

U. S. ATOMIC ENERGY COMMISSION
REGION II
DIVISION OF COMPLIANCE

Report of Inspection

CO Report No. 50-269/71-2

Licensee: Duke Power Company
Oconee 1
License No. CPPR-33
Category B

Dates of Inspection: January 25, 1971
February 10-12, 1971

Dates of Previous Inspection: January 5-8, 1971

Inspected By: C. E. Murphy
C. E. Murphy, Reactor Inspector (Operations)

3/8/71
Date

Reviewed By: W. C. Seidle
W. C. Seidle, Senior Reactor Inspector

2/11/71
Date

Proprietary Information: None

SCOPE

A routine, announced inspection was made of the 2568 Mw(t) pressurized water reactor under construction near Seneca, South Carolina, known as Oconee Station No. 1. Purposes of the inspection were:

1. To determine the construction status and significant changes to the schedule dates.
2. To review the outstanding items remaining to be completed at the facility.
3. To review the electrical and instrumentation installations with DRL, DRS, and DR personnel.
4. To review the test program.

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SUMMARY

Safety Items - None

Nonconformance Items - None

Unusual Occurrences - None

Status of Previously Reported Problems -

1. The licensee has revised the FSAR to show the station batteries in the new location. (See Section F and Management Interview.)
2. The cleaning procedures for the reactor coolant piping and equipment has been revised to conform to the FSAR. (See Section G and Management Interview.)
3. The licensee is presently reviewing and correcting the deficiencies in the electrical and instrumentation QA documentation. (See Section F.)

Other Significant Items - S. Hanauer, DR, V. A. Moore, DRS, A. Schwencer, DRL, O. D. Parr, DRL, and F. Rosa, DRS, visited the site to review the electrical and instrumentation installation on February 11 and 12, 1971. This review did not reveal any items of major significance. (See Section F.)

Outstanding Items - See Exhibit A for current status of outstanding items.

Management Interview - The management interview was held on February 12, 1971, and was attended by Smith, Hampton, Owen and Wells.

1. Owen stated that the ventilation system for the Keowee plant battery system would be modified to ensure adequate air supply and exhaust in both battery areas. (See Section F.)
2. Smith stated that procedures would be developed to require periodic checking of the blocking diodes in the switchyard d.c. system. (See Section F.)
3. Owen and Smith stated that the temporary steam line above the 4 kv switchgear would be removed, the manual valve closed and its handwheel removed. A blank flange would be installed at the valve discharge. (See Section F.)
4. The inspector reviewed the problems associated with the relocation of the station batteries. Owen advised the inspector that a protective

housing would be installed around the station power batteries. The instrument air line in the control power battery room will be removed and the floor drain line for the elevation above the battery room will have a guard installed to prevent water from spilling onto the battery. Owen stated that the licensee's response to the C.I. ^{1/} would describe these changes. (See Section F.)

5. The containment leak rate test procedure specifies that the leak rate will be determined both by the absolute method and the reference vessel method at the maximum accident pressure and at 50% of this pressure. The accuracy of the tests is to be verified by introducing a controlled leak after the completion of the test at 50% pressure. The inspector advised Smith that consideration should be given to including the controlled leak rate test at the conclusion of the 100% pressure test since the accuracy of the leak rate measurement at the full accident pressure must be verified. Smith stated that consideration would be given to the inspector's comments. (See Section G.)
6. In response to the inspector's question, Smith stated that the test procedures would be revised to reflect the latest revisions to the FSAR and the Technical Specifications. (See Section G.)
7. The elevator in the auxiliary building opens into the penetration room. Since this room must be maintained at a negative pressure, the inspector asked if the effect of the elevator door remaining open had been considered. Owen stated that the door details would be reviewed to determine the adequacy of the seals. Smith said that he would verify that the doors would close automatically at this level.
8. The need for separation of redundant circuits in the control boards was discussed. Owen stated that the licensee would establish criteria for separation of safety-related circuits and issue a report to DRL. Those wires in redundant circuits which failed to meet the criteria would be rerouted. (See Section F.)
9. Wells stated that the cable trenches in the powerhouse and switchyard area would be cleaned of debris and mud.
10. In response to the inspector's question, Wells stated that the instrument air line attached to the cable tray supports in the auxiliary building would be removed.
11. The inspector advised Smith and Hampton that the procedures for the hydrostatic testing did not provide for repairing leaks and retesting. In addition, no acceptance criteria were given nor were the individual

^{1/}CDN issued on January 29, 1971.

leak rates determined. This would not appear to permit adequate evaluation of the tests. Smith stated that consideration would be given to changing the procedures.

