE 99-13)**

Neither the control rod drive mechanism position indication nor the associated electronics are initiators of any accidents analyzed in the FSAR. This TM also does not increase the probability of any malfunctions, which initiates abnormal operational transients, because neither the Rod Worth Minimizer (RWM) nor the Reactor Protection Indication System (RPIS) are associated with any of these events.

This TM will not affect scram insertion times governed by Technical Specifications and therefore there is no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This Temporary Modification did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Temporary Modification (TM) 99-001**

#### **General Summary**

This TM was written to temporarily disable the Control Rod Overtravel alarm for control rod 30-31. This alarm was bypassed due to a position indicator malfunction for that rod. Other means available for overtravel verification include the full core display and the alarm typer from the Rod Position Indication System. Additionally, Operation's

procedures required once-per-shift checks of rod position indication as well as weekly rod coupling checks. This change renders the FSAR Section 7.7.4.4 different than that stated. The FSAR states that "If a rod drive piston moves to these overtravel positions, an alarm is sounded in the Main Control Room". The remaining eighty-eight rods met this statement.

Safety Evaluation Summary (SE 99-04)

The rod overtravel annunciator is not an initiator of any accident or abnormal operational transient analyzed in the FSAR. Coupling integrity of rod 30-31 will continue to be determined through the use of the full core display and the alarm typer.

The margin of safety is not reduced, as there is still positive indication that the drive remains coupled.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This Temporary Modification did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Temporary Modification (TM) 99-10, "Chemical Addition to Service Water System"**

General Summary

This TM evaluates the temporary installation of a chemical addition system used on the Service Water System to chemically clean the inner surfaces of pipes, valves and pumps that have been previously identified as having Microbiologically Influenced Corrosion (MIC) deposits.

A initial dose of approximately 6400 gallons was injected into the Service water System and then the TM was disassembled. All Service Water System materials that potentially came into contact with the chemical are compatible with the chemical concentration used for this TM.

Safety Evaluation Summary (SE 99-18)

This TM does not increase the probability of an accident evaluated in the FSAR as this treatment process improved the hydraulic performance of the Service Water System resulting in overall improved system performance. This TM also does not increase the probability of a malfunction of equipment important to safety, since all materials were evaluated as compatible.

The subject activity is bounded by the current FSAR description of the chemical addition to Circulating and Service Water Systems and therefore the margin of safety has not been reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Temporary Modification (TM) 99-016, "Torus Area Air Conditioning"**

#### **General Summary**

This TM was used to minimize the potential for reaching a Technical Specification Torus water temperature limit of 90°F due to the heating effect of the ambient air in the Torus area. This TM installed a mobile air conditioning unit that was ducted into the Reactor Building Torus area via the south access ladder way. Two additional blowers on the Torus catwalk circulated cooled air within the Torus area. To additionally help cool the area, the normal HVAC registers were blanked off during the daytime when outside air was greater than 75 °F ± 5°. This modification enhanced the cooling in the Torus airspace. Added airflow in the HPCI and RCIC areas, as a result of the blanked off registers, had no adverse affect on the HELB temperature detectors in that area.

#### **Safety Evaluation Summary (SE 99-019)**

Supplying enhanced cooling to the Torus area or blanking off the normal supply registers will not initiate an accident nor change any accident initiator. The installation of the mobile air conditioning unit including the ductwork register alteration has no credible failure mode that would increase the probability of a malfunction as analyzed in the FSAR.

There are no technical Specification limits applicable to this TM; therefore, the margin of safety is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Temporary Modification 99-031, "Main Steam Line Temporary Plugs"**

#### **General Summary**

This TM was written to allow installation of temporary plugs in the downstream piping of the outboard Main Steam Line Isolation Valves (MSIV) while refurbishing the MSIV's during Refueling Outage 21. The plug provided two functions. One, to act as a Foreign Material Barrier (FME) to block migration of debris and machine turnings down the steam lines and two, to provide a secondary containment boundary during periods of the outage where the MSIV's and the turbine stop valves are both open to atmosphere at the same time. The safety evaluation addresses the secondary containment function of the

plug. The plugs are a sulfur-cured rubber nitrile elastomer thermal material covered with a flame retardant material.

#### Safety Evaluation Summary (SE 99-40)

The installation of these plugs can only occur while the plant is shutdown and therefore do not affect any of the accidents analyzed in the FSAR that require the plant to be operating. The plug is a passive component and as such cannot be an initiator of a Refueling Accident or any accident enveloped by it. Likewise, with the plant shutdown the installation of the plug cannot be an initiator of a malfunction as described in the FSAR. The plugs would be expected to maintain secondary containment integrity in the event of a Refueling Accident.

The plugs passed the secondary containment integrity test and were removed following the refueling, therefore there was no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TM did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

#### Safety Evaluation Summary, Revision 1 (SE 99-40, Rev. 1)

Due to a concern about the original plug material, the plug was re-designed using the same core material but without the fire retardant wrapping and with the addition of a metal rod through the center to hold the plug together. The new plug did require a fire retardant material to be placed over the plug during any hot work. This re-design did not affect the conclusion of the original safety evaluation.

### **Installation and Test (I&T) Procedure for EDCR 98-408, "Main Station Battery Rack Modifications"**

#### General Summary

This I&T installed additional hardware that interfaces with the existing battery racks to support Seismic Qualification Utility Group (SQUG) upgrades. The modifications are classified as safety related and were performed to ensure that seismic capacity of the Vermont Yankee Main Station Batteries meet or exceed the seismic requirements. There was no change to the batteries themselves. The equipment remained operational during the installation.

