UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-327/81-14 and 50-328/81-14

Licensee: Tennessee Valley Authority
500A Chestnut Street
Chattarooga, TN 37401

Facility Name: Sequoyah 1 and 2

Docket Nos. 50-327 and 50-328

License Nos. DPR-77 and CPPR-73

Inspection at Sequoyah site near Chattanooga, TN

Inspector: W. H. Miller, Jr. 4/24/81
W. H. Miller, Jr. Date Signed

Approved by: for T. E. Conlon, Section Chief 4/24/81
Engineering Inspection Branch Date Signed
Engineering and Technical Inspection Division

SUMMARY

Inspected on March 24-27, 1981

Areas Inspected

This special, unannounced inspection involved 32 inspector-hours on site in the areas of fire protection/prevention.

Results

Of the areas inspected, no violations were identified. One apparent deviation was found; Fire detectors not provided over ERCW pumps - paragraph 5.b.(61) and 5.b.(64).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. M. Ballentine, Plant Superintendent/Plant
C. R. Brimer, Outage Director
*C. E. Chmielewski, Nuclear Engineer/Plant
*J. D. Collins, Supervisor Electrical Design/ENDES
*E. A. Craigge, Supervisor Plant Safety & Fire Protection Staff
L. Cowan, Outage Electrical Engineer
*D. L. Cowart, QA Engineer/Power
*A. W.. Crevasse, QA Manager/Power
*H. E. Crister, Mechanical Engineer/ENDES
*C. C. Denney, Electrical Engineer/ENDES
*V. L. Dudley, Fire Protection Engineer/Power
M. K. Eisenbise, Outage Engineer
*A. H. Gelston, Compliance/Power
*M. R. Harding, Compliance Supervisor
D. O. McCloud, QA Supervisor/Power
*J. McGriff, Assistant Plant Superintendent
*P. A. Thornton, Electrical Engineer/Construction
*V. P. Thomas, Supervisor Coordination/Construction
*R. Thompson, Supervisor Fire Protection Engineering/Power
*K. O. Smith, Electrical Engineer/Construction
G. Williams, Fire Protection Specialist

NRC Resident Inspector

*E. J. Ford

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 27, 1981 with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

a. (Open) Deviation (327/80-10-01): Substandard fire protection administrative control procedures. This item is being evaluated by NRR and will remain open pending completion of the evaluation.

b. (Open) Deviation (327/80-10-02): Substandard supervision of fire protection control valves. This item is being evaluated by NRR and will remain open pending completion of the evaluation.

c. (Open) Unresolved Item (327/80-10-03): Two inch drain test fitting for sprinkler systems. This item is under review by the licensee and remains open.

d. (Closed) Unresolved Item (327/80-10-05): Equipment list for exterior fire equipment houses. The licensee revised the list of equipment to be provided within each house and forwarded this data to NRR on June 11, 1980 in a letter from L. M. Mills, TVA to L. S. Rubenstein, NRR. NRR subsequently issued Supplement 2 to the Safety Evaluation Report which apparently approved TVA's revised equipment list. This item is closed.

e. (Open) Unresolved Item (327/80-10-07): Supervision of containment isolation fire protection valves. TVA has taken no action on this item and is awaiting guidance from NRC. This item is being evaluated by NRR and will remain open pending completion of the evaluation.

f. (Closed) Deviation (327/80-17-01): Inadequate fire barriers for conduits containing redundant steam generator instrumentation circuits. The inspector reviewed the licensee response of June 30, 1980, from L. M. Mills, TVA to James P. O'Reilly, NRC Region II. The inspector walked down the conduit installation. All of the conduit appeared to be properly insulated. This item is closed.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 5.b.(14), 5.b.(35), 5.b.(60), and 5.b.(61B) & (64B).

5. Fire Protection/Prevention Program Modifications and Commitments (Unit 2)

a. Commitments (Unit 2)

The inspector evaluated the licensee's action on fire protection commitments made to the NRC. The NRC Fire Protection Safety Evaluation Report (FPSER), Section 9.5 of the facility Safety Evaluation Report, Supplement 1 of February 1980 and Supplement 2 of August 1980, and the licensee's Sequoyah Nuclear Plant Fire Protection Program Reevaluation (FPPR) of January 20, 1977, Revision 4 were used in this evaluation. These documents describe the fire protection commitments, requirements,

and schedule dates of implementation. The commitments and findings are as follows:

