REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:7912120404 DOC.DATE: 79/12/07 NOTARIZED: NO DOCKET #
FACIL:50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana & 05000315
50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316
AUTH.NAME AUTHOR AFFILIATION
DOLAN,J.E. Indiana & Michigan Electric Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards addl info for mods to auxiliary feedwater sys re 790809 amend request.

DISTRIBUTION CODE: A001S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 9
TITLE: General Distribution for after Issuance of Operating Lic

NOTES: I&E - 3 cys all matl.

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
ACTION:	05 BC ORB #1	7	7			
INTERNAL:	01 REG FILE	1	1	02 NRC PDR	1	1
	12 I&E	2	2	14 TA/EDO	1	1
	15 CORE PERF BR	1	1	17 ENGR BR	1	1
	18 REAC SFTY BR	1	1	19 PLANT SYS BR	1	1
	20 EEB	1	1	21 EFLT TRT SYS	1	1
	22 BRINKMAN	1	1	EPB-DOR	1	1
	OELD	1	0			
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
	23 ACRS	16	16			

DEC 12 1979

MP
4

TOTAL NUMBER OF COPIES REQUIRED: LTTR 42 (39) ENCL 41 (38)

GD

INDIANA & MICHIGAN ELECTRIC COMPANY

P. O. BOX 18
BOWLING GREEN STATION
NEW YORK, N. Y. 10004

December 7, 1979
AEP:NRC:00307

Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

This letter and its attachment provides additional information and clarification on the modifications we are planning to make to the auxiliary feedwater system (AFS) at the Cook Plant.

On August 9, 1979 we submitted the required Technical Specification changes and Amendment No. 84 to the FSAR concerning these modifications. During discussions with members of your staff held on November 2, 6 and 16, 1979 certain additional information was requested. The attachment provides the requested information.

Very truly yours,

John E. Dolan

John E. Dolan
Vice President

cc: R. C. Callen
G. Charnoff
R. S. Hunter
R. W. Jurgensen
D. V. Shaller-Bridgman

A001
S
4041/1

7912120

ATTACHMENT TO AEP:NRC:00307
DONALD C.COOK NUCLEAR PLANT
DOCKET NOS. 50-316 & 50-316
LICENSE NOS.DPR-58 & DPR-74

Item 1:

With regards to the AC to DC power modifications we described in our August 9, 1979 letters, we are postponing until the Unit 1 Spring-1980 refueling outage the conversion of the turbine driven auxiliary feedwater pump (TDAFP) train from AC to DC power. In fulfillment of license condition 3.K, the Unit 2 TDAFP train will be converted to DC power as planned, that is, by the end of the current refueling outage. The Unit 1 modifications are equal to those of Unit 2.

Additionally, we have been forced to re-schedule the final work involved in the installation of an additional motor driven auxiliary feedwater pump (MDAFP) in each Unit of the Cook Plant. As discussed in our August 9 submittals, this modification is being implemented to enhance the availability of both Units 1 and 2 by eliminating the dependence on equipment operability in the opposite Unit. This work requires simultaneous Unit outages in order to be completed. Our present plans are to complete this work on both Units 1 and 2 during the Spring - 1980 refueling outage of Unit 1. However, this schedule is dependent upon the manpower needed to implement other required modifications and as such we reserve the option to implement this modification at a subsequent refueling outage. We will be maintaining the present shared MDAFP trains until such time when the additional MDAFP is installed in each Unit. You will be advised of any change of plans to install the additional MDAFP's during the Spring - 1980 Unit 1 refueling outage.

As a result of our review of the design of the auxiliary feedwater system (AFS) including the modifications described in FSAR Amendment 84 and subsequent to our meeting on May 12, 1979 with members of your staff conducting post-TMI-2 AFS reviews, we have decided to keep in place the existing cross-tie lines between the MDAFP's to serve as manual backups only. These two cross-tie lines will be isolated by means of a locked-closed, manual valve in each line. In this way, if during an emergency requiring auxiliary feedwater, all three trains of a Unit's AFS were inoperable, we would retain the capability in the new design to manually valve in auxiliary feedwater flow from the MDAFP's (one or both) in the opposite Unit.

Administrative controls and procedures will be implemented to maintain the cross-tie lines in an isolated condition and to govern its use if a condition arose where auxiliary feedwater from the opposite Units would be required. The normal valve position for this backup flow path will be closed and the three AFS pumps in each Unit (after Amendment 84) will serve their own Unit. We view this step as an additional measure to preclude a total loss of feedwater (main and auxiliary) in the Cook Plant design.

