

**TENNESSEE VALLEY AUTHORITY**

KNOXVILLE, TENNESSEE 37902

400 West Summit Hill Drive, E3A8

November 29, 1985

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

Dear Mr. Denton:

Your letter to W. F. Willis dated September 26, 1985, requested copies of investigation reports and related documents dealing with potentially safety-related employee concerns on TVA's nuclear plants. Copies of the requested information as outlined in TVA's October 7, 1985, letter are enclosed and cover the period of November 22, 1985 through November 28, 1985. TVA has previously submitted copies of the requested information through November 21, 1985. We are also enclosing computer summaries of the information which we have transmitted to date.

The column labeled "Date Invest Closed" on the enclosed computer printout has been changed from "Date Closed" to clarify the meaning of the listed dates. These dates mean that either no corrective actions were deemed necessary, or that NSRS and the line organization have arrived at a mutually agreeable course of corrective action. Therefore TVA considers the investigation closed. We hope this clarifies any confusion over the meaning of this information.

If you have questions concerning the material transmitted, please contact M. S. Kidd or B. F. Siefken at FTS No. 856-2289 or 856-6230, respectively.

Sincerely,



K. W. Whitt  
Director, Nuclear Safety  
Review Staff

8512030628 851129  
PDR ADOCK 05000259  
P PDR

**Enclosures**

**cc (Enclosures):**

Mr. James M. Taylor, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. J. Nelson Grace  
Regional Administrator  
U.S. Nuclear Regulatory Commission, Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30323

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TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT  
EMPLOYEE CONCERN PROGRAM  
NUCLEAR REGULATORY COMMISSION LISTING

QTC NUMBER	SUBJECT	INVEST ORG	DATE REPORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	
** MILESTONE:									
IN-85-160-001	UNREPORTED FIRE	NSRS	11/07/85	.F.	/ /		11/12/85	CONSTR	TI 1
WI-85-084-001	WELDER CERTIFICATION	ERT	11/12/85	.T.	/ /		11/12/85	WELDING	1
** Subtotal **									
2									
** MILESTONE: 1 FUEL LOAD									
EX-85-003-003	UNAUTH CHNG TO WDREC	ERT	07/09/85	.T.	07/24/85	T	07/24/85	WELDING	1
EX-85-049-001	NO SECURITY BARRIER	NSRS	10/17/85	.T.	/ /		/ /	SECURITY	1
IN-85-001-003	WELDS UNDER WATER	ERT	07/10/85	.T.	09/23/85	T	09/23/85	WELDING	1
IN-85-010-002	VIOLATION OF 050 NTS	NSRS	11/22/85	.T.	/ /		/ /	HANGERS	1
IN-85-012-X02	TENSILE STRNG OF FIT	NSRS	08/05/85	.T.	/ /		08/05/85	MATERIAL	1
IN-85-018-004	SUPV NOT FOLLOW PROC	NSRS	11/14/85	.T.	/ /		11/20/85	ELECTRICAL	1
IN-85-021-X05	WELDER CERTIF FALSIF	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-024-001	DRWNS & 050 NOTES	NSRS	07/03/85	.T.	/ /		/ /	HANGERS	1
IN-85-031-001	ENBD PLTS NOT CORREC	ERT	08/20/85	.T.	11/18/85		/ /	DESIGN	1
IN-85-037-001	CONCRETE ANCHORS	ERT	07/09/85	.T.	09/11/85	F	/ /	CIVIL	1
IN-85-038-001	ANALYS OF LARGE PIPE	ERT	07/08/85	.T.	09/05/85	T	09/05/85	DESIGN	1
IN-85-039-001	THML STRS ON PIPING	ERT	07/09/85	.T.	09/05/85	T	09/05/85	DESIGN	1
IN-85-039-002	STRES&SUPPRT LD PROB	ERT	11/08/85	.T.	/ /		11/12/85	DESIGN	1
IN-85-052-001	DRWNGS & 050 NOTES	NSRS	07/03/85	.T.	07/30/85	F	/ /	HANGERS	1
IN-85-088-001	VACUP TEST ON DOORS	ERT	07/09/85	.F.	/ /		07/09/85	TESTING	1
IN-85-091-X02	NO NCR FOR LOST DOCU	ERT	08/26/85	.T.	/ /		10/03/85	DOCUMENT	1
IN-85-130-002	FIRE SEALS BREACHED	ERT	07/05/85	.T.	09/13/85	T	09/13/85	CONSTRUCTI	1
IN-85-134-001	CRIT NOT MET/IDSS WL	NSRS	11/22/85	.F.	/ /		11/22/85	QA	1
IN-85-169-001	SYS 62 VALVE CLASS	ERT	07/10/85	.T.	07/26/85	T	07/26/85	MATERIAL	1
IN-85-202-001	CRACK IN WELD	ERT	07/10/85	.T.	/ /		07/09/85	WELDING	1
IN-85-207-002	USE OF FISH TAPE	NSRS	11/22/85	.T.	/ /		/ /	ELECTRICAL	1
IN-85-251-002	MAINT WITHOUT NCR	NSRS	10/31/85	.F.	/ /		/ /	QA	1
IN-85-260-003	WELD DOCUMNTATION	ERT	10/07/85	.F.	/ /		/ /	WELDING	1
IN-85-311-000	CR ENTRANCE FIREDOOR	ERT	08/19/85	.T.	09/24/85	T	10/10/85	OPERATIONS	1
IN-85-325-006	VALV CONT/OPER TRAN	NSRS	10/01/85	.F.	/ /		10/04/85	OPERATIONS	1
IN-85-393-003	FSAR REQ FOR SUPERV	NSRS	07/03/85	.T.	11/25/85	T	11/27/85	OPERATIONS	1
IN-85-406-001	UNAUTH CHNG TO WDREC	NSRS	07/09/85	.T.	07/24/85	T	07/24/85	WELDING	1
IN-85-413-001	"050"NOTES	NSRS	08/09/85	.T.	/ /		08/04/85	HANGERS	1
IN-85-424-011	INADEQ UPDT WELD CER	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-424-X13	FALSIF WELDER CERTIF	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-439-003	INADEQ CRAFT SUPV	NSRS	10/30/85	.F.	/ /		10/30/85	CONSTRUCTI	1
IN-85-445-008	PROC DIFFICULT TO KN	NSRS	10/23/85	.F.	/ /		10/30/85	CRAFT	1
IN-85-445-010	EYE TEST INADEQUATE	NSRS	10/28/85	.T.	/ /		/ /	INSPECTION	1
IN-85-445-013	47-050 HARD TO USE	NSRS	10/10/85	.T.	/ /		10/16/85	HANGERS	1
IN-85-457-001	INADQ REVIEW BY PORC	NSRS	10/17/85	.T.	/ /		/ /	OPERATIONS	1
IN-85-465-002	LOOSE CONDUIT	NSRS	09/09/85	.F.	11/14/85	T	11/20/85	HANGERS	1
IN-85-472-002	NO NCRS ON ERCW LINS	NSRS	10/03/85	.F.	/ /		/ /	QA	1
IN-85-534-005	FIRE PROTEC HYDRO TE	NSRS	10/02/85	.F.	/ /		/ /	TESTING	1
IN-85-544-001	WORK W/O WORKPLAN	ERT	10/22/85	.F.	/ /		/ /	QA	1

TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT  
EMPLOYEE CONCERN PROGRAM  
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QTC NUMBER	SUBJECT	INVEST ORG	DATE REPORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	#
IN-85-544-002	VIOLATION OF PROCEDU	ERT	10/23/85	.T.	/ /		/ /	QA	1
IN-85-581-002	WLDRS NOT QUAL ELEC	NSRS	10/17/85	.T.	/ /		10/17/85	CONSTRUCTI	1
IN-85-612-X07	WELDER CERTIF FALSIF	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-676-001	DISAGREE W/TVA POLIC	NSRS	10/31/85	.T.	/ /		/ /	QA	1
IN-85-684-001	DEFECTIVE TUBE STEEO	NSRS	09/16/85	.F.	/ /		09/16/85	MATERIAL	1
IN-85-770-002	PROC FOR CER NOT PER	ERT	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-770-003	UNCERTIFIED WELDERS	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-770-X07	WELDERS CERT FALSIFI	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-778-X07	WELDER CERT CARD FAL	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-795-001	COMPRESS FITTING	ERT	08/07/85	.T.	10/07/85	F	/ /	INSTRUMENT	1
IN-85-795-002	COMPRESS FITTING	ERT	08/07/85	.T.	10/07/85	F	/ /	INSTRUMENT	1
IN-85-847-006	CRFT SUP ALW UNAP PL	NSRS	10/29/85	.T.	/ /		/ /	QA	1
IN-85-850-002	QUANTITY VS. QUALITY	NSRS	11/07/85	.F.	/ /		11/12/85	QA	1
IN-85-853-X02	VIOLAT TVA PROCEDURE	ERT	10/12/85	.F.	/ /		10/18/85	QA	1
IN-85-897-001	INEXP CRAFTSMEN	NSRS	11/07/85	.T.	/ /		11/12/85	CRAFT	1
IN-85-915-003	DRAWING CONTROL	NSRS	10/22/85	.T.	/ /		/ /	DOCUMENT	1
IN-85-965-001	WELDOR CER BACKDATED	ERT	10/24/85	.T.	/ /		/ /	WELDING	1
IN-85-977-001	TAPE NOT REPL ON RCS	NSRS	10/10/85	.F.	/ /		/ /	QA	1
IN-85-977-002	DOCUMENT OF TCS/SIS	NSRS	10/03/85	.T.	/ /		/ /	DOCUMENT	1
IN-86-055-003	HYDRAZINE SPILL	.SRS	10/17/85	.T.	/ /		/ /	OPERATIONS	1
IN-86-068-002	RETUB'N OF HEAT EXCH	ERT	11/05/85	.T.	/ /		/ /	MAINTENANC	1
IN-86-081-001	INADEQ PLANT SYS STA	NSRS	11/19/85	.T.	/ /		/ /	OPERATIONS	1
IN-86-087-004	DIFFERENCE IN Q-LIST	NSRS	10/04/85	.T.	/ /		/ /	QA	1
IN-86-090-001	DIFFERENCE IN Q-LIST	NSRS	10/04/85	.T.	/ /		/ /	QA	1
IN-86-090-003	SIS APPROVAL W/O REV	NSRS	10/17/85	.T.	/ /		/ /	OPERATIONS	1
IN-86-102-001	REQ FOR CONDUIT INSU	NSRS	10/11/85	.T.	/ /		/ /	HANGERS	1
IN-86-102-002	NO ATTACH D/CONDUIT	NSRS	10/14/85	.F.	/ /		10/16/85	CONSTRUCTI	1
IN-86-103-002	REMOVAL OF INSULATIO	NSRS	11/13/85	.F.	/ /		11/15/85	CONSTRUCTI	1
IN-86-143-002	WELDER CERT BACKDATE	ERT	10/24/85	.T.	/ /		/ /	WELDING	1
IN-86-155-004	WELDS MAY NOT INSPEC	NSRS	10/22/85	.F.	/ /		10/22/85	WELDING	1
IN-86-167-005	WELDER REQUAL BACKDT	ERT	10/24/85	.T.	/ /		/ /	WELDING	1
IN-86-167-X06	WELDER CERT CARD FAL	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
IN-86-210-001	HEAT EXCH TUBES INAD	ERT	11/05/85	.T.	/ /		/ /	DESIGN	1
IN-86-221-004	CLEANERS NOT APPVD	NSRS	10/10/85	.T.	/ /		/ /	MATERIAL	1
IN-86-226-001	HARAS FOR REP QC	NSRS	11/15/85	.T.	/ /		/ /	QA	1
IN-86-259-004	INADEQ CABLE PULL	NSRS	10/31/85	.T.	/ /		11/04/85	ELECTRICAL	1
NS-85-001-001	INACCUR WELD INSPECT	ERT	08/13/85	.T.	09/27/85	F	/ /	WELDING	1
PH-85-003-021	ENG EVAL NOT CONDUCT	NSRS	10/10/85	.T.	/ /		10/16/85	QA	1
PH-85-006-001	CHANGES TO 050 NOTES	NSRS	08/09/85	.F.	/ /		08/09/85	HANGERS	1
PH-85-012-001	INSPECT OF WELDS	ERT	07/19/85	.T.	/ /		07/19/85	WELDING	1
PH-85-018-001	AUDIT FINDS WITHHELD	ERT	07/10/85	.F.	/ /		07/10/85	QA	1
WI-85-003-001	FALSE WELD CERTF CRD	ERT	10/24/85	.T.	/ /		/ /	WELDING	1
WI-85-003-X02	WELDER CERT CARD FAL	ERT/OGC	10/24/85	.T.	/ /		/ /	WELDING	1
WI-85-013-003	INSPECT THRU PAINT	ERT	11/06/85	.T.	/ /		/ /	INSPECTION	1
WI-85-016-001	PROCEDURE VIOLATIONS	ERT	11/01/85	.F.	/ /		/ /	CIVIL	1
WI-85-055-001	WELDER RECERTIFICATI	ERT	09/24/85	.T.	/ /		10/02/85	WELDING	1

