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Dominion

June 1, 2004

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 03-373D
NL&OS/ETS: R3
Docket Nos. 50-336
50-423
License Nos. DPR-65
NPF-49

DOMINION NUCLEAR CONNECTICUT, INC. (DNC)
MILLSTONE POWER STATION UNITS 2 AND 3
RESPONSE TO GENERIC LETTER 2003-01 CONTROL ROOM HABITABILITY - TESTING AND TECHNICAL INFORMATION SUBMITTAL

On June 12, 2003, the NRC issued Generic Letter (GL) 2003-01, "Control Room Habitability," to all operating reactors. The GL requested information that demonstrates that the control room at each facility complies with the current licensing and design bases as well as applicable regulatory requirements. DNC herein provides the requested information for Millstone Power Station Units 2 and 3 (MPS 2 and 3) as attachments 1 and 2, respectively, to this letter. Based on the change in the tracer gas test schedule for MPS 3 documented in DNC letter 03-373B dated March 5, 2004, supplemental information to complete the generic letter response will be provided by August 31, 2004.

A license amendment was submitted for MPS 3 on May 27, 2004 (Serial No. 04-285) requesting a revised licensing basis utilizing the NRC's approved Alternate Source Term (AST) methodology. Tracer gas testing will be accomplished in June/July to support the MPS 3 AST license amendment request and response to GL 2003-01. MPS 2 currently performs tracer gas testing as a routine Technical Specification requirement.

If you have any questions, please contact Mr. Thomas Shaub at (804) 273-2763.

William R. Matthews
Senior Vice President - Nuclear Operations

Attachments

Commitments made by this letter:

1. Submit amendment request for MPS 2 that will incorporate the intent of the current proposed TSTF-448 within six months following either the approval of TSTF-448 or its adoption in the Consolidated Line Item Improvement Process (CLIIP) by the NRC, whichever is later.

2. Provide the MPS 3 control room tracer gas test results and delineate plan and schedule for any proposed changes to the MPS 3 Technical Specifications to verify the integrity of the Control Room Habitability Envelope and the maximum assumed unfiltered in-leakage rates by August 31, 2004.

cc: U. S. Nuclear Regulatory Commission
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Attachment 1

Millstone Power Station Unit 2
Response to Generic Letter 2003-01
Control Room Habitability

DOMINION NUCLEAR CONNECTICUT, INC. (DNC)

Millstone Power Station Unit 2
Response to NRC Generic Letter 2003-01

This letter is provided in response to U. S. Nuclear Regulatory Commission (NRC) Generic Letter (GL) 2003-01, "Control Room Habitability" for Millstone Power Station Unit 2 (MPS 2).

NRC Requested Information, Item 1

Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the CRHSs are designed, constructed, configured, operated, and maintained in accordance with the facility' design and licensing basis:

DNC Response:

Dominion Nuclear Connecticut, Inc., (DNC) assembled and reviewed control room habitability (CRH) design and licensing bases documents, consistent with Nuclear Energy Institute (NEI) 99-03, Rev. 1, and confirmed that the MPS 2 control room meets the applicable habitability regulatory requirements. Specifically, these systems are designed, constructed, configured, operated and maintained in accordance with the MPS 2 design and licensing bases.

Control Room Habitability Design Features[1]

The MPS 2 control room envelope (CRE) consists of the control room, the Shift Supervisor Office, a Shift Technical Advisor Area, an Administrative Area, an entrance area and interconnecting aisle and corridor. The MPS 2 control room is adjacent to the retired Millstone Power Station Unit 1 (MPS 1) control room. Separation of the two control rooms is provided by a smoke barrier. The remaining CRE boundary walls are a combination of poured concrete and masonry blocks. The floors and ceiling of the MPS 2 control room are poured concrete. Door and penetration seals are provided and a few system components are located outside of the CRE (e.g., emergency supply fans, associated ductwork and dampers). These features minimize the infiltration of unfiltered air from outside of the CRE. The CRE, associated ventilation systems, and fire protection systems are described in detail in the MPS 2 Final Safety Analysis Report (FSAR)[2]. Pertinent features of the applicable systems are described below:

The MPS 2 control room emergency ventilation system (CREV) is comprised of the control room air conditioning system (CRACS) and the control room filtration system (CRFS). With the exception of some common ductwork and dampers, the MPS 2

[1]MPS 2, FSAR Section 9.9.10, Control Room Air Conditioning System (Ref. 1)
[2]MPS 2, FSAR Section 1.2.10.8, Fire Protection System, Section 9.10, Fire Protection System, Section 9.9.10, Control Room Air Conditioning System

CRACS consists of two full capacity, independent air handling and mechanical refrigeration subsystems. The system has the capability of ventilating with outside air while cooling. Each subsystem is provided with a bypass through the CRFS consisting of particulate and HEPA filters, charcoal adsorbers and fan. Each CRFS unit is capable of recirculating 2500 cfm of control room air or introducing outside air into the system when aligned in the Emergency Fresh Air Intake Mode.

Control room pressure is maintained at a relatively neutral pressure during normal plant operations by air balancing the heating, ventilation, and air conditioning (HVAC) system. The HVAC system utilizes the CRACS and ductwork that is aligned to the outside (for outside air suction and air exhaust during normal plant operation). When the HVAC system is in the recirculation mode (i.e. CRACS and CRFS in service / accident condition), the control room in-leakage rate will not exceed 130 cfm (MPS 2 Technical Specifications limit). The normal post-accident alignment is the HVAC system in the recirculation mode. Outside makeup air is avoided to minimize possibilities of introducing contamination into the control room post accident. Specifically, outside air is not used for pressurizing the control room. Outside air is introduced in the long-term during post-accident recovery only to provide fresh air for personnel safety when conditions permit.

The CRACS operates during all modes of operation and shutdown. Both control room air conditioning subsystems are served by the smoke detection system. Smoke detectors are provided in the return ductwork to automatically realign the supply unit and initiate purging operations. The control room is purged by operating the exhaust fans and discharging to atmosphere. Discharge dampers to other areas are automatically closed. Fire dampers are provided at all ductwork penetrations through firewalls.

The CRACS is designed to maintain a suitable environment in the control room for operating personnel and safety-related equipment. Normally, the method of conditioning the air is controlled by the automatic temperature control system. In the event of a LOCA, the emergency safeguards system generates an Enclosure Building Filtration Actuation Signal (EBFAS), which automatically shifts the CRACS to a complete recirculation mode of operation. In the event of a fuel handling accident in the spent fuel pool area, an Auxiliary Exhaust Actuation Signal (AEAS) is generated which automatically shifts the system to the complete recirculation mode. The post-accident mode of operation is a closed cycle (recirculation) mode with air intakes and outlets isolated.The smoke detection system is overridden by the complete recirculation mode of operation to prevent malfunctions during post-accident conditions.