12. Smith stated that operating procedures, emergency procedures and health physics procedures would be made available to the inspector.
13. Wells advised the inspector that the defective section of feedwater piping at the steam generator 1A ring header would be replaced.
14. The inspector advised Wells that during a tour of the reactor building he had observed a bundle of stainless steel welding rod laying on a scaffold near steam generator 1A. This rod, which had no identification as to source, was in an area where welding of stainless pipe was in progress. Wells stated that he would follow up on this item and instruct his men to be on watch for improperly handled rods.
15. The inspector stated that he had observed an unlocked door on steam generator 1B clean room. The door was not guarded nor was there a notice restricting admission. Smith stated that he would follow up and correct this item.
16. The inspector advised Smith that he had reviewed Procedure TP 200 16, Enclosure 13.4, dated December 30, 1970, which described the cleaning of the steam generator tubes. The procedure was considered to be acceptable.

DETAILS

A. Persons Contacted

Duke Power Company (Duke)

R. L. Dick - Manager of Construction
J. C. Rogers - Project Engineer
D. G. Beam - Assistant Project Engineer
J. R. Wells - Principal Field Engineer
G. L. Hunnicutt - Senior Field Engineer
N. E. Blaisdell - Field Engineer, Welding
G. M. Grier - Field Engineer, NDT
C. B. Aycock - Field Engineer, Electrical
J. C. Smith - Plant Superintendent
J. W. Hampton - Assistant Superintendent

B. Administration and Organization

There have been no significant changes to the licensee's staff since the previous inspection.

C. Quality Assurance

The licensee has instituted a program for training and upgrading the NDT technicians. The technicians are being given 16 hours of formal instruction in dye penetrant testing. Those that complete the course and pass a written examination will be qualified as SNT, Level II technicians. After the completion of this course, the licensee plans to conduct similar courses in MT and RT. At present, sixteen men have been qualified to Level II in dye penetrant testing.

D. Construction Progress

1. Installation of the reactor vessel internals is underway.
2. Seismic braces are being installed on the primary system piping and the steam generators.
3. Testing of the piping, electrical and instrumentation systems is in progress.
4. Approximately 70% of the instrument and control cable and 92% of the power cable have been installed.

E. Construction Schedule

1. The hydrostatic test of the reactor coolant system is scheduled for mid-March 1971.
2. The containment proof test is scheduled for the last week of March 1971.
3. The start of the hot functional test is now planned for April 1971.

F. Electrical and Instrumentation1. DRL Site Visit

S. Hanauer, DR, V. A. Moore, DRS, A. Schwencer, DRS, O. D. Parr, DRL, and F. Rosa, DRL, visited the site to review the electrical and instrumentation installation on February 11 and 12, 1971.

The Compliance inspector participated in this review. At the conclusion of the review, a meeting was held with the licensee's personnel and the following items were discussed.

- a. Keowee Hydro Plant - The ventilation system for the two battery rooms appears to ventilate only one room.

Owen stated that the system would be revised to incorporate a separate ventilation system for the second battery room.

- b. 230 kv Switchyard - Two batteries provide power for operating the power circuit breakers in the switchyard. Blocking diodes are used to provide isolation between the two batteries. The licensee has not provided a method for monitoring the diodes for possible failure.

Smith stated that procedures would be developed for the periodic testing of the diodes. This item will be reviewed in the technical specification meetings.

- c. 4160 Volt Switchgear - A steam line to be used in the alkaline wash of the secondary systems passes in close proximity to the Unit 1 engineered safety system 4160 volt switchgear.

Owen stated that this was a temporary line and that the pipe would be removed and its supply valve closed and capped. As a final safety measure, Smith stated that the valve operator would be removed.

- d. Battery Room - The control power batteries were relocated from the turbine building mezzanine floor to the auxiliary building. The new location contained an instrument air line and a floor drain line serving that elevation above the batteries.

Owen stated that the air line would be removed and the drain line would have a guard installed to prevent spills onto the batteries. The FSAR has been revised to show the new battery locations and the licensee's response to the CDN^{1/} will include the corrective action taken.

- e. Control Room - Wiring to switches that provide for manual actuation of redundant engineered safety feature pumps and valves appeared to be bundled together.

Wylie stated that the licensee would establish criteria for the separation of wiring for redundant devices. The designs

^{1/}CDN issued January 29, 1971.

for these devices would be reviewed and those that did not have proper separation would be rewired to provide separation. The results of this review will be submitted to DRL.

