



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Docket No. 50-328

March 11, 1988

Mr. S. A. White  
Manager of Nuclear Power  
Tennessee Valley Authority  
6N 38A Lookout Place  
1101 Market Street  
Chattanooga, Tennessee 37402-2801

Dear Mr. White:

SUBJECT: PRELIMINARY SAFETY EVALUATIONS ON THE TENNESSEE VALLEY AUTHORITY  
EMPLOYEE CONCERN ELEMENT REPORTS

Re: Sequoyah Nuclear Plant, Unit 2

This letter forwards our preliminary Safety Evaluations (SEs) on the Tennessee Valley Authority's (TVA) element reports submitted as part of the Employee Concern Special Program (ECSP). These SEs will be published in the near future as NUREG-1232, Volume 2, Part 2. Our SE on the programmatic aspects of the ECSP was transmitted to you in a letter dated October 6, 1987. The staff will address the element reports for Sequoyah, Unit 1 in a future licensing action.

TVA has divided all the employee concerns in the ECSP into the nine functional categories listed in Table 1 and has determined that about 1100 of the more than 5000 employee concerns in the ECSP have a direct or generic relationship to Sequoyah with about 500 of these concerns to be potentially safety related or safety significant. The staff's preliminary SEs contained in Enclosure 2, and listed in Table 2, cover the Sequoyah employee concern issues which the staff has considered restart items required to be resolved before the restart of Sequoyah, Unit 2. These SEs are for the first six categories listed in Table 1. The preliminary SEs in the Quality Assurance and Welding categories contain the staff's evaluation of all employee concerns related to Sequoyah, Unit 2 (i.e., both restart and non-restart related concerns) due to the methods utilized by the staff to review these two categories.

TVA's evaluations of the employee concerns in categories 7 and 8, Industrial Safety and Management and Personnel, respectively, concluded that there were no safety-related concerns in these categories. The staff has reviewed categories 7 and 8 separately and found TVA's response acceptable. The staff's SEs for these two categories were forwarded in letters dated August 24, 1987 (Industrial Safety) and December 14, 1987 (Management and Personnel). Employee concerns in category 9, Intimidation, Harassment and Wrongdoing were removed from the ECSP and assigned to the TVA Office of the Inspector General (OIG) for evaluation. The staff's evaluation of OIG's resolution of these employee concerns is contained in a letter dated October 8, 1987.

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Based on the enclosed SEs, the staff concludes that TVA has sufficiently resolved the restart employee concerns in the ECSP to support the restart of Sequoyah, Unit 2. There are a number of confirmatory items contained in the preliminary SEs that are summarized in Table 3. The staff considers these to be non-restart issues and expects that they will be resolved shortly after the restart of Sequoyah, Unit 2.

Sincerely,

Original Signed by  
Gary G. Zech, Assistant Director  
for Projects  
TVA Projects Division  
Office of Special Projects

Enclosures:

- 1. Tables 1, 2 and 3
- 2. Preliminary Safety Evaluations on Employee Concern Element Reports

cc w/enclosures:  
See next page

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Mr. S. A. White  
Tennessee Valley Authority

Sequoyah Nuclear Plant

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ENCLOSURE 1

Table 1	Employee Concern Functional Categories
Table 2	TVA Employee Element Reports Evaluated in Enclosure 2
Table 3	Employee Concern SE Confirmatory (Non-Restart) Issues