#### Safety Evaluation Summary (SE 99-25)

The modifications detailed in this I&T do not affect any accident initiators as defined in the FSAR. The equipment remained operable and was available to perform its intended safety function. The modifications were made to passive structural members and

administrative and physical controls were put in place to provide assurance that the active components remained operable. Therefore, there was no increase in the probability of a malfunction of equipment important to safety.

As this modification only modified passive components, electrical power is available for operation of systems required for reactor safety, therefore, the margin of safety was not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This I&T did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Basis for Maintaining Operability (BMO) 98-36, "Effect of Main Steam Tunnel and Turbine Building HELBs on the HVAC Rooms"**

#### **General Summary**

BMO 98-36 was written to address a potential concern with the HVAC room masonry wall integrity. This was related to Turbine Building (TB) pressurization as a result of a Main Steam Tunnel (MST) or TB High Energy Line break (HELB). Based on a Design Engineering evaluation a concern was identified relating to the masonry walls that provide separation between the Control Room HVAC equipment and the turbine operating deck.

The deficiency addressed by this BMO was a lack of documented basis to support either that the Control Room HVAC equipment can operate in a harsh environment or that cooling of the Control Room using portable ventilation equipment is acceptable if the masonry walls were to fail.

An administrative limit on coolant Iodine I-131 activity to 0.05  $\mu\text{Ci/ml}$  was established and standing night orders were provided to the operators to initiate temporary cooling of the Control Room in the event that a HELB prevents normal cooling of the Control Room.

#### **Safety Evaluation Summary (SE 98-047)**

Neither the HVAC systems nor the masonry walls that provide the separation between the HVAC and the turbine operating deck are accident initiators nor do they initiate any abnormal operational transients. Administratively limiting the I-131 dose equivalent specific activity and implementing an order to temporary cool the Control Room to ensure doses remain within analyzed limits.

There is no specific system failure point or accepted safety limit for the control Room HVAC equipment. Administratively limiting the I-131 dose equivalent specific activity increases the margin of safety. Therefore, there is no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This BMO did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Basis for maintaining Operability (BMO) 98-044, “Significant Degradation of Residual Heat Removal Service Water (RHRSW) Pump Hydraulic Performance”**

General Summary

This BMO was written to establish required interim pump design parameters based on operation of the Alternate Cooling System (ACS) given noted degradation of RHRSW pumps. The RHRSW pumps have experienced significant degradation due to biofouling because of microbiologically-induced corrosion (MIC). The impact of this was investigated to identify any potential adverse effect on safety.

The original parameters of 144 psid @ 2810 gpm are based on the worst-case design conditions for ACS operation assuming 105°F initial deep basin temperature. This BMO modifies the design criteria to ensure operation in a degraded mode due to MIC will not prevent the pumps from providing their expected function. The new parameters are 100 psid based on an initial deep basin temperature of  $\leq 71^\circ\text{F}$  at a flow rate of 2810 gpm. This satisfies the Technical Specification requirements.

BMO 98-044, Revision 1

This revision was initiated to include losses within the RHRSW pump suction barrels as part of the NPSH calculations. It was concluded that the ACS could provide the required heat removal at a flow rate of 4300 gpm with an initial deep basin temperature of  $\leq 73^\circ\text{F}$  with four RHRSW pumps running. The new reduced flow provides a positive margin on NPSH as was demonstrated during Special Test Procedure 95-002.

No revision of the safety evaluation was required for revision one.

BMO 98-044, Revision 2

This revision was written to identify the necessary actions and procedural changes to close out BMO 98-044. Changes have been made to plant procedures regarding the ACS and RHRSW pumps.

### Safety Evaluation Summary (SE 98-055)

The RHRSW system, the ACS and their components are not accident initiators nor do they initiate any abnormal operational transients. The ACS is not an Engineered Safeguard System and is not relied upon for mitigation of the analyzed accidents. The RHRSW system is an accident mitigator, however the changes made to system operation are procedural changes that do not adversely affect operation of the system during an accident.

The margin of safety is not reduced as the compensatory actions specified in BMO 98-44 will ensure that the ACS is operated within its design basis.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This BMO did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

The revised safety evaluation for revision two added the fact that AP 0150, "Conduct of Operations and Operator Rounds" was revised to include a verification that the deep basin temperature was maintained  $\leq 73^{\circ}\text{F}$ .

### **Bases for Maintaining Operability (BMO) 99-08 "Alternate Cooling/Augmented Fuel Pool Cooling"**

#### General Summary

This BMO was written to address a concern that was determined to exist in that insufficient technical guidance was provided for the initiation and operation of the Alternate Cooling System (ACS). The guidance was considered insufficient as no specific details were provided regarding frequency of operation of the Augmented Fuel Pool Cooling mode and its effect on Reactor Coolant System cooling when the plant is on Shutdown Cooling.

To address this, several procedures were revised to provide improved guidance. As part of this effort, related issues were also addressed regarding, the draining of RHR water during system warming, Equipment Qualification in the Reactor Building, and Inservice testing of manual valves in the Augmented Fuel Pool Cooling system.

#### BMO 99-08, Revision 1.

Revision 1 was initiated to account for the revised heat load in the fuel pool as a result of the RFO 21 refueling outage. This revision includes more conservative direction by using test data from a heat-up rate test performed on the fuel pool, and an assessment using a Time to Boil model.

Safety Evaluation Summary (SE 99-17)

This BMO and the subsequent procedure changes deal with events which require ACS operation. These events, loss of Vernon Pond, flooding of the service water intake structure, or fire in the Service Water Intake Structure are separate initiating events from those described in FSAR Chapter 14.6, Analysis of Design Basis Accidents and therefore are not initiators of any design basis accidents.