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QTC NUMBER	SUBJECT	INVEST ORG	DATE RFP/PORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	#
WI-85-056-001	NOT FOLLOW CODE REQU	ERT	09/24/85	.T.	/ /		10/02/85	WELDING	1
** Subtotal **									
** MILESTONE: 2 CRITICALITY									
IN-85-016-003	TUBING NOT CLAMPED	NSRS	09/03/85	.T.	/ /		/ /	HANGERS	1
IN-85-025-001	INCORE THERMO TEST	NSRS	07/03/85	.F.	/ /		/ /	TESTING	1
IN-85-064-002	SHUTDN BDS TOP OPEN	NSRS	06/28/85	.T.	07/22/85	T	07/22/85	ELECTRICAL	1
IN-85-069-001	INADEQUATE INSPECTS	ERT	07/10/85	.T.	10/10/85	F	/ /	HANGERS	1
IN-85-106-001	MN STM LOADS SUPPORT	ERT	07/11/85	.F.	/ /		07/11/85	DESIGN	1
IN-85-109-002	BOLTS REPLAC BY WELD	NSRS	11/07/85	.T.	/ /		/ /	DESIGN	1
IN-85-186-002	INSL ON CONDT & CABL	ERT	07/10/85	.F.	09/24/85	T	10/10/85	ELECTRICAL	1
IN-85-216-001	WELDING SEQUENCE	ERT	07/10/85	.T.	08/05/85	F	/ /	WELDING	1
IN-85-217-001	CONDENS POTS, #1	ERT	07/15/85	.T.	/ /		07/14/85	DESIGN	1
IN-85-246-001	INSUFFNT MOVEMT/NVR	NSRS	08/09/85	.F.	/ /		08/09/85	DESIGN	1
IN-85-281-001	DIFFUSER FLOW	ERT	07/05/85	.T.	07/25/85	T	07/25/85	DESIGN	1
IN-85-281-003	TRNSM NOT READ SAME	NSRS	08/15/85	.T.	09/17/85	T	09/17/85	DESIGN	1
IN-85-415-002	CONCRETE ERCW LINES	NSRS	07/11/85	.F.	/ /		07/11/85	MECHANICAL	1
IN-85-439-006	SUBSTD WEAK CONCRETE	NSRS	11/07/85	.F.	/ /		/ /	CIVIL	1
IN-85-460-003	GOUGE IN LINE, #1	ERT	08/29/85	.T.	09/24/85	T	10/17/85	MECHANICAL	1
IN-85-460-X05	EXCAV ARC STRK SYS72	ERT	10/21/85	.T.	/ /		/ /	WELDING	1
IN-85-485-X01	SOFT CONCRETE	NSRS	11/07/85	.F.	/ /		/ /	CIVIL	1
IN-85-534-001	FIRE PROTECT SYSTEM	NSRS	10/08/85	.F.	/ /		/ /	DESIGN	1
IN-85-601-001	INADEQ SURVL INSTRUC	NSRS	10/09/85	.T.	/ /		10/09/85	QA	1
IN-85-802-001	TARGET ROCK VALVES	NSRS	10/25/85	.T.	/ /		/ /	DESIGN	1
IN-86-122-001	CRACKS IN WF 33 BEAM	NSRS	10/10/85	.T.	/ /		10/16/85	MATERIAL	1
XX-85-020-001	SQN/ECNS APPLICABILI	NSRS	11/19/85	.F.	/ /		11/19/85	OPERATIONS	1
** Subtotal **									
** MILESTONE: 3 5% POWER									
IN-85-001-002	WELD ROD CONTROL	ERT	07/10/85	.F.	/ /		07/06/85	WELDING	1
IN-85-016-001	BROKN CONCRE AT PLAT	NSRS/ERT	08/05/85	.F.	/ /		08/04/85	CIVIL	1
IN-85-021-003	BACKDATE CERTF CARDS	ERT	08/19/85	.T.	/ /		/ /	WELDING	1
IN-85-027-002	COMPUTER ANALYSIS	ERT	03/01/85	.T.	11/20/85	F	/ /	DESIGN	1
IN-85-052-008	PROCED FOR WELD RODS	ERT	07/10/85	.T.	09/24/85	F	/ /	WELDING	1
IN-85-064-001	SPRAY ON SHUTDN BDS	NSRS	06/28/85	.T.	/ /		06/28/85	ELECTRICAL	1
IN-85-086-001	STM GEN MATERIALS	ERT	07/10/85	.F.	/ /		07/10/85	MATERIAL	1
IN-85-108-001	SYS 68 PIPING	ERT	07/12/85	.F.	/ /		07/12/85	MATERIAL	1
IN-85-113-003	WELDER CERTIFICATION	ERT	07/10/85	.T.	11/12/85	T	11/20/85	WELDING	1
IN-85-140-001	OPER WATCH VS PAPER	NSRS	08/30/85	.T.	10/16/85	T	10/16/85	OPERATIONS	1
IN-85-186-004	BOARDS IN ELEC PANEL	ERT	07/05/85	.F.	09/23/85	T	09/23/85	ELECTRICAL	1
IN-85-211-001	ERCW LINE LEAK	NSRS	06/27/85	.F.	/ /		06/27/85	MECHANICAL	1
IN-85-221-001	IMPROPER VALVE OPER	ERT	07/05/85	.T.	09/23/85	T	09/23/85	OPERATIONS	1
IN-85-346-003	WELD CERTIFICATIONS	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-352-001	UPDATE WELD CERTIFIC	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1

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QTC NUMBER	SUBJECT	INVEST ORG	DATE REPORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	#
IN-85-388-006	HEAT CODE TRACEABILI	NSRS	07/03/85	.T.	07/26/85	T	07/26/85	MATERIAL	1
IN-85-453-007	INADEQ CERTF OF WELD	ERT	08/19/85	.T.	/ /		/ /	WELDING	1
IN-85-463-007	DELAY IN DOCUMT DRWS	NSRS	11/22/85	.F.	/ /		11/27/85	DOCUMENT	1
IN-85-465-001	LINES CLOSE TO HANGR	NSRS	07/30/85	.T.	08/09/85	T	09/08/85	MECHANICAL	1
IN-85-493-004	INADEQ WELD CERTIFIC	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-95-501-001	UNUSED WLD RDS DISPO	ERT	09/03/85	.T.	/ /		/ /	WELDING	1
IN-85-532-004	WELDER RECERTIFICATE	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-532-005	RECERT W/O VERIFICAT	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-534-002	FIRE PROT LINES	NSRS	10/22/85	.F.	/ /		10/22/85	DESIGN	1
IN-85-540-001	INADE WELD CERTIFICA	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-543-002	INADEQ WELD CERTIFIC	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-554-001	INCOMP STAIN STEL LN	NSRS	09/03/85	.F.	/ /		09/03/85	CONSTRUCTI	1
IN-85-612-006	INADEQ WELD CERTIFIC	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-671-004	WELDS NOT PROP INSPE	NSRS	10/22/85	.T.	/ /		10/22/85	WELDING	1
IN-85-705-001	UNQUALIFIED PERSONNE	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-725-X14	INADQ RECERT PROG	ERT	11/05/85	.F.	/ /		/ /	WELDING	1
IN-85-725-X15	TEST PLATES INADQ	ERT	11/05/85	.F.	/ /		/ /	WELDING	1
IN-85-778-001	WELDER CERTIFICATION	ERT	09/26/85	.T.	/ /		10/15/85	WELDING	1
IN-85-824-002	UNAPPROV BEND PROCED	ERT	08/23/85	.T.	10/18/85	T	10/30/85	QA	1
IN-85-845-004	IMPROPER WELDING	ERT	10/10/85	.F.	/ /		10/16/85	WELDING	1
IN-86-055-002	LEAKING PIPE	NSRS	11/22/85	.F.	/ /		11/27/85	MAINTENANC	1
IN-86-119-001	INADEQUATE CONDUITS	NSRS	10/09/85	.T.	/ /		/ /	ELECTRICAL	1
IN-86-173-001	DESIGN CALCULATIONS	NSRS	10/28/85	.T.	/ /		/ /	DESIGN	1
IN-86-259-006	INADQ SEPAR OF CABLE	NSRS	11/01/85	.T.	/ /		/ /	ELECTRICAL	1
IN-86-262-003	EXCEED MAX PULL TENS	NSRS	10/31/85	.T.	/ /		11/04/85	ELECTRICAL	1
IN-86-268-003	IMPROPER INSTAL CABL	NSRS	11/01/85	.T.	/ /		/ /	ELECTRICAL	1
PH-85-001-002	INST LNS SLOPE PROB	ERT	07/06/85	.T.	09/20/85	T	09/23/85	INSTRUMENT	1
WI-85-053-003	IMPORP WELDING DOCUM	NSRS	11/14/85	.T.	/ /		11/20/85	CONSTRUCTI	1
WI-85-053-006	TEST DIR NOT QUAL	NSRS	10/25/85	.F.	/ /		/ /	CONSTRUCTI	1
WI-85-054-003	DRAINS PLUGGED UP	NSRS	11/22/85	.F.	/ /		11/27/85	MECHANICAL	1
** Subtotal **									
45									
** MILESTONE: 5 100% POWER									
IN-85-010-004	FIRE PROT PIPNG DESN	ERT	09/16/85	.F.	/ /		09/24/85	DESIGN	1
IN-85-021-002	SYS77 DRAINS IN FLR	ERT	08/23/85	.T.	/ /		08/30/85	DESIGN	1
IN-85-218-001	APPROVAL OF AS-BUILT	FPT	07/29/85	.T.	08/22/85	T	08/22/85	INSTRUMENT	1
IN-85-407-001	INACCURATE Q-LIST	NSRS	10/04/85	.T.	/ /		/ /	DESIGN	1
IN-85-688-003	VALIDITY OF CRIT SYS	NSRS	10/04/85	.T.	/ /		/ /	DESIGN	1
IN-85-945-001	ELEC MANHOLES DISORG	NSRS	10/22/85	.T.	/ /		/ /	ELECTRICAL	1
IN-86-087-002	EFFECT OF QA DEPT	NSRS	11/19/85	.F.	/ /		11/21/85	QA	1
** Subtotal **									
7									

TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT  
EMPLOYEE CONCERN PROGRAM  
NUCLEAR REGULATORY COMMISSION LISTING

QTC NUMBER	SUBJECT	INVEST ORG	DATE REPORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	#
** MILESTONE: 6 01/01/86									
EX-85-012-001	UNQUALIFIED PERSONNE	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-078-001	UO/SAFTY RELATE SYST	NSRS	10/14/85	.F.	/ /		10/16/85	OPERATIONS	1
IN-85-196-003	VALVE OPER INADEQ	ERT	08/24/85	.T.	/ /		/ /	OPERATIONS	1
IN-85-496-002	LINER OF ERCW PIPING	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1
IN-85-618-004	DAMAGED INST TUBING	NSRS	08/12/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-825-002	CLAIRTY IN PROCEDURE	NSRS	10/22/85	.F.	/ /		10/22/85	OPERATIONS	1
** Subtotal **									
6									
** MILESTONE: 6 09/02/85									
IN-85-020-001	IMPROP INSTAL REDHDS	NSRS/ERT	08/15/85	.T.	/ /		/ /	CIVIL	1
** Subtotal **									
1									
** MILESTONE: 6 1ST REFUEL									
IN-85-211-002	ERCW LINE NOT STAINL	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1
** Subtotal **									
1									
** MILESTONE: 6 I85-166WBN									
IN-86-145-002	CONCRETE LINING APAR	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1
** Subtotal **									
1									
** MILESTONE: 6 IN85-113003									
EX-85-021-002	VERIFI PROCESS/WELD	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-426-002	INADEQ WELD CERTIFIC	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-815-001	CERTIFICATI OF WELDR	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
IN-85-835-002	WELDING CERTIFICATIO	ERT	09/26/85	.T.	/ /		10/03/85	WELDING	1
** Subtotal **									
4									
** MILESTONE: 6 IN85-406001									
IN-85-445-002	UNAUT ACCS TO WLD SY	ERT	08/27/85	.T.	/ /		08/27/85	WELDING	1
IN-85-458-007	CHNG OF WELD STATUS	ERT	08/27/85	.T.	/ /		08/27/85	WELDING	1
** Subtotal **									
2									
** MILESTONE: 6 IN85-415002									
IN-85-196-004	INPROP INSTAL PIPING	NSRS	10/11/85	.F.	/ /		10/16/85	MATERIAL	1
IN-85-442-X12	LINING LOSS IN PIPE	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1
IN-85-589-001	LINER ON ERCW LINE	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1
IN-85-713-004	CONCRETE LIN IN PIPE	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1
IN-85-846-002	GOUT LINER/SAFTY HAZ	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1

TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT  
EMPLOYEE CONCERN PROGRAM  
NUCLEAR REGULATORY COMMISSION LISTING

QTC NUMBER	SUBJECT	INVEST ORG	DATE REPORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	#	
** Subtotal **										5
** MILESTONE: 6 NO DATE										
EX-85-039-003	DESIGN DEFICIENCY	NSRS	11/07/85	.T.	/ /		/ /	DESIGN	1	
EX-85-042-003	WELDERS REQUALIFICAT	ERT	10/23/85	.T.	/ /		10/30/85	WELDING	1	
IN-85-103-001	IEB 79-02	NSRS	08/09/85	.T.	/ /		08/09/85	DESIGN	1	
IN-85-279-005	NO TRACKING SYSTEM	NSRS	11/13/85	.T.	/ /		11/15/85	DESIGN	1	
IN-85-337-001	ERCW LN W/CEMENT LIN	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1	
IN-85-373-001	DAMAGED CABLE	NSRS	06/28/85	.T.	07/25/85	T	07/25/85	ELECTRICAL	1	
IN-85-532-006	OVERSIZED WELDS	NSRS	08/16/85	.T.	/ /		/ /	HANGERS	1	
IN-85-543-004	DETERIORIATE STEEL	NSRS	07/29/85	.F.	09/26/85	T	07/29/85	CONSTRUCTI	1	
IN-85-630-003	ERCW LINE IMPROP INS	NSRS	11/19/85	.F.	/ /		/ /	MECHANICAL	1	
IN-85-630-004	INADQ DOC FOR ERCW	NSRS	11/19/85	.F.	/ /		/ /	MECHANICAL	1	
IN-85-915-002	DRAWING CONTROL	NSRS	10/17/85	.F.	/ /		10/17/85	DOCUMENT	1	
IN-86-108-001	DRAWINGS NOT CURRENT	NSRS	11/01/85	.F.	/ /		11/04/85	DOCUMENT	1	
IN-86-110-001	INADQ ICE LOADING	NSRS	10/25/85	.T.	/ /		10/30/85	DESIGN	1	
IN-86-190-003	ANCHOR NOT TEST INDI	NSRS/ERT	10/24/85	.T.	/ /		10/30/85	CIVIL	1	
IN-86-199-001	CAB PULL/REQ PER QCI	NSRS	10/31/85	.T.	/ /		11/04/85	ELECTRICAL	1	
IN-86-201-001	CAB PULL LIMIT EXCEE	NSRS	10/31/85	.T.	/ /		11/04/85	ELECTRICAL	1	
IN-86-232-001	REPAIR ERCW VIOLAT	NSRS	10/03/85	.F.	/ /		/ /	MECHANICAL	1	
IN-86-259-001	FAILURE USE FUSE LIN	NSRS	10/31/85	.T.	/ /		11/04/85	ELECTRICAL	1	
IN-86-259-005	OVERFILLED CABLE TRA	NSRS	11/14/85	.T.	/ /		/ /	ELECTRICAL	1	
IN-86-259-X11	TVA PROC NO IEEE STD	NSRS	11/14/85	.F.	/ /		/ /	DESIGN	1	
IN-86-262-0J2	OVERCROWDING CABLES	NSRS	11/14/85	.T.	/ /		/ /	ELECTRICAL	1	
IN-86-266-X09	LACK OF COVERAGE	NSRS	10/31/85	.F.	/ /		11/04/85	ELECTRICAL	1	
WI-85-040-001	NCR FOR ERCW LINE	NSRS	11/19/85	.F.	/ /		/ /	MECHANICAL	1	
WI-85-040-002	INADQ PROC/INSP PLAN	NSRS	11/19/85	.F.	/ /		/ /	MECHANICAL	1	
** Subtotal **										24
** MILESTONE: 6 PH85-001002										
IN-85-119-001	IMPROPER LINE INSTAL	ERT	09/18/85	.T.	10/22/85	T	10/30/85	INSTRUMENT	1	
** Subtotal **										1
** MILESTONE: 6 U2 FUEL LD										
IN-85-173-001	LEAK IN SPRINK SYS	ERT	08/13/85	.F.	/ /		08/13/85	MATERIAL	1	
IN-85-189-002	ACCESS TO VALVES/#2	NSRS	10/04/85	.F.	/ /		10/04/85	DESIGN	1	
IN-85-246-005	RUSTED WELDS/#2/RB	ERT	10/24/85	.T.	/ /		/ /	WELDING	1	
IN-85-530-001	WLDS NOT ACCRD PROC	NSRS	08/15/85	.F.	/ /		08/15/85	WELDING	1	
IN-85-615-001	OBSTRUCTED ACCESS	NSRS	10/04/85	.F.	/ /		10/04/85	DESIGN	1	
** Subtotal **										5

TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT  
EMPLOYEE CONCERN PROGRAM  
NUCLEAR REGULATORY COMMISSION LISTING

QTC NUMBER	SUBJECT	INVEST ORG	DATE REPORT	S U B ?	DATE RESPONSE	A C C ?	DATE INVEST CLOSED	KEY WORD	#
** MILESTONE: 7 N/A									
EX-85-008-001	UNQUAL SUBJOURNEYMEN	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
EX-85-009-001	SUBSTN WK BY SUBJRMN	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
EX-85-010-002	UNQAUL SUBJOURNEYMEN	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-021-001	TUBE BENDERS	ERT	07/27/85	.T.	10/22/85	T	10/30/85	CONSTRUCTI	1
IN-85-091-001	LOST DOCUMENTATION	ERT	09/16/85	.T.	/ /		/ /	DOCUMENT	1
IN-85-130-001	UNQUILIFIED PERSONNE	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-411-001	SAFTY HAZ ON PLATFRM	NSRS	07/23/85	.T.	08/09/85	T	09/08/85	CONSTRUCTI	1
IN-85-514-001	CONTAM DURING CUTTIN	ERT	08/22/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-541-001	REQ WELD ON 2 SIDES	NSRS	08/15/85	.F.	/ /		08/15/85	DESIGN	1
IN-85-556-001	SUBJ DOING JOUR WORK	ERT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-589-002	SUBJ DOING JOURN WRK	EPT	09/28/85	.T.	/ /		/ /	CONSTRUCTI	1
IN-85-748-001	TIE-IN OF SEAL DRAIN	ERT	08/16/85	.F.	/ /		08/16/85	DESIGN	1
NS-85-002-001	BPN/SUPTS ON RHR SYS	ERT	10/12/85	.T.	/ /		/ /	OPERATIONS	1
XX-85-001-001	SQN/D-G BATTERIES	NSRS	11/18/85	.T.	/ /		/ /	QA	1
XX-85-013-001	SQN/WRONG WELD ROD	ERT	08/22/85	.F.	/ /		08/27/85		1
XX-85-019-001	BLN/AUDIT FINDINGS	ERT	07/10/85	.F.	/ /		07/10/85	QA	1
** Subtotal **									16
*** Total ***									228

NRC

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : E. R. Ennis, Plant Manager, Watts Bar Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : **NOV 27 1985**

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-157-WBN

Subject HANGER QUALITY CONTROL 47A050 NOTES (EVALUATIONS)

Concern No. IN-85-010-002

and associated recommendations for your action/disposition.

It is requested that you respond to this report and the attached recommendations by December 27, 1985. Should you have any questions, please contact C. R. Elledge at telephone 3697-WBN.

Recommend Reportability Determination: Yes X No     

Original signed by  
M. S. Kiser

\_\_\_\_\_  
Director, NSRS/Designee

CRE:JTH  
Attachment  
cc (Attachment):  
H. N. Culver, W12A19 C-K  
QTC/ERT, Watts Bar Nuclear Plant  
W. F. Willis, E12B16 C-K (4)

-----  
--Copy and Return--

To : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

From: \_\_\_\_\_

Date: \_\_\_\_\_

I hereby acknowledge receipt of NSRS Report No. I-85-157-WBN  
Subject HANGER QUALITY CONTROL 47A050 NOTES (EVALUATIONS) for  
action/disposition.

\_\_\_\_\_  
Signature Date



TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-157-WBN

EMPLOYEE CONCERN IN-85-010-002

MILESTONE 1

SUBJECT: HANGER QUALITY CONTROL 474050 NOTES (EVALUATIONS) DID NOT SATISFY INSPECTION CRITERIA

DATES OF INVESTIGATION: October 9-November 14, 1985

INVESTIGATOR:

*Chahl Eledge*  
-----  
C. R. Eledge

*11/22/85*  
-----  
Date

REVIEWED BY:

*P R Washer*  
-----  
P. R. Washer

*11/22/85*  
-----  
Date

APPROVED BY:

*H. A. Harrison*  
-----  
H. A. Harrison

*11/22/85*  
-----  
Date

## I. BACKGROUND

NSRS has investigated Employee Concern IN-85-010-002 which Quality Technology Company (QTC) identified during the Watts Bar Employee Concern Program. The concern was worded:

Hanger quality control 47A050 notes (evaluations) did not satisfy inspection criteria. There was an NRC violation written against Q.C. pertaining to this item. C/I has previously expressed this concern to INPD, NRC, and NSRS. C/I would not provide any additional info. to ERT because C/I feels it would be a waste of time to investigate this since he has previously reported it to INPD, NRC, and NSRS.

The concerned employee was recontacted through QTC's Employee Response Team (ERT) and questioned about the timeframe of the NRC violation and the meaning of the term "evaluations." A timeframe was not recalled. The term "evaluations" meant the process of modifying the 47A050 notes to eliminate the adverse Inspection Rejection Notices (IRNs).

## II. SCOPE

The dispositioning of Inspection Rejection Notices (IRNs) by revising 47A050 notes without adequate justification to accommodate an as-built condition, which did not conform to the original design, was determined to be the primary concern. The 47A050 notes have been the subject of several NSRS investigations (I-85-110-WBN, I-85-124-WBN, I-85-234-WBN). Also, NRC Reports 50-390/85-02 and 50-391/85-02 addressed the FCR process by which design changes were made. This investigation used the NSRS and NRC reports as a basis and expanded into the area of determining whether the 47A050 note tolerances yield an acceptable design. This concern was investigated by reviewing associated documents and interviewing personnel in Drawing Control, RIMS Data Base, Construction Quality Control (QC), Hanger Engineering, Electrical Engineering, Construction Procedures and Training (training IRNs), Office of Engineering (OE) onsite, and OE Knoxville.

