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Edwin I. Hatch Nuclear Plant
Response to Generic Letter 2003-01
Control Room Habitability

Ladies and Gentlemen:

On June 12, 2003, the NRC issued Generic Letter (GL) 2003-01, "Control Room Habitability," requesting the submittal of information to demonstrate that the control room at each plant complies with the respective plant's current design and licensing bases and applicable regulatory requirements, and that suitable design, maintenance, and testing control measures are in place to ensure continued compliance. GL 2003-01 was written to inform licensees that the design basis assumptions used for control room unfiltered inleakage, even with a pressurized control room, could be non-conservative. Information in the GL was validated through testing at several power reactor facilities using the standard test method described in ASTM consensus standard E741, "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution." By letters dated August 4, 2003; March 29, 2004; October 27, 2004; and November 10, 2005, Southern Nuclear Operating Company (SNC) submitted a course of action for developing responses to GL 2003-01 for Plant Hatch.

By letter dated November 10, 2005, Southern Nuclear Operating Company (SNC) indicated that within 90 days after the completion of tracer gas testing at Plant Hatch, SNC would provide the Plant Hatch response to GL 2003-01. Tracer gas testing was completed on June 2, 2006. The enclosure to this letter provides the SNC response to GL 2003-01 information requests for Plant Hatch.

Sincerely,

L. M. Stinson

LMS/PAH/daj

Enclosure: SNC Response to GL 2003-01

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Enclosure
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SNC Response to GL 2003-01

Enclosure
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SNC Response to GL 2003-01

On June 12, 2003, the NRC issued Generic Letter (GL) 2003-01, "Control Room Habitability," and requested addressees submit responses to information requests related to Control Room Habitability Systems (CRHS). This enclosure provides Southern Nuclear Operating Company's (SNC) response to the GL for the Edwin I. Hatch Nuclear Plant (HNP). The information provided in this response reflects the design and licensing bases for HNP as presented in the HNP Final Safety Analysis Report (FSAR), the Technical Specifications (TS) and associated Bases, and information from the HNP Unit 1 and 2 Safety Evaluation Reports (SERs) issued by the NRC.

NRC REQUEST 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 CRHS are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases. Emphasis should be placed on confirming:

(a) That the most limiting unfiltered inleakage into your control room envelope (CRE) (and the filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analyses for control room habitability. Describe how and when you performed the analyses, tests, and measurements for this confirmation.
(b) That the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessments. 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.
(c) That your technical specifications verify the integrity of the 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 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 E741), 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 integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

SNC RESPONSE TO REQUEST 1:

SNC has reviewed the HNP MCR design and licensing bases against the applicable habitability regulatory requirements in order to provide confirmation of the following:

(a) That the most limiting unfiltered inleakage into the MCR is no more than the value assumed in the design basis radiological analyses for MCR habitability;
(b) That the most limiting unfiltered inleakage into the MCR is incorporated into hazardous chemical assessments; and
(c) That the Technical Specifications (TS) verify the integrity of the MCR envelope, and the assumed inleakage rates of potentially contaminated air.

Each of the three confirmation requests is addressed below, followed by a discussion of conformance with applicable GDCs.

MCR Design Features

The HNP main control room (MCR) for Units 1 and 2 is described in Sections 6.4 and 9.4 of the Unit 2 FSAR. The following information summarizes key features of the MCR with regard to habitability.

HNP Units 1 and 2 have a shared MCR which is located on elevation 164 ft. between the open end bays of the Units 1 and 2 turbine buildings. The MCR heating, ventilation, and air conditioning (HVAC) system consists of an air-conditioning system and the Main Control Room Environmental Control System (MCREC). The air-conditioning system consists of three 50% air handling units with direct expansion cooling coils and matching water cooled condensing units. Electric duct heaters are provided at the discharge of the air handling units (AHUs) for temperature control requirements. The MCREC system consists of two redundant filter trains. Each filter train has HEPA and carbon filters, and thus provides filtered air to the air conditioning units for supply to the main control room. During normal plant operation, the air conditioning system maintains acceptable environmental conditions within the MCR. During an accident or abnormal condition, the MCREC system is activated for pressurization and for maintaining habitable condition in the MCR. In addition, there are two 100% exhaust fans that are not operated during normal plant operation and are normally isolated from the main control room by means of normally closed isolation dampers. The exhaust fans are operated for purging smoke from the MCR in the event of a fire. When operating, the fans exhaust to the reactor building vent plenum.

