TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

May 5, 1981

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

In the Matter of) Docket No. 50-327
Tennessee Valley Authority)

In the TVA/NRC meeting of April 1, 1981, NRC requested that TVA submit a seismic margin program plan and a list of components to be investigated. Enclosed is TVA's program plan for the seismic design margin review of the Sequoyah Nuclear Plant as required by item 2.C(6) of the full power operating license for unit 1.

In September 1981, TVA will get in touch with NRC to discuss the advisability of a TVA/NRC meeting concerning interim progress. The TVA program is expected to be completed and results available for presentation by January 2, 1982.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Sworn to and subscribed before me
this 5th day of May 1981
Paulette H. White
Notary Public
My Commission Expires 9-5-84

Enclosure

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8105120313

ENCLOSURE
SEISMIC DESIGN MARGIN REVIEW PROGRAM
SEQUOYAH NUCLEAR PLANT

Introduction

The TVA seismic evaluation program was presented to the Nuclear Regulatory Commission (NRC) in March 1979. Because of time limitations, NRC was not able to complete its review of all equipment; only mechanical equipment critical to safe shutdown was reviewed and documented. The work completed and the scope of work to be done are discussed for each of the four items of seismic qualification. Items 1 and 2 were completed in 1979, and no further work is anticipated on these items. The TVA program concentrates on item 4, safety-related equipment.

The format of the March 1979 presentation was extremely effective in communicating basic technical information for both NRC and TVA. This presentation consisted of the exchange of technical data, criteria, and engineering rationale directly across the table between TVA and NRC cognizant engineering employees. Copies of technical information such as pertinent criteria, qualification report excerpts, engineering notes, etc., were provided to the NRC representative upon request as the presentation proceeded.

TVA proposes that this same informal technical information exchange format be used for a followup presentation. For obvious reasons, the presentation would be most effective if conducted in the TVA offices in Knoxville.

TVA Program

1. Category I structures - Category I structures have been shown acceptable for seismic loading associated with the 84th percentile site-specific response spectra. This includes the original analyses of Sequoyah Nuclear Plant (SQN) soil-supported structures which reflect a degree of conservatism sufficient to envelope the higher seismic levels associated with the 84th percentile earthquake. No further effort is required.

2. Safety-related piping systems - The reanalysis of selected systems effectively represented a reevaluation of all safety-related piping systems. From a review of all safety-related piping systems, those systems with the highest ratio of stress resulting from combined loads to the corresponding allowable stress were selected for reanalysis to the 84th percentile earthquake. With these most critical systems having been found acceptable, it is reasonable to conclude that the remaining systems are at least equally acceptable.

   The reevaluation of the piping systems and the conclusion that they are acceptable against the 84th percentile earthquake applies equally to all interfaces of the piping systems with safety-related equipment. The piping reevaluation included confirmation that the original criteria for the seismic qualification of the pipe-supported equipment (valves, strainers, etc.) was not exceeded by the 84th percentile earthquake. It was further confirmed that the original criteria for piping systems nozzle loads imposed on floor-mounted equipment such as pumps was not exceeded.

3. HVAC ducting - Because of time limitations, TVA was able to only briefly touch on the consideration of HVAC ducting reevaluation during the March 1979 presentation. The criteria which dictates the

installation and support of the HVAC ducting reflects a degree of conservatism which is more than sufficient to envelope the increased seismic levels of the 84th percentile earthquake. A more detailed discussion to HVAC ducting and duct-mounted equipment will be included in the remaining work for the followup program.

4. Safety-related equipment - The March 1979 evaluation and report to NRC addressed only selected items of mechanical equipment critical to safe shutdown. In the followup program, TVA will continue and expand the presentation of equipment evaluation for 84th percentile earthquake as follows.

   a. Consistent with the original guidelines developed with NRC regarding the scope of this reevaluation effort, the items of equipment to be considered will be limited to TVA-procured, balance-of-plant equipment. It is understood that the NSSS-supplied equipment has been evaluated by NRC with the NSSS vendors on a generic basis.

   b. After review of mechanical equipment listing, TVA will include any critical items which were not covered in the March 1979 presentation.

   c. TVA will provide a thorough presentation of critical Category I instrumentation and electrical equipment qualification to show that it envelopes the 84th percentile earthquake.