## III. SUMMARY OF FINDINGS

Based on a review of applicable documents and interviews with appropriate personnel, NSRS substantiated the identified concern. Listed below are the specific findings identified.

### A. Review of Documents

1. TVA-TR75-1A, Revision 8, Table 17D-2 (Topical Report), commits TVA to Regulatory Guide 1.64, Revision 2, June 1976, for the quality assurance requirements for the design of nuclear power plants. Regulatory Guide 1.64 endorses ANSI-N45.2.11, 1974. ANSI-N45.2.11, Paragraph 8, states that field changes shall be justified and subjected to design control measures commensurate with those applied to the original design.

2. The review of Hanger QC, Electrical QC, Mechanical/ Instrumentation QC, Hanger Engineering, and OE documents revealed that FCRs have been initiated by WBN Construction Engineers and approved by Engineering Design without adequate documented justification. 50 percent of all FCRs associated with 47A050 notes initiated by the Hanger Engineering Unit since January 1, 1985 were reviewed for documented justification. While justification for the design change was explained by OE (Knoxville) personnel, adequate documented justification did not exist for some of the design changes reviewed.
3. A review of IRN Instruction WBN-QCI-1.02-1, Revision 9, revealed that IRNs were not considered QA records. Therefore QC was not required to maintain a copy of completed IRNs over sixty days. Also, IRNs were not adequately filled out by QC inspectors. As a result of the above, only three FCRs associated with 47A050 notes were identified as having been initiated as a result of QC IRNs. The OE (Knoxville) document review showed that justification had been documented for two of the three design changes, and the third item was in work. The IRN retention issue is discussed in NSRS Report I-85-443-WBN.
4. A review of RIMS failed to identify any adverse NRC violations directly associated with this concern during 1984 or 1985. A related issue dealing with the improper voiding of IRNs was found. This item was appropriately addressed by identifying all improperly voided IRNs and determining the acceptability of the subject feature.
5. A review of OE procedures revealed that prior to June 28, 1985, Engineering Design procedures did not adequately depict the design control requirements stated in ANSI-N45.2.11, 1974 Edition. ANSI-N45.2.11 required field changes to be justified and subjected to design control measures commensurate with those applied to the original design. EN DES-EP-4.03, "Field Change Request Initiated by Construction," did not require documented justification for all design changes. OEP-11, Revision 0, "Change Control," implemented on June 28, 1985, did address the ANSI-N45.2.11 field change justification requirement by stating that changes will be justified and approved prior to implementation. However, OEP-11, Revision 0, did not identify the mechanism used to control the processing of field change requests nor make reference to WBEP Project Manual Procedure WB-EP-4.03 which describes the handling of field change requests. Therefore, many field changes were made prior to June 28, 1985 without documented justification. After June 28, 1985 OE (Knoxville) did not have a procedure in place to control the processing of field change requests.

#### B. Personnel Interviews

1. Interviews with twelve Hanger QC inspectors were conducted in an effort to identify IRNs that were dispositioned by revising the 47A050 notes. The inspectors were unable to identify specific IRNs that resulted in a 47A050 note revision. Inspectors stated that 47A050 notes had been revised as a result of inspectors rejecting items that deviated from the design criteria. Also, inspectors stated that specific IRNs could not be identified as being dispositioned by 47A050 note changes because IRNs were not written when the Construction Engineer initiated an FCR to obtain a note revision at the time of the inspection.

2. Interviews with Construction Electrical and Hanger Engineering personnel revealed that, in some cases, IRNs were dispositioned by initiating FCRs to revise a typical drawing or 47A050 note in lieu of reworking the hardware.
3. Interviews with management personnel revealed that IRN trend meetings were held weekly among the units responsible for hanger installation and inspection. Trends in IRNs were discussed, and methods of eliminating the trends were proposed. At times, the proposed corrective action was to revise the 47A050 notes to allow Construction more flexibility or to clarify the notes.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

The concern was substantiated since revisions were made to 47A050 notes and typical drawings without documented justification. However, NSRS was unable to identify specific IRNs that were dispositioned by revising 47A050 notes without documented justification.

##### B. Recommendations

###### I-85-157-WBN-01 - OE (Knoxville) Evaluate Field Changes Justification

Verify that all design changes made to 47A050 notes and typical drawings prior to June 28, 1985 were adequately justified. Note: This recommendation is similar to I-85-124-WBN-01 - Justification for Deviations.

###### I-85-157-WBN-02 - Establish Field Change Procedure

OE (Knoxville) should establish a procedure for controlling field change requests or revise OEP-11 to reference the Engineering Procedure Project Manuals which will control the field change process.

###### I-85-157-WBN-03 - Procedure Revision

OE should revise WB-EP-4.03 to clearly state that changes will be identified, justified, and approved prior to implementation.

###### I-85-157-WBN-04 - QC Inspection Rejection Notice

QC inspectors should be more descriptive in documenting the design criteria deviation on the IRN to clearly identify the cause for rejection.

NRC

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : E. R. Ennis, Plant Manager, Watts Bar Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : NOV 27 1985

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-702-WBN

Subject BREACHING ELECTRICAL PENETRATIONS

Concern No. IN-85-207-002

and associated recommendations for your action/disposition.

It is requested that you respond to this report and the attached recommendations by December 27, 1985. Should you have any

questions, please contact G. R. Owens at telephone 3656-WBN.

Recommend Reportability Determination: Yes X No     

Original signed by  
M. S. Kidd

\_\_\_\_\_  
Director, NSRS/Designee

GRO:JTH  
Attachment  
cc (Attachment):  
H. N. Culver, W12A19 C-K  
QTC/ERT, Watts Bar Nuclear Plant  
W. F. Willis, E12B16 C-K (4)

-----  
--Copy and Return--

To : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

From: \_\_\_\_\_

Date: \_\_\_\_\_

I hereby acknowledge receipt of NSRS Report No. I-85-702-WBN  
Subject BREACHING ELECTRICAL PENETRATIONS for action/disposition.

\_\_\_\_\_  
Signature Date



• TENNESSEE VALLEY AUTHORITY  
NUCLEAR SAFETY REVIEW STAFF  
NRS INVESTIGATION REPORT NO. I-85-702-WBN  
• EMPLOYEE CONCERN IN-85-207-002  
MILESTONE 1 •

SUBJECT: BREACHING ELECTRICAL PENETRATIONS

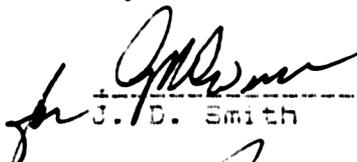
DATES OF INVESTIGATION: November 8-20, 1985

INVESTIGATOR:

  
-----  
B. R. Owens

11/22/85  
Date

REVIEWED BY:

for   
-----  
J. D. Smith

11/22/85  
Date

APPROVED BY:

  
-----  
W. A. Harrison

11/22/85  
Date

## I. BACKGROUND

Concern IN-85-207-002 was received by the Quality Technology Company (QTC) Employee Response Team that stated:

Crafts are using steel fish tape in lieu of fiberglass or wood rods to breach penetration seals. This may cause damage to existing cables in the breached penetration. This practice of using steel fish tapes violates procedure MAT-14 and Const. Mgmt. memo of approx. July 1984.

