April 11, 1985

Docket Nos. 50-315
and 50-316

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Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Dolan:

We have completed our review of the Indiana and Michigan Electric Company letter dated August 2, 1984 regarding the Donald C. Cook Nuclear Plant provisions for meeting the requirements of TMI Action Item IIB3, Post Accident Sampling System (PASS). Our safety evaluation for the remaining open items is enclosed. Based on our review, we find your PASS meets the requirements of IIB3 of NUREG 0737 and is therefore acceptable.

Sincerely,

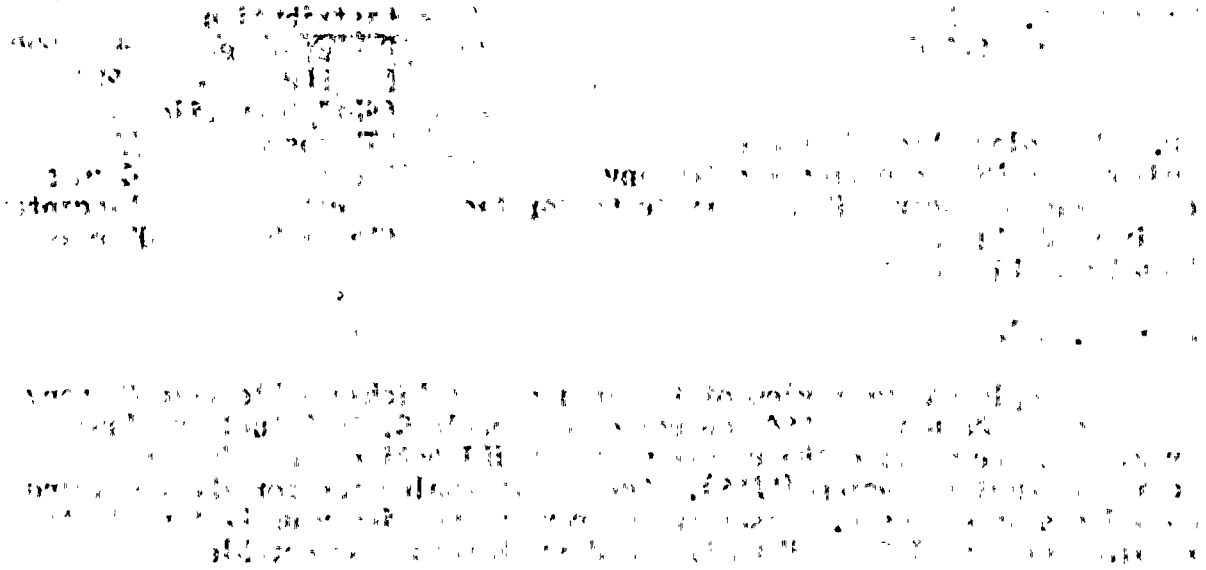
/s/SAVarga

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

ORB#1:DL	ORB#1:DL	BC-ORB#1:DL
CParrish	DWigginton/ts	SVarga
04/10/85	04/10/85	04/11/85



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Safety Evaluation by
the Office of Nuclear Reactor Regulation
Related to Operating of
D. C. Cook Nuclear Plant, Units 1 & 2
Indiana & Michigan Electric Company
Docket Nos. 50-315/316

Post-Accident Sampling System (NUREG-0737, II.B.3)

Introduction

In our draft safety evaluation, we found that the licensee's post-accident sampling system (PASS) met five of the eleven criteria for Item II.B.3 in NUREG-0737. The following six criteria were unresolved:

Criterion (2) Provide a core damage estimate procedure to include radionuclide concentrations and other physical parameters as indicators of core damage.

Criterion (3) Replace all non-qualified valves used in PASS with valves which will function in the post-accident environment.

Criterion (5) Provide PASS capability to analyze for chloride by a method with the required sensitivity in the presence of anticipated interfering species.

Criterion (8) Provide for the collection of undiluted samples of reactor coolant.

Criterion (10) Develop more sensitive analytical methods for boron and chloride. Provide information demonstrating applicability of procedures and instrumentation in the post-accident water chemistry and radiation environment, and retraining of operators on a semi-annual basis.

Criterion (11) Provide a means to minimize iodine plateout in the containment air sample line.

Evaluation

By letters dated August 2, August 31 and November 7, 1984, the licensee provided information on the PASS.

Criterion (2):

The licensee shall establish an onsite radiological and chemical analysis capability to provide, within the three-hour time frame established above, quantification of the following:

a) certain radionuclides in the reactor coolant and containment atmosphere that may be indicators of the degree of core damage (e.g., noble gases, iodines and cesiums, and non-volatile isotopes);

b) hydrogen levels in the containment atmosphere;

c) dissolved gases (e.g., H_2), chloride (time allotted for analysis subject to discussion below), and boron concentrations of liquids;

d) alternatively, have in-line monitoring capabilities to perform all or part of the above analyses.

The PASS provides the capability to collect diluted and undiluted samples of reactor coolant and to analyze them for pH, boron, chloride, radionuclides and dissoved gases. It also provides the capability to take diluted grab samples of the containment atmosphere for analysis by gas chromatograph for hydrogen. In addition, in-line monitoring of the coolant is provided for dissolved hydrogen by gas chromatography and for dissolved oxygen by polarography. In-line monitoring of hydrogen in the containment atmosphere by gas chromatograph is also provided.

The licensee provided a plant specific procedure for assessing core damage during accident conditions based on the generic Westinghouse Owner's Group Core Damage Assessment Methodology, Revision 1, dated March 23, 1984.