Item 2:

As requested,we transmitted 2 copies of the largest size print of FSAR Figure 8-1 on November 7, 1979 as the reduced size copy contained in Amendment 84 did not make for easy reading.

Item 3:

As requested, we provided your Staff with copies of the elementary diagrams for the battery system and for the ventilation system on November 7 and 20, 1979. The description of the system's DC control and valve bus operation is provided below as additional explanatory information.

A. The turbine driven auxiliary feed pump control bus and motor operated valve motors will receive their power from the "N" train battery.

B. Two battery chargers are provided for the "N" train battery. Each charger has sufficient capacity to meet steady state loads and recharge the battery from full discharge (1.75 volts per cell) to full charge in 24 hours. Only one of the chargers will be in service at any one time. The idle charger will have its 600 volt circuit breaker and its 250 volt disconnect switch at the battery distribution cabinet open. Either charger may be selected as the active charger.

C. The battery is capable of serving the TDAFP train for at least 4 hours without either charger in operation.

D. Initiation of load shedding of the safety buses as a result of diesel generator operation on loss of safety bus voltage or safety injection, will de-energize the 600 volt contactor to the active battery charger and leave it open. The battery charger may be restored to service, at the operator's discretion, by manual action.

E. Either battery charger may be connected to the battery under normal conditions. Parallel operation of the chargers is not intended and would result in cross connecting loads in the two safety trains of the same unit. An interlock is provided which prevents energizing the motor control center contactor of one of the chargers if the motor control center contactor of the opposite train battery charger is energized. This interlock will prevent connecting both battery chargers to the "N" train battery at the same time. This design is in compliance with the requirements of Regulatory Guide 1.6.

F. The backup feeds from the AB and CD batteries will be disabled, as originally planned in the design, by disconnecting and insulating the ends of the interconnecting cable at the train "N" distribution cabinet and at the distribution cabinets for the AB and CD batteries. The resulting design complies with the requirements of Regulatory Guide 1.6. Until such time as an interlock can be provided to prevent connecting load groups of the two safety trains of the same Unit, the backup feeds will remain disconnected.

Item 4:

The "N" train has no independent power source in the same sense as the two existing safety trains which have both offsite and redundant onsite power sources. The purpose of the train "N" system is to provide sufficient energy storage in a battery to permit operation of the TDAFP train, without reliance on either the two existing safety train power systems, following a shutdown of the reactor. The train "N" power system consists of a storage battery, its distribution cabinet, valve control center, one steam supply shutoff valve and four auxiliary feedwater shutoff valves and the TDAFP control bus. This power system is considered to be part of the AFS in terms of its functional requirements.

During power operation of the reactor, the TDAFP is in standby mode and is operated for surveillance purposes only. During this time, the "N" train battery is maintained in fully charged condition by either of 2 battery chargers. Each charger receives its AC power from a motor control center through a manually operated, molded case circuit breaker and a magnetic starter. The DC output of the charger is connected to the train "N" distribution cabinet through a manually operated, fused, disconnect-switch located at the train "N" distribution cabinet. The AC motor control centers are not located in the same room as the train "N" distribution cabinet. A type HGA (see item 9) auxiliary relay is connected to the output of the charger and will be energized if either the AC power to the charger is energized or if the DC, fused, disconnect-switch in the train "N" distribution cabinet is closed. The auxiliary relay contacts are arranged to operate an annunciator in the control room if both of the auxiliary relays are energized or to operate a separate annunciator, if both auxiliary relays are de-energized. The first condition is a possible cross train connection while the second case indicates that both chargers have been disconnected.

During power operation of the reactor, one of the chargers is energized by manually closing the 600 volt motor control center circuit breaker, energizing the magnetic contactor by manually operating its control switch and by manually closing the, fused, disconnected switch at the train "N" battery distribution panel. Energizing either the AC or DC side of the second charger will alert the control room operator that one of the two breaks placed in series has been closed. The annunciator operates before the existing safety trains have been cross-connected. Energizing of the magnetic contactors of both chargers at the same time is prevented by an interlock which prevents energizing a magnetic contactor if the magnetic contactor of the opposite train charger is energized.

In the event of a blackout of the safety bus feeding the active charger or a safety injection actuation by the reactor protection system, the magnetic contactor of the charger is de-energized and the charger is disconnected from the corresponding AC power source. Restoration of the charger to service requires manual action by the operator. No automatic restoration is provided.