The components of the CRACS are designed to engineered safety feature requirements including seismic response. All components are protected from missile damage and pipe whip by physical separation. Each subsystem is powered by a separate emergency source. The CRACS will normally be configured automatically, but there are low probability events that will impact the automatic alignment capabilities of the system for which operator action will be needed. This issue was documented in Technical

Specification Amendment 228 and was determined to be acceptable by the NRC in a letter dated March 10, 1999. This issue is reflected in Section 3/4.7.6 of the TS MPS 2 Bases. The operator actions are documented in the MPS 2 Emergency Operating Procedures (EOPs). All CRACS fans and filters are remote from the control area and are not exposed to fire hazards. As a contingency, self-contained breathing apparatus (SCBA) are located in and just outside the control room for protection against prolonged exposure to smoke and / or noxious vapors. If deemed necessary by the Operations staff, the CRE can be manually isolated to prevent introduction of smoke or toxic gases into the CRE.

General Conformance with General Design Criteria (GDC)[3]

The proposed General Design Criteria for Nuclear Power Plants issued on July 11, 1967, in the Federal Register were utilized during the design of MPS 2. Therefore, the design and construction of the facility complied with the above version of GDC for GDC 1, 3, 4, 5 and 19. Subsequent to the Three Mile Island accident and the issuance of NUREG 0737, MPS 2 committed to GDC 19 of the current version of the GDC. The following discussion is extracted from the MPS 2 Final Safety Analysis Report:

"On February 20, 1971, the Atomic Energy Commission published in the Federal Register the General Design Criteria for Nuclear Power Plants. Prior to this date, proposed General Design Criteria for Nuclear Power Plants as issued on July 11, 1967, in the Federal Register were in effect. Before issuance of the construction permit for MPS 2, discussions reflecting the design intent in consideration of the 1967 proposed criteria were submitted in the Preliminary Safety Analysis Report (PSAR). Design and construction was thus initiated and has been completed based upon the 1967 proposed criteria. Since February 20, 1971, MPS 2 has attempted to comply with the intent of the newer GDC to the extent possible, recognizing previous design commitments. The extent to which this has been possible is reflected in the MPS 2 FSAR Appendix 1A."

Specific Conformance with Control Room Habitability Regulatory Requirements:

GDC-1, Quality Standards and Records

The CRH structures, systems and components (SSCs) credited in support of CRH have been designed, fabricated, erected, tested and maintained as safety-related SSCs. The control room and associated CRH systems are contained within the Seismic Category 1 Auxiliary Building. Portions of the normal ventilation systems associated with the control room isolation function are safety-related. The emergency filtration and emergency cooling systems are safety-related. The safety-related classification of individual components is provided in the plant Mechanical Equipment List Database. Safety-related SSCs of the CRE are designed, constructed, operated and maintained in accordance with the Millstone Station Quality Assurance Program (QAP) Topical Report. The Millstone Station QAP Topical Report complies with the requirements set forth in Appendix B of 10 CFR Part 50. The Millstone Station QAP Topical Report is

[3] MPS 2, FSAR Appendix 1A provides the extent of compliance to the GDCs applicable to the CRH

submitted periodically to the NRC in accordance with 10 CFR 50.54(a).

MPS 2 is considered to be in full compliance with GDC 1.

GDC 3 – Fire Protection

The Millstone Unit 2 compliance basis related to GDC 3 was originally approved in NRC Safety Evaluation Reports dated October 21, 1980, November 11, 1981, October 31, 1985, April 15, 1986, January 15, 1987, April 29, 1988, and November 3, 1995. Changes to the program elements described in these documents have been evaluated consistent with the requirements of Condition 2.C.(3) of the Millstone Unit 2 Operating License, using the guidelines of either 10CFR50.59 or Generic Letter 86-10 as appropriate. Records of these changes are maintained on-site and have been subject to periodic inspection by the NRC since the issuance of the Operating License.

MPS 2 control room SSCs important to safety are designed and located to minimize the probability and effects of fires. Fire protection systems (active and passive) have been designed, installed and provided to assure that all possible fires in the control room are detected, controlled and extinguished. Fire protection and detection systems and components meet the applicable requirements of the National Fire Protection Association (NFPA) or have been evaluated using guidelines of GL 86-10. In areas where a combustible material may exist, fixed fire detection and suppression are generally provided.

The environmental boundaries of the CRE are formed by the control room ceiling, floor and walls (Fire Area A-25). Portable carbon dioxide (CO_2) and halon fire extinguishers are provided within this area. Additional portable fire extinguishers are available in the adjacent technical services area hallway. Ionization smoke detection is provided for above the control rack and in the main control board. This system alarms in the control room. Smoke detectors are installed in the return air supply ducts of the air supply system and would initiate purge on sensing smoke. This system alarms in the control room. Detectors will trip the control room supply fans. The suppression effects are evaluated for the consequences of inadvertent operation and rupture of fire suppression systems at MPS 2. This zone is not subject to any adverse effects to safety-related equipment by inadvertent operation or rupture of fire suppression systems.

Fire area R-1 (Appendix R) includes the control room (Fire Area A-25 of the Fire Hazards Analysis), cable vault, enclosure building, new computer room and several other areas as identified in the MPS 2 Appendix R Compliance Report. Most plant equipment has power and control cables located in Fire Area R-1, (i.e., in the control room and cable vault). Fire in these areas may affect shutdown components (i.e., components necessary to safely place the plant in a shutdown condition). Diesel generators A and B may become unavailable. Most direct current (DC) power could be lost. A specific train of equipment will be used to achieve and maintain the plant in Hot Standby using Fire Shutdown Panel, C10, located in the Turbine Building at the fifty-four foot elevation. Plant shutdown can be accomplished using plant shutdown procedures.

MPS 2 is considered to be in full compliance with GDC 3 as described above.

GDC 4 – Environmental and Dynamic Effects Design Bases

With respect to environmental and dynamic effects, MPS 2 SSCs important to safety have been designed to withstand the effects of natural phenomenon such as earthquakes, wind, tornadoes, hurricanes, seiches and floods as described in FSAR Chapters 2 and 5. The Auxiliary Building that houses the control room has been designed, fabricated and erected in accordance with applicable codes so as to withstand the most severe earthquakes, flooding conditions, windstorms, ice conditions, temperature and other deleterious natural phenomena which could be reasonably assumed to occur at the site during the lifetime of this plant. The Auxiliary Building houses the control room and has been analyzed for wind and tornado loads, pipe restraint loads, and pipe whipping loads. MPS 2 Safety Evaluation Report (SER), dated May 10, 1974 under Habitability System documents: "The control room has been designed with adequate concrete to protect the control room occupants complying with the CRH requirements."

In addition, MPS 2's current shielding analysis complies with NUREG 0737 and GDC 19 requirements.

The CRACS including the CRFS components which include fans and motors, direct expansion and condenser coils, housings, compressor, CRFS filters, ductwork and supports, dampers and damper operators, refrigeration piping and supports, refrigerant valves and valve operators, and temperature control system control panels are designed as Seismic Class I. Also, Engineered Safety Actuation System Status Panel, Reactor Protection System, Seismic Measurement Instrumentation, Main Control Boards, Hot Shutdown Control Boards are designed as Seismic Class I.

During any of the postulated Design Basis Accidents (DBAs), the CRACS and CRFS operate to maintain the control room atmosphere within suitable temperature and humidity limits for emergency equipment operability and human occupancy. The system design is based on heat gain from electrical heat load, control room occupancy, surrounding area temperatures (i.e., CRE walls, roof, and floor).