No.	Location/Item	Section	Status
	Primary Containment - Reactor Bldg.		
(1)	Reactor Coolant Pump		
(1A)	- Fire Detection (Thermal & Flame)	F.1.H	Closed
(1B)	- Oil Collection System	F.1.B	Open
(1C)	- Noncombustible Housing	F.1.B	Open
(1D)	- Water Spray System (Closed Heads)	F.1.F	*Closed
(2)	Standpipe Fire Hose System (Dry)	F.1.D	Closed
(3)	Fire Detection - Cooling Units	F.1.H	Closed
	Annulus Area - Reactor Bldg.		
(4)	Sprinkler System - Divisional Cable Interaction	F.1.G	*Closed
(5)	Fire Detection (Smoke)	F.1.H	Closed
(6)	Standpipe Fire Hose System	F.1.D	Closed
(7)	Fire Extinguishers	F.1.C	Closed
(8)	Exposed Cables Coated (Flame-mastic)	F.1.A	Closed
	Control Building - Control Room Complex (EL 732')		
(9)	Fire Detection	F.2.B	
	Peripheral Areas (Ionization & Thermal)		Closed
	Control Room (Ionization)		Closed
	Control Consoles (Ionization)		Closed
	Fire Barriers	F.2.A	
	Fire Doors (3 Hr) - Between Control Room & Turbine & Auxiliary Buildings		Closed
	Fire doors (1½ Hr) - Between Peripheral Rooms		Closed
(11)	Standpipe Fire Hose System (Stairwells)	F.2.D	Closed
(12)	Fire Extinguishers (Halon 1211)	*Q20.C	Closed
(13)	Sprinkler System		*Closed
	Mechanical Room	F.2.E	
	Operators Living Area	F.2.E	
	Corridor	F.2.E	
	Record Storage	F.2.F	
	PSO Engineer Shop	F.2.F	
	HEPA/Charcoal Filters	F.2.G	

(14)	Ceiling for Control Room/N...combustible	*Q20.A	Open
	Curbs	F.2.I	Closed
	Control Room Doors		
	AHU Compressor/Mechanical Room		
	Control Building - Spreading Room (EL 706')		
(16)	Fire Detection (Ionization)	F.3.E	Closed
(17)	Sprinkler System (Two Levels)	F.3.E	*Closed
(18)	CO2 System (Manual)	F.3.E	Closed
(19)	Standpipe Fire Hose System	F.3.D	Closed
(20)	Fire Extinguishers	F.3.C	Closed
(21)	Fire-proof Structural Steel (Pyro-crete)	F.3.B	Closed
(22)	Exposed Cable Coated (Flame-mastic)	F.3.A	Closed
(23)	Fire Barriers	F.3.B	
	Fire Doors (3 Hr)		
	Walls, Floor and Ceiling		
	Control Building - Auxiliary Instrument Room (EL 685')		
(24)	Fire Detection (Ionization & Thermal)	F.5	Closed
(25)	CO2 System (Automatic)	F.5	Closed
(26)	Fire Barrier	F.5	Closed
	Fire doors (1½ Hr)		
	Fire Dampers (1½ Hr) - Wall		
	Fire Dampers (3 Hr) - Floor		
	Turbine Building		
(27)	Fire Barrier - Between Turbine & Control Building	F.8	Closed
	Fire Doors (3 Hr)		
	Water Curtain for Wall Penetrations		
	Auxiliary Building - (EL 653')		
(28)	Fire Detection (Ionization)	*Q.1	Closed
	Open Area		
	RHR Pump Rooms		
	Containment Spray Pump Rooms		
(29)	Fire Barrier (1½ Hr) - Pump Compartments	*Q.1	Closed
	- Fire Doors (1½ Hr)		
(30)	Standpipe Fire Hose System	*Q.1	Closed

Auxiliary Building - (EL 669')

(31)	Fire Detection (Ionization) Open Area Pump Compartments (Ioni on & Thermal)	*Q.1	Closed
(32)	Fire Barriers (1½ Hr) - ump Compartments	*Q.1	Closed
(33)	Standpipe Fire Hose System	*Q.1	Closed
(34)	Sprinkler System Open Area Pump Compartments	*Q.1	*Closed
(35)	Redundant Cable Separation (20') Between Reciprocal Charging Pump, Power Supply, Control Circuit, Room Cooler Circuits and Redundant Train A Circuits	*Q.1	Open

Auxiliary Building - (EL 690')

