ATTACHMENT I TO IPN-90-056

PROPOSED TECHNICAL SPECIFICATION CHANGES

RELATED TO

TOXIC GAS MONITORING

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

2. The requirements of 3.3.H.1 may be modified as follows:

   a. The control room ventilation system may be inoperable for a period not to exceed seventy-two hours. At the end of this period if the mal-condition in the control room ventilation system has not been corrected, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures. If after an additional 48 hours the mal-condition still exists, the reactor shall be placed in the cold shutdown condition utilizing normal operating procedures.

3. Two independent toxic gas monitoring systems, with separate channels for detecting chlorine, ammonia, and oxygen shall be operable in accordance with 3.3.H.1 except as specified below. The alarm setpoints for ammonia and chlorine shall be adjusted to actuate at 35 ppm and 3 ppm, respectively.

   a. With any channel for a monitored toxic gas inoperable, restore the inoperable channel to operable status within 7 days.

   b. If 3.a above cannot be satisfied within the specified time, then within the next 8 hours initiate and maintain operation in the control room of alternate monitoring capability for the inoperable channel.

   c. With both channels for a monitored gas inoperable, within 8 hours initiate and maintain operation in the control room of an alternate monitoring system capable of detecting the gas monitored by the inoperable channel.

      AND

      1. Within 72 hours after identification of the inoperability of both installed monitoring channels, restore one monitoring channel to operable status.

      OR

      2. Submit a Special Report to the NRC pursuant to Technical Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the monitoring systems.

Basis

The normal procedure for starting the reactor is, first, to heat the reactor coolant to near operating temperature, by running the reactor coolant pumps. The reactor is then made critical by withdrawing control rods and/or diluting boron in the coolant. [1] With this mode of startup, the energy stored in the reactor coolant during the approach to criticality is substantially equal to that during power operation, and, therefore, the minimum required engineered safeguards and auxiliary cooling systems are required to be operable.

The probability of sustaining both a major accident and a simultaneous failure of a safeguards component to operate as designed is necessarily very small. Thus, operation with the reactor above the cold shutdown condition with minimum safeguards operable for a limited period does not significantly increase the probability of an accident having consequences which are more severe than the Design Basis Accident.

The operable status of the various systems and components is demonstrated by periodic tests defined by Specification 4.5. A large fraction of these tests will be performed while the reactor is operating in the power range. If a component is found to be inoperable, it will be possible in most cases to effect repairs and restore the system to full operability within a relatively short time. For a single component to be inoperable does not negate the ability of the system to perform its function, [2] but it reduces the redundancy provided in the reactor design and thereby limits the ability to tolerate additional equipment failures. To provide maximum assurance that the redundant component(s) will operate if required to do so, the redundant component(s) are to be tested prior to initiating repair of the inoperable component. If it develops that (a) the inoperable component is not repaired within the specified allowable time period, or (b) a second component in the same or related system is found to be inoperable, the reactor, if critical, will initially be brought to the hot shutdown condition utilizing normal operating procedures to provide for reduction of the decay heat from the fuel, and consequent reduction of cooling requirements after a postulated loss-of-coolant accident. This will also permit improved access for repairs in some cases. If the reactor was already subcritical, the reactor coolant system temperature and pressure will be maintained within the stated values in order to limit the amount of stored energy in the reactor coolant system. The stated tolerances provide a band for operator control. After a limited time in hot shutdown, if the malfunction(s) are not corrected, the reactor will be placed in the cold shutdown condition, utilizing normal shutdown and cooldown procedures. In the cold shutdown condition there is no possibility of an accident that would release fission products or damage the fuel elements.

The plant operating procedures require immediate action to effect repairs of an inoperable component, and, therefore, in most cases repairs will be completed in less than the specified allowable repair times. The limiting times to repair are based on two consideration:

1) Assuring with high reliability that the safeguard system will function properly if required to do so.

2) Allowances of sufficient time to effect repairs using safe and proper procedures.