Core damage estimates are based on utilizing post-accident sampling system measurements on fission product concentrations in primary coolant and in containment. Additional procedures are provided for estimating the extent of metal-water reactor based on measured hydrogen concentration in containment and for estimating the extent of core damage based on containment radiation monitors. Reactor vessel water-level and core exit thermocouple temperatures are used to establish if there has been adequate core cooling. These provisions meet Criterion (2) of Item II.B.3 of NUREG-0737 and are, therefore, acceptable.

Criterion (3):

> Reactor coolant and containment atmosphere sampling during post-accident conditions ahll not require an isolated auxiliary system (e.g., the letdown system or the reactor water cleanup system) to be placed in operation in order to use the sampling system.

Reactor coolant and containment atmosphere sampling during post-accident conditions does not require an isolated auxiliary system to be placed in operating in order to perform the sampling function. The PASS provides the ability to obtain samples from the reactor coolant system, the pressurizer steam space, the RHR system, the containment sump and the containment atmosphere without using an isolated auxiliary system. However, portions of the existing Nuclear Sampling System need to be placed in service to obtain post-accident samples. Some of the valves in this system fail closed upon loss of instrument air, or are not qualified for post-accident service.

The licensee made modifications in the PASS valves and in the instrument air system so that the valves will function in the post-accident environment in which they will operate. With these modifications, the sampling system meets Criterion (3) of Item II.B.3 of NUREG-0737 and is, therefore, acceptable.

Criterion (5):

> The time for a chloride analysis to be performed is dependent upon two factors: (a) if the plant's coolant water is seawater or brackish water and (b) if there is only a single barrier between primary containment systems and the cooling water. Under both of the above conditions the licensee shall provide for a chloride analysis within 24 hours of the sample being taken. For all other cases, the licensee shall provide for the analysis to be completed within 4 days. The chloride analysis does not have to be done onstie.

The licensee will analyze diluted coolant samples for chloride onsite within 4 days by the ion chromatographic method which is not subject to interference by iodide ion. Because the sample is diluted by a factor of 1000, the limit of detectability in the reactor coolant is 5 ppm. For more sensitive chloride analysis, the licensee has the capability to take an undiluted grab sample within 4 days after reactor shutdown and retain it for analysis within 30 days consistent with ALARA. These provisions meet the requirements of Criterion (5) and are, therefore, acceptable.

Criterion (8):

> If in-line monitoring is used for any sampling and analytical capability specified herein, the licensee shall provide backup sampling through grab samples, and shall demonstrate the capability of analyzing the samples. Established planning for analysis at offsite facilities is acceptable. Equipment provided for backup sampling shall be capable of providing at least one sample per week until the accident condition no longer exists.

In-line monitoring is provided for pH, dissolved oxygen and dissolved hydrogen in the coolant and for hydrogen concentration in the containment atmosphere. The license has provided the capability to take an undiluted grab sample of reactor coolant for validating the in-line monitoring results. This provision meets the requirements of Criterion (8) and is, therefore, acceptable.

Criterion (10):

Accuracy, range, and sensitivity shall be adequate to provide pertinent data to the operator in order to describe the radiological and chemical status of the reactor coolant systems.

With the improvements in analytical procedures for chloride and boron, and with the provisions of the capability for taking undiluted reactor coolant samples, the accuracy, range, and sensitivity of the PASS instruments and analytical procedures are consistent with the recommendations of Regulatory Guide 1.97, Rev. 3, and the clarifications of NUREG-0737, Item II.B.3, Post-Accident Sampling Capability, transmitted to the licensee on June 30, 1982. Therefore, they are adequate for describing the radiological and chemical status of the reactor coolant. The analytical methods and instrumentation were tested for their ability to operate in the post-accident sampling environment. Equipment used in post-accident sampling and analyses will be tested approximately every six months. Retraining of operators for post-accident sampling is scheduled at a frequency of once every six months. We find that these provisions meet Criterion (10) and are, therefore, acceptable.

Criterion (11):

In the design of the post-accident sampling and analysis capability, consideration should be given to the following items:

a) Provisions for purging sample lines, for reducing plateout in sample line, for minimizing sample loss or distortion, for preventing blockage of sample lines by loss material in the RCS or containment, for appropriate disposal of the samples, and for flow restrictions to limit reactor coolant loss from a rupture of the sample line. The post-accident reactor coolant and containment atmosphere samples should be representative of the reactor coolant in the core area and the containment atmosphere following a transient or accident. The sample lines should be as short as possible to minimize the volume of fluid to be taken from containment. The residues of sample collection should be returned to containment or to a closed system.

b) The ventilation exhaust from the sampling station should be filtered with charcoal adsorbers and high-efficiency particulate air (HEPA) filters.

The licensee has addressed provisions for purging to ensure samples are representative, for limiting reactor coolant loss from a rupture of a sample line, and for ventilation exhaust from PASS filtered through charcoal adsorbers and HEPA filters. The reactor coolant system sampling locations were selected to provide coolant samples that are representative of core conditions. A heat tracing system will be installed on the containment atmosphere iodine sampling line during refueling outages in 1985.

We determined that these provisions meet Criterion (11) and are, therefore, acceptable.

Conclusion

Based on our evaluation, we conclude that the post-accident sampling system meets the eleven criteria of Item II.B.3 of NUREG-0737, and is, therefore, acceptable.

Principal Contributor:

S. Kirslis