   The completion of the TVA program of evaluation of critical items of equipment will provide a sufficient basis to form the engineering conclusion that the seismic qualification of all electrical and mechanical equipment critical to safe shutdown can be shown to be sufficiently conservative to envelope the 84th percentile earthquake.

   Note: Tabulations of safety-related mechanical and electrical equipment to be considered in the reevaluation effort are included in the attached TVA correspondence.

Program Schedule

TVA has committed to complete the equipment reevaluation program by March 1, 1982, as reflected in SQN's operating license. To support this schedule, the following milestones have been established.

1. Interim status - In September 1981, TVA will get in touch with NRC representatives on an informal basis to discuss the progress of the reevaluation and any problems which might have been encountered. The advisability of a TVA/NRC interim meeting will be discussed and scheduled if considered appropriate.

2. Presentation of results - January 2, 1982, has been established as the target date for completing the reevaluation effort. By this date, TVA will get in touch with NRC representatives to coordinate a meeting for the presentation of equipment reevaluation results. A meeting held as soon as possible after this date would leave time to resolve any questions or concerns regarding the presentation of reports.

3. The effort will be completed by March 1, 1982.

UNITED STATES GOVERNMENT ATTACHMENT A1

Memorandum

TENNESSEE VALLEY AUTHORITY

CEB '80 0826 007

TO : Those listed

FROM : R. O. Barnett, Chief, Civil Engineering Branch, W9D224 C-K

DATE : AUG 2 6 1980

SUBJECT: SEQUOYAH NUCLEAR PLANT - SEISMIC REEVALUATION OF SAFETY-RELATED EQUIPMENT

Reference: Supplement No. 2 to the Safety Evaluation Report, NUREG-0011, dated August [illegible], 1980.

As outlined in the reference TVA has committed to reevaluate the seismic qualification of safety-related electrical and mechanical equipment against the more severe 84th percentile earthquake. This effort will include all equipment necessary for decay heat removal. Civil Engineering Branch's (CEB's) Component Qualification Section will be responsible for the technical reevaluation; however, your assistance will be required to accomplish this task in a timely manner.

The pacing item for this effort is, of course, the definition of specific items of electrical and mechanical equipment critical to the decay heat removal process. It is requested that the Nuclear Engineering Branch (NEB) /with necessary support from the Electrical Engineering Branch (EEB)/ provide this detailed list of equipment. In order to provide a timely response to the Nuclear Regulatory Commission (NRC), the requested equipment lists should be provided to CEB's Component Qualification Section by October 15, 1980. If, for any reason this target date cannot be met, advise CEB as to your proposed alternative completion date.

A large portion of this task will be that of retrieving the seismic qualification documentation for each item of equipment from procurement contract files. It is requested that the Mechanical Engineering Branch (MEB) and EEB each designate an individual to coordinate the qualification report retrieval effort among the various procurement organizations.

Any comments or questions concerning the above should be directed to F. H. Coleman at extension 2157.

R. O. Barnett

R. O. Barnett

F. W. Chandler, W8C126 C-K
C. A. Chandley, W10D224 C-K
G. F. Dilworth, W10C126 C-K

ROB:FHC:DCG
cc: MEDS, E4B37 C-K
R. W. Cantrell, 204 GB-K (2)

ATTACHMENT A2

R. O. Barnett, Chief, Civil Engineering B anch, W9D224 C-K

John A. Raulston, Chief Nuclear Engineer, W10C126 C-K

NOV 26 1980

(5)

SEQUOYAH NUCLEAR PLANT - SEISMIC REEVALUATION OF SAFETY-RELATED EQUIPMENT

Reference: Your memorandum to Those listed dated August 26, 1980 (CEB 800826 007)

Your memorandum requested a listing of electrical and mechanical equipment critical to the decay heat removal process as input to the seismic qualification reevaluation program for SQN. The attachment presents a table of safety-related mechanical equipment to be used in defining the extent and detail of the program. This listing includes only major mechanical equipment and does not include NSSS equipment, other than a systems list, according to your guidance. Also, it should be noted that the listing does not individually specify certain components (e.g., valves and dampers) within an identified system.