(36)	Fire Detection (Ionization) - Area	*Q.1	Closed
(37)	Sprinkler System Open Area		*Closed
	Beneath Pipe Break Barriers for Feedwater Pump	*Q13.B	
	Beneath Mezzanine For Component Cooling Water Pumps	*Q13.C	
(38)	Fire Barrier (1½ Hr) for Cable Above Component Cooling Water Pumps	*Q13.E	Not Required
(39)	Fire Barriers (½ Hr) Between Component Cooling Water Pumps	*Q13.D	Closed
(40)	Standpipe Fire Hose System		Closed
(41)	Fire Rated Enclosure (1½ Hr) - ERCW Pump Junction Box	*Q11.B	Incomplete
(42)	Fire Barrier (½ Hr) Between Redundant Power Cables	*Q11.B	Incomplete
(43)	Reroute Train B ERCW Pump Cable and Transformer Cables - 20' Clearance	*Q11.B	Incomplete

Auxiliary Building - Fuel Storage Area (EL 706')

(44)	Fire Detection (Ionization)	F.12	Closed
(45)	Standpipe Fire Hose	F.12	Closed
(46)	Fire Extinguishers	F.12	Closed

Auxiliary Building - Waste Package Area (EL 706')

(47)	Sprinkler System	F.14	Closed
(48)	Standpipe Fire Hose	F.14	Closed
(49)	Fire Detection (Ionization)	F.14	Closed

Auxiliary Building - Auxiliary Control Complex (EL 734')

(5C)	Sprinkler System	F.6	*Closed
(51)	Fire Detection (Ionization)	F.6	
(52)	Fire Barrier - Between Cells & Adjacent Areas Fire Doors (1½ Hr) Fire Dampers (1½ Hr)	F.6	Closed
(53)	Standpipe Fire Hose System (Adjacent Areas)	F.6	Closed
(54)	Curbs at Doorways	F.6	Closed
(55)	Exposed Cables Coated (Flame-mastic)	F.6	Closed

Auxiliary Building - 125V Vital Battery Rooms I-IV (EL 749')

(56)	Sprinkler Systems (Manual)	*Q.1	Closed
(57)	Fire Detection (Ionization)	*Q.1	Closed
(58)	Fire Barrier (1½ Hr) - Between Compartments Fire Doors Fire Dampers	*Q.1	Closed
(59)	Exhaust Systems Redundant Fans Loss of Flow Alarms	*Q.19	Closed

Auxiliary Building - General Areas

(60)	Fire Barrier for Pressurizer and Steam Generator Instrumentation	*Q.1	Open

ERCW Pumping Station

(61)	Fire Detection		
(61A)	Electrical Equipment Rooms (Ionization)	*Q.1	Closed
(61B)	ERCW Pumps (Thermal)	*Q.14	Open
(62)	Standpipe Fire Hose System	*Q.1	Closed
(63)	Fire Barriers/Between Compartments Fire Doors (3 Hrs)	*Q.14	Closed

Intake Pumping Station

(64)	Fire Detection	*Q.1	
(64A)	Elevation 690' (Ionization)	*Q.1	Closed
(64B)	ERCW Pump (Thermal)	*Q.14	Open
(65)	Standpipe Fire Hose System	*Q.1	Closed

Diesel Generator Building

(66)	Fire Barriers (3 Hr) Between Generators Between Electrical Board Rooms/Fire Door Automatic Closing	F.9.A	Closed
(67)	Curbs - Generator Doors	F.9.A	Closed
(68)	Fire Detection Generator Rooms (Thermal) Oil Storage & Transfer Rooms (Thermal) Pipe Gallery & Corridor (Thermal) Air Intake & Exhaust Rooms (Thermal) Engine Room/Electrical Cabinets (Ionization) Electrical Board Rooms & Cabinets (Ionization)	F.9.B	Closed
(69)	Standpipe Fire Hose System	F.9.D	Closed
(70)	Sprinkler System (Corridor)	F.9.E	*Closed
(71)	CO2 System (Automatic) Generator Rooms Board Rooms Lubrication Oil Storage Room	F.9.E	Closed

NOTES: "Open" - Item is not complete. Refer to Paragraph 5.b for details.

"Closed" - Item appears to meet the commitments to the NRC based on review of documentation data and field inspection by the inspector. Installation of portions of the fire protection systems, such as the annulus sprinkler systems, have not been completed or fully tested. However, the system installations are nearing completion and the licensee's procedures appear adequate to assure that the systems will be functional prior to fuel load.

"*Q" - Response to NRC question on FPPR.