TABLE 1

EMPLOYEE CONCERN FUNCTIONAL CATEGORIES

1. Construction - Concerns related to the adequacy of: construction practices; the quality of as-constructed facilities (excluding welding and as-designed features); instorage and installed maintenance prior to turnover to Operations; measuring, test, and handling equipment used during construction; and construction testing activities.
2. Engineering - Concerns related to the adequacy of the design process and the as-designed plant features. The design process is the technical and management process which commences with the identification of design inputs and leads to and includes the issuance of the design output documents.
3. Material Control - Concerns related to the adequacy of materials including their procurement, receipt, handling, storage, and to the controlling procedures.
4. Operations - Concerns related to operational activities including: operator qualifications, maintenance, security, health physics and ALARA implementation, and preoperational and surveillance testing.
5. Quality Assurance/Quality Control - Concerns related to the adequacy of QA/QC programs and procedures [e.g., document control, records, deficiency reporting and corrective action, inspection (except for NDE and weld inspection), auditing] and the training, qualification, and certification of QA/QC personnel.
6. Welding - Concerns related to any aspect of welding including welder or weld procedure qualification, weld inspection/nondestructive examination (NDE), heat treatment, weld quality, filler material quality and weld documentation. Welding QA/QC programmatic concerns shall be addressed in the QA/QC category.
7. Industrial Safety - Concerns related to the working environment and controls which protect the health and safety of employment in the workplace (excluding health physics and ALARA).
8. Management and Personnel - Concerns related to the adequacy of policies, management attitude and effectiveness, organization structures, personnel management, and personnel training and qualifications, except those covered by the QA/QC category.
9. Intimidation, Harassment and Wrongdoing - Concerns related to personnel conduct which interferes with an employee's ability to fulfill his/her assigned responsibility, actions taken against employees for fulfilling their assigned responsibility, and illegal activities or violations of TVA policies and regulations.

TABLE 2

## TVA EMPLOYEE ELEMENT REPORTS EVALUATED IN ENCLOSURE 2

CATEGORY	ELEMENT REPORT NUMBER	ISSUE
CO	10505	ELECTRICAL CONTROL CABINETS
CO	10900	CABLE INSTALLATION PROBLEMS
CO	11103	SNUBBERS/HANGERS INSTALLATION PROBLEMS
CO	11106	HANGER INSPECTION DOCUMENTATION
CO	11203	POOR PLANNING COORDINATION
CO	11206	UNAUTHORIZED/UNDOCUMENTED WORK
CO	11301	DESIGN OF BASE PLATES
CO	11305	ANCHORS CUT OFF
CO	11306	TESTING OF ANCHORS
CO	15102	ELECTRICAL PENETRATIONS
CO	15109	INSTRUMENT TUBING DAMAGE
CO	17101	VALVES INCORRECTLY INSTALLED
CO	17105	PIPE FITTINGS
CO	17301	INSTRUMENT LINE SLOPE
CO	17303	INSTRUMENT LINE CLAMPS
CO	17304	COMPRESSION FITTINGS
CO	19101	USE OF GALVANIZED JUNCTION BOXES
CO	19201	CONDUIT ISSUES
CO	19203	CONDUIT FITTINGS WERE ALUMINUM
EN	20101	REGULATORY REQUIREMENTS NOT FOLLOWED
EN	20103	DESIGN CRITERIA NOT UTILIZED
EN	20104	STANDARDS/GUIDES INPROPERLY USED
EN	20105	TRACKING OF COMMITMENTS AND DESIGN CHANGES
EN	20106	TRACEABILITY OF DESIGN REQUIREMENTS
EN	20303	TRACKING SYSTEM FOR COMMITMENT INADEQUATE
EN	20401	ORGANIZATION STRUCTURE
EN	20402	SYSTEM DESIGN RESPONSIBILITY
EN	20403	DESIGN RESPONSIBILITY FIELD VS. OFFICE
EN	20404	DESIGN DOCUMENT COMPLETENESS
EN	20405	DESIGN REVIEW PROCESS
EN	20406	ECN PROCESS
EN	20409	USE OF REVERSE PRINT
EN	20501	CALCULATION PREPARATION REQUIREMENTS
EN	20502	CALCULATION CONTROL & INTERFACE REQ
EN	20503	CALCULATION RECORDS RETENTION
EN	20504	VERIFICATION OF COMPUTER CODES
EN	20601	AS-BUILT INACCURACIES
EN	20702	SAFETY AND LICENSING EVALUATIONS
EN	20704	DEVIATION IN CAQ DOCUMENTATION
EN	20801	HUMAN FACTORS REVIEW PROGRAM
EN	20901	Q-LIST DIFFERENCES
EN	20902	IMPACT OF Q-LIST DIFFERENCES
EN	21001	INSTRUMENTS IN HARSH ENVIRONMENT
EN	21002	INADEQUATE EQ OF ELECTRICAL AND I&C
EN	21301	INADEQUATE AC & DC PROCEDURES
EN	21302	INADEQUATE ELECTRICAL PROCEDURES
EN	21303	INADEQUATE ELECTRICAL DESIGN CRITERIA
EN	21304	ELEC. PROC. DO NOT IDENTIFY IEEE PROC.