We are requesting by this memorandum that EEB supply a corresponding listing of major electrical equipment necessary to support the identified mechanical equipment.

More detailed and specific mechanical and electrical equipment lists can be generated, if required.

John A. Raulston

John A. Raulston

RSM:PJB
Attachment
cc (Attachment):
R. W. Cantrell, 204 GB-K (2)
F. W. Chandler, W8C126 C-K - Please provide the electrical equipment list as discussed above.
C. A. Chandley, W10D224 C-K
R. A. Costner, W11D190 C-K
NEDS, E4B37 C-K

E50305.01

System	Component	Drawing
Auxiliary Power	6.9 kV/480V Press Htr Transformers 1A-A	45N234
	" 1B-B	45N234
	" 2A-A	45N234
	" 2B-B	45N234
	480V Distribution Panel Bds for Press Htr 1A-A	
	" 1B-B	
	" 2A-A	
	" 2B-B	
120V AC Vital Control Power	Static Inverter 1-I, 1-II, 1-III, 1-IV	45N230
	" 2-I, 2-II, 2-III, 2-IV	45N230
	Instr. Pwr Bds. 1-I, 1-II, 1-III, 1-IV	45N230
	" 2-I, 2-II, 2-III, 2-IV	45N230
125V DC Vital Control Power	Battery Chargers I & II, spare 1	45N230
	" III & IV, spare 2	45N230
	Transfer Devices for Batt Chargers I & II, (2) spare 1	45N230
	Transfer Devices for Batt Chargers III & IV (2) spare 2	45N230
	Vital Batteries I & II	45N230
	" " III & IV	45N230
	Vital Batt Bd. I & II	45N230
	" " " III & IV	45N230
Electrical Penetrations	High Voltage Power Penetrations	
	Nuclear Instr. System Penetrations	
	Control Rod Pos. Ind Penetrations	
	Low Voltage, Power Control, and Indication Penetrations	
	Thermocouple Penetrations	

System	Component	Drawing
Auxiliary Power	6.9 kV Shutdown Board Logic Panels	45DS7006
	6.9 kV Swgr for New DG	45N728
	6.9 kV Air Interrupter Switch for DG	
	6.9 kV Shutdown Board 1A	45N724-1
	6.9 kV Shutdown Board 1B	45N724-1
	6.9 kV Shutdown Board 2A	45N724-2
	6.9 kV Shutdown Board 2B	45N724-2
	480V Shutdown Board 1A1-A & 2A1-A	45N749-1
	" 1A2-A & 2A2-A	45N749-2
	" 1B1-B & 2B1-B	45N749-3
	" 1B2-B & 2B2-B	45N749-4
	480V Reactor Mov Bd 1A1-A	45N364
	" 1B1-B	45N366
	" 1A2-A	45N364
	" 1B2-B	45N366
	" 2A1-A	45N368
	" 2B1-B	45N370
	" 2A2-A	45N368
	" 2B2-B	45N370
	480V Reactor Vent Board 1A-A	45N380
	1B-B	45N380
	2A-A	45N382
	2B-B	45N382
	480V Control & Auxiliary Bldg Vent Bd 1A1-A	45N383
	" 1B1-B	45N384
	" 1A2-A	45N383
	" 1B2-B	45N384
	" 2A1-A	45N385
	" 2B1-B	45N386
	" 2A2-A	45N385
	" 2B2-B	45N386
	480V Diesel Auxiliary Board 1A1-A	15N216
	" 1A2-A	15N216
	" 1B1-B	15N216
	" 1B2-B	15N216
	" 2A1-A	15N218
	" 2A2-A	15N218
	" 2B1-B	15N218
	" 2B2-B	15N218
	6.9kV/480V Shutdown Board Transformers 1A1-A	45N332
	" 1A-A	45N332
	" 1A2-A	45N332
	" 1B1-B	45N332
	" 1B-B	45N332
	" 1B2-B	45N332
	" 2A1-A	45N332
	" 2A-A	45N332
	" 2A2-A	45N332
	" 2B1-B	45N332
	" 2B-B	45N332
	" 2B2-B	45N332

