50-298

Nebraska Public Power District

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LQA8200031

September 1, 1982

U.S. Nuclear Regulatory Commission
Attention: Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing
Washington, DC 20555

Subject: Schedule and Answers to Criteria Contained in NUREG-0737 Item II.B.3 Post Accident Sampling System

Reference: 1) Letter from D. B. Vassallo to J. M. Pilant dated August 9, 1982, "NUREG-0737 Item II.B.3 Post Accident Sampling System"

2) Letter from J. T. Collins to J. M. Pilant dated July 1, 1982, "Results of Inspection Conducted on March 9-11, 1982"

3) Letter from J. M. Pilant to J. T. Collins, dated August 6, 1982, "NPPD Response to NRC Inspection Report 50-298/82-08"

Dear Mr. Vassallo:

Per the NRC request made in Reference 1, enclosed is a summary listing of the proposed schedule and/or answers to the criteria contained in NUREG-0737 Item II.B.3. Complete documentation of the procedures and analyses discussed herein is available at the site for I&E review.

If additional clarification is necessary regarding the enclosed information, please do not hesitate to contact me.

Sincerely,

Jay M. Pilant

Jay M. Pilant
Division Manager of Licensing
and Quality Assurance

JMP:EMM:JDW:cmk

Enclosure

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Drawing to BC

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ATTACHMENT NO. 1
TO POST ACCIDENT SAMPLING SYSTEM
NUREG-0737 ITEM II.B.3
SCHEDULE AND ANSWERS TO CRITERIA

NUREG-0737 ITEM II.B.3 CRITERION	NEBRASKA PUBLIC POWER DISTRICT SCHEDULE AND ANSWERS
(1) 3 Hour Sample Time Limit	Cooper Nuclear Station (CNS) demonstrated on a recent NRC audit the capability to obtain and analyze a reactor coolant sample in less than three hours using the Post Accident Sampling (PAS) System (Reference 2, Item 14). The analytical facilities are located one elevation directly above the PAS station, accessible by elevator or stairway. Provisions for sampling during loss of site power are addressed in CNS Standard Operating Procedure 8.4.1.1, PAS System. A discussion of loss of power capabilities was provided in Reference 3 (Response to Open Item 82-08-05). A system flow diagram (13095.12-FSK-1-1) is attached for information.
(2) Radiological and Chemical Analysis Capability	(a) 1. CNS Chemistry Procedure for PAS includes provisions for handling samples and analysis of the radionuclides listed in Reference 1 clarification 2(a).1. 2. CNS is currently developing a procedure for estimation of core damage and will be completed by January 1, 1983. (b) The CNS PAS System has the capability to obtain a containment atmosphere grab sample within the allotted three hours, however H_2 concentration of the containment atmosphere is obtained from previously installed instrumentation, which has remote readout in the Control Room. (c) The PAS System is designed to quantify the amount of total gas in the reactor coolant using the PAS System volumes. Conductivity and pH are determined from PAS System in-line monitors. Radionuclide acitvity analysis of reactor coolant and containment atmosphere is conducted on diluted samples in the site laboratory facilities. CNS also has the capability to determine boron and chloride concentrations using diluted reactor coolant samples and present CNS lab procedures. Existing containment atmosphere analyzers provide Control Room indication of H_2 and O_2 concentrations. (d) The installed instrumentation (pH and conductivity) is similar to those used in other CNS system applications. Prior performance of these instruments has shown that they are very reliable and require little maintenance. In addition, the PAS System is operated quarterly to verify proper instrument operation.

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(3) Isolated Auxiliary Systems	Reactor coolant samples are taken from the non-isolable portion of the reactor recirc system through containment isolation valves. The containment atmosphere sample is taken from the existing containment atmosphere activity monitor sample line which remains operable under post accident conditions. Water from PAS recirculation is returned through containment isolation valves to the drywell equipment drain sump. All valves to and from the containment, and from the reactor coolant system are classified seismic category I, safety class I or II.
(4) Reactor Coolant Gas Analysis	The PAS System has the capability to separate and quantify reactor coolant total dissolved gas by expanding an undiluted sample and applying Henry's Law. CNS does not have the capability to analyze for H_2 or O_2 gas concentration on reactor coolant samples which is consistent with the original criteria.
(5) Chloride Analysis	CNS is not located on a sea or brackish water site, therefore the 96 hour time requirement for chloride analysis applies. Within four days, CNS has the capability to analyze an undiluted sample for chlorides and not exceed the exposure limits of NUREG-0737.
(6) Limiting Radiation Exposure	Initial estimation of radiation exposure for sampling, transport and analysis shortly after the accident (within one day) will be less than 3 rem whole body. The calculated personnel exposures based on person-motion will be submitted by January 1, 1983.
(7) Boron Analysis Capability	CNS has the capability to perform a boron analysis with a low limit of detectability (LLD) of 10 ppm concentration on a 100:1 dilution rate shortly after the accident.
(8) Backup Sampling Provisions	The only in-line monitoring in the CNS PAS System is pH and conductivity. In conjunction with the chloride analysis of criterion 5, the capability for a backup grab sample exists for the analysis of reactor coolant pH and conductivity. Equipment available at CNS for backup grab sampling is capable of providing one sample per day for seven days following the onset of the accident, and at least one sample per week indefinitely.
(9) Sample Analysis Provision	(a) The PAS System is designed to dilute highly radioactive post accident samples, which will then be analyzed with normal laboratory equipment. Any concentration sample can be diluted down to the counting equipment capabilities. The CNS Chemistry Procedure for PAS does not allow samples > 100 mrem/hr into the laboratory or samples > 10 mrem/hr into the counting room.

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	(b) The predicted background levels in the counting room will be less than 15 mrem/hr at the onset of the accident. The sample will be counted in a lead shield. Therefore, background radiation will not affect the sample accuracy.
(10) Analysis Accuracy	CNS is currently accumulating information on accuracy, range and sensitivity of the required sample analyses and will be completed by January 1, 1983.
(11) Design Considerations	(a) Sample lines are 1/4" O.D. SS tubing, which minimizes purge volumes, maintains turbulent flow through the sample line, and provides a flow restriction to minimize reactor coolant loss from a ruptured sample line. Purge volumes are returned to the drywell equipment drain sump and diluted samples are disgarded in the radioactive waste system. The containment atmosphere sample line is insulated and heat traced from the drywell wall to the PASS. The sample lines do not contain flow restrictors. Reactor coolant and RHR samples are taken through the normal sample points which are automatically isolated on containment isolation and/or safety injection signals. To ensure adequate mixing between the core area and the shroud area where the sample is taken, one of the following conditions must be met: 1) at least one Reactor Recirculation pump running, 2) shutdown cooling system in service, 3) reactor water level above 48" with natural circulation. Containment atmosphere samples can be taken from three different representative drywell elevations.
	(b) The PASS is located inside the Reactor Building which has exhaust ventilation through charcoal absorbers and HEPA filters.