Since the cross connections in the originally proposed design were controlled by manually operated disconnect switches without interlocks, the backup battery feeds from the AB and CD batteries will be disabled by disconnecting the cross connecting cables at the train "N" distribution cabinet and at the AB and CD battery distribution cabinets as indicated earlier.

The train "N" power system design is in compliance with Regulatory Guide 1.6.

Item 5:

In compliance with Appendix A to Branch Technical Position APCSB 9.5-1 we have performed a fire protection review and associated fire hazards analysis for the train "N" power system. One new battery room is being installed in each Unit and are designated as fire zones 106 and 107. The results of this review are summarized below:

A) Method of Fire Containment (Each Room):

The battery room is fully enclosed by walls, floor and ceiling which are 2 hour fire rated. Doors and ventilation dampers are Class B (1 ½ hour) rated. All openings will be sealed with silicone foam.

B) Safety Related Equipment in Room:

i) Battery shunt cabinets

ii) Batteries (40 cases)

iii) Cable

C) Automatic Fire Detection/Suppression

i) Detection - rate of rise fire detection with alarm in Unit 1 control room (EF Panel).

ii) Suppression - no automatic CO_2 or sprinkler suppression is applied in the battery rooms because of thermal shock to the battery cases.

D) Manual (or Backup) Fire Suppression Equipment (Each Room)

i) Two 20 lb. ABC dry chemical extinguishers

ii) Two 15 lb. CO_2 extinguishers in adjacent areas

iii) Water and CO_2 hose reels in adjacent areas

E) Consequences of a Design Basis Fire:

The major combustible in these fire zones are plastic battery cases. Based on the fire loading, the BTU/ft.^{2} released by complete combustion of all the combustible materials in the zone is of a moderate degree indicating that 1½ hour fire resistance is adequate to prevent the extension of any postulated fire. Actual boundary walls, floor, ceiling, dampers and door agree with the fire resistance requirements. Due to the diversity and redundancy in the design of the entire auxiliary feedwater system, no unacceptable safety related consequences would result from a design basis fire in these zones.

F) Consequences of Fire - Fire Protection Functioning as Designed:

In addition to the adequate fire containment features, Fire Zones 106 and 107 are equipped with rate of rise fire detection. On operation or a troubled condition, the detection will alarm in the Unit 1 control room. Sufficient backup, manual fire fighting equipment, is available for fire brigade use. The above combination of fire containment, detection and backup equipment is sufficient to protect zones 106, 107 and adjacent areas, from any postulated fire in them or in areas adjacent to the zones with no unacceptable safety-related consequences.

The ventilation system in both of the new battery rooms is designed to maintain hydrogen concentration well below 2 volume percent. Ventilating facilities are Seismic Class I Group D (explosion proof) construction with non-sparking fan blades. Redundant exhaust fans are provided, therefore the ventilation design meets the single failure criterion. Indications and alarms supervising the battery room exhaust fans are provided in the control room. An alarm will result if the fan motor stalls, draws excessive current, fails to start, shuts off or if single phasing occurs.

The fire protection features and ventilation system design meet the requirements of Appendix A to Branch Technical Position APCSB 9.5-1. The installation of the train "N" battery system is consistent with the fire protection program at the Cook Nuclear Plant.

Item 6:

The electrical equipment installed in the train "N" system has been qualified in accordance with IEEE 323 - 1971. This includes the battery, battery chargers, distribution cabinets, valve control centers and DC valve motors.

Item 7:

The train "N" power system installation meets the requirements of Regulatory Guide 1.75 consistent with the design basis as stated in the FSAR (see FSAR, Appendix Q, response to Question 40.6 on page 40.6 - 2).

Item 8:

The preoperational testing will be performed to comply with the requirements of the proposed Technical Specifications.

Item 9:

In Figure 8.3.3 of FSAR Amendment 84, relays are identified as HGA and NGV relays. An HGA relay is a hinged clapper auxiliary relay manufactured by General Electric Company. Direct current versions of the relay typically will pick up at less than 80% and drop out at approximately 20% of rated voltage. The relays are not intended to be adjusted and cannot be calibrated.

The NGV relay is a battery monitor relay manufactured by General Electric. The relay has an adjustable drop out characteristic and is calibrated to operate a control room annunciator on loss of the battery charger.

Item 10:

The statement on page 8.3.7 of FSAR Amendment 84 concerning the 3 cells per unit is correct as it stands. The cell is considered to be a positive plate (s), negative plate (s), and electrolyte in a container with a nominal voltage of 2 volts. The train "N" battery has 120 cells. The battery is assembled of units containing 3 cells in each container connected in series with a nominal voltage of 6 volts.