MPS 2 is considered to be in full compliance with GDC 4 as described above.

GDC 5 – Sharing of Structures, Systems, and Components

The MPS 2 control room is located inside the Auxiliary Building. The Auxiliary Building is separated from the Containment, which is to the north, by an expansion joint and from the turbine building to the west by slotted connections. Although the control rooms of MPS 1 and MPS 2 are combined in one area, the buildings are separated by Teflon-lined sliding bearings. These isolation joints provide the auxiliary building with structural independence from the surrounding buildings in the lateral direction. Both the auxiliary

and the turbine buildings of MPS 2 are structurally connected to their respective MPS 1 buildings. The combined buildings are isolated in the lateral direction. All vertical loads that may interact between MPS 1 and MPS 2 portions of the buildings were investigated to ensure that they would function safely under all design conditions.

These shared systems described in FSAR Section 1.2.13, include the MPS 2 control room for monitoring and controlling MPS 1 systems and Station Air which has a system cross-tie between Millstone Power Station Unit 3 (MPS 3) service air and MPS 2 station air headers. The sharing of these SSCs does not impair safety functions.

MPS 2 is considered to be in full compliance with GDC 5 as described above.

GDC 19 – Control Room

General

The CRH systems include radiation shielding, CRACS and CRFS, radiation monitoring, lighting and fire protection equipment. The CRE includes the following areas / major components: 1) control room / control boards, 2) reactor protection and nuclear instrument safety channel cabinets, 3) radiation monitoring equipment, 4) annuciator logics cabinets, 5) engineered safety actuation system cabinets, 6) the Shift Supervisor Office, 7) the Shift Technical Advisor area, 8) an administrative area, 9) entrance area, 10) an aisle that leads to the Shift Supervisor Office, 11) an area at the end of the aisle that was formerly used to access the MPS 1 control room and 12) a corridor leading from the aisle to the control room. The kitchen and sanitary facilities are just outside the MPS 2 CRE.

MPS 2 complies with the Order for Modification of License, dated March 14, 1983, NUREG-0737 requirement III.D.3.4, CRH that required licensees to: (a) Submit CRH Evaluation Information, and (b) Submit modifications necessary to assure CRH with a schedule for completion. These actions were completed and confirmed by the NRC in a July 1982 letter that stated, "Our review of your submittals shows that you have adequately responded to NUREG-0737 Item III.D.3.4 and therefore we find your responses acceptable." The letter was predicated on commitments to modify the control room HVAC and provide SCBA in the control room. These actions were completed by a design change (PDCR 2-7-85) and by incorporating into procedures requirements to provide SCBA in the control room. There have been subsequent changes in the licensing and design basis since the July 1982. However, the current licensing and design bases remain consistent with NUREG-0737 requirement III.D.3.4[4]

[4]Northeast Utilities Letter DT320001, Enclosure 3, Docket No 50-336, July 1981, Response to NUREG-0737, Item III.D.3.4 had submitted complete response to the NRC. Since this response the facility has been modified and radiological and toxic gas analyses have been revised.

Radiation Protection

Radiation protection is provided by shielding (concrete walls and floors), radiation monitoring and control room isolation and ventilation. The MPS 2 design basis Loss of Coolant Accident (LOCA) dictates the shielding requirement design for the control room.

The MPS 2 control room is designed to permit personnel to operate the unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including a LOCA and Main Steam Line Break (MSLB) Accident. Doses resulting from a MPS 3 LOCA have also been evaluated for an operable MPS 2 control room. Adequate radiation protection is provided to permit access and occupancy of the control room during a 30-day period under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident. These are below the General Design Criteria 19 limits[5].

The most limiting MPS 2 DBAs for determining post-accident control room operator dose are analyzed and described in the MPS 2 FSAR, Section 14. These accidents include the LOCA, MSLB, and the Fuel Handling Accident (FHA). Each is analyzed to demonstrate adequate control room design to maintain resulting post accident doses below applicable regulatory and design limits.

The control room dose consequence analyses assume the MPS 2 Technical Specification limit for unfiltered in-leakage is 130 cfm[6]. This limit has been confirmed by tracer gas testing that complies with ASTM E741 test criteria. The latest tracer gas tests performed on January 9, 2003 and November 14, 2003 resulted in measured inleakage values less than the limit of 130 cfm.

MPS 2 is considered to be in full compliance with GDC 19 criteria.

Onsite and Offsite Toxic Chemicals and Smoke

A survey of the onsite and offsite chemical hazards was performed using the guidance of NEI 99-03, Rev. 1; Regulatory Guide (RG) 1.78, Rev. 0; and RG 1.95, Rev. 1[7]. There is no onsite or offsite chlorine storage or transportation of chlorine that is considered a CRH hazard. All identified onsite and offsite chemical hazards have been assessed, with the conclusion that there are no onsite or offsite chemical hazards that would adversely impact CRH. As a result of the activities to develop the GL response several non-conforming conditions were identified with the existing CRH calculations. These non-conforming conditions were entered into the Millstone Corrective Action Program for resolution. These nonconformances do not affect CRE operability.

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[5] MPS 2 FSAR Section 14.8.4

[6] The basis of this value is a Calculation 80-115-382GM, Rev 1, "MPS 2 Control Room Infiltration Calculation"

[7] Technical Evaluation MG-EV-04-0001, Rev. 0, "Technical Evaluation for Survey and Assessment of Onsite and Offsite Hazardous Chemicals for Control Room Habitability (Ref. 24)"

With respect to MPS 2's degree of compliance to RG 1.78, Rev. 0, the MPS 2 chemical hazard assessments do not address potential chemical hazards stored or transported on the east bank of the Thames River (Groton, CT). This small area is 4.9 miles from the control room fresh air intake, however, this area contains a Pfizer Pharmaceutical Manufacturing Facility. This distance essentially meets the five mile exclusion criteria defined in RG 1.78, Regulatory Positions 1 and 2. MPS 2 compliance to RG 1.78, Rev. 0 includes a deviation from Regulatory Position 2, as there are no specific design features (e.g., instrumentation) provided to detect release of onsite hazardous chemical. With these clarifications, MPS 2 meets the guidance outlined in RG 1.78, Rev. 0.

Protection against external sources of smoke is provided as noted in the section on design features. In the event of a control room smoke/fire, alternate shutdown provisions are provided as described in response section 1(b) under title "Assessment of Reactor Control Capability During a Smoke Event Originating Inside or Outside The Unit 2 Control Room – Compliance to GL 2003-01."

Shutdown Capability Outside the Control Room

The MPS 2 control room is equipped to operate the unit safely under normal and accident conditions. Its shielding and ventilation design permits continuous occupancy of the control room for the duration of a DBA without the dose to personnel exceeding the limits specified by GDC 19. Control of important plant operations, including emergency shutdown, can be accomplished at the main control boards in the control room. In the event the operator is forced to abandon the control room, a Hot Shutdown Panel (C21) provides the instrumentation and control necessary to maintain the plant in the hot shutdown condition. The Hot Shutdown Panel is located in the West 480 Volt Switchgear Room at 36'-6" elevation in the Turbine Building. This panel is built and analyzed to meet Seismic Class I specifications. The panel, including all mounted equipment, will remain structurally intact such that no equipment will become loose, separated, or dislocated when subjected to a Design Basis Earthquake (DBE)[8].