The control room envelope (CRE) boundary consists of the main control room area and is maintained as an air tight design. The CRE is maintained at a positive pressure during normal plant operation and at 0.1 inch minimum water gauge (WG) positive pressure relative to the turbine building during accident and post accident conditions.

The majority of the ductwork associated with the air conditioning, the MCREC system, and the exhaust fan is located external to the control room envelop on the control room roof within the confines of the HNP Unit 1 and 2 turbine buildings. The walls of the control room are extended vertically to provide missile protection for the MCREC system, including ductwork. However, the ductwork is open to the turbine building environment.

The MCREC is designed:

- With sufficient redundancy and separation of active components to provide reliable operation under normal conditions and to ensure operation under emergency conditions.
- To provide an environment with controlled temperature to ensure both the comfort and safety of the operators and the integrity of the MCR components.
- To provide purging capability for removing radioactive and foreign material from the main control room (MCR) environment.
- To detect and limit the introduction of radioactive material into the MCR.
- To minimize the possibility of exhaust air recirculation into the air intake.

The MCR is fully air-conditioned and the MCREC system provides a protected environment for the plant operators in the event of a postulated design basis accident (DBA) on either unit.

No single active or passive electrical failure will cause the loss of supply or exhaust air for the MCR. The single-failure criterion is met, since all active components are located in the redundant portions of the system. Where redundancy does not exist, the system is normally operated such that at least one isolation barrier is normally closed.

Noncombustible materials are used in construction and equipment as much as possible. The quantity of combustible material, such as paper and other flammable supplies, is kept to a minimum. Plant operators receive training in firefighting. Therefore, a trained firefighter is on duty at all times.

During normal operation, the room air is re-circulated through each operating AHU. The MCR is normally maintained at a slightly positive pressure relative to the surrounding turbine building. A ducted air supply provides fresh makeup air that is mixed with the re-circulated air before it passes over the cooling coil of each operating AHU. Each of the three return air paths from the MCR is provided with prefilters. Electric heaters can heat the supply air to the MCR in accordance with room temperature requirements for personnel comfort.

Radiation monitors are provided in the MCR outside air intake duct and in the MCR. The monitors alarm in the MCR upon detection of high-radiation conditions. The radiation monitor in the MCR intake ductwork activates the MCREC system. Additionally, the pressurization mode is initiated by LOCA signals from either unit, refueling floor high radiation from either unit, and main steam line high flow from either unit.

Redundant differential pressure switches sense the differential pressure between the MCR and the turbine building. These switches alarm in the MCR on low ΔP when the MCREC system is in the pressurization mode.

MCR Radiological Effects Considering MCR Unfiltered Inleakage

GL 2003-01 requested the consideration of the potential impact of unfiltered inleakage into the MCR. The original licensing basis for Plant Hatch assumed no inleakage into the control room during radiological events based on operation of the MCREC System in the pressurization mode. However, in order to address the issues presented by the GL, and in particular, the possibility of unfiltered inleakage into the HNP MCR, the incorporation of potassium iodide (KI) into the licensing basis as a measure to limit the thyroid dose to control room occupants in the event of a design basis LOCA was approved by the NRC on an interim basis. The incorporation of KI was provided to assure that the 30-day thyroid dose remains within the regulatory limits of 10 CFR 50, Appendix A, General Design Criterion (GDC) 19, with MCR unfiltered inleakage up to 110 cfm. The effectiveness of KI in blocking the uptake of radioiodine by the thyroid is well documented and use of KI on an interim basis is acceptable as stated in NRC and industry documents, including 10 CFR 20.1702, NRC IN 88-15, regulatory position 2.7.3 of Regulatory Guide (RG) 1.196, entitled "Control Room Habitability at Light-Water Nuclear Power Reactors," and Appendix F of NEI 99-03 Revision 0, entitled "Control Room Habitability Guidance."