All evaluations and analysis determined that no increase in the probability of a malfunction was introduced which would initiate an abnormal operational transient.

The margin of safety has not been reduced as all Technical Specifications are met.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This BMO did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

Safety Evaluation Summary, Revision 1 (SE 99-17, Rev.1)

Revision 1 of the safety evaluation is essentially the same as the original with the exception of the removal of a statement which stated the period of time that the SDC will not be available.

**Special Test Procedure STP-98-008 – “Standby Fuel Pool Cooling System Heat Exchanger Thermal Performance Test”**

General Summary

This test was written to provide the steps and test equipment necessary to perform the Standby Fuel Pool Cooling System (SFPCS) heat exchangers thermal performance testing to ensure heat removal capability during worst case accident scenarios. Completion of this Special Test Procedure (STP) satisfies Generic Letter 89-13 commitments.

The heat exchangers were tested against design criteria with the exception of Service Water inlet temperature. The original specification was based on a 90° F Service Water Supply Temperature. However, in accordance with the FSAR, the maximum service water inlet temperature allowed is 85° F. Therefore, credit is being taken for the lower Service Water supply temperature.

### Safety Evaluation Summary (SE 98-039)

The SFPCS and SW systems are not accident initiators as discussed in the FSAR, therefore the installation of temporary test equipment does not increase the probability of occurrence of an accident. The probability of an increase in the radiological consequences of an accident is not increased as the systems will be operated within their design limits.

The performance of this test does not reduce the difference between a system failure point and the accepted safety limits nor does it reduce the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This STP did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### Special Test Procedure (STP) 99-003, "Increased Core Flow"

#### General Summary

This STP provides direction for the implementation of Increased Core Flow (ICF) up to a maximum of 107% of rated flow. Engineering Design Change Request (EDCR) 98-406 provided the documentation and a review of the analysis supporting this implementation. The directions provided in this STP include re-adjustments to mechanical and electrical stops and software changes in the process computer to allow the increased flow and to provide appropriate protection in accordance with the Supplemental Reload Licensing Report.

#### Safety Evaluation Summary (SE 99-32)

Implementation of ICF does not increase the probability or occurrence of any previously analyzed accident. The limiting abnormal operational transients were analyzed at ICF conditions and approved as part of the plants licensing basis for Cycle 20. Although core flow is a major factor during the course of these abnormal operational transients, the initiators of these plant transients will not be affected by ICF.

Evaluations performed in support of EDCR 98-406 found no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This STP did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Special Test Procedure (STP) 99-002, "In-Situ Differential Pressure Testing of Valve V70-19A and V70-20"**

**General Summary**

This STP was written to provide direction for testing Service Water (SW) non-essential load isolation valves, V70-19A and V70-20, as part of the Motor Operated Valve Joint Owners Group periodic verification program. This test aids in determining the change in valve performance over time. This testing was performed during the plant refueling outage. Although the SW system is not required to be operable with the reactor sub-critical and water temperature less than 212°F, the SW system has to be functional for the Emergency Diesel Generators to be operable. The test was conducted so that at any given time either one or the other valves remained operable. These valves are required to be operated slowly to prevent water hammer, however, for this test they were operated normally. As these valves have a long stroke time and with the short test time there was no voiding of the pipes and no water hammer was observed.

**Safety Evaluation Summary (SE 99-37)**

Testing the subject valves is not an initiator of any of the accidents or abnormal operational transients analyzed in the FSAR nor does it increase the probability of an accident or malfunction. This testing was conducted in a manner consistent with quarterly valve surveillance and Motor Operated Valve testing.

This testing does not reduce the margin of safety, as the removal of the subject valves is defined in Technical Specifications and associated bases and maintaining one loop operable during the testing meets the Technical Specifications requirements. Therefore, the margin of safety is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This STP did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Procedure Change Evaluation for OP 2001, "Crossflow Ultrasonic Flow Meter Data Collection, Analysis and Implementation"**

**General Summary**

This procedure change was written to proceduralize the use of the new crossflow measuring equipment, used to compare Feedwater Flow Rate of the installed Feedwater venturis to the flow rate using the new ultrasonic measuring equipment. This will provide more accurate feedwater flow rate which in turn is used to determine reactor power.

Safety Evaluation Summary (SE 99-11)

The cross-flow system is not nor does it affect initiators of previously analyzed accidents. Use of this system will not increase the potential for any abnormal operational transients identified in the FSAR. This system is a stand alone, non-intrusive system which performs a feedwater flow calibration.

The Feedwater Flow system does not have a Technical Specification associated with it. Therefore, there is no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This procedure change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Procedure Change for OP 1111, "Control Rod Removal and Installation, Rev. 28"**

General Summary

This procedure change provides direction for withdrawal of multiple (greater than one) control rods with the mode switch in Refuel, as discussed in Technical Specifications. The procedure steps are written to support control rod blade replacement and any other activities where multiple blade withdrawal will be required to support gaining access to areas of the core for maintenance activities.

Safety Evaluation Summary (SE 99-43)

The procedure changes do not affect the coupling between a control rod and its associated control rod drive hence there is no increase in the probability of a Control Rod Drop Accident as described in the FSAR. It does not affect the analyzed Refueling Accident as this change does not impact fuel handling equipment. This change also does not affect other analyzed accidents as this procedure is not used during power operations.

The probability of a malfunction as analyzed in the FSAR is not increased as: 1) a control rod cannot be removed without first removing all fuel from the cell and, 2) controls were in place to prevent allowing a fuel bundle to be loaded into a cell without a control rod. Other analyzed malfunctions are not impacted by this change.