Subsequent to a hot shutdown, if necessary, the unit can be brought down to a cold shutdown condition with the following additional provisions and plant procedures. Boric acid gravity feed valves can be manually operated to effect boric acid flow to the charging pump suctions. Low-pressure safety injection (LPSI) pumps can be controlled by control switches provided on the associated 4,160-volt emergency switchgear cubicles[9].

Administrative Control Programs

Procedural controls are provided to ensure continued compliance with the CRH design and licensing basis. Controlled plant procedures are provided for operation, maintenance, instrument calibration and testing of CRH systems. Plant configuration,

[8]Procedure AOP 2551, Shutdown From Outside Control Room
[9]Procedure AOP 2552, Cooldown From Outside Control Room

including design documents, licensing documents, equipment databases, calculations, specifications, reports, etc., is maintained in accordance with established procedures.

As a result of the administrative controls review, improvements in the identification and control of CRHE barrier breaches have been further clarified in station procedures. In addition, a new checklist item was added to the Design Control Manual in order to strengthen consideration of potential impacts to the CRHE relating to plant design changes.

Review of the Licensing and Design Bases

The performance characteristics of the control room HVAC system components were reviewed. A review of the calculations, related specifications, drawings, and technical evaluations was performed. The areas adjacent to the CRE and ventilation systems that serve the CRE were evaluated and were factored in the control room in-leakage test procedure. The licensing, and design bases were consistent with the plant design. A further review of the Operations Procedures, Abnormal Operating Procedures (AOPs) and EOPs was performed. The procedures matched the performance of the plant and were consistent with the safety analyses. In addition, various programs (identified above under *Administrative Control Programs)* pertaining to CRH were reviewed. Some programmatic improvement issues were identified and entered into the Millstone Corrective Action Program for resolution and disposition. No degraded and nonconforming material conditions were identified. All SSCs of the CRE were noted to be in compliance with the design and licensing bases.

Conclusion:

The MPS 2 control room and the associated systems meet the applicable requirements of GDCs 1, 3, 4, 5 and 19. Programmatic improvements identified during these activities have been entered into the Millstone Corrective Action Program. There were no operability or reportability issues identified. Identified deficiencies do not adversely impact CRH. The CRACS and CRFS have been designed, constructed and configured in accordance with the design and licensing basis. In conclusion, through the controlled plant processes, these systems are operated and maintained in accordance with NRC reviewed and approved licensing and design bases.

NRC Requested Information, Item 1(a)

Confirm that the most limiting unfiltered inleakage into your CRE (and the filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analyses for CRE habitability. Describe how and when you performed the analyses, tests, and measurements for this confirmation.

DNC Response:

The MPS 2 CRACS / CRFS was first modified in response to NUREG-0737, Item III.D.3.4; "Control Room Habitability" per NRC Order dated July 10, 1981. The NRC accepted the Millstone position for compliance to the NUREG-0737, Item III.D.3.4 via a letter dated July 19, 1982. MPS 2 subsequently modified the control room HVAC system via a design change, Plant Design Change Record (PDCR) 2-7-85. This included installation of three isolation dampers, installation of redundant radiation detectors, increase in control room filtration unit flow capacity (to 2500 cfm), and control room modifications to reduce air infiltration by weather stripping and sealing penetrations. MPS 2 received approval to amend its operating license on March 10, 1999[10] to increase allowable CRACS in-leakage from 100 cfm to 130 cfm and to provide a more conservative value for the maximum differential pressure across the HEPA filters and charcoal adsorbers.

The first MPS 2 tracer gas test was performed on October 22, 1992, with an inleakage criterion of 100 cfm. The inleakage criterion has since changed to 130 cfm with a new tracer test (not a differential pressure (ΔP) surveillance) via the license amendment previously described. Subsequent tests have been performed satisfactorily on an 18-month frequency as required by the MPS 2 Technical Specifications. All tests have successfully met the control room in-leakage criteria.

The design bases radiological analyses for CRH were performed assuming the 130 cfm in leakage value for all DBAs at MPS 2. The specific accidents for which the MPS 2 control room was analyzed include: LOCA, Steam Generator Tube Rupture (SGTR), Control Rod Ejection Accident, Main Steam Line Break (MSLB), Fuel Handling Accident in the Spent Fuel Storage Pool, Fuel Handling Accident in Containment, Spent Fuel Cask Drop Accident, and MPS 1 Fuel Handling Accident.

The most limiting DBAs for MPS 2 are the LOCA and the MSLB. The results of the radiological analyses demonstrate that the MPS 2 Control Room meets the GDC 19 criteria of 5 rem whole body or equivalent.

NRC Requested Information, Item 1(b)

Confirm that the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessment. This inleakage may differ from the value assumed in your design basis radiological analyses. Also confirm that the reactor control capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

[10] SER via License Amendment 228 to DPR-65, Dated March 10, 1999.

DNC Response:

The CRH hazardous chemical assessments do not credit manual or automatic isolation of the control room fresh airflow (400 to 800 cfm). Therefore, the 130 cfm control room unfiltered inleakage limit is not applicable to these analyses. Further, the onsite chemical survey has not identified any chemicals stored in control room adjoining spaces that are control room hazards. In addition, although not necessary for protective action following a toxic chemical release event, SCBA are required by the Fire Protection Program to be available for the control room operators.

Fire / Smoke Analysis[11]

DNC performed an engineering evaluation of secondary environment (smoke) effects resulting from a fire. In part, the evaluation addressed the potential for smoke propagation to affect redundant safe shutdown components in adjacent fire areas. The evaluation also reviewed the feasibility of performing safety shutdown manual actions (including control room access and egress) necessary to achieve and maintain safe shutdown in a secondary environment (smoke).

The evaluation concluded that in a postulated fire scenario, the secondary environment (smoke) effects will not prevent safe shutdown of the plant from either the control room or alternate shutdown panel.

NRC Requested Information, Item 1(c)

Confirm that your Technical Specifications verify the integrity of your CRE and the assumed inleakage rates of potentially contaminated air. If you currently have a ΔP surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of the ASTM E741 testing results. If you conclude that your ΔP surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E-741), and 2) making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.

If your facility does not currently have a technical specification surveillance requirement for your CRE, explain how and on what frequency you confirm your CRE integrity.

DNC Response:

MPS 2 does not have a ΔP surveillance requirement. MPS 2 had a ΔP surveillance

[11]Technical Evaluation M2-EV-04-0002 Rev 0, "Assessment of Reactor Control Capability during a Smoke Event originating inside or outside the MPS 2 Control Room - Compliance to GL 2003-01"

requirement which was performed to verify a positive ΔP of at least 1/16" wg. This test was changed to the current test method via a license amendment request during 1988.

The MPS 2 control room pressure is maintained at a relatively neutral pressure during normal plant operations by air balancing the HVAC system. In the event of a DBA the CRACS is automatically switched to the isolation/recirculation mode.