The current analyses assume 110 cfm unfiltered inleakage. The MCREC is designed to ensure habitability for a postulated LOCA, the fuel-handling accident, the main steam line break accident, and the control rod drop accident. The control room was designed to meet the dose requirements of GDC 19.

The MCR is pressurized to greater than or equal to 0.1-in. water gauge relative to the surrounding turbine building. The air intake rate is ~ 400 cfm of outside air in the normal ventilation intake on the west wall of the turbine building and is mixed with ~2100 cfm of MCR air and passed through the charcoal adsorber filter train for removal of airborne radioactivity. The normal AHUs continue to recirculate air at ~14,000 cfm/operating AHU. The charcoal adsorber has an expected methyl iodide removal efficiency of 97.5%. Each HEPA filter is rated for 1000 cfm and maximum total dioctyl phthalate (DOP) smoke penetration of 0.05% upstream concentration.

Radiological exposure to the operators in the MCR, considering MCR unfiltered inleakage of 110 ft^3/min and crediting KI is as follows:

Thyroid	29.3 rem
β-skin	7.5 rem
Whole body	0.2 rem

The LOCA is the limiting DBA with respect to MCR doses. As illustrated above, the doses for the LOCA are within the limits of GDC 19.

Tracer gas testing of the MCR envelope was completed on June 2, 2006 using ASTM Standard E741. The tests demonstrated unfiltered inleakage between 0 to 5 scfm into the MCR for the different system lineups for the pressurization mode of operation. For the isolation mode of operation, the unfiltered inleakage was 16 scfm. There is significant margin between the measured inleakage (less than 5 scfm) and the unfiltered inleakage assumed in the most limiting DBA (LOCA) dose analysis for operators in the MCR (110 scfm). No compensatory measures were required as a result of the tracer gas testing.

MCR and turbine building ventilation systems were tested in a number of configurations in order to bound the range of operational modes and equipment combinations which may be encountered. Table 1 shows the configurations used to test the MCR boundary in the pressurization mode with the annex door closed. The annex door, which is a control room boundary door, provides access to the control room annex, which is not part of the control room boundary. In all cases, the filter bypass damper was in the open position, to represent the assumed single failure. The first two entries show test results for both trains of pressurization fans with the A and C trains of air conditioning, and demonstrate that train A pressurization mode has the slightly larger inleakage. The third entry shows results for the A and B trains of air conditioning with the more limiting train A. This worst case pressurization mode inleakage was 5 scfm, although there are not significant differences between the test results for any combination of equipment.

TABLE 1 Pressurization Mode Test Results

Test Configuration	**Unfiltered Inleakage With Tracer Gas Airflow**
A Train, A&C A/C	3 scfm
B Train, A&C A/C	0 scfm
A Train, A&B A/C	5 scfm

The second mode of operation tested was the isolation mode. This mode would be used if a toxic chemical release or external smoke event threatened the habitability of the control room (although this mode is not currently required for any toxic chemicals on-site). Since all configurations showed essentially the same leakage characteristics for the pressurization mode test, only one configuration was selected for the isolation mode test. The annex door was closed and the filter bypass damper was in the open position for this test.

TABLE 2 Isolation Mode Test Results

Test Configuration	**Unfiltered Inleakage With Tracer Gas Airflow**
B Train, A&C A/C	16 scfm

Finally, an additional test was performed to gain knowledge (for information only) of the potential impact of not closing the MCR annex door to the MCR annex, although this is not a modeled or credited configuration for the accident analyses. This test also provided an indication of the impact of various turbine building HVAC configurations which may reduce the differential pressure between the turbine building and the control room. These configurations could not be tested during operation due to the need for turbine building

HVAC, so the annex door was opened to reduce the control room differential pressure. The results demonstrate that the inleakage is not sensitive to control room to turbine building pressure differential.