TABLE 2 (CONTINUED)

CATEGORY	ELEMENT REPORT NUMBER	ISSUE
EN	21501	SEISMIC CRITERIA
EN	21502	CUT REBAR CONTROL
EN	21506	HANGER LOADS ON STRUCTURES
EN	21509	STRUCTURAL STEEL CONNECTION DESIGN
EN	21510	FEEDWATER HEATER MONORAIL DESIGN
EN	21801	THERMAL ANALYSIS OF PIPING <120 F
EN	21804	PIPE STRESS CALCULATIONS
EN	21807	PIPE STRESS A/C FOR OVERLAP AREAS
EN	22001	HANGER AND BOX ANCHOR DRAWINGS INADEQ.
EN	22003	SEISMIC DESIGN OF SUPPORTS
EN	22011	TEMP. VAR. EFFECTS ON PIPE/HANGER CALC.
EN	22102	ZERO PERIOD ACCELERATION NOT ANALYZED
EN	22106	OBSERVED BENDING OF PIPE CLAMP EARS
EN	22110	SUPPORT OF UPPER HEAD INJECTION SYS.
EN	22202	BOX ANCHORS WITH EXCESSIVE WELDING
EN	22203	DRAWINGS DO NOT SHOW WELD SIZE
EN	22205	BOLTS REPLACED BY WELDS
EN	22206	AISC MINIMUM WELD CRIT. NOT FOLLOWED
EN	22301	INSTRUMENT LINE SUPPORT CONNECTIONS
EN	22302	INSTRUMENT MOUNTING BRACKETS
EN	22303	LOCAL INSTRUMENT SEISMIC QUAL.
EN	22405	SUPPORT OF CABLES IN SPREADING ROOM
EN	22500	BATTERY SUPPORT DESIGN
EN	22600	DESIGN OF LIGHTING FIXTURE SUPPORTS
EN	22800	UNISTRUTS USED IMPROPERLY
EN	22901	ORIFICE PLATES SIZED IMPROPERLY
EN	22902	CONTAMINATION RESULTING FROM OPEN DRAINS
EN	22905	CONTROL AIR SYSTEMS ADEQUACY
EN	22908	CHILLED WATER SYSTEM LEVEL SWITCHES
EN	22911	RADIATION MONITORING INADEQUATE
EN	23001	FIRE DAMPING LATCHING TEST FAILED
EN	23005	AIRBORNE RADIOACTIVITY IN CDWE BLDG
EN	23101	FIRE PROTECTION PIPING ISSUES
EN	23104	LACK OF FIRE DAMPERS IN D/G BLD
EN	23105	BATTERY ROOM VENTILATION SYSTEM DESIGN
EN	23106	FIRE PROTECTION QA DOCUMENTS
EN	23203	IMPROPER PIPING INSULATION MATERIAL
EN	23206	RUBBER GASKET DETERIORATION
EN	23208	CRITERIA FOR MIN PIPE WALL THICKNESS
EN	23502	EXPOSED 480V SHUTDOWN BOARDS
EN	23508	PLASTIC CONDUIT USED INSIDE CONTAINMENT
EN	23511	CONTROL SWITCH MALFUNCTIONS
EN	23701	THERMAL OVERLOAD PROTECTION
EN	23702	BREAKERS UNACCEPTABLY SET
EN	23704	BYPASS OF OVERTORQUE LIMIT SWITCHES
EN	23801	CONDUIT OVERFILL & CABLE DAMAGE
EN	23803	CABLE TRAY OVERFILL
EN	23900	CABLE ROUTING PROBLEMS

TABLE 2 (CONTINUED)

