CP&L

Carolina Power & Light Company

SERIAL: LAP-83-282

JUL 05 1983

Director of Nuclear Reactor Regulation
Attention: Mr. D. B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324
LICENSE NOS. DPR-71 AND DPR-62
NUREG-0737 ITEM II.K.3.28
QUALIFICATION OF ADS ACCUMULATOR SYSTEMS

Dear Mr. Vassallo:

By letter dated May 11, 1983, you requested Carolina Power & Light Company (CP&L) to provide additional information concerning NUREG-0737 Item II.K.3.28, Qualification of ADS Accumulator Systems, for the Brunswick Steam Electric Plant. As discussed with the NRR Project Manager, Mr. Sam D. MacKay, we understand that your May 11, 1983 request for additional information supersedes your January 31, 1983 request concerning this NUREG-0737 item.

Based on the eleven questions received in the May 11, 1983 letter, CP&L believes that our previous correspondence on this subject may have been misunderstood or misinterpreted. The principal concern addressed by your staff's questions involves ADS accumulator leakage. However, the Brunswick design provides a reliable source of air to the ADS valves under design basis accident conditions for both short-term and long-term cooling requirements. Hence, ADS accumulator leakage is of negligible concern.

A summary description of the ADS accumulator system and other associated systems is provided in Enclosure 1. This description provides the basis for our conclusion concerning the reliability of the Brunswick ADS accumulator design. Carolina Power & Light Company's responses to the eleven questions from your May 11, 1983 request are provided in Enclosure 2.

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If you have any questions concerning this submittal, please contact our staff.

Yours very truly,

S. R. Zimmerman
Manager
Licensing & Permits

WRM/cfr (6665WRM)
Enclosures

cc: Mr. D. O. Myers (NRC-BSEP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. S. D. MacKay (NRC)

ENCLOSURE 1

SUMMARY DESCRIPTION OF THE BRUNSWICK
AUTOMATIC DEPRESSURIZATION SYSTEM ACCUMULATOR SYSTEM

Each ADS valve accumulator is connected to both divisions of the non-interruptible instrument air system through spring check valves (Figure 1). During normal operation, non-interruptible instrument air is supplied from the three station air compressors in the main instrument air system through double spring check valves. A 96 ft^3 air receiver is connected to each division of the non-interruptible instrument air system. If the non-interruptible instrument air system pressure drops to 95 psig, the independent emergency standby compressors are started automatically to maintain the non-interruptible instrument air system at greater than or equal to 95 psig. This automatic start capability is provided by a low pressure switch located between the discharge check valve on the standby compressor and the 96 ft^3 air receiver for each non-interruptible instrument air division. Each standby air compressor is rated at 19.5 scfm at 100 psig and is powered from the emergency buses (which receive power from the onsite diesel generators during a loss of offsite power). The controls for the non-interruptible instrument air compressors are supplied from emergency power. The ADS valves, accumulators, and the non-interruptible instrument air system (including the standby air compressors, the 96 ft^3 air receivers, and the required controls) are seismically qualified. Environmental qualification of these systems is being addressed consistent with the schedular requirements of 10 CFR 50.49. Additionally, the capability exists to cross-connect the non-interruptible instrument air system of each unit and also to supply the non-interruptible instrument air system with nitrogen from the containment atmosphere dilution (CAD) system.

An alarm is provided in the control room to alert the operators when the air pressure in the 96 ft^3 air receivers reaches 95 psig. Annunciator procedure UA-6 requires the operator to verify the standby compressor is running.

Based on the above, CP&L believes that the Brunswick non-interruptible instrument air system provides a reliable source of air to the ADS valves, thus assuring both short-term and long-term availability of the ADS.

ENCLOSURE 2

NRC OUESTION 1:

Define the number of times the ADS valves are capable of cycling using only the accumulator inventory at atmospheric pressure and at a specified percent (i.e., 70%) of drywell pressure, and the length of time these accumulators are capable of performing their function following an accident.

CP&L RESPONSE:

The ADS valves are capable of cycling nine (9) times at atmospheric pressure and three (3) times at 70 percent of maximum calculated post LOCA drywell pressure using only the accumulator inventory.

NRC QUESTION 2:

When taking into account leakage, seismic events and harsh environment, what is the length of time the accumulators are available to perform their function, both at normal containment pressure and at a specified percent of drywell pressure following an accident? Does this meet the requirements specified in the plant's FSAR?

CP&L RESPONSE:

When taking into account leakage, seismic events and harsh primary containment environments, the automatic depressurization system is capable of performing its intended function indefinitely at atmospheric pressure or 70 percent of drywell pressure (based on reliability of the non-interruptible instrument air system). This is consistent with FSAR requirements.

NRC QUESTION 3:

Describe the ADS accumulator system design and operation (e.g., trains, air supply, capacity, alarms and their location, etc.).