The margin of safety is not reduced due to this change, as administrative controls including upper management approvals are in place which prohibited fuel movement in the core with blades withdrawn. Additionally, voided cells will not reduce the Shutdown

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Setpoint Change 98C-06 – “Turbine Control Valve/Turbine Stop Valve Reactor Protection System Bypass”**

#### **General Summary**

This setpoint change corrected a condition whereby the Turbine Stop Valve/Control Valve Fast Closure SCRAM Bypass pressure switches did not release in accordance with Technical Specifications when reactor power exceeded 30%. With further investigation, it was determined that the original setpoint in Technical Specifications indicated that it was equal to a turbine first stage pressure of 30% turbine power. In the mid 1980's, General Electric SIL-423 identified this conflict with other BWR's and recommended that the Technical Specifications be corrected to indicate a first stage pressure equal to 30% reactor thermal power.

#### **Safety Evaluation Summary (SE 98-043)**

The Turbine Stop Valve/Control Valve Fast Closure SCRAM Bypass pressure switches are not initiators of any accident listed in the FSAR. Lowering the setpoint allows the SCRAM to be un-bypassed earlier than the then current setpoint, thus making it more conservative.

This bypass is installed to increase plant availability at low power levels. Consequently, this does not increase the probability of a malfunction.

The Margin of Safety has not been reduced due to this change, but has become more conservative with the SCRAM bypass being removed at an earlier power level.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Setpoint Change 98C-070 – “High pressure Coolant Injection (HPCI) System Minimum Flow Bypass Switch”**

#### **General Summary**

This setpoint change was written to raise the low flow setpoint of the HPCI Minimum Flow Bypass Switch from a nominal 400 GPM to a nominal 600 GPM. The original low flow setpoint was below the manufacturer's recommended minimum flow of 450 GPM.

This set-point change provides allowance for instrument accuracy and margin to ensure the HPCI pump has minimum flow under all potential operating conditions.

Safety Evaluation Summary (SE 98-054)

The change to the HPCI minimum flow valve opening setpoint will not affect systems, structures or components that initiate any of the design basis accidents. Additionally, due to the minimum flow set-point, allowing a flow rate sufficiently above the minimum flow requirement, this set-point change will not increase the probability of a malfunction occurring which could initiate an abnormal operational transient. This modification does not alter the mitigation capabilities of the HPCI system.

The margin of safety is not reduced, as the setpoint change will ensure the HPCI minimum flow is maintained. There is no impact on HPCI design flow rates and no negative effects on any safety limit

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This setpoint change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change, Sections 7.12.2 and 7.12.4, "Process Radiation Monitoring System"**

General Summary

FSAR Sections 7.12.2, Off-Gas Radiation monitoring System, and 7.12.4, Process Liquid Radiation Monitoring System, were revised in response to the questions relative to the definition of the word "Safety" as it applies to these sections. The function of these systems was reviewed by design engineering and it was determined that there was an inconsistency within these two sections regarding the use of the word "safety". This change clarified these sections.

This change to the FSAR removed the discussion of Safety Objective, Safety Design Basis, and Safety Evaluation from the description of each system. This will not affect the quality of the instrumentation in these systems and will not change the classification of the instruments. These instruments are classified as non-nuclear safety.

Safety Evaluation Summary (SE 98-041)

This change is only descriptive in nature and therefore cannot be an initiator of any accidents previously evaluated in the FSAR nor does it change any margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This FSAR change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change, Table 7.4.1 “Changes Needed to Close BMO 97-52, Revision 1.**

**General Summary**

This FSAR change is required to correct the High Pressure Coolant Injection (HPCI) exhaust pressure switches (PS 23-97A/B) specification contained in FSAR Table 7.4.1. The specifications, in the FSAR, listed the range of the switches as 10 – 300 psig and the accuracy as  $\pm 2$  psig. The installed switches have a range of 77-1200 psig, and an accuracy of  $\pm 0.5\%$  ( $\pm 6$  psig). The original pressure switches supplied by the NSS vendor had a range of 50 –1200 psig with an accuracy of 1%.

This change was the result of a concern which addressed the 150 psig exhaust pressure trip requirement and its associated accuracy and instrument uncertainty. It was determined that the specification had been met, when including these factors.

**Safety Evaluation Summary (SE 98-042)**

The HPCI turbine is not an initiator of any of the accidents or transients evaluated in the FSAR. The different range and accuracy of the switches did not compromise their function. This modification does not alter the mitigation capabilities of the HPCI system.

The margin of safety was not changed as the original set-point remains the same and the differential pressure between the upper pressure switch set-point and the lower rupture disk release pressure was not changed.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change, Section 5.2 - “Primary Containment”**

This change to section 5.2.5 of the FSAR was a result of a postulated occurrence of a single failure in the Primary Containment Isolation System (PCIS) with a LOCA, while inerting or de-inerting the primary containment. This could have resulted in the bypass of steam to the torus gas space resulting in the reduction of the vapor suppression function. This modification does not alter the mitigation capabilities of the PCIS.

Section 5.2.5 was revised to direct that the Primary Containment Atmosphere Control (PCAC) System shall not be aligned such that a torus to drywell bypass flow is open with a flow capacity in excess of that allowed in the accident analysis. Inerting and de-inerting is allowed using the eighteen inch PCAC valves provided it is accomplished on a single volume basis.