CATEGORY	ELEMENT REPORT NUMBER	ISSUE
EN	24000	CABLE DERATING AND AMPACITY
EN	24101	INADEQUATE CABLE SPLICING
EN	24102	CRIMPING CONDUCTORS LOWERS CURRENT CAPACITY
EN	24103	NO MEGGER TEST ON LOW VOLTAGE CABLES
EN	24104	AMPHENOL CONNECTORS ON D/G
EN	24105	WIRE CORROSION IN PENETRATION
EN	24200	INADEQUATE ELECTRICAL SEPARATION
EN	24300	INADEQUATE D/G MARGIN
MC	40206	MATERIAL PROCUREMENT POLICY
MC	40301	VALVE SUBSTITUTIONS
MC	40302	CRACKED PRESSURIZER VALVE
MC	40307	SCRAP MATERIAL USED IN PLANT
MC	40703	HEAT CODE AS RELATED TO MATERIAL CONTROL
MC	40705	QUALITY RECEIVING UNIT
OP	30101	KEROTEST VALVE LEAKAGE/CORROSION
OP	30102	D/G RELIABILITY PROBLEMS
OP	30107	CONTAINMENT SUMPS MAY BE CLOGGED BY PAINT
OP	30115	EQUIPMENT IN FIELD IDENTIFIABLE
OP	30201	RAYCHEM HEAT SHRINKABLE TUBING
OP	30202	D/G LOW VOLTAGE PROBLEMS
OP	30206	TRANSFER CANAL ELECTRICAL EQUIPMENT
OP	30302	CALIBRATION OF LEVEL TRANSMITTERS
OP	30303	TARGET ROCK VALVES AND RMS ACCURACY
OP	30305	RELIABILITY AND MAINTENANCE OF RMS
OP	30401	PROCEDURE PROBLEMS WITH ELECTRICAL EQUIPMENT
OP	30402	ELECTRICAL PENETRATION BREACHED IMPROPERLY
OP	30403	ELECTRICAL MANHOLE PROBLEMS
OP	30601	FIRE DOOR LEFT OPEN
OP	30701	PLANT OPERATIONS REVIEW COMMITTEE
OP	30704	WORKPLAN PROCESSING PROCEDURES
OP	30705	SURVEILLANCE PROGRAM/INSTRUCTIONS
OP	30706	TEST PROCEDURE/PROGRAMS
OP	30707	RADIOLOGICAL EMERGENCY PLAN
OP	30708	TRAINING PROGRAM FOR EMPLOYEES
OP	30711	MGMT NON-RESPONSIVE & CHEMISTRY ISSUES
OP	30713	CONFIGURATION CONTROL
OP	30802	PREVENTIVE MAINTENANCE IN VENDOR MANUALS
OP	30803	CORRECTIVE MAINTENANCE
OP	30804	MAINTENANCE PROGRAMS/PROCEDURES NOT FOLLOWED
OP	30806	SUBJOURNEYMAN DOING JOURNEYMAN TASKS
OP	30807	CLAM CONTROL PROGRAM
OP	30901	REPLACEMENT OF TEFLON TAPE
OP	30905	SHIFT TECHNICAL ADVISOR TRAINING
OP	31001	OPERATION PROGRAM/PROCEDURES INADEQ
OP	31002	OPERATOR QUALIFICATIONS
OP	31101	HEALTH PHYSICS STAFF TRAINING



TABLE 2 (CONTINUED)

CATEGORY	ELEMENT REPORT NUMBER	ISSUE
QA	80000	GENERAL MANAGEMENT AND POLICY
QA	80101	QA PROGRAM ADEQUACY
QA	80102	QA INDEPENDENCE AND AUTHORITY
QA	80104	QA MANAGEMENT PERFORMANCE
QA	80201	INSPECTION CRITERIA
QA	80202	INSPECTION PROCEDURES
QA	80203	INADEQUATE INSPECTIONS
QA	80205	INSPECTION PROGRAM SCOPE
QA	80303	QA PERSONNEL-PERSONNEL TRAINING
QA	80401	NONCONFORMANCE REPORTING
QA	80402	PREVENTED REPORTING QA DEFECTS
QA	80404	PROGRAM IMPLEMENTATION
QA	80501	NO ACCEPTANCE CRITERIA FOR INST MOUNTINGS
QA	80503	DOCUMENT DISTRIBUTION CONTROL
QA	80504	QA RECORDS

THESE EMPLOYEE CONCERNS WERE NOT EXPLICITLY ADDRESSED BY TVA IN THEIR ELEMENT REPORTS. THE STAFF WAS ABLE TO FIND THE NECESSARY INFORMATION IN VARIOUS TVA REPORTS.

