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 PARKER,W.O. Duke Power Co.  
 RECIP.NAME RECIPIENT AFFILIATION  
 DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards safety & relief valve & block valve qualification & piping & support evaluation repts per NUREG-0737,Item II.D.1,

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# DUKE POWER COMPANY

POWER BUILDING

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WILLIAM O. PARKER, JR.  
VICE PRESIDENT  
STEAM PRODUCTION

July 1, 1982

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373-4083

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

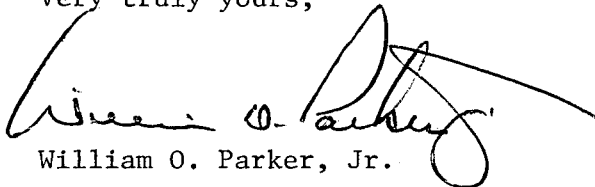
Attention: Mr. J. F. Stolz, Chief  
Operating Reactors Branch No. 4

Re: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287

Dear Sir:

In accordance with NUREG-0737, Item II.D.1 as revised on September 29, 1981, please find attached the Oconee Nuclear Station specific submittal regarding safety and relief valve qualification, block valve qualification, and piping and support evaluation reports. As indicated in the attached submittal, the relief and safety valve piping and support system evaluation is preliminary at this time due to the late completion of the EPRI tests (final report to be completed today by EPRI). The Oconee Nuclear Station final evaluation will be submitted by January 1, 1983.

Very truly yours,



William O. Parker, Jr.

JFN/php  
Attachment

cc: Mr. James P. O'Reilly, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

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OCONEE NUCLEAR STATION  
SAFETY VALVE QUALIFICATION REPORT  
NUREG - 0737, ITEM II. D.1.A.

This report is in response to the requirements of NUREG - 0737, Item II.D.1.A. to demonstrate safety valve operability for Oconee Nuclear Station. The basis for this report is the generic safety/relief valve test program developed by Electric Power Research Institute (EPRI) on behalf of the participating utilities. Duke Power has been a participant in the EPRI program and the program results were submitted to the NRC on April 1, 1982 on behalf of the utilities by David Hoffman of Consumers Power.

VALVE DESCRIPTION

MANUFACTURER	-	Dresser Industries
TYPE	-	Spring Loaded Safety Valve
MODEL	-	31739A
MANUFACTURER DRAWING	-	2 1/2-31739A-1-X6-XFC1-X05120
VALVES PER UNIT	-	2

The two safety valves are each mounted directly on a pressurizer nozzle with no water loop seals.

EPRI TEST PROGRAM

The Oconee Safety valve is represented by the program results submitted to the NRC on April 1, 1982 in the following reports:

- 1) Valve Selection/Justification Report
- 2) Valve Inlet Fluid Conditions for Pressurizer Safety and Relief Valves for B & W 177 and 205 FA Plants
- 3) Test Condition Justification Report
- 4) Safety and Relief Valve Test Report

## APPLICABILITY OF EPRI TEST PROGRAM

The EPRI test results are applicable to Oconee Nuclear Station as follows:

- Test Valve - Oconee safety valves and the test valve are both, Dresser, model 31739A, nozzle type relief valves with similar designs and specifications.
- Fluid Conditions - The tested conditions covered all design basis events for the Oconee pressure relief system. The test valve was also tested on subcooled water which is representative of the non-design basis event, Extended High Pressure Injection, which may challenge the safeties with water.
- Test Facility - The short inlet valve test configuration is similar to and approximates the valve arrangement used at Oconee.

## VALVE OPERABILITY

For the short inlet valve tests applicable to Oconee, the Dresser 31739A valve successfully opened and closed and had stable behavior for all tests. With the "reference" ring settings selected for the later tests, the valve exceeded rated flow for each test except one. This test was for a very high backpressure that exceeds the backpressure applicable to Oconee.

For tests outside of the Oconee design basis, highly subcooled water flow, the valve performance was acceptable. The valve opened to less than full lift but was stable for each temperature. Based on preliminary system analysis, the amount of flow the valve passed for each test case was sufficient to prevent an overpressure condition from occurring based on Oconee input parameters.

As part of the B & W Owners Group, Duke is currently negotiating with valve vendors/consultants to determine the optimum safety valve ring settings for Oconee.

CONCLUSION

Based on the test data and the above discussion, operability of the Ocone safety valve has been demonstrated for expected and operating conditions as required by NUREG 0737, Item II.D.1.A.

OCONEE NUCLEAR STATION  
POWER OPERATED RELIEF VALVE  
QUALIFICATION REPORT  
NUREG-0737, ITEM II.D.1.A.

This report is in response to the requirements of NUREG-0737, Item II.D.1.A. concerning operability of Power Operated Relief Valves (PORV) for Oconee Nuclear Station. The basis for this submittal is the generic safety/relief valve test program that was developed on behalf of participating utilities by the Electric Power Research Institute (EPRI). Duke Power has been a full participant of this program and the program results were submitted to the NRC on April 1, 1982 by David Hoffman of Consumers Power on behalf of the utilities.

PORV DESCRIPTION

Manufacturer	-	Dresser Industries
Type	-	Electromatic Relief Valve
Model	-	31533VX-30-1 (-2 Internals)
Manufacturers Drawing	-	CP-1548
Actuator	-	DC Solenoid
Valves Per Unit	-	1

Oconee utilizes a single PORV mounted with an isolation valve directly on the pressurizer nozzle. The valve is normally actuated with a high setpoint of 2450 psia, and its operation limits the openings of the spring loaded safety valves. During periods of water solid operation, the PORV is also used for low pressure overpressurization protection. The PORV setpoint is reduced to 550 psig whenever the reactor coolant system cold leg temperature is less than 275°F.