Safety Evaluation Summary (SE 98-044)

This change cannot initiate any of the accidents analyzed in the FSAR nor does it have any affect on equipment failure and therefore, can not initiate any abnormal operating transients. Revising the inerting procedure to prohibit the simultaneous intering of both the drywell and the torus has no impact on the reliability and integrity of the equipment and no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change, Section 5, "Containment and Section 12 Station Structures"**

General Summary

This FSAR change revised the pressure at which the Reactor Building Blowout Panels, located on the refuel floor level, would operate to relieve excess pressure in the Reactor building due to a High energy Line Break (HELB) or a tornado. It was analytically determined that the blowout panels actually open within a range of 0.35 psig to 0.60 psig and not the 0.25 psig as described in the FSAR. The structural limit of 0.25 psig is maintained following an accident by the Steam Tunnel to Turbine Building blowout panels and exterior doors to the Turbine Building.

During recent EQ model HELB reviews the rivet strength and failure characteristics of the blowout panels were investigated and found to fail higher than originally modeled. Consequently the set-point of the panels, as described in the FSAR had to be changed.

Revised EQ profiles were evaluated and analysis proved that the increased pressure will not adversely affect the existing equipment or plant structures.

Safety Evaluation Summary (SE 98-052)

The revised set-point for the Reactor Building Blowout Panels cannot initiate an accident or a malfunction which initiates an abnormal operational transient as analyzed in the FSAR. Secondary containment integrity capability for internal pressures below 0.25 psi remains unchanged.

There is no decrease in the margin of safety as the Reactor Building and hence the Secondary Containment will continue to be maintained for values of internal pressure below 0.25 psi.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This FSAR change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change to Section 5.3.4.5 and Supporting Procedure Changes to OP 2117, “Standby Gas Treatment”, OP 4116, “Secondary Containment Surveillance”, and OP4117, “ Standby Gas Treatment System Surveillance”**

General Summary

The safety evaluation revises FSAR Section 5.3.4.5, “Inspection and Testing “ of the Secondary Containment which describes the flow measurement methodology the procedures that implement that methodology. Additionally, the procedure was revised to eliminate the requirement to verify Standby Gas Treatment flow during operation of the units. The requirement is eliminated since the actual reading from the old instruments are not considered to be highly accurate. A more practical and credible method was substituted by ensuring that the Reactor Building differential pressure is negative and that flow is indicated for the SBT units.

Safety Evaluation Summary (SE 99-01)

The SBT system is not an accident initiator and changes to the method of operation; maintenance or testing has no effect on any analyzed accident. The SBT system is not connected to any structures, systems or components that could lead to any operational transients. This modification does not alter the mitigation capabilities of the SBT system.

This change in flow measurement and operational verification methodology improves the capability of the SBT system and provides increased assurance that the SBT system flow requirements will be met ensuring no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This FSAR change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change, Section 10.5.5 Revision, “Fuel Pool Cooling and Demineralization System”**

General Summary

This revision corrects the statement in the FSAR that states that under all conditions of Station Service Water System operation, a positive differential pressure exists between the Service Water (SW) and the Spent Fuel Pool Cooling (SFPC) system to prevent

leakage of radioactive water into the environment via the SW system. However, it was determined that there were three abnormal operating conditions where a positive differential pressure was not maintained. The three conditions are: loss of offsite power with consequential loss of SW pump power; failure of Emergency Diesel Generator (EDG) or EDG bus and breaks in non-seismic piping leading to a lower pressure; and a postulated fire in the Reactor Building Area RB-3 causing SFPC valves to inadvertently open and SW isolation valves to fail to isolate. In all cases, these conditions are corrected within a short period of time.

#### Safety Evaluation Summary (SE 99-30)

Examination of the initial conditions and assumptions for entering the analyzed accidents show that a negative differential pressure between the SW and SFPC systems cannot initiate any of these accidents nor can it cause a malfunction which initiates an abnormal operational transient. This modification does not alter the mitigation capabilities of the SW or SFPC systems.

There is no specific failure point or safety limit associated with a negative differential pressure between the SW and SFPC systems. Therefore, the margin of safety is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This FSAR revision did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

#### **FSAR Change, 16/024 and Supporting Procedure Changes to OP 2184, “Normal Fuel Pool Cooling System”, Simultaneous Operation of the Normal Fuel Pool Cooling and Standby Fuel Pool Cooling Systems”**

##### General Summary

Section 10.5 of the FSAR, “Fuel Pool Cooling and Demineralizer System” stated that the Standby Fuel Pool Cooling System (SFPCS) operated only under certain circumstances to augment the Normal Fuel Pool Cooling System (NFPCS).

This change provided additional operational flexibility that will allow simultaneous operation of the NFPCS and the SFPCS. In this mode of operation, the SFPCS could be used to cool the spent fuel pool while the NFPCS could be used to clean up the water in the reactor cavity.

FSAR Section 10.5 was revised to describe the simultaneous operation of the NFPCS and the SFPCS

Safety Evaluation Summary (SE 99-41)

Neither the NFPCS nor the SFPCS are initiators of accidents or initiators of any abnormal operational transients as defined in the FSAR as they have no interface with any systems or equipment other than with the reactor coolant pressure boundary when the plant is in the refueling mode.

The acceptable safety limits of fuel pool temperature and level are unchanged by operating these two systems together. Therefore, the margin of safety is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. These changes did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**FSAR Change, Section 10.8.3, "Revision as a Result of Basis for Maintaining Operation (BMO) 97-52, Rev. 1 Closure"**

General Summary

FSAR Section 10.8.3 stated that draining of the deep basin would require deliberate manual actions. The revised FSAR qualifies this statement by adding the word "normally" such that it reads: "draining the deep basin would normally require manual actions". An additional statement was also added to note that under certain break conditions, manual isolation would be required to prevent pool inventory from falling below the minimum acceptable level.