CATEGORY	EMPLOYEE CONCERN NUMBER	ISSUE
OP	XX-85-093-004	GASSING OF CURRENT TRANSFORMERS
OP	SQP-85-004-007	POLAR CRANE
CO	PH-85-003-003	WIRE TERMINATIONS

TABLE 2 (CONTINUED)

CATEGORY	ELEMENT REPORT NUMBER	ISSUE
WE	I-85-135-SQN	WELDER CERT. UPDATED IMPROPERLY
WE	I-85-346-NPS	QC HOLDPOINT SIGNOFF VIOLATION
WE	I-85-373-NPS	DOC.OF REQ. OJT FOR NDE PERSONNEL
WE	I-85-560-SQN	BOX HANGER WELD DESIGN DEFICIENCY
WE	I-85-636-SQN	DRAVO ASME CLASS SPOOL PIECE
WE	I-85-652-SQN	SNQ WELD INSP. NOT AS STRICT AS WBN
WE	I-85-735-SQN	NDE INSPECTORS CANNOT WRITE NOTICE
WE	I-85-738-SQN	ACCEPTANCE OF PREV. REJECTED NDE ITEMS
WE	I-85-750-SQN	PERFORMANCE OF REMOTE VISUAL INSP.
WE	I-85-756-SQN	IMPROPER WELD ROD USED IN D/G BUILD
WE	I-85-776-SQN	SOCKET WELDS NOT INSPECTED
WE	I-86-115-SQN	WELDER INCAPABLE OF MAKING PROPER WELDS
WE	WP-01-SQN	ASME WELDING MC, TRACEABILITY, ETC.
WE	WP-02-SQN	INSPECTION OF WELDS THROUGH PAINT
WE	WP-03-SQN	WELDER PERFORMANCE QUAL. CONTINUITY
WE	WP-04-SQN	AVAILABILITY OF WELD INSPECTION TOOLS
WE	WP-05-SQN	DUCT INSTALLATION AND DOCUMENTATION
WE	WP-06-SQN	WELDING INSPECTORS NOT QUALIFIED
WE	WP-07-SQN	WELDER TRAINING PROGRAM INADEQUATE
WE	WP-08-SQN	PAINTING REQ. RELATED TO WELDS
WE	WP-09-SQN	WELD INSPECTION CRIT. USED AT SNQ
WE	WP-10-SQN	SNQ IMPLEMENTATION OF WELD PROGRAM
WE	WP-11-SQN	SURFACE GRINDING OF WELDS
WE	WP-12-SQN	WELDING ELECTRODE QUALITY
WE	WP-13-SQN	SUITABILITY OF WELDING EQUIPMENT
WE	WP-14-SQN	TWO ADMINISTRATIVE POLICY CONCERNS
WE	WP-15-SQN	DESIGN CONSIDERATIONS ON BOX ANCHORS
WE	WP-16-SQN	PERFORMANCE OF PREWELD INSPECTIONS
WE	WP-17-SQN	VENDOR WELD QUALITY
WE	WP-18-SQN	EFFECTS OF LAMINATIONS ON WELD QUALITY
WE	WP-19-SQN	WBN CONCERNS W/NO GENERIC APPLIC. TO SNQ
WE	WP-20-SQN	UNDERSIZED SOCKET WELDS ON THE SI SYSTEM
WE	WP-21-SQN	WELD MATERIAL SUBSTITUTION AND QUALITY
WE	WP-22-SQN	INADEQUATE WELD PROCEDURE
WE	WP-23-SQN	CONTROL OF UNUSED WELD MATERIAL
WE	WP-24-SQN	IMPROPER WELDING CERTIFICATION
WE	WP-25-SQN	IMPROPER WELD REPAIR
WE	XX-85-013-001	WELD FILLER MATERIAL
WE	XX-85-088-003	ALTERED WELDERS CERTIFICATION
WE	XX-85-100-001	IMPROPERLY REPAIRED WELDS
WE	XX-85-101-006	WELDER CERTIFICATION NOT PROPER

TABLE 3

EMPLOYEE CONCERN SE CONFIRMATORY (NON-RESTART) ISSUES

- I. For the following element numbers, the staff will confirm as a post-restart activity, that the restart corrective actions agreed upon by TVA have been completed properly.