- f. Instruments Inside Containment - Transducers for the primary system flows and the primary system pressure channels were mounted side by side.

Owen stated that the installation would be reviewed to assure separation of redundant systems.

2. Electrical and Instrumentation Records

Wylie advised the inspector that the licensee's review of the electrical and instrumentation documentation was nearing completion. He stated that the deficiencies which had been previously noted by the inspector^{1/} were being corrected and that more thorough reviews would be made in the future to ensure that the documentation was accurate and complete.

- G. Test and Operation

1. Reactor Coolant System Cleaning Procedure

The inspector reviewed Reactor Coolant System Cleaning Procedure TP 1A 200 16 with Smith and Hampton. This procedure, which replaced Field Installation Procedure 15, presents in detail the methods for cleaning, inspecting and testing to assure the cleanliness of the reactor coolant system. The inspector advised Smith that no deficiencies had been noted in this procedure. Enclosure 13.4, dated December 30, 1970, of the procedure gave detailed requirements for cleaning the steam generator tubes using felt plugs. This enclosure, if followed, would provide adequate assurance that the steam generator tubes were properly cleaned. The inspector plans no further action on this item at the present time.

2. Instrument Test Procedures

The inspector advised Smith that the instrument test procedures should state which sections, if any, could be accomplished with the plant operating. Smith stated that all instrument procedures would be reviewed to determine which could be completed with the

^{1/}CO Report No. 50-269/70-12.

plant operating and these procedures or procedure sections would be identified. Other instrument procedures would only be used during plant shutdown.

3. Containment Leak Rate Measurements

The inspector discussed Containment Leak Rate Test Procedure TP 1A 150 3 in detail with Smith and Hampton. This procedure specifies that the leak rate would be calculated by the absolute method and by the reference vessel method. The data for these calculations are to be taken with the containment pressurized to the calculated accident pressure and to 50% of this pressure. Since essentially the same data is used for both calculational methods, a controlled leak is to be introduced to verify the sensitivity of the instruments to a known leak and to verify the accuracy of the data used in the leak rate calculations. The licensee has proposed that the controlled leak rate test be performed at 50% of calculated accident pressure. The inspector advised Smith that he should consider running the controlled leak rate test at 100% pressure since confirmation of the leak rate test at this pressure is of more value than at 50% pressure. Smith advised the inspector that this matter would be considered.

4. Test Procedure Review

The inspector gave Smith and Hampton comments on the following procedures:

<u>Number</u>	<u>Title</u>
TP 1A 150 4	Reactor Building Hatches Leak Tests
TP 1A 170 2	Auxiliary Building Vent System Functional Operational Test
TP 1A 200 1	Reactor Internals Vent Valve Inspection Test
TP 1A 200 3	Reactor System Hydro Test
TP 1A 200 1/A	Reactor Flow Instrument Control Pre-op Calibration
TP 1B 202 1A	Reactor Coolant Pump Seal Supply Return Temperature Pre-op Calibration
TP 1B 202 1E	Letdown Storage Tank Pressure Instrument
TP 1B 202 1F	Letdown Storage Tank Level Instrument
TP 1B 202 1G	Letdown Storage Tank Temperature Instrument
TP 1B 202 1I	Letdown System Temperature Instrument
TP 1B 202 1J	Letdown System Pressure Instrument
TP 1B 202 1K	Hydrogen Makery System Pre-op
TP 1A 202 2	HP System Hydro Test
TP 1A 202 5	HP System Engineered Safeguards Test
TP 1B 203 1A	Borated Water Storage System Level Instrument

TP 1B 203 1B	Borated Water Storage Tank Temperature Instrument
TP 1A 203 4	LP Injection System Hydrostatic Test
TP 1A 203 6	LP Injection System ES Test
TP 1A 120 3	Fuel Handling System Integrated Functional Test
TP 1B 150 1A	Reactor Building Humidity Measurements
TP 1B 150 1C	Reactor Building Absolute Measurements
TP 1A 160 2	Reactor Building Coolers Functional Test
TP 1B 161 2	Reactor Building Vent System Functional Test
TP 1B 161 4	Hydrogen Purge Test
EP 1 1800 18	Emergency Procedure - Emergency Plan

Hampton stated that the inspector's comments would be reviewed and if any were not incorporated into the procedures, the inspector would be advised.

5. FSAR and Technical Specification Changes

The inspector pointed out to Smith and Hampton that the test procedures reviewed to date contained data which were in the Technical Specifications. Specific examples were the reactor coolant system heatup rate, the nil ductility transition temperatures and containment accident pressures. Since the FSAR and the Technical Specifications were being revised, the test procedures should be reviewed and corrected as required. Smith and Hampton stated that this would be done.