This change came about following a hydraulic analysis performed to determine the impact that breaks in non-seismic portions of the Service Water (SW) piping in the Turbine Building would have on the potential for draining the deep basin. No plant procedure changes were required, as procedures already require operator action to locate and isolate affected plant components in the event of a piping rupture in the SW system.

Safety Evaluation Summary (SE 99-42)

The SW, RHRSW and Alternate Cooling System (ACS) and their components are not initiators of any of the accidents analyzed in the FSAR nor does partial loss of the ACS deep basin inventory increase the probability of occurrence of a malfunction which would initiate an abnormal operational transient. This change does not alter the mitigation capabilities of the SW, RHRSW or ACS systems.

This revision does not reduce the margin of safety as the isolation of any large breaks will ensure that the system inventory will be above the minimum point required for ACS operation and therefore meet system operability requirements per Technical Specifications.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This FSAR revision did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Technical Requirements Manual (TRM) Change 99-003, “Inoperable Fire Barrier Compensatory Actions”**

#### **General Summary**

This TRM change modifies the compensatory actions listed in the TRM for inoperable fire barriers. Compensatory action established in the Vermont Yankee TRM required a continuous fire watch for degraded or inoperable fire barriers with no credit taken for active fire detection or fire suppression systems installed in the same area as the inoperable fire barrier. This change modified the requirement to require a hourly fire watch provided there was an operable fire detection system in service on at least one side of the degraded barrier.

#### **Safety Evaluation Summary (SE 99-21)**

Inoperable fire barriers are not accident initiators for any of the analyzed accidents nor do they increase the probability of a malfunction that could initiate an abnormal operational transient.

Fire protections requirements are no longer listed in Technical Specifications and therefore no margin of safety has been reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TRM change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Technical Requirements Manual Change 99-004, “Fire Protection Reporting”**

#### **General Summary**

This change request was to delete sections of the TRM that require a 30 day Special Report for inoperable fire protection equipment. The Vermont Yankee Facility operating License allows changes without prior commission approval provided the change would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. The 30-day report does increase the overall fire safety or directly impact safe shutdown equipment. The operability of fire protection equipment is tracked by several programs including the Vermont Yankee (VY) Event Reporting process, daily Plant Status, System Engineering system health reports, oversight by the VY fire protection staff and reports to the fire insurance carrier (NEIL).

Safety Evaluation Summary (SE 99-44)

Not reporting out-of-service fire protection equipment does not increase the probability of occurrence of an accident or increase the probability of a malfunction as analyzed in the FSAR.

The margin of safety is not reduced as fire protection equipment is not a part of the Technical Specifications.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This TRM change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Document Change Request (DCR) 98-005/0 “Peak Suppression Pool Temperature”**

General Summary

The purpose of this DCN is to update all plant documents affected by the revised Torus temperature analyses. Originally, the initial maximum operating temperature of the suppression pool was 90°F and a subsequent post-accident peak of 166°F was postulated. Licensing Amendment 88 increased the suppression pool initial temperature to 100°F. That application for amendment was focused on changes related to Safety Relief Valve blowdown and the peak temperature was not re-evaluated.

A number of issues beyond the SRV blowdown needed to be analyzed in support of the Amendment 88 submittal. For an initial pool temperature of 90°F the peak was determined to be 176°F and a Basis for Maintaining Operation was written to justify operation at an initial pool temperature of 90°F. Subsequent calculations determined that the peak pool temperature, assuming an initial temperature of 90°F would result in a postulated temperature of 182.6°F. A Technical Specification change was then submitted to lower the initial pool temperature to 90°F.

Safety Evaluation Summary (SE 98-053)

There are no initiating events related to the change in Torus temperature which are associated with any FSAR analyzed accident or Abnormal Operational Transient.

The margin of safety is not decreased as condensation loads from SRV discharges would not be greater than those already analyzed for Vermont Yankee.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Document Change Request (DCR) 98-007, “Returning Reactor Building Closed Cooling Water (RBCCW) Heat Transfer Function to NNS (Non Nuclear Safety) Designation (From SC-3)”**

**General Summary**

This DCR was written to re-classify the RBCCW heat transfer function as NNS and remove the RBCCW System from the Generic Letter 89-13 program. This DCR also removes the RBCCW pumps and check valves from the ASME Section XI, IST program, documents the Residual Heat Removal (RHR) pump seal design temperatures and provides appropriate RBCCW system monitoring to ensure reliable shutdown cooling.

This change was possible as the installed Standby Fuel Pool Cooling system meets the heat transfer needs and therefore, the Normal Fuel Pool Cooling system was no longer needed to perform a safety function.

**Safety Evaluation Summary (SE 99-08)**

The RBCCW system is completely independent from any FSAR Chapter 14 events and therefore cannot be an accident initiator. This change also does not increase the probability of a malfunction which would cause an abnormal operational transient. The system is no longer needed to perform a safety function and any affected increase in bearing temperatures for other equipment is acceptable.

The margin of safety is not reduced, as there are no Technical Specifications (TS) or TS bases for RBCCW heat transfer.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This Document Change Notice did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Document Change Request (DCR) 99-001, “Loss of Stator Cooling (LOSC) Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) Penalty Elimination”**

**General Summary**

This DCR eliminates the Maximum Average Planer Linear Heat Generation Rate (MAPLHGR) penalty required for twenty fuel assemblies to satisfy the fuel thermal overpower limit. In order to eliminate this penalty, the extraction steam flow assumptions in the calculations and hence the final feedwater temperature were changed to more realistic numbers. The original analysis assumed that the extraction steam to both trains of feedwater heaters completely stopped resulting in a feedwater temperature drop to 207.01 °F. This change revised the assumption regarding steam flow to the turbine and subsequently estimated the extraction steam flow available to the heaters. This results in

a feedwater temperature reduction of only 185°F. This allows the MAPLHGR penalty to be eliminated for the twenty assemblies.