"*Closed" - Automatic sprinkler systems at Sequoyah do not fully meet all of the provisions of NFPA-13. The principal discrepancies include the unsupervised electrical actuation circuits and piping for the pre-action systems. These items are discussed in IE Reports 50-327/79-34, 50-328/79-19, 50-327/80-10 and 50-328/80-06. NRR's memorandum of February 13, 1980 from V. Benaroya, NRR/ASB to H. Thornburg, IE/HQ stated that the sprinkler systems at Sequoyah were acceptable to NRR. Therefore, no further action is to be taken on this item.

b. Findings

Additional information on the "Open" items in paragraph 5.a is listed below. The below listed numbers correspond to the items in paragraph 5.a.

(1A) & (1B) - The oil collection system for the reactor coolant pumps does not meet the description provided within the FPPR and does not appear to meet the provisions of 10 CFR 50, Appendix R, Section III.O. However, NRR's memorandum of February 13, 1980 from V. Benaroya, NRR/ASB to H. Thornburg, IE/HQ advised that the fire protection features provided for these pumps were adequate and met the NRC guidelines. Refer to IE Reports 50-327/79-34, 50-328/79-19, 50-327/80-10 and 50-328/80-06 for additional information on this item.

(14) - The suspended ceiling for the control room is a combustible plastic material and does not conform to the noncombustible provisions of 10 CFR 50 Appendix A, Criterion 3. This item is currently under review by TVA and NRC/NRR and it appears that all or a portion of this ceiling may be replaced. This item is identified as Unresolved Item (327/81-14-01 and 328/81-14-01), combustible ceiling in control room, and will be reviewed following the evaluation.

(35) - Table 1.2 in TVA's response to NRC's Question 1 in the FPPR states that the cables for the reciprocal charging pump power supply and control circuits and the power cable to the reciprocal charging pump room cooler unit will be relocated, installed in conduit from the pump room to the associated 480V switchgear, and located such that these circuits will be separated by at least 20 feet from the charging pump train A circuits. This work was accomplished under Engineering Change Notice No. 2463 and Release No. E874 and was completed on December 19, 1979. The inspector reviewed the construction installation documents for this modification and visually inspected the cable/conduit installation from the pump room on the 669' elevation to the switchgear rooms at the 734' elevation. It appears that at least 20' minimum separation was provided between the reciprocal charging pump components (pump C) and the redundant circuits from charging pump A in all areas except at the 669' elevation. At column line A10-t on the 669' elevation, the reciprocal charging pump component circuits were located approximately 13 feet from cable tray MT-A which contains the control circuits for charging pump A and were located approximately 15 feet from cable tray AB-A which contained the power circuits for charging pump A. This item is identified as Unresolved Item (328/81-14-02), electrical cable to reciprocal charging pump and room cooler are inadequately separated from charging pump A circuits. This item is required to be completed prior to fuel load for Unit 2.

(38) - The licensee's evaluation determined that the power and control circuits located on the mezzanine level above the component cooling water pumps are not required for safe shutdown and therefore do not have to be provided with the 1-½ hour fire rated barrier.

(41)-(43) - These items are not required to be completed until June 1981.

(60) - Table 1.3 in TVA's response to NRC's Question 1 on the FPPR identifies the conduits in Unit 2 to be wrapped with a 1-inch "Kaowool" insulation to provide a ½ hour fire barrier. These conduits contain instrumentation circuits for the pressurizer and steam generator and extend in the auxiliary building from the containment penetration at the 734' elevation of the auxiliary building to the control building penetrations of the Q-line wall at the 714' elevation of the auxiliary building. These conduits have been insulated; however, a large percentage of the conduit insulation on the 714' elevation has been removed and damaged due to the construction activities. The licensee is aware that these conduits are required to be insulated prior to the fuel load of Unit 2. This item is identified as Unresolved Item (328/81-14-04), damaged fire barrier for pressurizer and steam generator instrumentation circuits, and will be reviewed during a subsequent NRC inspection.

(61B)&(64B) - Table 1.1 in TVA's response to Question 1 of the FPPR states that rate compensated thermal detectors with heat collectors will be provided above each ERCW pump in the ERCW pump house and the intake pumping station. TVA's response to NRC's Questions 14.B of the FPPR also states that thermal spot detectors and heat collectors will be provided immediately above each ERCW pump in the CCW intake pumping station and the ERCW pumping station to provide early warning fire detection capability. However, fire detectors are not provided over the ERCW pumps. This is a failure to meet a commitment to the NRC and for Unit 1 is identified as Deviation Item (327/81-14-03), fire detection is not provided over ERCW pumps and is identified as Unresolved Item (328/81-14-03) for Unit 2. This item is required to be completed prior to the fuel load for Unit 2.