MPS 2 Technical Specifications identifies Surveillance 4.7.6.1.e.3 to verify that control room air in-leakage is less than 130 CFM with the CRACS / CRFS operating in the recirculation/filtration mode. This test is performed in accordance with a plant procedure[12] every 18 months following methodology of ASTM Standard E741-83, "Standard Practice for Measuring Air Leakage Rates by Tracer Dilution Method." The tests have been completed successfully satisfying the control room unfiltered in-leakage of less than 130 cfm as required by the Technical Specifications at the required frequency. This test demonstrates the MPS 2 CRE Integrity.

Also, Dominion/DNC has been involved with the NEI CRH Task Force and is following the progress of Technical Specification Task Force effort TSTF-448. Based on review of the task force recommendation, changes are anticipated to be required for the MPS 2 Technical Specifications. These changes are anticipated to include a requirement for a CRH Program and are anticipated to add a requirement for inleakage testing in accordance with ASTM E741 or other method that may be approved by the NRC in the future (Note: MPS 2 Technical Specifications already require a control room in-leakage test at least once every 18 months, but the Technical Specifications do not commit to ASTM E741. However, testing has been performed in accordance with ASTM E741 at MPS 2.)

Although DNC anticipates that the finalized TSTF-448 will be acceptable for reference, a commitment to adopt this TSTF without knowing its final content cannot be made at this time. Therefore, DNC plans to submit proposed changes to the MPS 2 Technical Specifications that will incorporate the intent of the current proposed TSTF-448. The Technical Specification changes will be submitted within six months following either the approval of TSTF-448, or TSTF-448 being made available for adoption in the Consolidated Line Item Improvement Process (CLIIP) by the NRC, whichever is later. DNC's proposed changes will include addition of a CRH Program in Section 6, incorporating elements described in RG 1.196.

MPS 2 has procedures for monitoring and maintaining the integrity of the CRE and has performed tracer gas testing in accordance with Technical Specifications to verify consistency with dose analyses for MPS 2. Delaying Technical Specification changes involving CRH until TSTF-448 is finalized and approved will not adversely affect control room integrity for MPS 2.

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[12]SP 21205, "Control Room In-leakage Verification"

NRC Requested Information, Item 2

If you currently use compensatory measures to demonstrate CRE habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures
DNC Response:

No compensatory measures are required to support maintaining CRH at MPS 2.

NRC Requested Information, Item 3

If you believe that your facility is not required to meet either the GDC, the draft GDC, or the "Principle Design Criteria" regarding control room habitability, in addition to responding to items 1 and 2 above, provide the documentation (e.g., Preliminary Safety Analysis Report, Final Safety Analysis Report sections, or correspondence, etc.) of the basis for this conclusion and identify your actual requirements.

DNC Response:

MPS 2 is required to meet either the GDC, the draft GDC, or the "Principle Design Criteria" regarding CRH as discussed in item 1 above and therefore, no response is required for this section.[13]

Attachment 2

Millstone Power Station Unit 3
Response to Generic Letter 2003-01
Control Room Habitability

DOMINION NUCLEAR CONNECTICUT, INC. (DNC)

Response to Millstone Power Station Unit 3
NRC Generic Letter 2003-01

This letter is provided in response to U.S. Nuclear Regulatory Commission (NRC) Generic Letter (GL) 2003-01, "Control Room Habitability".

NRC Requested Information, Item 1

Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the CRHSs are designed, constructed, configured, operated, and maintained in accordance with the facility' design and licensing basis:

DNC Response:

Dominion Nuclear Connecticut (DNC) assembled and reviewed control room habitability (CRH) design and licensing bases documents, consistent with Nuclear Energy Institute (NEI), NEI 99-03, Rev. 1, and determined that Millstone Power Station Unit 3 (MPS 3) meets the applicable habitability regulatory requirements. Specifically, these systems are designed, constructed, configured, operated and maintained in accordance with the MPS 3 design and licensing bases.

Control Room Habitability Design Features

The CRH systems include radiation shielding, redundant air supply and filtration systems, redundant air-conditioning systems, fire protection, personnel protective equipment, first aid, food, water storage, emergency lighting, and sanitary facilities. The control room habitability envelope (CRHE) includes: the computer, instrument rack, and mechanical equipment rooms. Other CRH areas include: the tagging office, conference room, viewing gallery (including entrance ramp), back stairwell, Shift Manager's Office, kitchenette and toilet facilities. The control room layout, ventilation and fire protection systems are described in the MPS 3 Final Safety Analysis Report (FSAR) Sections 6.4, 9.4, 9.5.1, and Fire Protection Evaluation Report (FPER).

The Control Building lower level is approximately 20 feet below grade and contains the east emergency switchgear room, west emergency switchgear room, battery chargers, battery rooms, and inverters. The west emergency switchgear room contains the Auxiliary Shutdown Panel (ASP) and the east switchgear room contains the Fire Transfer Panel (FTP). The second floor is the Cable Spreading Area (CSA). The third floor is the control room complex that contains the control room, instrument rack room, computer room, and facilities for personnel. The fourth floor contains the mechanical equipment room that contains CRHE ventilation and air-conditioning equipment.

The MPS 3 control room air conditioning and ventilation system consists of two subsystems: (1) The control room air-conditioning subsystem consists of two redundant 100 percent capacity air-conditioning units, each containing a fan, cooling coil, an electric heating element, and filter. A humidifier maintains a minimum humidity level in winter. (2) The instrument rack room and the computer room air-conditioning subsystem consists of two redundant 100 percent capacity air-conditioning units, each containing a fan, cooling coil, an electric heating element, and filter. A humidifier maintains a minimum humidity level in winter. The control room toilet and kitchenette exhaust ventilation subsystem consists of an exhaust fan.

The control room emergency ventilation filtration and pressurization system consists of redundant pressurization air storage tanks and two redundant emergency air filtration units. The air pressurization system operates during the first hour of an accident. After one hour, realignment of the control room ventilation system from the pressurization mode to the filtration/recirculation mode of operation can be initiated. The isolation valves are opened to divert outside air through the control room emergency ventilation filter. In the event that the inlet isolation valves fail to open, operators are able to open these valves within one hour and 40 minutes following a Control Building Isolation (CBI) signal. In the event of a Loss of Coolant Accident (LOCA) or Control Rod Ejection Accident (CREA), operator action is credited to secure selected exhaust fans in the Main Steam Valve House, Auxiliary Building and Emergency Safeguards Features Building. This action is completed within one hour and 20 minutes following CBI during which time the control room will depressurize to ambient pressure.

Each of the air-conditioning units is supplied with chilled water by the Control Building Chilled Water System. The Control Building Chilled Water System is redundant and consists of two 100 percent capacity water chillers, two 100 percent capacity chilled water pumps, and two expansion tanks. The chilled water piping is arranged in two redundant flow paths to serve the control building air-conditioning unit cooling coils.

The Control Building Purge Ventilation System removes smoke and/or fire suppression agent from the instrument rack and computer room, switchgear rooms, and the mechanical equipment room through administrative controls. The purge system shares a common air intake duct with 100 percent outside air circulation, but is operated completely independent of all control building air-conditioning and ventilation systems. The system is designed to permit the operator to purge each space containing smoke, carbon dioxide (CO_2) and/or Halon by opening the supply and exhaust purge isolation dampers from outside that space. The CSA purge ducts are permanently blocked off to help minimize smoke, CO_2 and/or Halon entering the control room.