Assuming the reactor has been operating at full rated power, the magnitude of the decay heat decreases after initiating hot shutdown. Thus, the requirement for core cooling in case of a postulated loss-of-coolant accident while in the hot shutdown condition is significantly reduced below the requirements for a postulated loss-of-coolant accident during power operation. Putting the reactor in the hot shutdown condition significantly reduces the potential consequences of a loss-of-coolant accident, and also allows more free access to some of the engineered safeguards components in order to effect repairs.

Failure to complete repairs within 1 hour of going to the hot shutdown condition is considered indicative of a requirement for major maintenance and, therefore, in such a case the reactor is to be put into the cold shutdown condition.

The limits for the Boron Injection Tank, Refueling Water Storage Tank, and the accumulators insure the required amount of water with the proper boron concentration for injection into the reactor coolant system following a loss-of-coolant accident is available. These limits are based on values used in the accident analysis.[9] [13]

The specified quantities of water for the RWST include unavailable water (4687 gals) in the tank bottom, inaccuracies (1406 gals) in the alarm setpoints, and minimum quantities required during injection (246,000 gals) [3] and recirculation phases (80,000 gals). [4] The minimum RWST (e.g., 346,870 gals) provides approximately 13,370 gallons margin. The minimum RWST boron concentration ensures that the reactor core will remain subcritical during long term recirculation with all control rods fully withdrawn following a postulated large break LOCA.

The four accumulator isolation valves (894 A,B,C,D) are maintained in the open position when the reactor coolant pressure is above 1000 psig to assure flow passage from the accumulators will be available during the injection phases of a loss-of-coolant accident. Indication is also provided on the monitor light panel, should any of these valves not be in the full open position even with the valve operator deenergized. The 1000 psig limit is derived from the minimum pressure requirements of the accumulators combined with instrument error and an operational band and is based upon avoiding inadvertent injection into the reactor coolant system. The accumulator isolation valve motor operators are de-energized to prevent an extremely unlikely spurious closure of these valves from occurring when accumulator core cooling flow is required. Valves 856 B and G are maintained in the closed position to prevent hot leg injection during the injection phase of a loss-of-coolant accident. As an additional assurance of preventing hot leg injection, these valve motor operators are deenergized to prevent spurious opening of these valves during the injection phase of a loss-of-coolant accident. Power will be restored to these valves at an appropriate time in accordance with plant operating procedures after a loss-of-coolant accident in order to establish hot leg recirculation.

Valves 1810, 822, and 744 are maintained in the open position to assure that flow passage from the refueling water storage tank will be available during the injection phase of a loss-of-coolant accident. As additional assurance of flow passage availability, these valve motor operators are de-energized to prevent an extremely unlikely spurious closure. This additional precaution is acceptable, since failure to manually re-establish power to close these valves following the injection phase is tolerable as a single failure.

Valves 842 and 843 in the mini-flow return line from the discharge of the safety injection pumps to the refueling water storage tank are de-energized in the open position to prevent an extremely unlikely spurious closure which would cause the safety injection pumps to overheat if the reactor coolant system pressure is above the shutoff head of the pumps.

With respect to the core cooling function, there is some functional redundancy for certain ranges of break sizes. (3) The measure of effectiveness of the Safety Injection System is the ability of the pumps and accumulators to keep the core flooded or to reflood the core rapidly where the core has been uncovered for postulated large area ruptures. The result of their performance is to sufficiently limit any increase in clad temperature below a value where emergency core cooling objectives are met. (13)

During operating modes in the temperature range between 200°F and 350°F, a sufficient decay heat removal capability is provided by a reactor coolant pump with a steam generator heat sink or a residual heat removal loop. This redundancy ensures that a single failure will not result in a complete loss of decay heat removal.

During operating modes when the reactor coolant T_{avg} is less than 200°F, but not in the refueling operation condition, a sufficient decay heat removal capability is provided by a residual heat removal loop.