Note: During the course of the investigation it became apparent that MAT-14 referred to MAI-14, the Nuclear Power procedure entitled "Installation and Inspection of Electrical Penetration Pressure Seals, Fire-Stop Barriers, and Flame-Retardant Cable Coating." The July 1984 memo could not be identified, but it was assumed to restrict the use of fish tape similar to MAI-14.

## II. SCOPE

Interviews were conducted with cognizant personnel, and reviews of applicable installation and inspection procedures were accomplished in order to evaluate the concern of record.

## III. SUMMARY OF FINDINGS

### A. Applicable Procedural Requirements

1. E. R. Ennis memo to Those Listed dated 7/29/85 (T10 850724 931) summarized responsibilities for all breaching activities. The Nuclear Services Branch (NSB) was made responsible for all breaches needed for Office of Construction (OC) work, and Mechanical Maintenance was made responsible for all Nuclear Power breaches.
2. OC Standard Operating Procedure (SOP)-42 entitled "Breaching and Sealing Behind Unit 1 Security" was being used by NSB to accomplish breaching activities. One of the references in SOP-42 was Nuclear Power procedure MAI-14 (the intent being for NSB to perform breaches according to MAI-14).
3. MAI-14 presented the specific procedural steps to follow in order to breach cable tray and conduit pressure seals. Section 2.8.1.1 stated:

Remove Kaowool board or cut access holes as required. Breach the RTV foam in the cable sleeve with a clockwise motion using a tool as shown on attachment 7 (see attachment to this report). After removing the wooden nose cone, install a taped split bushing on the end of the conduit tool. Cables may be pulled through the breaching tool. Withdraw the breaching tool one inch from the face of the seal. Pack the hole between the tool and the face of the seal with Kaowool fiber. Inspect nozzle of application equipment through split conduit as breaching tool is withdrawn from penetration.

## B. Findings

### 1. Interviews with Cognizant Personnel

- a. The actual method used to breach the cable tray penetration seals was being performed with a wooden-type probe (i.e., "broomstick" handle or wooden dowel) or a fiberglass rod. The primary restriction being that the device be nonconducting in order to ensure personnel safety. (This nonconducting-type requirement was stated in Section 8.8.2.2 of MAI-14 for breaching conduit and conduit pressure seals, but it was not specifically stated for the cable tray breaching section.) The breaching tool shown in MAI-14 was not being used.
- b. Those interviewed considered the wooden and fiberglass probes to be acceptable breaching tools in place of the tool shown in MAI-14.
- c. Based on the interviews, there have been cases in which penetrations that were congested with cables caused difficulty in using the wooden or fiberglass probes. Evidently, instructions had been given to the installation personnel that for such cases they were to return to engineering personnel to seek a reroute of the cables in order to avoid the congested penetrations. However, in some cases, fish tapes were apparently used in order to breach a congested penetration.

Note: NSRS Investigation Report I-88-701-WBN addressed electrical penetrations in which cables were being planned for routing through penetrations that were deemed "closed" because of being full of cables.

- d. The interviewees were not aware of any cables ever being damaged as a result of a breaching activity.
- e. The wooden-type probes and fish tapes were examined by the investigator. Two sizes of fish tapes were used in routine cable pulling activities, 1/8" and 1/4". The fish tapes examined were metallic, flexible, with rounded edges. (However, if a fish tape was broken, it could potentially have sharp edges.) The wooden probes were purposely blunted on the penetrating end to prevent a sharp point that could cause damage to cables.
- f. GC inspectors observe the cables being pulled through the breached penetrations and the resealing of the penetrations, but they do not observe the actual breaching activity itself.

2. There have been previous concerns raised on inadequate management controls over breaching activities. This involved concerns about breaching work being performed without a centralized tracking control point. Results of the investigation were documented in NSRS Report IN-85-130-002. Following this, Plant Manager E. R. Ennis's memo of 7/29/85 was issued to improve control and understanding on the overall breaching activities. These concerns, however, did not address the method of breaching and controls over the method.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

1. The concern of record regarding the use of steel fish tape to breach electrical penetration seals was substantiated based on personnel interviews. This practice was not in accordance with existing procedures. Verification of any cables actually damaged as a result of this practice could not be made based on the information obtained. However, the potential for damage and for personnel hazard does exist if the steel tapes are used.
2. Management controls over the breaching process have been inadequate to ensure that breaching is accomplished according to approved procedures or practices.

##### B. Recommendations.

###### I-85-702-W8N-01 - Improve Control Over the Breaching Process

Improve management control over the breaching process by the following.

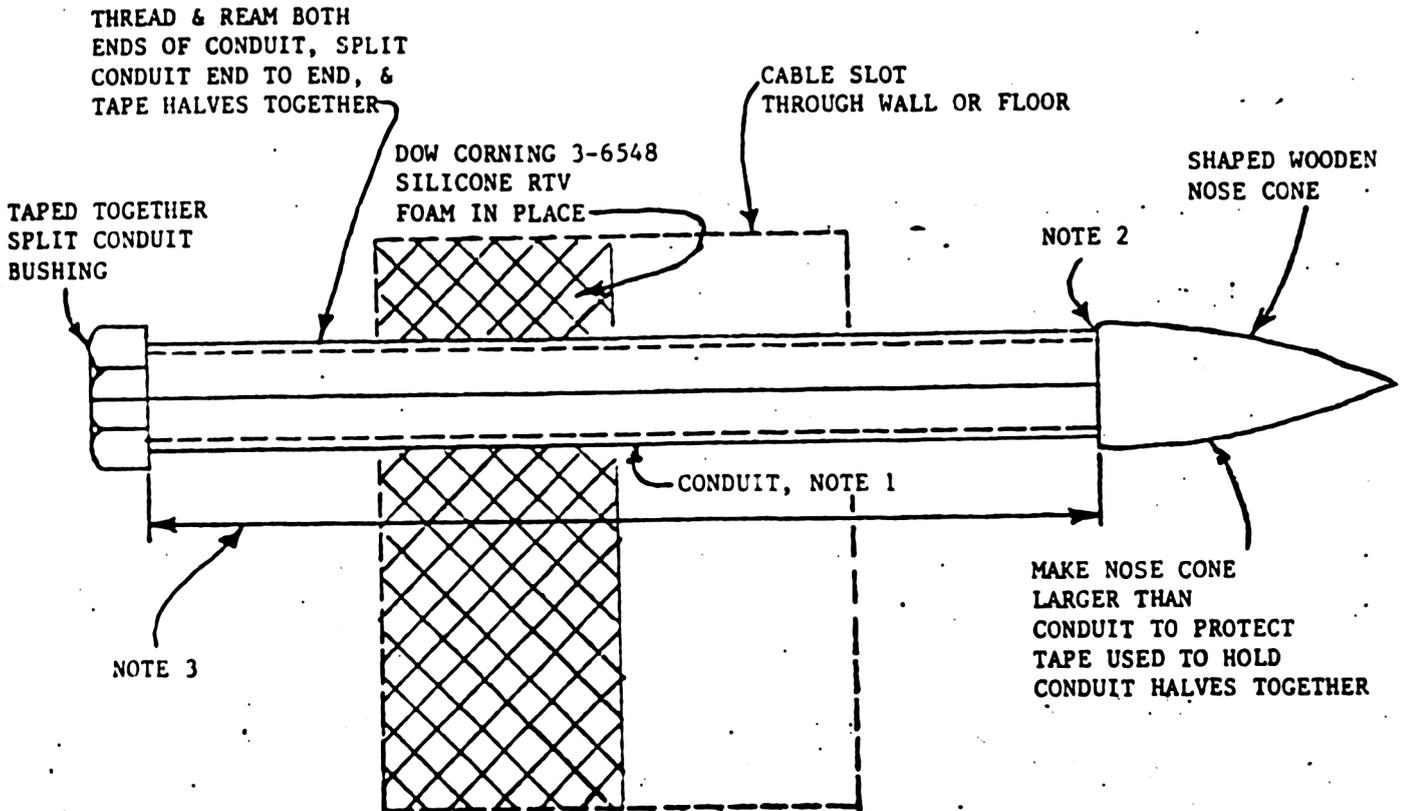
1. Review the breaching procedures, and either revise the procedures to permit additional tools to be used or confirm the existing ones to be adequate.