Radiation monitors connected with the makeup air duct of the control room area air conditioning units detect and respond to the presence of radioactivity. At the discretion of the operator, the emergency ventilation system can be started manually and the return air of the control room or the outdoor air supply diverted through the emergency ventilation filtration assembly. High radiation detected by the monitors located in the air

intakes results in control building isolation.

Fusible link fire dampers are provided on openings in fire barriers separating fire areas. The dampers automatically isolate the area affected by fire. Fire damper assemblies installed in ventilation ductwork common to redundant portions of this system consist of at least two fire dampers in parallel in order to preclude a single failure of one fire damper from impairing the safety function of the system. Administrative controls to shut down control room air-conditioning units in the event of a fire detection alarm within the CRHE are used to ensure fire damper closure if a fire exists. Tightly sealed doors, sealed penetrations and firewalls minimize smoke, heat, and CO_2 from entering the control room. Inspections are performed on 10 percent of the penetration seals for Technical Requirements Manual fire barriers every 18 months and 100% in 15 years. Fire rated assemblies including the concrete and raised control room floor ceiling are inspected every 18 months.

Each safety-related subsystem employs redundant trains of Class 1E power.

General Conformance with General Design Criteria (GDC)

MPS 3 FSAR documents the compliance to NRC GDC for Nuclear Power Plants, Appendix A to 10 CFR 50, as amended through October 27, 1978.[1] This compliance is provided in the FSAR Section 3.1. This Section evaluates the design bases of MPS 3 as measured against the GDC.

Specific Conformance with CRH Regulatory Requirements:

GDC-1, Quality Standards and Records

Structures, systems, and components (SSCs) credited in support of the CRH are categorized as nuclear safety-related. These SSCs are designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. Quality standards applicable to these SSCs are generally contained in codes such as the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The applicability of these codes is specifically identified in the FSAR and is summarized in FSAR Section 3.2.5. Further, FSAR Chapter 17 provides direct reference to the Quality Assurance (QA) Program established to provide assurance that safety related SSCs satisfactorily perform their intended safety functions. The Millstone QA Program Topical Report defines the QA Program. This program covers the Control Room SSCs.[2]

The purge system shares a common air intake duct, but is operated completely independent of all control building air-conditioning and ventilation systems. The purge system supply and exhaust isolation dampers to CSA, East switchgear, West switchgear, instrument rack/computer and mechanical equipment rooms are failed

[1] MPS 3 FSAR Section 3.1, "Conformance with NRC General Design Criteria"
[2] QA Program Topical Report, Appendix A, Item m.

closed/normally closed with damper instrument air supplies normally isolated. Therefore these dampers are not QA category 1 components.

MPS 3 is considered to be in full compliance with GDC 1.

GDC-2, - *Design Bases for Protection against Natural Phenomena*

Essential SSCs associated with CRH are designated as nuclear safety-related and Seismic Category I and enclosed in structures that protect against natural phenomenon, such as earthquakes, hurricanes, tornadoes and floods. Essential components are designed such that failure of non-seismic equipment will not affect the design function of the essential components. MPS 3 complies with the guidance provided in Regulatory Guide (RG), RG 1.29, "Seismic Design Classification), Rev. 3.[3]

MPS 3 is considered to be in full compliance with GDC 2.

GDC 3 – Fire Protection

The MPS 3 Fire Protection Program is addressed in FSAR Section 9-5.1 and the MPS 3 FPER. The fire protection program design basis is documented in the FPER Appendix B, which indicates the degree of compliance with Branch Technical Position, BTP CMEB 9.5-1 in NUREG 0800, July 1981.

The MPS 3 Control Room Fire Hazard Analysis is documented in FPER Section 5. The CRH areas (Control Room area including offices, toilet and kitchenette, instrument rack and computer room, piping chase and mechanical equipment room) were analyzed for the major equipment in the area, fire suppression and detection, design feature of the area and consequences of the postulated fire. The deviations are also documented with the respective analysis in the FPER.

The control room complex is separated from other plant areas by 3-hour fire-rated construction. Portable fire fighting capability is provided with portable fire extinguishers within the control room. Manual hose streams can be brought into the control room from the adjacent service building and the control building stairwell if needed. Self Contained Breathing Apparatus (SCBA) for the operators is provided in the control room. Smoke detection is provided within the main control board cabinets and in selected areas. The outside air intake for the ventilation system has smoke detection capability with annunciation in the control room. Cables entering the control room terminate in the control room. The cables in the control room do not meet required fire separation criteria; however, alternate shutdown capability has been provided. A deviation request dated October 1, 1985 was submitted to the NRC regarding alternate shutdown capability.[4] Also, another deviation request dated August 16, 1985 was submitted to the NRC regarding partial fire detection coverage for Fire Area CB-9

[3] MPS 3 FSAR Section 3.2.1, "Seismic Classification."
[4] Letter B11761, J.F. Opeka to B.J. Youngblood, "Millstone Unit 3, Request for Deviations from BTP CMEB 9.5-1," dated October 1, 1985 - Docket No. 50-423.

(Control Room) and the lack of automatic water suppression and the lack of ventilation duct protection for peripheral rooms in Fire Area CB-9.[5] These deviations were approved in Supplement 4 to the original MPS 3 Safety Evaluation Report.

DNC has requested a license amendment to change the Fire Protection Program to address concerns associated with an inadvertent actuation of the CO_2 system on January 15, 1999 in the Cable Spreading Area (CSA).[6] Several measures have been taken to address this issue including manual operational control of the CO_2 system.

MPS 3 is considered to be in full compliance with GDC 3.

GDC 4 – Environmental and Dynamic Effects Design Bases

The CRHE and essential supporting systems are designed to accommodate the effects of the environmental conditions associated with postulated accidents and are protected against dynamic effects that may result from equipment failures and other events. The design includes consideration of tornado generated external missile hazards. Additional details are provided in FSAR Section 3.8.4.

MPS 3 is considered to be in full compliance with GDC 4.

GDC 5 – Sharing of Structures, Systems, and Components

No portions of the MPS 3 CRHE or essential supporting systems are common with other Millstone units.

MPS 3 is considered to be in full compliance with GDC 5.

GDC 19 – Control Room

General

The CRH design features include radiation shielding, redundant air supply and filtration systems, redundant air-conditioning systems, fire protection, personnel protective equipment, first aid, food, water storage, emergency lighting, and sanitary facilities. The control room layout is described in the MPS 3 FSAR. The design of the MPS 3 Control Room complies with NUREG-0737, Item III.D.3.4 and is addressed in MPS 3 FSAR.[7] In addition, SCBA are available for the control room operators, but are not necessary for protective action following a toxic chemical or radiological release events.

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[5] Letter B11658, J.F. Opeka to B.J. Youngblood, "Millstone Nuclear Power Station, Unit No. 3, Request for deviations from BTP CMEB9.5-1," dated August 16, 1985.
[6] DNC Letter Serial No. 04-070, dated April 04, 2004, submitted under Docket 50-423, "Dominion Nuclear Connecticut, Inc. Millstone Power Station Unit 3 License Amendment Request regarding a Change to the Fire Protection Program (Tac No. MB8731)."
[7] MPS 3 FSAR Table 1.10-1, TMI Action Items and Chapter 18.1, "Human Factors Control Room Design Review"

Radiation Protection

Radiation protection is provided by shielding (concrete walls and floors), radiation monitoring, ventilation, and control room isolation. The MPS 3 design basis LOCA dictates the shielding requirements for the control room.