The containment cooling and iodine removal functions are provided by two independent systems: (a) fan-coolers plus charcoal filters and (b) containment spray with sodium hydroxide addition. During normal power operation, the five fan-coolers are required to remove heat lost from equipment and piping within containment at design conditions with a cooling water temperature of 95°F. (4) In the event of a Design Basis Accident, any one of the following configurations will provide sufficient cooling to reduce containment pressure at a rate consistent with limiting off-site doses to acceptable values: (1) five fan-cooler units, (2) two containment spray pumps, (3) three fan-cooler units and one spray pump. also in the event of a Design Basis Accident, any one of three configurations of fan-cooler units (with charcoal filters) and/or containment spray pumps (with sodium hydroxide addition) will reduce airborne organic and molecular iodine activities sufficiently to limit off-site doses to acceptable values. (5) Any one of these three configurations constitutes the minimum safeguards for iodine removal.

The combination of three fan-coolers and one containment spray pump is capable of being operated on emergency power with one diesel generator failing to start. Adequate power for operation of the redundant containment heat removal systems (i.e., five fan-cooler units or two containment spray pumps) is assured by the availability of off-site power or operation of all emergency diesel generators.

Due to the distribution of the five fan cooler units and two containment spray pumps on the 480 volt buses, the closeness to which the combined equipment approaches minimum safeguards varies with which particular component is out of service. Accordingly, the allowable out of service periods vary according to which component is out of service. Under no conditions do the combined equipment degrade below minimum safeguards.

The seven day out of service period for the Weld Channel and Penetration Pressurization System and the Isolation Valve Seal Water System is consistent with W Standardized Technical Specifications. This is allowable because no credit has been taken for operation of these systems in the calculation of off-site accident doses should an accident occur. No other safeguards systems are dependent on operation of these systems. (11) The minimum pressure settings for the IVSWS and WC & PPS during operation assures effective performance of these systems for the maximum containment calculated peak accident pressure of 42.42 psig. (15) A WC & PPS zone is considered that portion of piping downstream of the air receiver discharge check valve up to the last component pressurized by that system portion.

The Component Cooling System is not required during the injection phase of a loss-of-coolant accident. The component cooling pumps are located in the Primary Auxiliary Building and are accessible for repair after a loss-of-coolant accident. (6) During the recirculation phase following a loss-of-coolant accident, only one of the three component cooling pumps is required for minimum safeguards. (7)

A total of six service water pumps are installed, only two of the set of three service water pumps on the header designated the essential header are required immediately following a postulated loss-of-coolant accident. (8) During the recirculation phases of the accident, two service water pumps on the non-essential header will be manually started to supply cooling water for one component cooling system heat exchanger, one control room air conditioner, and one diesel generator; the other component cooling system heat exchanger, the other control room air conditioner, the two other diesel generators and remaining safety related equipment are cooled by the essential service water header. (14) The operability requirements on service water temperature monitoring instrumentation and the frequency of service water temperature monitoring insures that appropriate action can be taken to preclude operation beyond established limits. The locations selected for monitoring river water temperature are typically at the circulating or service water inlets, circulating water inlet boxes to the condenser hotwells or at the service water supply header to the fan cooler units. Temperature measurements at each of these locations are representative of the river water temperature supplied to cool plant heat loads. Alternate locations may be acceptable on this basis. The limit on the service water maximum inlet temperature insures that the service water and component cooling water systems will be able to dissipate the heat loads generated in the limiting design basis accident [15]. This restriction allows up to seven hours for river water temperature transients which may temporarily increase the service water inlet temperature due to tidal effects to dissipate.

Two full rated recombination systems are provided in order to control the hydrogen evolved in the containment following a loss-of-coolant accident. Either system is capable of preventing the hydrogen concentration from exceeding 2% by volume within the containment. Each of the systems is separate from the other and is provided with redundant features. Power supplies for the blowers and ignitors are separate, so that loss of one power supply will not affect the remaining system. Hydrogen gas is used as the externally supplied fuel. Oxygen gas is added to the containment atmosphere through a separate containment feed to prevent depletion of oxygen in the air below the concentration required for stable operation of the combustor (12%).