6. Outstanding Items List

The inspector reviewed the outstanding items list with Smith and Hampton. None of the items listed has been resolved except item 42, Cleaning Reactor Coolant System Piping and Equipment.

Attachment:
Exhibit A

LICENSE Duke Power Company

FACILITY Oconee Station No. 1

DOCKET & LICENSE NOS. 50-269, CPPR-33

REACTOR OUTSTANDING ITEMS

IDENTIFIED	ITEM	CLOSED
1. 68-2, 3/5/68, <u>NC</u>	Concrete test cylinder breaks below specs	68-3, D.5., 6/19/68
2. 68-3, 6/19/68, <u>NC</u>	Unauthorized revision to Cadweld specifications	68-4, Summary, 9/25/69
3. 68-3, 6/19/68, <u>NC</u>	Failure to provide concrete inspector	68-4, Summary, 9/25/69
4. 68-4, 9/25/68 <u>NC</u>	Failure to properly test Cadweld splices	69-1, Summary, 1/6/69
5. 69-8, 9/9/69, <u>NC</u>	Failure to properly qualify weld procedures	69-9, G, 11/3/69
6. 69-8, 9/9/69, <u>NC</u>	Failure to properly qualify weldors	69-9, G, 11/3/69
7. IEB, 4/11/69	Procedure for repair of arc strikes not available	70-5, Summary, 4/27/70
8. CDN, 1/8/70	NDT of core flooding valves	Memo, WCS to HQ, 2/2/70
9. 70-1, 1/6/70, <u>NC</u>	Welding and NDT deficiencies, CDN issued	Memo, WCS to HQ, 3/26/70
10. Bingham 69-1, 12/9/69, <u>NC</u>	Main coolant pump discrepancies	Memo, WCS to HQ, 4/21/70
11. 70-4, 4/27/70, <u>NC</u>	Low strength concrete	Memo, WCS to HQ, 8/7/70
12. IEB, 5/1/70	Pressure vessel safe ends	Memo, WCS to HQ, 8/5/70
13. 73-6, 5/25/70, <u>NC</u>	Tendon stressing discrepancies	Memo, WCS to HQ, 8/7/70
14. 70-8, 8/3/70, <u>NC</u>	Tendons and stress gages	Memo, WCS to HQ, 10/8/70
15. 70-8, 9/1/70, <u>UN</u>	Fissures in primary coolant pipe cladding	FSAR, Amend.24, 12/17/70
16. IEB, 9/11/70, <u>UN</u>	a. Determination of safety system response to axial power imbalances b. Availability of in-core detectors	

IDENTIFIED Column: S - safety item; NC - noncompliance or nonconformance item; UN - unresolved item; IN - inquiry item; IEB - Reactor Inspection and Enforcement Branch request; O - other source of identification (briefly specify)

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REACTOR OUTSTANDING ITEMS

IDENTIFIED	ITEM	CLOSED
	c. Measurements of flow and temperature during initial operation	
	d. Verification of bypass flow	
	e. Verification of axial peak effects on DNBR	
	f. Data during startup for single loop, two pump operations	
	g. Inspection of reactor internals after completion of preoperational tests	
	h. Field test of steam generator	
	i. Low strength concrete and omitted tendons	Memo, WCS to HQ, 10/8/70
	j. Penetration room valves	70-12, Summary 12/1/70
	k. Strain gauge failures	Memo, WCS to HQ, 10/8/70
	l. HP and LP injection system startup times	
	m. Core flooding tank MO valve	
	n. Reactor building spray pump performance	
	o. Condenser cooling water crossover header valve	
	p. Spent fuel accident filters	
	q. Administrative control of MCP startup	
	r. Flow tests per 200/12 and 200/13	
	s. Flow distribution chart	

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DOCKET & LICENSE NOS. 50-269, CPPR-33