TABLE 3 MCR Boundary Door Open

Test Configuration	**Unfiltered Inleakage With Tracer Gas Airflow**
A Train, A&B A/C	0 scfm

Hazardous Chemical Assessment

An evaluation of off-site hazardous materials was performed to identify any previously unreviewed hazards to the control room personnel due to an accidental release of toxic chemicals stored or transported within a five-mile radius of HNP. This evaluation concluded that no new hazards were identified and that the requirements of Regulatory Guide 1.78 (1974) continue to be satisfied.

A carbon dioxide storage unit is located outside the cable spreading room in the control building at elevation 147 ft. The storage unit is separated from any safety-related equipment by a walled enclosure and is constructed of steel with a steel outer container with insulation between. Pressure is controlled by a refrigeration unit, and over-pressurization is prevented by two relief valves. The possibility of an explosion is not contemplated since CO_2 is a stable compound. For these reasons, no mechanisms of vessel rupture are postulated, and only a break of the largest line (6 in.) leading from the unit is considered.

In the event of a fire in the cable spreading room and concurrent discharge of 97% liquid CO_2 at system design flow, the current ventilation system exhaust ducting will provide enough vent area to maintain the differential pressure within acceptable limits. The cable duct seals leading to the MCR are designed to withstand pressure substantially greater than the resultant pressure, and the cable spreading room has a separate ventilation system, thus precluding the entrance of CO_2 into the MCR.

Hazardous chemical releases are discussed in detail in Section 15.4 of the Unit 2 FSAR. The plant has the capability to inject diluted solutions of chemicals (e.g., sodium hypochlorite) into the service water systems and the circulating water systems to control organic biofouling, corrosion, and silt deposition. Fumes and vapors from these other chemicals cannot incapacitate the MCR operators and at no time does the MCR chlorine concentration exceed the toxicity limit of Regulatory Guide 1.78 (1974). Therefore, no hazard to the MCR operators can occur.

All industrial facilities located within five miles of HNP and all materials currently manufactured, stored, or transported in the vicinity of HNP, have been assessed for control room habitability and determined to pose no threat to HNP.

Various smoke events were evaluated to ensure that safe shutdown capability from the MCR or access to the remote shutdown panel will not be adversely affected by any single smoke event. To ensure safe shutdown of the plant, operators must remain in a tenable environment within the MCR envelope or safely egress to the remote shutdown panel(s) located outside of the MCR boundary. For the assessment, a smoke event within the CRE, a smoke event occurring outside the CRE, and a smoke event external to CRE that exposes the CRE, Control Building, Reactor Building and Turbine Building simultaneously were evaluated.

In the event of the smoke alarm in the main control room, the smoke concentration within the Control Room will be visually monitored and smoke purge mode will be initiated as needed. Should the MCR smoke concentration level continue to impair the ability to maintain acceptable vision levels, the Shift Supervisor may elect to use SCBA's and remain in the MCR or evacuate the MCR via redundant pathways to the respective Remote Safe Shutdown panel locations and implement a dual unit safe shutdown per procedure.

In the event of smoke outside the Control Room, plant operators are expected to remain in the main control room to perform shutdown activities. Since the MCR is normally pressurized during normal plant operation, smoke migration into the MCR is not a concern. However if smoke migration occurs at the outside air intake, the operator may close the outside air intake dampers, and place the MCR HVAC system in the isolation mode. In the event the control room operator is not aware of a smoke event outside, smoke intrusion will be annunciated through activation of one or more of the 58 ionizing smoke detectors located above and below the main control room ceiling for the operator to take appropriate action.

In the event of a smoke event outside the CRE that may simultaneously expose the CRE, the Control Building, both Reactor Buildings and both Turbine Buildings, the MCR ventilation systems may be aligned as needed to place the ventilation system in Isolation Mode. For fires within the plant boundary or nearby forest fire, the control room operators will be notified through a number of onsite and offsite methods. If smoke intrusion into the control room occurs, the outside air supply dampers will be manually closed.