CO 11103  
CO 11203  
CO 17105  
CO 17303  
CO 17304  
CO 19203  
EN 21303  
EN 22303  
EN 22600  
EN 23511  
EN 24101  
EN 24200  
WE I-85-373-NPS

- II. For the following element numbers, the staff's review of the Sequoyah Nuclear Performance Plan (to be published as NUREG-1232, Volume 2, Part 1) will resolve the remaining non-restart items. Section references are provided.

CO 11301, Section 2.3.2  
CO 11305, Section 2.3.2  
CO 17301, Section 3.4.1  
EN 21301, Section 2.3.3  
EN 21801, Section 2.4  
EN 21804, Section 2.4  
EN 24300, Section 2.3.3

- III. For the following element numbers, the staff will resolve the remaining non-restart issues as part of the employee concern program review.

EN 20601 - Contingent on the acceptability of the Independent Design Inspection effort.

EN 21801 - Contingent on the acceptability of the Independent Design Inspection effort.

EN 23101 - Adequacy of the welding of sprinkler system piping.

EN 23104 - Discrepancies between TVA general design criteria and actual design of the number 5 D/G fire dampers.

EN23702 - Fuse size selection for fifth D/G.

- EN 23900 - Contingent on the acceptability of the Independent Design Inspection effort.
- OP 30803 - Welding practices on non-safety related equipment.
- OP 30901 - Replacement program for teflon tape.
- WE WP-24-SQN - TVA should establish that all welders transferring from other TVA facilities to Sequoyah did meet code requirements for welding performance qualifications.

ENCLOSURE 2

PRELIMINARY  
SAFETY EVALUATIONS  
ON THE  
TENNESSEE VALLEY AUTHORITY  
EMPLOYEE CONCERN ELEMENT REPORTS  
FOR THE  
SEQUOYAH UNIT 2 RESTART EFFORT

SEQUOYAH NUCLEAR POWER PLANTS, UNITS 1 AND 2  
SAFETY EVALUATION REPORT FOR EMPLOYEE CONCERNS

I. Subject

Category: Construction  
Subcategory: Deterioration of Permanent Facilities (10500)  
Element: Electrical Control Cabinets as Related to Construction  
Employee Concerns: OW-85-007-010

The basis for Element Report C010505-SQN, Rev. 2, dated October 9, 1986, is Sequoyah Employee Concern OW-85-007-010 which states:

"Electrical control cabinets have been contaminated by construction dirt and metal grindings. This contamination entered the panels through the cooling vents on the top of the panels. This is a plant wide problem, because of the heavy build-ups of dust and metal particles that have been allowed to accumulate on top of equipment. This could cause the contactor or other components to deteriorate and blow out or become inoperative. A specific location given is Auxiliary Building, 757 ft. elevation, unit unknown."

II. Summary of Issue

The problem as defined by TVA is that the electrical control cabinets were contaminated by excessive dust and metal grindings, were not being properly protected nor cleaned, and the dust would adversely affect plant operation by causing contactors and other electrical components to blow out or become inoperative.

III. Evaluation

TVA conducted visual inspections of installed electrical control cabinets in the auxiliary, turbine and control buildings. Discussions were held with electrical maintenance personnel to determine if they were aware of any dust/metal grindings on or inside electrical control cabinets. The discussions with electrical personnel revealed that they do not feel dust or metal grindings on or inside the control cabinets to be a problem. Some dust was observed on the outside of some of the cabinets. No dust was observed on the inside of cabinets and metal grindings were not observed anywhere.

TVA reviewed Standard Practice SQA66, Revision 9, and concluded that paragraphs 4.0.6, 4.0.7, and 4.2, Sections E and F adequately addressed the accumulation of dust, foreign materials, and moisture on the inside and outside of electrical boards, panels, and cabinets.

#### IV. Conclusion

The results of TVA's investigation of the concern for dust/metal grindings in electrical control cabinets indicates that it is not a problem at Sequoyah. The NRC staff agrees with TVA's conclusion and resolution of the concern is described in Element Report C010505-SQN.