SEQUOYAH NUCLEAR PLANT

Mechanical Safety-Related Equipment List

System	Component	Drawing
*Main Steam	Isolation Valves	47W801-1
	Safety Valves	47W801-1
	Relief Valves	47W801-1
*SG Blowdown	Isolation Valves	47W801-2
*Main Feedwater	Isolation Valves	47W803-1
*Auxilia Feedwater	Turbine-Driven Pumps	47W803-2
	Motor-Driven Pumps	47W803-2
	Valves	47W803-2
*Chemical Volume and Control	NSSS Supplied	
*Residual Heat Removal	NSSS Supplied	
*Safety Injection	NSSS Supplied (Except Storage Tank	47W811-1)
*Upper Head Injection	NSSS Supplied	
*Containment Spray	Pumps	47W812-1
	Valves	47W812-1
	Heat Exchangers	47W812-1
*Reactor Coolant	NSSS Supplied	
**High Pressure Fire Protection	Pumps	47W832-1
	Valves	47W832-1
	Strainers	47W832-1
*Ice Condenser	Doors and Passive Portion of System which is Required for LOCA	47W814-2
Control Rod Drive	NSSS Supplied	
*Diesels	Generator	D-G Manual
	Engine	D-G Manual
	Coolers	D-G Manual
*Essential Raw Cooling Water (See note 6)	Pumps	47W845-1 & 5
	Valves	47W845-1 to 5
	Traveling Water Screens	47W845-1 & 5
	Screen Wash	47W845-1 & 5
	Strainers	47W845-1
*Control Air	Auxiliary Air Compressors	47W848-1
	After Coolers	47W848-1
	Air Receivers	47W848-1
	Air Dryers	47W848-1
	Filters	47W848-1
	Valves	47W848-1
*Diesel Starting Air	Motors	47W839-1
	Compressors	47W839-1
	Tanks	47W839-1
	Filters	47W839-1
	Valves	47W839-1
***Auxiliary ERCW	Pumps	47W845-1
	Towers & Fans	47W845-1
	Traveling Screens & Screen Wash	47W845-1
	Valves	47W845-1

System	Component	Drawing
*Standby Diesel Oil	7-Day Tanks	47W840-1
	Day Tanks	47W840-1
	Motor-driven Pumps	47W840-1
	Engine-driven Pumps	47W840-1
	Injectors	47W840-1
	Filters	47W840-1
	Valves	47W840-1
*Spent Fuel Pool Cooling	NSSS Supplied	
*Component Cooling Water	Pumps	47W859-1
	Heat Exchangers	47W859-1
	Surge Tanks	47W859-1
	Valves	47W859-1 to 4
	Seal Leakage Return Pumps	47W859-1
	Thermal Barrier Booster Pumps	47W859-2
*Main Control Room A/C	See Note 1	47W865-3
*480-V Bd. Room A/C	See Note 1	47W865-6
*Elec. Bd. Room A/C	See Note 1	47W865-7
*Shutdown Bd. Room A/C and Ventilation	See Note 1	47W866-8
Air Return System		47W866-3
	*Air Return Fans	47W866-1
	Hydrogen Recombiners	47W866-1
	*Dampers	47W866-1
*480-V Transformer Rm Ventilation	Exhaust Fans	47W866-3
	Intakes	47W866-3
	Dampers	47W866-3
*Vital Battery Rm Ventilation	Exhaust Fans	47W866-3
	Dampers	47W866-3
Emergency Gas Treatment System	Fans	47W866-1
	Filters	47W866-1
	Heaters	47W866-1
	Demister	47W866-1
Aux Bldg Gas Treatment System	Fans	47W866-10
	Filters	
	Heaters	
	Dampers	
	Vacuum Relief	
	Demister	
*Turbine-driven Aux. Feed Ventilation	Fans	47W866-2
	Dampers	47W866-2
Aux. Bldg. Secondary Containment	Dampers	47W866
*Control Bldg. Ventilation (Pressurization, Emerg. Pressurization, Air Cleanup, Battery Exhaust)	Fans	47W866-4
	Dampers	47W866-4
	Filters	47W866-4
	Fire Dampers	47W866-4
Waste Disposal System	NSSS Supplied	