The containment hydrogen monitoring system consists of two safety related hydrogen concentration measurement cabinets with sample lines which pass through the containment penetrations to each containment fan cooler unit plenum. Two of the five sampling lines (from containment fan cooler units nos. 32 and 35) are routed to a common source line and then to a hydrogen monitor. The other three sample lines (from containment fan cooler units nos. 31, 33 and 34) are likewise headered and routed to the other hydrogen monitor. Each monitor has a separate return line. The design hydrogen concentration for operating the recombiner is established at 2% by volume. Conservative calculations indicate that the hydrogen content within the containment will not reach 2% by volume until 12 days after a loss-of-coolant accident. [10] There is, therefore, no need for immediate operation of the recombiner following an accident, and the quantity of hydrogen fuel stored at the site will be only for periodic testing of the recombiners.

Auxiliary Component Cooling Pumps are provided to deliver cooling water for the two Recirculation Pumps located inside the containment. Each recirculation pump is fed by two Auxiliary Component Cooling Pumps. A single Auxiliary Component Cooling Pump is capable of supplying the necessary cooling water required for a recirculation pump during the recirculation phase following a loss-of-coolant accident.

The control room ventilation is designed to filter the control room atmosphere for intake air and/or for recirculation during control room isolation conditions. The control room system is designed to automatically start upon control room isolation and to maintain the control room pressure to the design positive pressure so that all leakage should be out leakage.

The control room is equipped with two independent toxic gas monitoring systems. One system in the control room consists of redundant channels for oxygen and a channel each for ammonia and chlorine. The second system in the control room ventilation intake consists of one channel each for oxygen, ammonia and chlorine. Oxygen detectors are used to indirectly monitor changes in carbon dioxide levels.

These toxic gas monitoring systems are designed to alarm in the control room upon detection of the short term exposure limit (STEL) value. The operability of the toxic gas monitoring systems provides assurance that the control room operators will have adequate time to take protective action in the event of an accidental toxic gas release. Selection of the gases to be monitored are based on the results described in the Indian Point Unit 3 Habitability Study for the Control Room, dated July, 1981. The alarm setpoints will be in accordance with industrial ventilation standards as defined by the American Conference of Governmental Industrial Hygienists.[16]

The OPS has been designed to withstand the effects of the postulated worse case Mass Input (i.e., single safety injection pump) without exceeding the 10 CFR 50, Appendix G curve. Curve III on Figure 3.1.A-3 provides the setpoint curve of the OPS PORVs which is sufficiently below the Appendix G curve such that PORVs overshoots would not exceed the allowable Appendix G pressures. Therefore, only one safety injection pump can be available to feed water into the RCS when the OPS is operable. The other pumps must be prevented from injecting water into the RCS. This may be accomplished, for example, by placing the SI pump switches in the trip pull-out position, or by closing and locking (if manual) or de-energizing (if motor operated) at least one valve in the flow path from these pumps to the RCS. For conditions when the OPS is inoperable, additional restrictions are imposed on the RCS temperature, and pressurizer pressure and level. See Specification 3.1.A.6.b. (3).

References

1) FSAR Section 9
2) FSAR Section 6.2
3) FSAR Section 6.2
4) FSAR Section 6.3
5) FSAR Section 14.3.5
6) FSAR Section 1.2
7) FSAR Section 8.2
8) FSAR Section 9.6.1
9) FSAR Section 14.3
10) FSAR Section 6.8
11) FSAR Section 6.5
12) Response to Question 14.6, FSAR Volume 7
13) FSAR Appendix 14C
14) Response to Question 9.35, FSAR Volume 7
15) WCAP-12313, "Safety Evaluation for an Ultimate Heat Sink Temperature Increased to 95° at IP-3"
16) American Conference of Governmental Industrial Hygienists 1982 Industrial Ventilation, 19th Edition

(1) The charcoal shall have a methyl iodine removal efficiency ≥ 90% at ± 20% of the accident design flow rate, 0.05 to 0.15 mg/m^3 inlet methyl iodine concentration, ≥ 95% relative humidity and ≥ 125°F.