#### Safety Evaluation Summary (SE 99-02)

This change will not increase the probability of an accident previously evaluated in the FSAR. The LOSC is a transient and not an accident. This change involves changing an overly conservative assumption in the loss of stator cooling (LOSC) transient analysis. This transient results in a reduction in feedwater temperature due to a decreased steam flow to the feedwater heaters following a generator runback. The original analysis assumed an instantaneous loss of extraction steam to the feedwater heaters resulting in a severe subcooling event. This change modifies that assumption regarding the amount of steam available after runback. This change impacts the course of the transient and does not affect the initiation.

The margin of safety is the difference between the Fuel Cladding Integrity Safety Limits and the point at which the fuel fails. This change does not involve anything that affects this difference.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This Document Change Notice did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

#### **Document Change Request (DCR) 99-002/0, "Criteria for Determining RHRSW System Operability"**

##### General Summary

This DCR changed the design bases defining Alternate Cooling System (ACS) operability from requiring all four Residual Heat Removal Service Water (RHRSW) pumps to be operable, to requiring four or less pumps to be operable depending on deep basin temperature.

The cooling requirements for post LOCA cooling can be met by either train of RHRSW and can in fact be met by one RHRSW pump supplying one RHR heat exchanger and one RHR pump. The normal shutdown cooling mode is less demanding than the post LOCA cooling mode.

The RHRSW pump capacity was reanalyzed which addressed the RHRSW NPSH with regard to biofouling of the suction piping, vendor NPSH data was with cold water, and vendor data was assuming that the pumps were not in the same configuration as at Vermont Yankee.

Safety Evaluation Summary (SE 99-15)

There is no mode of operation of the RHRSW system or ACS system or any type of failure that can initiate any of the design bases accidents nor initiate any abnormal operational transients as analyzed in the FSAR. This change does not alter the mitigation capabilities of the RHRSW or ACS systems.

The Technical Specification bases associated with the ACS address the cooling capacity of the system. The required cooling capacity of the ACS was not changed, but was assured, while operating with fewer pumps at a lower initial basin temperature.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This document change request did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Revising the Safety Classification for the Turbine First Stage Pressure Switches, PS-5-14A, 14B, 14C, and 14D.**

General Summary

This evaluation was written to establish a basis for the safety classification of the pressure switches that bypass the turbine control valve fast closure scram and the turbine stop valve <90% open scram when reactor power is  $\leq 30\%$  to limit spurious scrams during reactor startup at low power.

The safety classification of these switches was Safety Class 2 and Safety Class Electrical (SCE). These switches sense pressure via Non-Nuclear Safety (NNS) tubing connected to the turbine housing proper. The objective of this reclassification is to reclassify the pressure switches to SCE and the mechanical features of the switches as NNS. The tubing that connects the switches is NNS as well as the components it is attached to.

Safety Evaluation Summary (SE 98-048)

These switches are not accident initiators. Failure of one or more of the pressure sensors will not initiate a transient. Multiple failures of either instrument sensing line or the SCE switches would be necessary along with either a turbine or generator trip event for these failures to have any impact on the plant. If this event were to occur, the turbine bypass system can accommodate a full load rejection.

This reclassification has no impact on the reliability and integrity of the equipment and no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This safety class reclassification did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Revising the Safety Class of Primary Containment Isolation Valve Position Indication Power Feeds**

#### **General Summary**

This change revises the safety classification of the power feeds to post accident valve position indication to provide full compliance with Regulatory Guide 1.97. Electrical drawings were updated to show the safety class change from NNS to SCE. The justification to make this change was made through the dedication process which ensures that a SSC meets the required criteria. In this case the power feeds had the proper material capability and size and were purchased as original equipment with the same level of engineering and QA as other original equipment that have been placed in the safety classification program.

#### **Safety Evaluation Summary (SE 98-040)**

This change in safety classification does not increase the probability of an accident nor would the change create any situation which would be an accident initiator or initiator of any abnormal operational transient.

This change is limited to drawing changes and does not affect the physical or material condition of the plant. Therefore, this change does not reduce the margin of safety but will have a positive impact on the reliability and integrity of the equipment.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Revising the Safety Classification of Relief Valve SR-16-19-77 from NNS to SC3**

#### **General Summary**

This relief valve provides overpressure protection for the Nitrogen Supply System which is used for operating pneumatically operated components in the drywell when the primary containment is inerted. While the Nitrogen Supply System is a non-safety class system, it provides nitrogen to safety-related solenoid operated valves (SOVs).

These SOVs function to exhaust nitrogen (or air if the containment is not inerted) from components that provide a safety function. These SOV's have a maximum operating differential pressure (MODP) above which there is no assurance that they will function as expected. The relief valve maintains the Nitrogen Supply System less than MOPD by relieving system pressure. Exceeding MOPD could prevent the SOV from exhausting nitrogen and thus prevent its associated safety-related component from providing its intended safety function.

Safety Evaluation Summary (SE 98-038)

This change in safety classification does not increase the probability of an accident nor would the change create any situation which would be an accident initiator or initiator of any abnormal operational transient.

