



John C. Brons
Executive Vice President
Nuclear Generation

August 28, 1990

IPN-90-044

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attn: Document Control Desk

Subject: **Indian Point 3 Nuclear Power Plant**
Docket No. 50-286
Additional Information Regarding the Proposed
Technical Specification Amendment for the Toxic Gas Monitors

- References:
1. NRC letter to J. C. Brons, dated June 8, 1990, entitled "Proposed Changes to the Indian Point 3 Technical Specifications Related to Toxic Gas Monitors (TAC No. 61095)."
 2. NYPA letter, J. C. Brons to the NRC, dated May 19, 1988, entitled "Proposed Changes to the Technical Specifications Related to Toxic Gas Monitors (TAC No. M61095)."

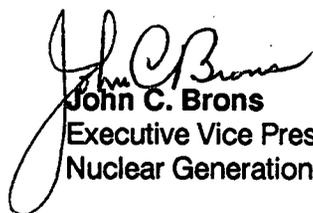
Dear Sir:

By letter dated June 8, 1990 (Reference 1), the NRC staff requested additional information regarding the Toxic Gas Monitor Technical Specification amendment proposed by Reference 2. The Authority is providing the requested information in Attachment 1 to this letter.

The Authority's submittal (Reference 2) stated that the gas monitor alarms would be set for a gas concentration of less than or equal to the threshold limit value. The Authority now plans to set the gas monitor alarms at the "short term exposure limit." The Authority will revise the Reference 2 submittal, by the end of 1990, to reflect the use of the short term exposure limit.

If you have any questions about this subject, please contact Mr. P. Kokolakis of my staff.

Very truly yours,


John C. Brons
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Attachment

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ATTACHMENT I TO IPN-90-044

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RELATED TO

TECHNICAL SPECIFICATIONS FOR TOXIC GAS MONITORS

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

Question 1

In the proposed change of Technical Specifications the licensee specified that when a single channel for monitoring toxic gas becomes inoperable and cannot be restored to operable status within 7 days, an alternate monitoring capability will be initiated within the next eight hours. Similarly, if two channels become inoperable an alternate monitoring system will be initiated within 8 hours. Since these alternate monitoring systems will replace regular toxic gas monitors, they should be able to perform the equivalent function which consists of alarming the operators in the control room in time for them to don protective gear before the concentrations of toxic gas reach the toxic limits (approximately 2 minutes). Describe these alternative monitoring systems and show that their capability is at least equivalent to the capability of the regular toxic gas monitors.

Response

The IP3 gas monitoring system was installed in 1983. Since that time, the system has been upgraded twice, when improvements in monitoring system technology became available. The current Indian Point 3 gas monitoring system consists of two independent subsystems, each with its own power supply and annunciator. Each subsystem has three separate channels; one channel monitors for ammonia, one for chlorine, and the third for oxygen. Both subsystems continuously monitor the control room atmosphere. If a channel from either subsystem became inoperable, the redundant channel from the other subsystem would continue to monitor for the particular gas. If a single channel becomes inoperable and cannot be restored to operable status within 7 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 from the same manufacturer, and be the same 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 two digital displays for gas concentration, an adjustable alarm setpoint, an alarm indicating light, and an audible alarm. The system alarm setpoints are discussed in the response to question 2.

Question 2

In the proposed basis for Technical Specifications, the licensee states that the threshold limits for the toxic gas monitors will be set in accordance with the industrial ventilation standards defined by American Conference of Government Industrial Hygienists 1982, Industrial Ventilation, 17th Edition. This document is endorsed neither by the NRC's Standard Review Plan (SRP) nor by Regulatory Guide 1.78. Therefore, provide information to demonstrate that the proposed criteria are at least equivalent to the SRP and RG 1.78 criteria, or provide that the SRP and RG 1.78 criteria will be used. In this demonstration, provide information to assure that the set point values are adequate for alarming the control room operators in time to allow them to take necessary protective actions before concentrations of toxic gas in the control room reach the toxic limits.

Response

The question states that the standards defined by "Industrial Ventilation" are not endorsed by the SRP or by Regulatory Guide (RG) 1.78. Regulatory Position C.4 of RG 1.78 states, "The toxicity limits should be taken from appropriate authoritative sources such as those listed in the References section." The source for Reference 5 of RG 1.78 is the American Conference of Governmental Hygienists, the same source as for the book "Industrial Ventilation." In fact, the guidance from section 13 of "Industrial Ventilation" (19th edition) that the Authority will use is an updated version of the guidance provided by Reference 5 of RG 1.78. Regulatory Guide 1.78 does not bind licensees to the listed references, it only lists examples of sources the NRC deems authoritative.

The gas monitoring system alarms will be set at the "Short Term Exposure Limit" (STEL) values. 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 of 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 IP3 limits of 35 ppm for ammonia and 3 ppm for chlorine are considerably more conservative.

The Authority's proposed Tech. Spec. amendment (Reference 2), stated that the gas monitor alarms would be set at the threshold limit value; the Authority will submit a revision to Reference 2, to reflect the use of the STEL, by the end of 1990.

The oxygen sensing channels in the gas monitoring system alarm if the oxygen level in the control room decreases below 19.5%; normal air contains 20.9% oxygen, and human beings become dysfunctional if the oxygen level decreases to 16%. The oxygen channels ensure that the operators are aware of any gas that depletes the control room oxygen level to 19.5%.