(2) A halogenated hydrocarbon (freon) test on charcoal adsorbers at ± 20% of the accident design flow rate and ambient conditions shall show ≥ 99% halogenated hydrocarbon removal.

(3) A locally generated DOP test of the HEPA filters at ± 20% of the accident design flow rate and ambient conditions shall show ≥ 99% DOP removal.

e. Each toxic gas monitoring system shall be demonstrated operable by performance of a channel check at least once per day, a channel test at least once per 31 days and a channel calibration each refueling cycle.

6. <u>Fuel Storage Building Emergency Ventilation System</u>

a. The fuel storage building emergency ventilation system fan shall be operated for a minimum of 15 minutes every month when there is irradiated fuel in the spent fuel pit.

b. Prior to handling of irradiated fuel, the following conditions shall be demonstrated before the system can be considered operable:

(1) The pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at ambient conditions and accident design flow rates.

(2) Using either direct or indirect measurements, the flow rate of the system fans shall be shown to be at least 90% of the accident design flow rate.

(3) The filtration system bypass assembly shall be isolated and leak tested to assure that it is properly sealed.

High efficiency particulate absolute (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of these adsorbers for all emergency air treatment systems. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The in-place test results should indicate a system leak tightness of less than or equal to one percent leakage for the charcoal adsorbers and a HEPA efficiency of greater than or equal to 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a methyl iodide removal efficiency of greater than or equal to 90 percent on the fuel handling system samples, and greater than or equal to 85 percent on the containment system samples for expected accident conditions. With the efficiencies of the HEPA filters and charcoal adsorbers as specified, further assurance is provided that the resulting doses will be less than the 10 CFR 100 guidelines for the accidents analyzed.

The basis for the toxic gas monitoring system is given in Technical Specification Section 3.3.

The control room air treatment system is designed to filter the control room atmosphere for intake air and/or for recirculation during control room isolation conditions. The control room air treatment system is designed to automatically start upon control room isolation.

High efficiency particulate absolute (HEPA) filters are installed before the charcoal adsorbers to similarly prevent clogging of these adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radio-iodine by control room personnel. The in-place test results should indicate a system leak tightness of less than or equal to one percent leakage for the charcoal adsorbers and a HEPA filter efficiency of greater than or equal to 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a methyl iodide removal efficiency of greater than or equal to 90 percent for expected accident conditions.

With the efficiencies of the HEPA filters and charcoal adsorbers as specified, further assurance is provided that the resulting doses will be less than the allowable levels stated in Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10CFR Part 50.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than or equal to 6.0 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per operating cycle to show system performance capability. Proper operation of the system fans should also be verified at least every refueling by either direct or indirect measurements.

If results of charcoal tests are unsatisfactory, two additional samples may be tested. If both of these tests are acceptable, the charcoal may be considered satisfactory for use in the plant. Should the charcoal of any of these air filtration systems fail to satisfy the test criteria outlined in this specification, the charcoal beds will be replaced with new charcoal which satisfies the requirements for new charcoal outlined in Regulatory Guide 1.52 (Revision June, 1973).

The hydrogen recombiner system is an engineered safety feature which would be used only following a loss-of-coolant accident to control the hydrogen evolved in the containment. The system is not expected to be started until approximately 12 days have elapsed following the accident. At this time, the hydrogen concentration in the containment will have reached 2% by volume, which is the design concentration for starting the recombiner system.[3] Actual starting of the system will be based upon containment atmosphere samples analysis. The complete functional tests of each unit at refueling shutdown will demonstrate the proper operation of the recombiner system. More frequent tests of the recombiner control system and airsupply blowers will assure operability of the system. The bi-annual testing of the containment hydrogen monitoring system will demonstrate the availability of this system.

For the eight flow distribution valves (856 A, C, D, E, F, H, J and K), verification of the valve mechanical stop adjustments is performed periodically to provide assurance that the high head safety injection flow distribution is in accordance with flow values assumed in the core cooling analysis.

