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SCHWENCER,A. Licensing Branch 2

SUBJECT: Forwards position paper rev to Halon conentration criterion for power generation control complex floor sys.Requests meeting during Jan 1985 to discuss details & merits of proposal.

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NIAGARA MOHAWK

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January 4, 1985
(NMP2L 0317)

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

Re: Nine Mile Point Unit 2
Docket No. 50-410

The enclosed position paper was developed by Niagara Mohawk and Illinois Power as a means to encourage the revision of the Halon concentration criterion for the Power Generation Control Complex (PGCC) floor system. The proposal for a different Halon limit is based upon Halon suppression test results sponsored by the NRC in 1981 which show that a criterion of 6% Halon with a ten minutes duration would be adequate.

A meeting in your offices during January 1985 is requested so that we may discuss the details and merits of this proposal. We have jointly developed this approach to reduce required staff resources and expedite NRC approval.

Very truly yours,

C. V. Mangan
Vice President
Nuclear Engineering & Licensing

NLR:ja
Attachment
xc: R. A. Gramm, NRC Resident Inspector
Project File (2)

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Alternative Approach to NEDO 10466-A

To protect personnel, equipment and the power plant operation in general, Halon (1301) is provided in the Power Generation Control Complex (PGCC) floor systems. The goal of this presentation from Niagara Mohawk and Illinois Power Companies is the NRC approval of the justification for an adequate (but lower) Halon (1301) concentration level and holding time sufficient to extinguish a deep seated fire while protecting human health and minimizng losses.

The PGCC floor modules are separated into distinct fire protection zones having individual Halon (1301) distribution systems. The installation of the floor modules is concluded by sealing the zones from each other. Physical constraints in some cases result in a less than perfect sealing of these zones; hence the match-up of the zone tightness and the Halon equipment capacity becomes necessary. The Halon injection equipment must be able to achieve a given Halon concentration within ten seconds and then sustain that concentration for a given holding time. The 20% concentration with a holding time of 20 minutes (20/20) is contained on page 4-25 of NEDO Document 10466-A (February 1979), but no reference was given so that the basis or circumstance could be studied in detail.

In 1981, Sandia National Laboratories conducted a series of Halon (1301) suppression tests on cable tray configurations while under contract for the NRC (SAND 81-1785). The test results established that a Halon concentration of 6% with a holding time of ten minutes (6/10) was sufficient for obtaining fire extinguishment and preventing subsequent reignition. This particular report was not released, but the test summary was published in NUREG/CR-2607. The particular tests (SAND 81-1785) were conducted in an open room tray design and the 6/10 was successful. We have determined that closed trays would be equally successful at 6/10 due to the confinement and metal mass of the floor trays (zones). We understand that NUREG/CR-3656, "Evaluation of Suppression Methods for Electrical Cable Fire" will be published soon, perhaps during the first quarter of 1985, and that it supports the criterion for a 6% Halon concentration sustained for a ten minute period.

The Halon (1301) fire suppression systems for the PGCC floor modules were designed for total flooding of the protected volumes. The physical conditions or constraints of a PGCC floor module (zone) are more conducive to Halon extinguishment than the open room tray arrangement used in the sandia tests. Oxygen input is substantially reduced and the combustion product efflux (reduction) is inhibited within the PGCC floor modules when compared with the open room tray tests. The enclosed tray (PGCC) is more effective in dissipating heat through the metal mass of the attached floor modules than the open room tray dispersion of heat into the air volume.

In summary, our analysis supports the acceptability of a lower Halon concentration (6%) and a reduced holding time. It seems prudent based on our analysis that a practical concentration value of 6% Halon (1301) be utilized (ten minute duration) to first ensure that adequate fire inhibition is present and secondly that human occupation of the control room can occur as long as can be reasonably expected under extreme conditions.