There is no specific failure point or accepted safety limit for this safety relief valve. This reclassification has a positive impact on the reliability and integrity of the system; therefore, there is no reduction in the margin of safety.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change in classification did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

**Revise Technical Specification Bases 3.3.E and 4.3.E to Allow the Normalization of the Base Points following a Refueling Outage.**

General Summary

This change to Technical Specifications Bases section 3.3E and 4.3.E, "Control Rod System" Reactivity Anomalies, allows predicted control rod reactivity to be normalized to the measured core reactivity value. This activity only changed the way the computer generated prediction of the eigenvalue is compared to the eigenvalue that is seen on the plants process computer. The comparison between measured and predicted initial core reactivity provides normalization for the calculational models used to predict core reactivity.

Safety Evaluation Summary (SE 99-22)

This activity is not an initiator of any of the accidents analyzed in the FSAR, nor does it increase the probability of a malfunction that would initiate an abnormal operational transient analyzed in the FSAR. This activity is performed at steady state conditions and does not affect any plant conditions; therefore, the margin of safety is not reduced.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This change in the Technical Specification bases did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

## **Evaluation for Radioactive Materials in Storm Drains**

### **General Summary**

This evaluation was initiated consistent with the expectations of I&E Bulletin No. 80-10 which requires that an evaluation be performed to assess if continued operation of a radiologically contaminated system, that previously had been considered “clean”, would create a significant unmonitored and uncontrolled release of radioactive material to the environment.

The technical approach used for this assessment consisted of four steps as follows:

1. Reviewed existing radioanalytical data for storm drain water and sediment samples, documenting highest measured concentration of each radionuclide.
2. Calculated the approximately annual volume of sediment and liquid discharged from the storm drain systems using storm water runoff and turbidity estimates.
3. Using the data generated in step 1, calculated the volume of sediments that would need to be discharged to the river to obtain 10% of the total body and critical organ doses allowed under routine effluent ALARA objectives of 10CFR50, Appendix I.
4. Compared the estimated volume of sediment discharged from the storm drain systems to the volume of sediment required to receive 10% of the applicable Technical Specifications objectives.

The conclusion of the assessment determined that the release of radioactive material from the storm drain system, as determined within the bounds of the calculations, is not significant.

### **Safety Evaluation Summary (SE 98-045)**

The plant storm drain system, located within the plant’s Protected Area and main parking lot does not interface with any safety related components, systems or structures. As such, it can not be an accident initiator or produce any malfunctions as described in the FSAR.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This evaluation did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

## **Hydrogen Concentration on Loss of Battery Room Ventilation**

### **General Summary**

The evaluation was written to support FSAR and Technical Specification Bases changes which established that it will take over five days for a 4% hydrogen concentration to buildup in the station battery rooms if ventilation is lost. The calculations for this determination considers contribution from both the station batteries and the neutron monitoring batteries, conservatively assumes no room leakage and that one station battery is on an equalization charge.

### **Safety Evaluation Summary (SE 98-37)**

Hydrogen buildup in the battery room over a five day period is not an accident initiator for any accidents analyzed in the FSAR. The reduction in time will not introduce any new equipment failures that could initiate a malfunction as analyzed in the FSAR.

The margin of safety is not reduced as the Technical Specification Bases determined that there is sufficient time for corrective action to preclude dangerous hydrogen buildup. Additionally, upon loss of room ventilation, portable ventilation is put in place and monitoring of concentration is required.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This evaluation did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

## **Substituting Reactor Building Closed Cooling Water (RBCCW) Monitoring for RBCCW IST Testing**

### **General Summary**

This evaluation examines the change whereby the RBCCW pump and discharge check valve monitoring has taken the place of the RBCCW IST pump and discharge check valve testing. As noted in DCR 98-007 (summary included in this report), the Standby Fuel Pool Cooling System (SFPC) and Residual Heat Removal (RHR) torus cooling (e.g torus water to RHR pump seals) are now credited for achieving the RBCCW safety related cooling functions. On this basis, IST testing is no longer required for RBCCW pumps or discharge check valves.

### **Safety Evaluation Summary (SE 99-09)**

The new monitoring program for the RBCCW system continues to look at key parameters that will maintain the system performance the same as was maintained under the IST program. The RBCCW system is not an accident initiator nor does it affect any of the analyzed abnormal operational transients.

The margin of safety is not reduced, as there are no Technical Specifications (TS) or TS bases for RBCCW heat transfer.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This evaluation did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

### **Using Uchida Correlation to Calculate Equipment Qualification (EQ) Profiles for High Energy Line Breaks in Vermont Yankee Reactor Building.**

#### **General Summary**

During 1997 and 1998, the EQ program for Vermont Yankee was updated to incorporate more appropriate setpoints for the blowout panels in the Reactor Building and Turbine Building. This resulted in changes in the reactor Building nodalization. Using the Reactor Building model, RELAP4/MOD5 calculated temperatures for the HPCI Double Ended Guillotine break in the Reactor Building exceeded the EQ profiles for the equipment located in the SE quadrant of the Reactor Building at elevation 280 feet. This deficiency was resolved by activating the Uchida condensing heat transfer correlation as a user-selected option. The option is used for all the heat structures modeled and was used for all subsequent HELB analyses.

#### **Safety Evaluation Summary (SE 99-20)**

Any Reactor Building harsh environment is a consequence of an accident and not an initiator of any accident. The changes to the environmental profiles resulting from HELBs does not lead to changes in equipment important to safety, as such there is no increase in the probability of a malfunction which initiates an abnormal operational transient.

The use of the Uchida correlation does not reduce the difference between a system failure point and the accepted safety limit nor does it reduce the margin of safety as defined in Technical Specifications.

There was no increase in the probability of occurrence or consequences of an accident or malfunction as previously evaluated in the FSAR. This evaluation did not present significant hazards not described or implicit in the Vermont Yankee FSAR, and there is reasonable assurance that the health and safety of the public was not endangered.