References

(1) FSAR Section 6.2

(2) FSAR Section 6.4

(3) FSAR Section 6.8

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Regional Administrator-Region 1 within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification;

a. Sealed source leakage on excess of limits (Specification 3.9)

b. Inoperable Seismic Monitoring Instrumentation (Specification 4.10)

c. Seismic event analysis (Specification 4.10)

d. Inoperable plant vent sampling, main steam line radiation monitoring or effluent monitoring capability (Table 3.5-4, items 5, 6 and 7)

e. The complete results of the steam generator tube inservice inspection (Specification 4.9.C)

f. Inoperable fire protection and detection equipment (Specification 3.14)

g. Release of radioactive effluents in excess of limits (Appendix B Specifications 2.3, 2.4, 2.5, 2.6)

h. Inoperable containment high-range radiation monitors (Table 3.5-5, Item 24)

i. Radioactive environmental sampling results in excess of reporting levels (Appendix B Specification 2.7, 2.8, 2.9)

j. Operation of Overpressure Protection System (Specification 3.1.A.8.c)

k. Operation of Toxic Gas Monitoring Systems (Specification 3.3.H.3.)

6.10 RECORD RETENTION

6.10.1 The following records shall be retained for at least five years:

a. Records and logs of facility operation covering time interval at each power level.

b. Records and logs of principal maintenance activities, inspection, repair and replacements of principal items of equipment related to nuclear safety.

c. ALL REPORTABLE EVENTS submitted to the Commission.

d. Records of surveillance activities, inspections and calibrations required by these Technical Specifications.

e. Records of changes made to Operating Procedures.

f. Records of radioactive shipments.

g. Records of sealed source and fission detector leak tests and results.

h. Records of annual physical inventory of all source material of record.

i. Records of reactor tests and experiments.

6.10.2 The following records shall be retained for the duration of the Facility Operating License:

a. Records of any drawing changes reflecting facility design modifications made to systems and equipment described in the Final Safety Analysis Report.

b. Records of new and irradiated fuel inventory, fuel transfers and assembly burnup histories.

c. Records of facility radiation and contamination surveys.

d. Records of radiation exposure for all individuals entering radiation control areas.

e. Records of gaseous and liquid radioactive material released to the environs.

f. Records of transient or operational cycles for those facility components designed for a limited number of transient cycles.

g. Records of training and qualifications for current members of the plant staff.

h. Records of in-service inspections performed pursuant to these Technical Specifications.

i. Records of Quality Assurance activities required by the QA manual.

j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59.

k. Records of meetings of the PORC and the SRC.

l. Records for Environmental Qualification which are covered under the provisions of paragraph 6.13.

m. Records of secondary water sampling and water quality.

n. Records of analyses required by the radiological environmental monitoring program that would permit evaluation of the accuracy of the analysis at a later date. This should include procedures effective at specified times and records showing that these procedures were followed.

o. Records of service lives of all safety-related hydraulic snubbers including the date at which the service life commences and associated installation and maintenance records.

6.11 <u>RADIATION AND RESPIRATORY PROTECTION PROGRAM</u>

6.11.1 Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved maintained and adhered to for all operations involving personnel radiation exposure as to maintain exposures as far below the limits specified in 10 CFR Part 20 as reasonable achievable. Pursuant to 10 CFR 20.103 allowance shall be made for the use of respiratory protective equipment in conjunction with activities authorized by the operating license for this plant in determining whether individuals in restricted areas are exposed to concentrations in excess of the limits specified in Appendix B, Table I, Column 1 of 10 CFR 20.

ATTACHMENT II TO IPN-90-056

SAFETY EVALUATION

RELATED TO

TOXIC GAS MONITORING

TECHNICAL SPECIFICATION CHANGES

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

Section I - Description of Changes

This application seeks to amend the Indian Point 3 (IP3) technical specifications, sections 3.3, 4.5, and 6.9, to incorporate technical specifications (tech. specs.) for the two toxic gas monitoring systems at IP3. Current pages 3.3-13 through 3.3-20, inclusive, will be replaced by the enclosed pages 3.3-13 through 3.3-21. The proposed tech. specs. follow the guidance and intent of NUREG-0737 Item III.D.3.4 ("Control Room Habitability Requirements") and Generic Letter (GL) 83-37, "NUREG-0737 Technical Specifications."