c. Unit 1 Fire Damper Modifications

Paragraphs 2.c.(16) of the Unit 1 operating license required the licensee to install five (5) fire dampers prior to November 1, 1981. The licensee stated that these dampers were installed under Work Plan No. 8832 and Engineering Change Notice No. 5005 and are as follows:

Mark No.	Tag No.	Size	Fire Rating (Hr)	Location
551	1-31C-1224	11½" X 11½"	1½	Aux. Bldg. 669' EL
552	0-31A-258	30½" X 32½"	1½	Unit 1 Instrument Room
553	0-31A-259	36½" X 26½"	1½	Unit 1 Instrument Room
554	0-31A-260	69" X 27"	3	Unit 1 Instrument Room
555	0-31A-261	33" X 61"	3	Unit 1 Instrument Room

Installation of these dampers was completed on October 31, 1980. The inspector reviewed the work plan, QC inspection and installation documents and visually inspected three (3) of the damper installations. No discrepancies were noted.

d. Unit 1 Sprinkler System Modifications

Paragraph 2.c.(16) of the Unit 1 operating license required the licensee to replace and relocate sprinkler heads in the auxiliary building. The FPSER, Supplement 2, page 9-2 states that 58 sprinkler heads in the auxiliary building needed to be installed or relocated but did not identify the specific location of these heads. The licensee stated that these modifications were accomplished under Work Plan 8817 and Engineering Change Notice No. 5002 which required a total of 58 sprinkler heads to be added on the 669', 690', and 714' elevations of the auxiliary building. The last modification was completed on October 30, 1980. The inspector reviewed the work plan and construction documents for the modifications and visually inspected the modifications on the 714' elevation. No discrepancies were noted.

e. Operating Plant Fire Protection Procedures

Refer to IE Report 50-327/80-10 and 50-328/80-06 for details on the inspection and review of the licensee's administrative fire protection procedures.

f. Fire Brigade Equipment and Fire Fighting Equipment

The inspector inspected the fire brigade equipment storage locker and found an adequate supply of fire fighting turnout gear and other miscellaneous items to satisfactorily equip the plant fire brigade. Two 5200 cfm portable electric smoke ejectors were stored in the equipment locker and four additional units were stored on the 653' elevation on the auxiliary building.

g. Exterior Fire Equipment Houses

The inspector inspected fire equipment house Nos. FH5, FH6, FH9 and GH11 and found the equipment to be in accordance with TVA's response of June 11, 1980 to NRC's Question 26. The licensee stated that all of equipment houses required for Unit 1 operation were equipped like those inspected and that all remaining equipment houses would be installed and equipped prior to intial fuel load for Unit 2.

h. Emergency Breathing Apparatus

A total of 10 self contained breathing apparatus and 10 spare cylinders are designated for fire brigade use. A total of 92 units and 154 spare cylinders are available at the site. The cylinders are recharged

onsite with an air compressor and cascade system which has a capacity to recharge approximately 8 cylinders per hour. The number of units and refill capacity available meets the intent of BTP9.5.1.

i. Fire Brigade Drills

The inspector reviewed the fire drill log data for January 1980 through February 1981 and noted that each operating crew had participated in at least one drill per quarter. The number and frequency of drills was in accordance with the licensee's procedures.

Training records for three fire brigade leaders and five fire brigade members were reviewed by the inspector and found to be satisfactory. The training records for the quarterly classroom brigade training is presently being filed as a general safety training. However, the licensee is to revise the plant procedures to classify the quarterly classroom training as staff training and to classify the training records as permanent plant records. Records for previous fire brigade classroom training are currently stored with other QA/QC type documents and would only have been retained for two years. Initiation of the licensee's proposed action will correct this potential discrepancy.

j. Offsite Fire Protection Drills and Training

The 1980 annual full scale site fire drill was conducted on December 17. The fire departments from the city of Soddy-Daisy with a chief and 12 fire fighters and the city of Chattanooga with a Chief Officer and 5 fire fighers participated. The inspector reviewed the drill critique records and had no further questions.

The licensee conducts an annual training in security, radiation protection, plant fire hazards and fire brigade and fire department interface with plant tour for the Soddy-Daisy and Chattanooga Fire Departments. For 1980, this training was conducted on August 7, 1980, for 22 fire fighters from the Soddy-Daisy Fire Department and on November 6, for 12 fire fighters from the Chattanooga Fire Department.

Except as noted above, no additional violations or deviations were identified, within the areas examined.