System	Component	Drawing
*Diesel Bldg. Ventilation (See Note 5)	Fans	47W866-9
	Dampers	47W866-9
Reactor Bldg. Purge	Fans	47W866-1
	Filters	47W866-1
	Dampers	47W866-1
	Valves	47W866-1
*Safety Feature Equipment Coolers (Serves RHR, SIS, CCS, EGTS, Boric Acid Transfer, CSS, AFW, SFPCS, and Centrifugal Charging Pumps and Pipe Chases and Penetration Rooms)	Air Handling Units	47W845-4
	Dampers	47W866-8
**Flood Mode Boration and Makeup (See Note 2)	Pumps	47W809-7
	Tank	47W809-7
	Valves	47W809-7
Containment Vaccum Relief	Valves	47W866-1

Miscellaneous

Cat. I Crans
Fuel Transfer Tube
Fuel Transfer Conveyor
New and Spent Fuel Racks
Pressure Confining Doors
Watertight Doors and Seals
RHR Sump Manways and Seals
ERCW Personnel Access Doors and Seals
Containment Personnel Access Doors and Seals
Missile Barriers for A/C Enclosures
Aux. Bldg. RR Access Hatches and Seals
Containment Equipment Access Hatch and Seal
Escape Hatches and Seals
Shield Door and Enclosure
*Seal Between Ice Condenser and Containment Vessel
Railroad Access Doors
Spent Fuel Pit Bridge Crane
Manipulator Crane
*CCW Discharge Gates and Hoists

Note 1: The total system should be included; i.e., AHU's, chillers, valves, fans, dampers, filters, pumps, compressors, condensers, etc.

Note 2: Only a limited seismic requirement is applicable to this system.

Note 3: The listing does not include containment isolation valves in nonsafety-related systems. These valves are also safety-related.

Note 4: This list does not include monitoring equipment for radiation and neutron flux, nor does it include the reactor protection system.

Note 5: The CO_2 and lube oil ventilation, fuel oil transfer room exhaust, corridor and toilet room ventilation, and unit heaters do not perform a primary safety function.

Note 6: This includes the ERCW pumps, valves, strainers, and traveling water screens at the intake pumping station, as well as the ERCW intake station, until the barge impact concern for the ERCW intake station is resolved. This equipment at the intake pumping station may be necessary if there is barge impact of the ERCW intake station. However, barge impact need not be considered simultaneous with a seismic event.

*Needed for decay heat removal.

**Needed for decay heat removal only in event of a flood.

***Needed for decay heat removal only in event of fire-caused loss of the cables for ERCW intake prior to completion of ECN L5298.

ATTACHMENT A3

TVA 38 (08-80)

UNITED STATES GOVERNMENT

Memorandum

FEB '81 0226 927

TENNESSEE VALLEY AUTHORITY

TO : R. O. Barnett, Chief, Civil Engineering Branch, W9D224 C-K
J. A. Raulston, Chief Nuclear Engineer, W10C126 C-K

FROM : F. W. Chandler, Chief, Electrical Engineering Branch, W8C126 C-K

DATE : February 26, 1981

8103050417

SUBJECT: SEQUOYAH NUCLEAR PLANT
SEISMIC REEVALUATION OF SAFETY-RELATED EQUIPMENT

Refer to J. A. Raulston's memorandum to R. O. Barnett dated November 26, 1980 (NEB 801126 252), concerning Balance of Plant (BOP) equipment to undergo seismic reevaluation as a result of Safety Evaluation Report (SER) requirement.

The referenced memorandum requested the Electrical Engineering Branch to supply a listing of major electrical equipment necessary to support the mechanical equipment identified in the reference. The major BOP electrical equipment is shown on the attached list. Not listed are motors since they are considered part of the driven equipment for seismic evaluation purposes and are assumed to be listed with the driven equipment.

All BOP safety related instruments are included in one of the three following categories:

1. Main Control Panel Mounted
2. Local Panel (rack) Mounted
3. In-line Mounted

Per discussions between CEB's F. H. Coleman and our B. O. Buchanan, no further detailed listing is necessary for the instrumentation.

F. W. Chandler

DPB:JM
Attachment
cc: R. W. Cantrell, 204 GB-K
MEDS, E4B37 C-K