Section II - Evaluation of Changes

NUREG-0737, Item III.D.3.4, "Control Room Habitability Requirements" requires that the control room operators be adequately protected against the effects of an accidental release of toxic gases. As a result of a habitability study performed for IP3 in July of 1981, the Authority committed to install a toxic gas monitoring system by the cycle 4/5 refueling outage (June, 1985). The Authority installed chlorine, ammonia, and oxygen detectors during the cycle 3/4 refueling outage to protect the control room operators.

Subsequent to the July, 1981 analysis, the Authority performed a probabilistic analysis of onsite and offsite chemical releases and their effects on control room habitability. This analysis (submitted to the NRC on September 10, 1985) concluded that neither the offsite toxic chemicals (chlorine and ammonia) nor the carbon dioxide stored onsite pose a credible hazard to the control room operators. Although this probabilistic analysis showed there was no need for a toxic gas monitoring system at IP3, the system was installed during the cycle 3/4 refueling outage and was upgraded during the cycle 4/5 refueling outage. The upgrade consisted of the addition of a redundant oxygen (O_2) monitor, and the incorporation of more sensitive chlorine (Cl_2) and ammonia monitors. The O_2 monitors are used to detect the presence of carbon dioxide (CO_2); CO_2 in the control room will deplete the O_2 in the control room atmosphere, and the O_2 monitor will alarm when the level reaches a preset value. The gas monitors are located in the control room. The system has a central control and alarm panel. Detectors are located near the fire display and control panel in order to monitor the atmosphere near the operators.

A second toxic gas monitoring system was installed during the cycle 4/5 refueling outage that provides continuous indication of the control room's oxygen, chlorine, and ammonia levels. An air sample is extracted from the outside air intake duct, analyzed, and exhausted back to the air intake. The detector and monitor are mounted in the air conditioning equipment room in the control building at El. 15'-0". An alarm on panel SM in the control room is provided that will alarm on detection of the toxic gases, O_2 depletion, equipment trouble, or loss of power. In addition, continuous digital LED readout is provided in the air conditioning equipment room for each detector. With the installation of this system, the control room operators are protected by two separate and independent toxic gas monitoring systems.

Regarding control room habitability, the NRC evaluated IP3 in letters dated January 27, 1982, September 27, 1985, March 13, 1986, and February 3, 1987. The NRC concluded that IP3 meets the requirements of NUREG-0737 Item III.D.3.4. However, the NRC does not agree with the probabilistic analysis the Authority submitted to show that a toxic gas monitoring system is not required at IP3. Therefore, the appropriate tech. specs. are required to be submitted in accordance with NUREG-0737 and GL 83-37.

The proposed tech. specs. follow the guidance and intent of GL 83-37, but do not conform to the recommendations completely. The Authority does not agree to place the control room ventilation system in a monitored recirculation mode of operation when one or both channels of a monitored toxic gas are inoperable. The Authority will place portable detectors in the control room instead of placing the ventilation system in the recirculation mode. IP3 tech. specs. for NUREG-0737 items such as plant vent sampling, wide range plant vent monitor, main steam line radiation monitor, and the high range containment radiation monitor contain alternate monitoring requirements. Alternate toxic gas monitors will be used to protect the operators if the normal system becomes inoperable, so there is no need to place the ventilation system in the recirculation mode. Additionally, if both channels for a monitored gas are inoperable and one channel is not restored to operable status within 72 hours, the Authority will submit a special report to the NRC within 14 days following the declaration of inoperability. This report will outline the actions taken, identify the cause of the malfunction, and the plans and schedule for restoring the channels to operability.