The MPS 3 control room is designed to operate the unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including a LOCA. Adequate radiation protection is provided to permit access and occupancy of the control room during a 30-day period under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident. The Large Break LOCA is the limiting radiological event. The design basis accidents, including dose analyses and consequences, are described in Chapter 15 of the FSAR. DNC has recently analyzed the accidents using the Alternate Source Term (AST) to demonstrate that the MPS 3 Control Room meets the 10 CFR 50.67 accident dose criteria of 5 Rem TEDE with an assumed 350 cfm unfiltered in-leakage during periods of neutral pressure and 100 cfm unfiltered in-leakage during periods of positive pressure. These analyses have been submitted to the NRC for review.[8] The NRC has recently approved the analyses of the Fuel Handling Accident (FHA) using the AST methodology. The FHA analyses assumed a control room unfiltered in-leakage of 300 cfm during the entire event. The safety evaluation issued with Amendment No. 219 concurred that the control room doses estimated by DNC for the FHA were acceptable.[9]

Toxic Gases and Smoke

A survey of the onsite and offsite chemical hazards was performed[10] using the guidance of NEI 99-03, Rev. 1, RG 1.78, Rev. 0 and RG 1.95, Rev. 1. There is no onsite or offsite chlorine storage or transportation that is considered a control room habitability hazard. All identified onsite and offsite chemical hazards have been assessed with the conclusion that there are no onsite or offsite chemical hazards that would adversely impact CRH.

As a result of the activities to develop the GL response effort several non-conforming conditions were identified with existing CRH calculations and these non-conforming conditions were entered into the Millstone Corrective Action Program for resolution and disposition. These non-conforming conditions do not affect control room envelope/barrier operability.

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[8] DNC Letter Serial No. 04-285, dated May 27, 2004 (Innsbrook to fill in the date), DNC, Inc. Millstone Unit No. 3 License Basis Document Change Request (LBDCR) 04-MPS 3-003, "Proposed Technical Specification Changes, Implementation of Alternate Source Term"

[9] NRC Letter dated March 17, 2004, "Millstone Unit No. 3 - Issuance of Amendment Re: Selective Implementation of Alternate Source Term (TAC No. MB8137)"

[10] Technical Evaluation MG-EV-04-0001, Rev 00, "Survey and Assessment of Onsite and Offsite Hazardous Chemicals for Control Room Habitability"

CSA CO_2 fire suppression system discharge events have the potential to impact control room, fire transfer panel, and ASP habitability due to potential CO_2 migration to the CRHE, east switchgear, and west switchgear rooms. CSA CO_2 fire suppression discharge events and habitability are addressed in Millstone License Amendment Request (Serial No. 04-070, dated April 15, 2004)[11] and will not be discussed within this correspondence.

With respect to MPS 3's degree of compliance to RG 1.78, Rev. 0, toxic chemical hazard assessments do not address potential chemical hazards stored or transported on the east bank of the Thames River (Groton, CT). This small area is 4.9 miles from the control room fresh air intake; however, this area contains the Pfizer Pharmaceutical Manufacturing Facility. This distance essentially meets the five-mile exclusion criteria defined in RG 1.78, Regulatory Positions 1 and 2. Also, as indicated in FSAR Table 1.8-1, MPS 3's degree of compliance to RG 1.78, Rev 0 includes deviation from Regulatory Position 2, as there are no specific design features (e.g., instrumentation) provided to detect release of onsite chemical hazard. With these clarifications, MPS 3 meets the regulatory guidance provided in RG 1.78, Rev. 0.

MPS 3 Control Room is protected against sources of smoke. An engineering evaluation was prepared[12] to assess this aspect and concluded that there was no single smoke generation event that would adversely impact both the CRHE and ASP. This is discussed further in the response to item 1(b) below.

Administrative Control Programs

Procedural controls are provided to ensure continued compliance with the CRH design and licensing basis. Controlled plant procedures are provided for operation, maintenance, instrument calibration and testing of CRH design features. Plant configuration (including design documents, licensing documents, equipment databases, calculations, specifications, reports, etc.) is maintained through controlled design and licensing procedures.

As a result of the administrative controls review, improvements in the identification and control of CRHE barrier breaches have been further clarified in station procedures. In addition, a new checklist item was added to the Design Control Manual in order to strengthen consideration of potential impacts to the CRHE relating to plant design changes.

Review of the Licensing and Design bases

The performance characteristics of the Control Room Heating, Ventilation and Air Conditioning (HVAC) system components were reviewed. A review of the calculations,

[11] Letter Serial No 04-070, dated April 15, 2004, "Dominion Nuclear Connecticut, Inc. Millstone Unit 3 License Amendment Request regarding a change to the Fire Protection Program (Tac No. MB8731)"
[12] Technical Evaluation M3-EV-04-0001, Rev 0, "Assessment of Reactor Control Capability during a Smoke Event originating inside or outside the Unit 3 Control Room - Compliance to GL 2003-01"

related specifications, drawings, and technical evaluations was performed. The areas adjacent to the CRHE and ventilation systems that serve the CRHE were evaluated and were factored in the control room in-leakage test procedure. The licensing and design bases were consistent with the plant design. A further review of the Operations Procedures, AOPs, and EOPs was performed. The procedures matched the performance of the plant and were consistent with the safety analyses. In addition, various programs pertaining to CRH were reviewed. Some programmatic issues were identified and entered into the Millstone Corrective Action Program. No degraded or nonconforming material conditions were identified. All components and SSCs of the CRHE were noted to be in compliance with the design and licensing bases.

Conclusion:

The MPS 3 CRHE and the associated essential support systems meet the applicable requirements of GDCs 1, 2, 3, 4, 5 and 19. The CRHE and essential support systems are designed, constructed and configured in accordance with the MPS 3 design and licensing basis. These systems are operated and maintained in accordance with licensing and design bases.

NRC Requested Information, Item 1(a)

Confirm that the most limiting unfiltered in-leakage into your CRE (and the filtered in-leakage if applicable) is no more than the value assumed in your design basis radiological analyses for CRE habitability. Describe how and when you performed the analyses, tests, and measurements for this confirmation.