CP&L RESPONSE:

This information is provided in Enclosure 1 of this response.

NRC QUESTION 4:

Define the basis for the allowable leakage criteria for the ADS accumulator system (e.g., boundary conditions, environmental, and seismic parameters, operator interface, margin, etc.).

CP&L RESPONSE:

The allowable leakage criteria for the Brunswick ADS accumulators has not been established. As stated in Enclosure 1, the Brunswick design provides a reliable source of air to the ADS valves for both short-term and long-term cooling requirements. Leakage is of negligible concern.

NRC QUESTION 5:

What margin is in the allowable leakage criteria to account for possible increase in leakage resulting from the effects of a harsh environment and/or a seismic event.

CP&L RESPONSE:

See CP&L response to NRC Question 4.

NRC QUESTION 6:

A statement that test and/or analysis performed verified that a harsh environment and/or seismic event would not increase the leakage rate.

CP&L RESPONSE:

See CP&L response to NRC Question 4.

NRC QUESTION 7:

A statement that verifies that no credit was taken for non-safety related equipment and instrumentation when establishing the allowable leakage criteria.

CP&L RESPONSE:

See CP&L response to NRC Question 4.

NRC QUESTION 8:

Define the periodic leak testing of the ADS accumulator system (i.e., the time interval between these leak tests, along with a concise description of the test procedure employed).

CP&L RESPONSE:

There is no periodic leak testing of the ADS accumulators. A periodic test is performed on the non-interruptible instrument air system once every refueling outage. One division of the non-interruptible instrument air system is isolated and the ability of the standby compressor to maintain header pressure greater than or equal to 95 psig is verified by monitoring system pressure. The test is then repeated for the other division of the non-interruptible instrument air system.

NRC QUESTION 9:

A concise description of the surveillance performed, and how frequent, on alarms and instrumentation associated with the ADS accumulator system.

CP&L RESPONSE:

The standby compressor controls and low pressure alarm are calibrated at a semi-annual frequency.

NRC QUESTION 10:

A statement that confirms that the ADS accumulator system, associated equipment and control circuitry, are seismically qualified.

CP&L RESPONSE:

The automatic depressurization system and the non-interruptible instrument air system are a class 1 seismic system.

NRC QUESTION 11:

A statement that confirms that the electrical and mechanical components in the ADS accumulator system and associated control circuitry are environmentally qualified for conditions associated with normal operation, maintenance, testing and postulated accidents.

CP&L RESPONSE:

Environmental qualification of the automatic depressurization system and the non-interruptible instrument air systems is being established consistent with the schedular requirements of 10 CFR 50.49.

(6665WRM cfr)

ENCLOSURE 3

APPLICABLE PORTION OF

ANNUNCIATOR PROCEDURE UA-6

ALARM
REACTOR BLDG. I.A. RECEIVER 2A PRESS. LO

AUTO ACTIONS
Standby Inst. Air Compressor 2A starts and loads

CAUSE

1. Low air pressure 95 psig in Inst. Air Receiver 2A
2. Loss of Plant Air Compressors.
3. Instrument air pipe rupture or air leak.

OBSERVATIONS
Standby compressor starts automatically and loads. It will unload at 105 psig. Service air and interruptable inst. air hdrs may have isolated.

ACTION

1. Check standby compressor running.
2. Check I.A. pressure maintaining or increasing above 95 psig.
3. Check plant compressors
4. Check for instrument air ruptures.
5. Isolate any Inst. Air piping leaks/ruptures
6. Isolate non-essential air supplies in order to maintain > 95 psig on Inst. Air Header.

DEVICE/SETPOINTS
PSL3595 · PSL 3596 psig Standby Compressor starts

PSL3597 · PSL3597 105 psig Standby Compressor unloads.

POSSIBLE PLANT EFFECTS

Reactor Scram if R.I.P. Valves drift shut and instrumentation in control is lost.

ALARM

REACTOR BLDG. I.A. RECEIVER 2B PRESS. LO

AUTO ACTIONS

Standby Inst. Air compressor 2B starts and loads.

CAUSE

1. Low air pressure 95 psig in Inst. Air receiver 2B.
2. Loss of Plant Air Compressors.
3. Instrument air pipe rupture or air leak.

OBSERVATIONS

Standby compressor starts automatically and loads. It will unload at 105 psig.

Service air and interruptable Inst. Air Hdrs. may have isolated.

ACTION

1. Check standby compressor running.
2. Check I.A. pressure maintaining or increasing above 95 psig.
3. Check plant compressors
4. Check for instrument air ruptures
5. Isolate any Inst. Air piping leaks/ruptures.
6. Isolate non-essential air supplies in order to maintain > 95 psig on Inst. Air Header.