If a single channel of the normal system becomes inoperable and cannot be restored to operable status within seven days, an alternative, portable monitoring channel will be placed in service. If both channels for a particular gas become inoperable, an alternative, portable monitoring channel will be placed in service to monitor the control room within eight (8) hours.

Three separate, alternative channels will be available, one each for ammonia, chlorine, and oxygen. The alternative channels will include a monitor and a portable sensor with a five foot long (minimum) cable, and will be placed in the control room to monitor the control room atmosphere. The portable channels will be the same make and models that the regular gas monitoring system uses, and will have capabilities equivalent to the regular system. Each portable monitor will be encased in an oil tight enclosure, and can be powered by ac or dc power. Each portable monitor will have an LCD readout for gas concentration, an adjustable alarm setpoint, an alarm indicating light, and an audible alarm.

As described in the Authority's letter to the NRC dated August 28, 1990 (Reference 2), the gas monitoring system alarms will be set at the "Short Term Exposure Limit" (STEL) values (as defined by the American Conference of Governmental Industrial Hygienists, 1982 Industrial Ventilation, 19th Edition). The STEL value for ammonia is 35 ppm; the STEL value for chlorine is 3 ppm. The STEL is a time-weighted average exposure that a worker can be exposed to for 15 minutes at a time without suffering from irritation, irreversible tissue damage, or narcosis to a degree that would increase the probability of accidental injury. An exposure to the STEL value should not be repeated more than four times within an eight hour period, and there should be at least a one hour break between exposures. The toxicity limits listed in Regulatory Guide (RG) 1.78, Table C-1, are defined by the RG as the maximum concentrations that can be tolerated for two minutes without physical incapacitation of an average human. For ammonia and chlorine, the RG 1.78, Table C-1 limits are 100 ppm and 15 ppm. The limits IP3 will use (35 ppm for ammonia and 3 ppm for chlorine) are considerably more conservative. The oxygen sensing channels of the gas monitoring system alarm if the oxygen level in the control room decrease below 19.5%; normal air contains 20.9% oxygen, and human beings become dysfunctional if the oxygen level decrease to 16%. The oxygen channels ensure that the operators are aware of depletion of the control room oxygen level to 19.5%.

Section III - No Significant Hazards Evaluation

Consistent with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based on the following information:

(1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response:

The proposed changes do not involve an increase in the probability of a previously-analyzed accident. The event related to this proposed amendment is an accidental release of toxic gases. The proposed amendment has no effect on the probability of occurrence of a gas release because the amendment involves no changes to the storage or use of toxic gases at IP3. The potential consequences of an accidental release of toxic gas are reduced since the proposed changes provide additional assurance that the toxic gas monitoring systems are operable.

(2) Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response:

The proposed changes do not create the possibility of a new or different kind of accident. The event related to this proposed amendment is an accidental release of toxic gases. The toxic gas monitoring systems do not physically affect storage or use of any toxic gases of concern.

(3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response:

The proposed amendment does not involve a significant reduction in a margin of safety. The proposed amendment provides an additional control that is not presently included in the IP3 tech. specs. The amendment does not affect safety limits or margins contained in any other tech. specs.

In the April 6, 1983 Federal Register, Vol. 048, No. 67, Page 14870, the NRC published a list of examples of amendments that are not likely to involve a significant hazards concern. Example (ii) of that list applies to the toxic gas monitor tech. spec. change because this is:

> A change that constitutes an additional limitation, restriction, or control not presently included in the technical specifications...

Section IV - Impact of Changes

These changes will not adversely impact the following:

ALARA Program
Security and Fire Protection Programs
Emergency Plan
FSAR or SER Conclusions
Overall Plant Operations and the Environment

Section V - Conclusions

The incorporation of these changes: a) will not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; b) will not increase the possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the bases for any Technical Specification; d) does not constitute an unreviewed safety question; and e) involves no significant hazards considerations as defined in 10 CFR 50.92.

Section VI - References

a) IP3 Final Safety Analysis Report
b) IP3 Safety Evaluation Report