To ensure safe travel for the MCR operators to the respective remote safe shutdown locations, SCBA units are staged in the MCR. The Control room personnel may use these units as needed to continue unit operation or for initiating unit safe shutdown as needed.

Periodic Verification of CRE Integrity

Normal operational surveillance of the habitability systems is in accordance with the HNP-1 and the HNP-2 TS. Periodic in-place testing of the HEPA filters and the charcoal adsorbers verifies no excessive bypass leakage exists. The HVAC system operates during normal conditions and does not require special operation for testing.

Testing the filter units satisfies the in-place testing and acceptance criteria and uses the test procedures detailed in Regulatory Positions C.5.a, C.5.c, and C.5.d of RG 1.52, Revision 2, March 1978, and ASME N510-1989. Sampling and testing of carbon samples are accomplished in accordance with Regulatory Position C.6.b of RG 1.52, Revision 2, March 1978. In-place testing procedures conform to applicable sections of ASME N510-1989. Carbon samples are tested for methyl iodide removal efficiency in accordance with ASTM D3803-1989 at a temperature of 30°C and a relative humidity of 95%.

Regulatory Guide 1.52, Revision 2 recommends an 18-month surveillance interval for ventilation filter testing. It states that certain factors, including "industrial contaminants, pollutants, temperature, and relative humidity contribute to the aging and weathering of filters and adsorbers, and reduce their capability to perform their intended functions." Periodic testing is specified as a means of ensuring reliability of these components. The 18-month surveillance interval was specifically recommended in Regulatory Guide 1.52, Revision 2, Sections C.5.c and C.5.d, and in Table 2, which is associated with Sections C.6.a and C.6.b. The regulatory guide does not discuss any specific failure mechanisms or degradation factors that were the basis for specifying 18 months. ASME N510-1989 specifies a recommended frequency of once per operating cycle, with no specific time value given for an operating cycle. Therefore, the18-month surveillance interval recommendation within Regulatory Guide 1.52 is interpreted as once per operating cycle.

HNP currently performs a positive pressure surveillance of the CRE every 24 months per TS for both units. The TS require that each MCREC subsystem be verified as able to maintain a positive pressure of ≥ 0.1 inches water gauge relative to the turbine building during the pressurization mode of operation at a subsystem flow rate of ≤ 2750 cfm and an outside air flow rate ≤ 400 cfm. This is demonstrated every 24 months on a staggered test basis. The system is tested in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal.

In addition, SNC has committed, via letter to NRC dated August 4, 2003 to implement TSTF-448 once it has been approved by NRC. Once this set of changes to the TS is implemented, the HNP TS will reflect industry standard requirements with regard to CRE boundary control and periodic tracer gas retesting.

General Conformance with General Design Criteria (GDC)

HNP Unit 1 was reviewed for construction on the basis of the proposed GDC which were published in the Federal Register on July 11, 1967. Appendix F.3 of the Unit 1 FSAR has an applicant provided evaluation of the design basis considering the GDC which were effective as of May 21, 1971, and as amended July 7, 1971. In the Unit 1 SER the NRC stated that: "Based on our evaluation of appendix F.3 and of the design of the plant, we concluded in that there is reasonable assurance that the intent of the GDC, published in the Federal Register on May 21, 1971 as Appendix A to 10 CFR Part 50, will be met." The HNP Unit 1 Safety Evaluation Report was issued on May 11, 1973.

The Commission published the GDCs on February 20, 1971, and HNP Unit 2 complied with the newer criteria to the extent practical, recognizing previous design commitments. As a result, the NRC SER for Unit 2 stated that: "Our review assessed the plant design against the GDCs now in effect, we conclude that with the exceptions addressed in the appropriate sections of this report, the plant design conforms to the newer criteria." The HNP Unit 2 SER (NUREG-0411) was issued on June 13, 1978.