DEVICE/SETPOINTS

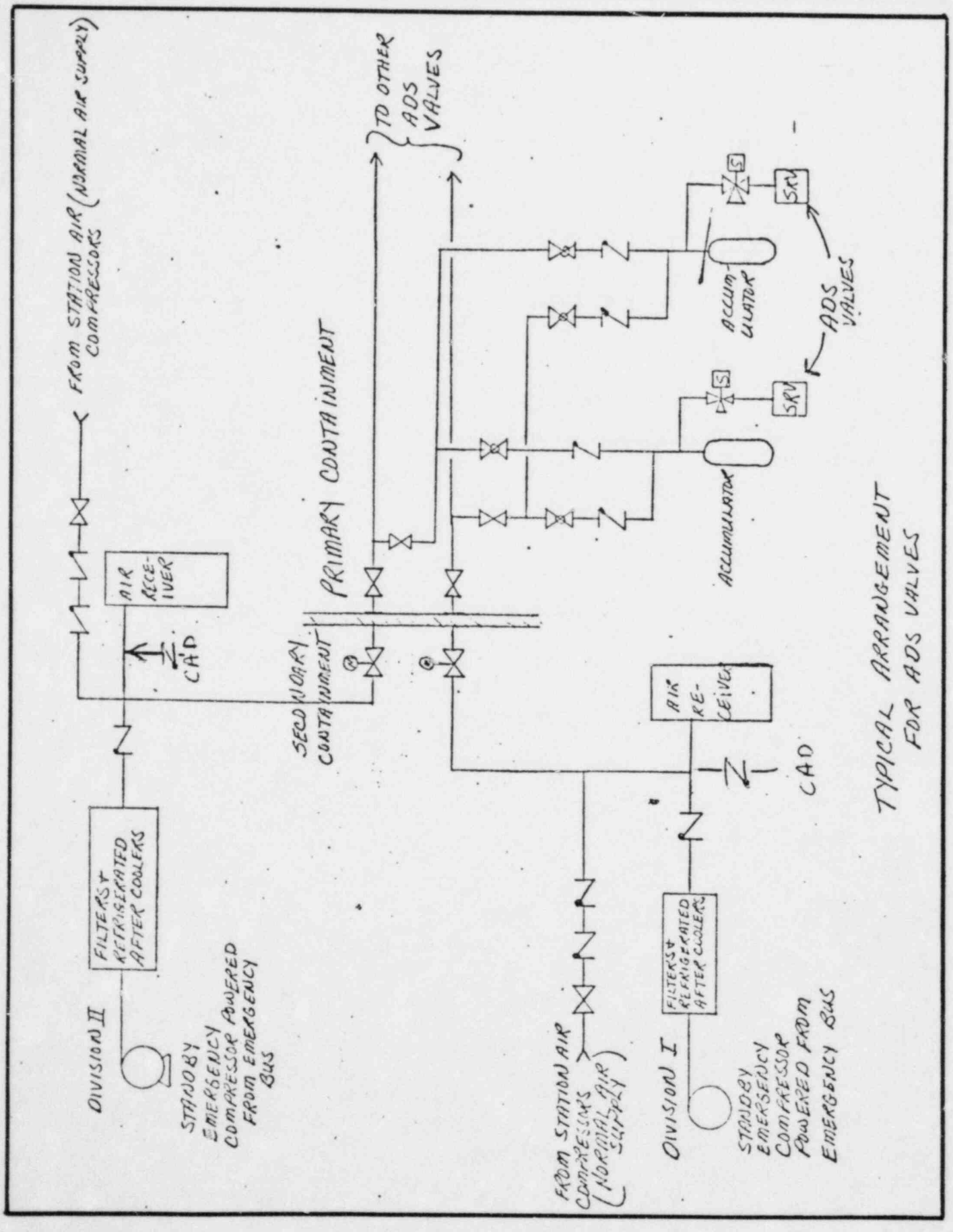
PSL3595 · PSL3596 95 psig Standby Compressor starts.

PSL3594 · PSL3597 105 psig Standby Compressor unloads.

POSSIBLE PLANT EFFECTS

Reactor Scram if R.I.P. Valves drift shut and instrumentation in control is lost.

FIGURE 1


FROM STATION AIR COMPRESSORS (NORMAL AIR SUPPLY)
AIR RECEIVER
CAD
SECONDARY CONTAINMENT
PRIMARY CONTAINMENT
TO OTHER ADS VALVES
ACCUMULATOR
S
SRV
ADS VALVES
DIVISION II
FILTERS + REFRIGERATED AFTER COOLERS
STANDBY EMERGENCY COMPRESSOR POWERED FROM EMERGENCY BUS
FROM STATION AIR COMPRESSORS (NORMAL AIR SUPPLY)
DIVISION I
AIR RECEIVER
CAD
FILTERS + REFRIGERATED AFTER COOLERS
STANDBY EMERGENCY COMPRESSOR POWERED FROM EMERGENCY BUS
TYPICAL ARRANGEMENT FOR ADS VALVES