DNC Response:

The MPS 3 CRHE was designed to be pressurized to minimize unfiltered in-leakage. The worst-case accident scenario for MPS 3 is the LOCA. The radiological analysis assumes that the post-LOCA pressure transient in containment initiates CBI at T=0 hours to automatically isolate the control room. The control room dampers close within 6 seconds and pressurization with bottled air is achieved within 1 minute of the CBI. During this one minute, the control room unfiltered in-leakage rate is estimated at 115 cfm, which is one half of the intake flow needed to maintain control room pressurization. While the control room is pressurized to 1/8 inch wg, an unfiltered in-leakage rate of 10 cfm is assumed to account for ingress/egress. After the bottled air is exhausted at approximately T=61 minutes, an additional 40 minutes is required to allow manual action to open the dampers and initiate control room filtered intake/recirculation. During this 40 minute time period, the control room is isolated but not pressurized and again assumes an unfiltered in-leakage rate of 115 cfm. Once the dampers are opened and the HVAC is aligned to the filtered intake/recirculation mode the control room remains pressurized for the remaining 30-day duration post accident. During pressurization (either by bottles or intake) the unfiltered in-leakage rate is 10 cfm. During the time of control room filtered intake/recirculation, the maximum filtered intake assumed is 230

cfm and the recirculation rate is 666 cfm, both through 95 percent efficient filters. Using these assumptions as design inputs, the analyses show that the MPS 3 control room doses are less than GDC 19 criteria of 5 rem whole body or equivalent. Also, calculations were performed to estimate the radiological doses to the MPS 3 control room personnel due to a MPS 2 LOCA. These doses are also less than GDC 19 criteria of 5 rem whole body or equivalent.

As described under item 1(c), the current Technical Specifications do not directly measure the CRHE in-leakage. Presently, the CRHE integrity is verified through the Technical Specification surveillances. A tracer gas test, which will validate the assumptions in the recent AST analyses, is scheduled to be performed and the results analyzed prior to August 31, 2004 as stated in a letter to the NRC dated March 5, 2004.[13]

DNC has completed the re-analyses of the above postulated accidents using the Alternate Source Term (AST) to demonstrate that the control room meets the 10 CFR 50.67 accident dose criteria of 5 rem TEDE with an assumed 350 cfm unfiltered in-leakage during periods of neutral pressure and 100 cfm unfiltered in-leakage during periods of positive pressure. These analyses have been submitted to the NRC.[14]

NRC Requested Information, Item 1(b)

Confirm that the most limiting unfiltered in-leakage into your CRE is incorporated into your hazardous chemical assessment. This in-leakage may differ from the value assumed in your design basis radiological analyses. Also confirm that the reactor control capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

DNC Response:

The CRH onsite and offsite hazardous chemical assessments do not credit manual or automatic isolation of the control room fresh airflow. Therefore, the hazardous chemical assessment assumes nominal unfiltered intake flow (normal fresh air supply) into the control room. This fresh airflow of approximately 1450 cfm is a bounding value. Control room unfiltered in-leakage is not applicable to these analyses.

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[13] Dominion Letter Serial No. 03-373B, Dated March 5, 2004, "Generic Letter 2003-01 Control Room Habitability – Revised Schedule for Control Room Testing and Technical Information Submittal"

[14] S. No. 04-285, dated May 27, 2004 (Innsbrook to fill in the date), DNC, Inc. "Millstone Unit No. 3 License Basis Document Change Request (LBDCR) 04-MPS 3-003, Proposed Technical Specification Changes, Implementation of Alternate Source Term"

Reactor Control Capability due to a smoke event

An engineering evaluation assessed[15] the reactor control capability from either the control room or the ASP if a smoke event were to occur either inside or outside the control room. This assessment was performed using the guidance from position 2.6 of RG 1.196. The assessment verified that auxiliary shutdown controls are not located within the CRHE and are adequately separated such that a single credible smoke/fire event in one area cannot affect the habitability of the other due to smoke. There is more than one egress path available to reach the ASP from the control room. Adequate plant-operating procedures or the fire brigade preplanned actions are in place, which govern the activities to remove or control smoke. All control room licensed and non-licensed operators are required to maintain the training qualifications for the use of SCBA. The control room is adequately equipped with SCBAs and other fire fighting equipment. Procedures are in place to inspect and inventory this equipment periodically. In conclusion, the control room operators have the capability to shutdown the plant from either the control room or the ASP during any single credible smoke event originating from inside or outside the control room.

NRC Requested Information, Item 1(c)

Confirm that your Technical Specifications verify the integrity of your CRE and the assumed in-leakage rates of potentially contaminated air. If you currently have a ΔP surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of the ASTM E741 testing results. If you conclude that your ΔP surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E-741), and 2) making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.

If your facility does not currently have a technical specification surveillance requirement for your CRE, explain how and on what frequency you confirm your CRE integrity.

DNC Response:

The MPS 3 Technical Specifications have surveillance requirements for the major components of the CRH boundary and ventilation systems. The requirements for the control room emergency ventilation filtration system include a 10-hr run of each control room emergency ventilation filtration train every 31 days, maintaining the filter testing program as warranted and at least once every 24 months, and verification every 24 months that the system maintains the CRHE pressure at 1/8" wg relative to the adjacent

[15] Technical Evaluation M3-EV-04-0001, Rev 00, "Assessment of Reactor Control Capability during a Smoke Event originating inside or outside the Unit 3 Control Room - Compliance to GL 2003-01"

areas and outside atmosphere with less than or equal to 230 cfm. The CRHE pressurization system is demonstrated operable by verifying the storage air bottle pressure every 7 days, the valve positions every 31 days, and CRHE isolation and positive CRHE pressure every 24 months. In addition, operability tests are performed for control room isolation valves, control building chilled water pumps and valves to satisfy Technical Specification 4.0.5 Inservice Testing requirements.

As stated in GL 2003-01, differential pressure (ΔP) surveillance may not be a reliable method for demonstrating CRHE integrity. MPS 3 will be performing an ASTM E741 tracer gas test prior to August 31, 2004[16], in part, to confirm that the current technical specification surveillances are adequate.

Dominion/DNC has been involved with NEI Control Room Habitability Task Force and is following the progress of Technical Specification Task Force Item No. TSTF-448. The proposed change being developed by the Task Force will modify technical specifications to include a CRH program. Although DNC anticipates that the final TSTF-448 will be acceptable for reference, a commitment to adopt TSTF-448 can't be made at this time without knowing the MPS 3 2004 CRHE tracer gas test program results or the TSTF-448 final content.

The MPS 3 correspondence that transmits the MPS 3 control room tracer gas test results will further discuss any proposed changes to the MPS 3 Technical Specifications to verify the integrity of the CRHE and the maximum assumed unfiltered in-leakage rates.

NRC Requested Information, Item 2

If you currently use compensatory measures to demonstrate CRE habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures.

DNC Response:

MPS 3 has no CRHE compensatory measures. A tracer gas test as stated earlier will be performed and will validate the CRHE in-leakage values assumed in the MPS 3 AST analyses.

[16] Dominion Letter Serial NO. 03-373B, Dated March 5, 2004, "Generic Letter 2003-01 Control Room Habitability – Revised Schedule for Control Room Testing and Technical Information Submittal."

NRC Requested Information, Item 3

If you believe that your facility is not required to meet either the GDC, the draft GDC, or the "Principle Design Criteria" regarding control room habitability, in addition to responding to items 1 and 2 above, provide the documentation (e.g., Preliminary Safety Analysis Report, Final Safety Analysis Report sections, or correspondence, etc.) of the basis for this conclusion and identify your actual requirements.

DNC Response:

MPS 3 is required to meet GDC 1, 2, 3, 4, 5 and 19 as clarified in MPS 3 FSAR Section 3.1, "Conformance with NRC General Design criteria". These GDCs have been addressed in this response under Item 1 of this Letter.