The following discussions are summaries from the SERs and FSARs of each unit. Since the units were under the same QA program and were designed very similarly, the discussions are primarily from documentation associated with HNP-Unit 2.

Specific Conformance with Regulatory Requirements-GDC 1, 3, 4, 5 and 19

Criterion 1-Quality Standards and Records

Structures, systems, and components (SSCs) which support the Control Room habitability (CRH) have been designed, fabricated, erected, and tested, and maintained as safety related. The control room and associated CRH systems are located in the Control Building, which is a seismic Category 1 building. Portions of the normal ventilation systems associated with the control room isolation function are classified and maintained as safety-related. The emergency filtration and cooling systems are safety-related. Safety related SSCs were designed and constructed with the GPC QA program as described in the original FSARs and the acceptance of this program was noted in the original SERs issued by the NRC. These systems are operated and maintained in accordance with the existing HNP Quality Assurance Program.

HNP conformance with Criterion 1 is confirmed.

Criterion 3 – Fire Protection

A complete description of the fire protection design bases is provided in the Edwin I. Hatch Nuclear Plant Units 1 and 2 Fire Hazards Analysis (FHA) and Fire Protection Program (incorporated by reference into the FSAR). The MCR is designed and operated under requirements to minimize the likelihood of a fire originating in the MCR. A fire external to the MCR might introduce smoke and heat into the MCR through the MCREC system outside air intake. There is no smoke detector in the outside air intake duct. However, upon smoke reaching the MCR, the operator would become aware and would manually isolate the MCR. The MCR remains habitable in the isolation mode for approximately 14 people for at least 50 hours, an interval limited by the buildup of carbon dioxide. Therefore, it is extremely improbable that a fire external to the MCR will require evacuation. Limitations are placed on combustible material in the MCR. Thermal and electric insulation was chosen to minimize flame spread, smoke, and noxious gas production. Analyses indicate that MCR personnel will not be adversely affected by the toxic fumes of fire-extinguishing agents and the products of combustion due to a fire. Even in the unlikely event of an Underwriters Laboratory Class A fire, MCR operators can quickly extinguish the fire and MCR evacuation should not be necessary. The MCR habitability system provides for rapid smoke clearing through the ventilation systems. Self-contained breathing devices are available should they be required due to smoke conditions. Therefore, it is extremely improbable that a fire could spread or compromise MCR habitability.

The MCR occupies one floor of the control building. The adjacent floors, both above and below, are isolated by fire barriers. The ventilation system for the MCR is isolated from and independent of the ventilation system for the cable spreading room. Cable and other penetrations into the MCR incorporate smoke and fire stops. The fire protection and suppression systems for the adjacent areas are described in the FHA.

For HNP, "Alternate Shutdown" is generally intended to describe a series of manual actions that are taken independently of the control room to achieve safe shutdown for a postulated fire in the control room. Procedures are provided for alternate shutdown of either unit using the respective Remote Shutdown Panels. Appropriate procedures and equipment are available and staged for use by the station fire brigade in coping with a fire in the control room.

HNP conformance with Criterion 3 is confirmed.

Criterion 4 – Environmental and Missile Design Bases

Structures, systems, and components important to safety are designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including the design basis LOCA. These structures, systems, and components are appropriately protected against dynamic effects and discharging fluids that may result from equipment failures.

Special attention was directed to the effects of pipe movement, jet forces, and missiles within the primary containment. Pipe whip restraints have been provided to the extent practical. The structures, systems, and components important to safety are protected from dynamic effects by separating redundant counterparts so that no single event can prevent a required safety action and by routing and locating, to the extent practical, these components to avoid potentially hazardous areas.

Dynamic effects external to the plant, induced by natural phenomena, i.e., tornado-produced missiles, are appropriately considered in FSAR Section 3.5. The NRC notes in the Unit 2 SER that the applicant was required to demonstrate the capability to withstand missile C, a one-inch diameter by three foot long steel rod expected to strike all elevations and missile F, a 13-1/2 inch diameter by 35 foot long telephone pole not expected to strike any higher than 30 feet above grade levels. The control building has 24-inch thick steel reinforced concrete walls and a main control room roof thickness of 30 inches. The concrete is rated for 4000 psi. The results of tornado missile tests have demonstrated that walls and roofs of steel reinforced concrete having a concrete strength of 3000 lbs/sq. in. or greater and thicknesses of 18 inches or greater will provide adequate tornado protection against missiles C and F.