REACTOR OUTSTANDING ITEMS

IDENTIFIED	ITEM	CLOSED
17. 70-2, 2/19/70, <u>UN</u>	Vendor NDT records for safeguards systems cables	70-11, F, 10/26/70
18. 70-4, 3/23/70, <u>UN</u>	Verification of separation of transducer tubing	
19. 70-8, 8/3/70, <u>UN</u>	Control rod drive guide bushings and torque tubes	
20. 70-8, 8/3/70, <u>UN</u>	Completion of HP facilities	
21. 70-8, 8/3/70, <u>UN</u>	Completion of HP procedures	
22. 70-8, 8/3/70, <u>UN</u>	Completion of HP personnel training	70-12, Summary 12/1/70
23. 70-8, 8/3/70, <u>UN</u>	Crane load test	71-1, 1/4/71
24. 70-8, 8/3/70, <u>UN</u>	Verify that test procedures are properly revised and approved when changes are required	
25. 70-8, 8/3/70, <u>UN</u>	Verify that analysis of containment is made	FSAR, Amend. 24
26. 70-8, 8/3/70, <u>UN</u>	Adequate fuel handling procedures	
27. 70-8, 8/3/70, <u>UN</u>	Main steam pipe hangers	
28. 70-9, 9/1/70, <u>UN</u>	Steam generator skirt adapter indications	
29. 70-9, 9/1/70, <u>UN</u>	HP injection pump QC records	70-11, C, 10/26/70
30. 70-9, 9/1/70, <u>UN</u>	Basis for particle size in flushing procedures	70-11, G, 10/26/70
31. 70-9, 9/1/70, <u>UN</u>	Protection of instrumentation during hydro test	
32. 70-10, 9/28/70, <u>UN</u>	Fuel transfer tube expansion joint replacement	
33. 70-10, 9/28/70, <u>UN</u>	Routing of cables exterior to cable trays	Memo, WCS to HQ 1/18/71

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DOCKET & LICENSE NOS. 50-269, CPPR-33

REACTOR OUTSTANDING ITEMS

IDENTIFIED	ITEM	CLOSED
34. DRL Rpt. No. 1, 7/24/70, <u>UN</u>	Installation of additional environmental monitoring equipment	
35. DRL Rpt. No. 1, 7/24/70, <u>UN</u>	Vent valve replacement test	
36. DRL Rpt. No. 1, 7/24/70, <u>UN</u>	Strong motion accelerometer installation	
37. DRL Rpt. No. 1, 7/24/70, <u>UN</u>	Penetration room flow indication and adjustment	
38. DRL Rpt. No. 1, 7/24/70, <u>UN</u>	Instrumentation bypass keys	Tech Specs Change 12/70
39. DRL Rpt. No. 3, 9/15/70, <u>UN</u>	Internals vibration test	
40. DRL Rpt. No. 3, 9/15/70, <u>UN</u>	Core flooding tank valves	
41. 70-10, 9/28/70, <u>UN</u>	Hydrostatic test pressures	71-1, 1/4/71
42. 70-11, 10/26/70, <u>UN</u>	Cleaning reactor coolant system piping and equipment	71-2, 1/25/71
43. 70-11, 10/26/70, <u>UN</u>	Sensitized stainless steel in reactor coolant pump discharge piping	71-1, 1/4/71
44. IEB, 12/22/70	Reactor coolant pump tests	
45. IEB, 10/30/70	Safety injection system testing	
46. 70-12, 12/1/70 <u>UN</u>	Vibration testing - equipment and piping	
47. 70-12, 12/1/70 <u>NC</u>	Location of station batteries	
48. 70-12, 12/1/70 <u>NC</u>	Nuclear instrumentation vendor tests	
49. 70-12, 12/1/70 <u>NC</u>	Electrical QC data packages	

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REACTOR OUTSTANDING ITEMS

IDENTIFIED	ITEM	CLOSED
50. 70-12, 12/1/70 <u>UN</u>	ITE relays	
51. 70-12, 12/1/70 <u>UN</u>	Heater and heat tracing tests	
52. 70-12, 12/1/70 <u>UN</u>	Control rod drive cooling system tests	
53. 70-12, 12/1/70	Containment and auxiliary building vent system filters	
54. FSAR, Amend 25 <u>UN</u> 12/30/70	Installation of strain gages	
55. 71-2, 1/25/71 <u>UN</u>	Keowee battery room ventilation	
56. 71-2, 1/25/71 <u>UN</u>	Switchyard battery blocking diode tests	
57. 71-2, 1/25/71 <u>UN</u>	Remove temporary steam line at 4 kv switchgear	
58. 71-2, 1/25/71 <u>UN</u>	Controlled leak rate tests	
59. 71-2, 1/25/71 <u>UN</u>	Penetration room elevator opening	
60. 71-2, 1/25/71 <u>UN</u>	Verification of separation of redundant circuits	
61. 71-2, 1/25/71 <u>UN</u>	Cleanup of cable trenches	
62. 71-2, 1/25/71 <u>UN</u>	Adequacy of leak rate tests	
63. 71-2, 1/25/71	Replacement of feedwater pipe	

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