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SUBJECT: Responds to request for info re test guide for testing of spray additive educators at plant.

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AEP:NRC:0914F

Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
TEST GUIDE FOR TESTING OF SPRAY ADDITIVE EDUCTOR

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Attn: A. B. Davis

January 10, 1989

Dear Mr. Davis:

This letter responds to an NRC request for information regarding testing of the spray additive system eductors at the Donald C. Cook Nuclear Plant. Specifically, we were requested to provide Region III with our planned surveillance test method for testing the eductors during the upcoming Unit 1 Cycle 10-11 refueling outage. Background information on the topic is contained in Attachment 1 to this letter; the requested test method is provided in Attachment 2.

Attachment 2 to this letter includes AEPSC drawing number 1-5144-31, entitled Flow Diagram Containment Spray. In accorance with the restrictions as to use set forth on the AEP drawing, AEP hereby releases these documents to the NRC for its information and use in connection with this submittal. AEP also permits the NRC to reproduce the drawings as necessary to facilitate review and distribution of the drawings to meet NRC requirements.

This document has been prepared following Corporate procedures that incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Sincerely,

M. P. Alexich
Vice President

A001 Drawing
1/1 To: Reg Files

ldp

cc: D. H. Williams, Jr.
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
NRC Resident Inspector - Bridgman
G. Bruchmann

ATTACHMENT 1 TO AEP:NRC:0914F

BACKGROUND ON NRC EDUCTOR TESTING CONCERNS

NRC Inspection Report 316/83/04 addressed concerns with the testing method used to demonstrate spray additive system eductor operability (Reference Technical Specification [T/S] 4.6.2.2.d). The inspector was concerned that the test conditions differed from conditions established during the pre-operational testing of the system, and also that the pre-operational testing was not adequate to demonstrate that the system would function as required during an accident.

In April 1983, calculations were provided to Region III which demonstrated adequacy of the system and the surveillance test method. The calculations were reviewed by NRR, as documented in a safety evaluation report (SER) dated November 26, 1984. In the SER, NRR found the theoretical basis of the calculations acceptable, but recommended the following actions be taken:

1) Demonstrate that actual system performance may be adjusted in accordance with proportionality principles.

2) Calculate a new spray additive flow rate based on the surveillance test program set-up.

3) Revise the T/S to include the surveillance test program.

4) Provide emergency procedures for operation of the spray additive system in the case of system malfunction during an accident.

Item 4 above, was accomplished in 1985. Rather than address items 1 through 3, we submitted analyses performed by Westinghouse Electric Corp. which demonstrated that the spray additive system was not necessary. The analyses were transmitted to the NRC in February 1986, as part of a letter which proposed to delete the spray additive system T/S. In May 1988, however, we were informed by the NRC that the T/S change would not be approved, and were requested to address the recommendations made in the November 26, 1984, SER.

In October 1988, extensive testing was performed on the Unit 2 eductors. The testing clearly demonstrated that the eductors performed in accordance with theoretical proportionality principles. The test results were used to calculate the range of eductor flow rates for all credible accident conditions. These calculations showed that eductor performance was very stable, with the flow rate per eductor varying between 34 and 41 gpm under the range of accident conditions.

The results of the October 1988, testing were presented to Region III and NRR staff at a meeting held in our Columbus, Ohio, offices on November 15, 1988. A refined T/S surveillance test

was discussed for future T/S testing. Since eductors are static devices with no moving parts, only one test point need be recorded to verify eductor performance, as opposed to the extensive testing performed in October 1988, to demonstrate proportionality.

The NRC staff present at the meeting concurred with the adequacy of our efforts to address the concerns of item 1, 2 and 3 in the 1984 SER, and agreed that a one point test would be adequate for future tests. We were requested to send Region III an informational copy of our revised surveillance test method once it was developed.

The test method is provided in Attachment 2 to this letter. The revised test method and acceptance criteria can be accommodated within the present T/S requirements, so no T/S change is proposed.

ATTACHMENT 2 TO AEP:NRC:0914F

REVISED EDUCTOR TEST METHOD

Test Guideline

Included with this attachment is AEPSC flow diagram OP-1-5144-31, entitled "Containment Spray." This diagram depicts the equipment associated with the proposed spray additive eductor test guide provided below.

Testing is to be performed with the containment spray pump operating on recirculation flow to the RWST. The spray additive tank is isolated from the eductors by closing valves IMO-202 and 204. The eductor suction flow is instead supplied by the RWST via the 2-inch test line.

The eductor suction pressure during the test, as measured at IPX-200, shall be 9 $\pm$ 0.5 psig. This pressure is obtained by throttling valves SI-181 and/or SI-182, located in the 2-inch test line. The containment spray pump discharge pressure must be $\geq$ 255 psig. This pressure is measured at IPI-210 or IPX-210 for the east train, and IPI-220 or IPX-220 for the west train. The eductor motive flow valves (IMO-212 for the east train, 222 for the west train) shall be fully opened.

Testing is to be performed one train at a time. With the test configuration as described, spray additive flow for each train, as measured at IFI-200, must be $\geq$ 35 and $\leq$ 50 gpm.

The test requirements and acceptance criteria are summarized in the attached tables.

Table 1: Eductor Test Requirements

East Train

Parameter	Requirement
Spray additive pressure IPX - 200	9 $\pm$ 0.5 psig
Containment spray pump discharge pressure IPI - 210 or IPX - 210	$\geq$ 255 psig
Eductor motive flow valve IMO - 212	wide open
Spray additive flow IFI - 200	$\geq$ 35 and $\leq$ 50 gpm

Table 2: Eductor Test Requirements

West Train

Parameter	Requirement
Spray additive pressure IPX - 200	9 $\pm$ 0.5 psig
Containment spray pump discharge pressure IPI - 220 or IPX - 220	$\geq$ 255 psig
Eductor motive flow valve IMO - 222	wide open
Spray additive flow IFI - 200	$\geq$ 35 and $\leq$ 50 gpm