The effects of various pipe breaks outside containment on the CRE and associated facilities have been considered and in all cases, the CRE will remain habitable and provide the capability for safe shutdown and cooldown of the plant.

HNP conformance with Criterion 4 is confirmed.

Criterion 5 – Sharing of Structures, Systems and Components

As noted previously, HNP Units 1 and 2 share a common control room. The control room air conditioning and filtration system is designed with sufficient redundancy and separation of components to provide reliable operation under normal and emergency conditions.

The worst case single active failure of a component of the control room air conditioning and filtration system, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

HNP conformance with Criterion 5 is confirmed.

Criterion 19 – Control Room

The MCR has been provided with appropriate controls and instrumentation to permit personnel to safely operate the unit under normal conditions and maintain it in a safe condition under accident conditions. The MCR and associated post-accident ventilation systems are designed in accordance with Category I requirements. The HNP control room habitability systems include radiation shielding, redundant emergency air filtering and air conditioning systems, radiation monitoring, and fire protection equipment. The design of the MCR permits access and occupancy during a postulated LOCA. The LOCA is the limiting event for radiological exposures to operators in the MCR. Sufficient shielding and ventilation are provided to permit occupancy of the control room for a period of 30 days following the LOCA, without receiving more than 5-rem integrated whole-body dose or its equivalent to any part of the body. An analysis of exposures within the control room is described in SNC's March 17, 2006 application to revise the licensing basis for HNP to incorporate the use of KI as a means to mitigate control room dose. This application was approved by NRC on May 25, 2006.

The remote shutdown panels have the capability for prompt hot shutdown of the reactor, including necessary instrumentation and control to maintain the unit in a safe condition during hot shutdown. The remote shutdown system panel contains controls for the following equipment:

1. RHR system-The controls for one loop of the RHR system are provided on the remote shutdown panel. All modes of the RHR system operation, low-pressure coolant injection (LPCI), suppression pool cooling, containment spray cooling, and shutdown cooling can be operated from the remote shutdown panel.

2. RCIC system - All basic RCIC equipment can be controlled from the remote shutdown panel.
3. Reactor recirculation system-The suction valve of one recirculation pump can be controlled from the remote shutdown panel.
4. Automatic depressurization system (ADS)-Two manual blowdown valves can be operated from the remote shutdown panel.
5. In addition, the diesel generator can be operated from the local panel in the diesel generator building.

Current design basis calculations for the radiological consequences of the postulated LOCA demonstrate that HNP meets the GDC 19 criterion of 5 rem integrated whole body dose with up to 110 ft^3/min of unfiltered inleakage. Thyroid dose is limiting for unfiltered inleakage into the MCR.

In conclusion, the HNP MCR and associated systems conform to the applicable requirements of GDCs 1, 3, 4, 5 and 19. No compensatory measures are required. Procedural controls are provided to ensure continued compliance with the MCR design and licensing basis. Controlled plant procedures are provided for operation, maintenance, instrument calibration and testing of control room habitability systems. Plant configuration, including design documents, licensing documents, equipment databases, calculations, specifications, reports, etc., is maintained through design control and licensing procedures. CRE barrier breaches are identified and controlled by design control and station procedures. Therefore, the MCR is designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases.

NRC REQUEST 2:

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

SNC RESPONSE TO REQUEST 2:

No compensatory measures are needed or used at HNP to demonstrate Control Room Habitability.

NRC REQUEST: 3:

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

SNC RESPONSE TO REQUEST 3:

HNP Units 1 and 2 conform to the GDCs referenced in GL 2003-01 in the manner and to the extent discussed in the response to Request 1 above.