EPRI TEST PROGRAM

Under the EPRI Test Program, for all tests applicable to Oconee, the Dresser PORV has opened and closed on demand. Water seal simulation test number 16-DR-6W, 22-DR-9W/W, and 24-DR-6W/W on tables 4/11-3a of the Safety and Relief Valve Test Report are not applicable to Oconee, since water seals are not used.

The Oconee PORV testing is represented by the following test reports:

- 1) Valve selection justification report
- 2) Valve inlet fluid conditions for pressurizer safety and relief valves for B & W 177 and 205 FA plants
- 3) Test condition justification report
- 4) Safety and relief valve test report

#### CONCLUSION

The functionability of the Dresser PORV has been shown for all expected operating and accident conditions applicable to Oconee Nuclear Station and the requirements of NUREG-0737, Item II.D.1.A. have been met.

OCONEE NUCLEAR STATION  
PORV BLOCK VALVE QUALIFICATION REPORT  
NUREG 0737, ITEM II.D.1.B.

This report is in response to the requirements of NUREG 0737, Item II.D.1.B. "Qualification Of Power Block Valves" for Oconee Nuclear Station. Duke Power has met this requirement through direct participation in the EPRI PORV Block Valve Test Program. The results of this program were documented in a report entitled "EPRI Safety and Relief Valve Test Program PORV Block Valve Information Package". This report will be transmitted to the NRC by Mr. David Hoffman on behalf of Duke Power and the other participating utilities on or before July 1, 1982.

Valve Description

Manufacturer	-	Westinghouse Electric Corporation
Type	-	3" Motor Operated Gate Valve
Model	-	03000GM88FNE000
Manufacturer Drawing	-	1167E74
Operator	-	Limatorque SB-00-15
Valves Per Unit	-	1

EPRI Test Program

Under the EPRI PORV Block Valve Test Program, a Westinghouse Model 3GM88 motor operated gate valve was tested on steam to full differential pressure conditions. A Limatorque SB-00-15 operator set to close on torque was used on the valve. This valve-operator combination successfully completed the EPRI test program by closing and opening 20 times against full differential pressure. Oconee uses the same Westinghouse valve and Limatorque operator combination for the PORV block valve application.

Operator Modifications

Subsequent to the EPRI testing, Westinghouse recommended an operator modification to increase the closing force available margin. The modification consisted of



1) changing the operator gear ratio to increase torque output, and 2) modifying the operator control scheme. The control modification makes use of the main compensator spring in the SB style operator. The operator is set to close on limit rather than torque so that it closes with a preset amount of compensator spring compression each time. Closing on limit makes the full stall torque of the motor available if closing difficulty is encountered, while the compression of the compensator spring prevents the extra torque from damaging the valve seats on closure. This modification has been made to each of the Ocone block valve operators.

### Conclusion

Based on the successful EPRI tests and combined with the Westinghouse operator modification, the Ocone PORV Block Valve tests meet the intent of NUREG 0737 Item II.D.1.B., and have been shown capable of operating closed and open for all fluid conditions expected under operating and accident conditions.

OCONEE NUCLEAR STATION  
PRESSURIZER SAFETY AND  
RELIEF VALVE PIPING SYSTEM  
PRELIMINARY EVALUATION REPORT  
NUREG - 0737, ITEM II.D.1

This portion of the report contains the preliminary evaluation of the Pressurizer Safety and Relief Valve (S/RV) Piping System of Oconee Nuclear Station, Units 1, 2, and 3. At present a study is underway to substantiate the integrity of the pressurizer S/RV piping system and supports in compliance with the Oconee Final Safety Analysis Report (FSAR). This study is based on applicable test results obtained from the EPRI S/RV test program (Ref. 1&2). The final edition of this report is scheduled for completion on July 1, 1982.

The Pressurizer S/RV Piping System was originally designed to the 1967 USAS B31.1 code for pressure piping. Qualification was accomplished by comparing calculated loads and pipe stresses resulting from design basis events with applicable design allowables. The consequences of both the transient and steady state loading associated with the operation of the safety relief valves and the PORV were considered in the original analysis.

The current analysis effort includes the EPRI S/RV Test Data. This analysis considers previously unanticipated physical phenomena at the discharge segment of the Pressurizer S/RV Piping System.

A preliminary review of piping downstream of the safety valves and the PORV indicates that the integrity of the valves is protected for any design loads

(transient and steady) imposed by the piping.

A final review of the Pressurizer S/RV System discharge piping stresses and support loads resulting from the unanticipated transient effects is underway. The final evaluation of the piping associated with the Pressurizer S/RV System will be based on receipt of the final piping data from EPRI July 1982. The final evaluation will be submitted on January 1, 1983 and will include a schedule for implementation of any modifications that may be required.

### References

- (1) "Preliminary Test Results on Dresser 31533 VX-30 PORV" EPRI Relief and Safety Valve Test Program 5-13-81
- (2) "Preliminary Discharge Piping Load Results for Dresser 31739A, Test Run # 1012, 1017 & 1027." EPRI Relief and Safety Valve Test Program 2-4-82