Note: Use of metal (conducting) tools should be prohibited, allowed only if grounded, or coated with an insulator.

2. Instruct the crafts on the use of the established procedures.
3. Require the breaching process to be observed by the QC inspectors and signed off accordingly.

ATTACHMENT 2

BREACHING TOOL



NOTES:

1. Conduit sized according to cable O.D.
2. Remove nose cone & install split conduit bushing before pulling cable through conduit.
3. Length as required.

NRC

UNITED STATES GOVERNMENT

## Memorandum

TENNESSEE VALLEY AUTHORITY

TO : E. R. Ennis, Plant Manager, Watts Bar Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : NOV 26 1985

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-381-WBN

Subject CONTROL OF PLANT SYSTEM STATUS - VALVE CONFIGURATION CONTROL

Concern No. IN-86-081-001

and associated recommendations for your action/disposition.

It is requested that you respond to this report and the attached recommendations by December 23, 1985. Should you have any questions, please contact J. B. Rollins at telephone 3707-WBN.

Recommend Reportability Determination: Yes X No     

Original signed by  
M. S. Kidd

\_\_\_\_\_  
Director, NSRS/Designee

JBR:JTH  
Attachment  
cc (Attachment):  
H. N. Culver, W12A19 C-K  
QTC/ERT, Watts Bar Nuclear Plant  
W. F. Willis, E12B16 C-K (4)

-----  
--Copy and Return--

To : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

From: \_\_\_\_\_

Date: \_\_\_\_\_

I hereby acknowledge receipt of NSRS Report No. I-85-381-WBN  
Subject CONTROL OF PLANT SYSTEM STATUS - VALVE CONFIGURATION CONTROL  
for action/disposition.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



119U

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-161-WBN

EMPLOYEE CONCERN IN-85-081-001

MILESTONE 1

SUBJECT: CONTROL OF PLANT SYSTEM STATUS - VALVE CONFIGURATION CONTROL

DATES OF INVESTIGATION: October 4-November 5, 1985

INVESTIGATOR:

*J. B. Rollins*  
-----  
J. B. Rollins

*11/18/85*  
-----  
Date

REVIEWED BY:

*W. D. Stevens*  
-----  
W. D. Stevens

*11/18/85*  
-----  
Date

APPROVED BY:

*M. H. Harrison*  
-----  
M. H. Harrison

*11/22/85*  
-----  
Date

## I. BACKGROUND

NSRE has investigated Employee Concern IN-85-081-001 which Quality Technology Company (QTC) identified during the Watts Bar Employee Concern Program. The concern is worded:

Control of plant system status is inadequate, and presents a potential personnel hazard. Details known to QTC, withheld due to confidentiality. Nuclear power concern. Time frame March/April 1985. CI has no further information.

Additional information was obtained from QTC. The information identified that a rawaste line in the pipe chase was cut into after a clearance had been obtained; however, the line was not isolated for three days.

## II. SCOPE

Control of plant system status, primarily, valve-configuration control, was determined to be the primary concern. This concern was investigated by contacting applicable personnel and reviewing documentation relating to valve-configuration control. NSRE reviewed procedures/instructions, flow-diagram drawings, and documents such as operations logs and applicable clearance sheets.

## III. SUMMARY OF FINDINGS

Based upon interviews with appropriate personnel and a review of applicable documents, the specific findings listed below were identified.

### A. WBNF Procedures/Instructions

A review of the applicable portions of WBNF Instruction AI-2.12, "Clearance Procedure," identified the following.

1. The procedure was developed for employee protection.
2. A clearance is established by the use of protective tags so as to indicate the main point of control and the boundary of isolation.
3. The shift engineer (SE) or designated assistant shift engineer (ASE) on shift shall be the only person authorized to issue a clearance.
4. The SE or designated ASE is responsible for completing all clearance sheets and supplements carefully and accurately and, as required, modifying existing clearances or verifying the clearance boundary is adequate to allow other work to be performed.
5. The person obtaining the clearance must have a clear understanding of the limits of the clearance.
6. After the clearance has been issued and before work is permitted to proceed, the person receiving the clearance must assure himself that the equipment is properly isolated and that protective tags are correctly placed.

## B. Interview Information

1. Craft supervision stated that a clearance was issued for the installation of isolation valves in the radwaste system. They were informed by Operations that the isolated lines were not drained. The spent-resin header in the pipe chase was cut, and the system was allowed to drain. Water was still running out of the line on the third day. Operations investigated the problem, the water stopped, and the craftmen did their work. During the course of the investigation, NSRS identified the clearance that was issued for the installation of isolation valves in the radwaste system.
2. Craft personnel directly involved with the installation of the isolation valve in the pipe chase were interviewed by NSRS and supported the statements made by craft supervision.
3. Operations personnel stated that the mixed bed demineralizer 1A was in service and pressurized causing water to leak through the resin-discharge valve. Mixed bed demineralizer 1A was taken out of service and the leak stopped. A maintenance request (MR) was not generated for the leaking valve.
4. Office of Engineering personnel stated that under normal operating conditions the mixed bed demineralizer resin-discharge valve should not leak through.
5. The responsible craft supervisor that was issued the clearance did not make a visual verification of the boundaries of the clearance and was not aware of other clearances associated with the work.

## C. Documentation

1. NSRS reviewed the specific clearance sheet for this work, other applicable clearance sheets, and mechanical flow-diagram drawings. This review was to verify the boundary of isolation and conformance with the clearance procedure for valve-configuration control. The results of this review were as follow.
  - a. The clearance did not establish a complete boundary of isolation for the work performed. The clearance sheet did not reference other clearances included in the boundary of isolation.
  - b. The name of the craft supervisor requesting the clearance was not added to other applicable clearances nor was he informed of the other clearances.
2. NSRS reviewed maintenance history records of resin-discharge isolation valves to identify past maintenance problems. The review determined that there were no MRs initiated for these valves, and a maintenance history was not established.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

The employee concern was substantiated. Conformance with WBN Instruction AI-2.12, "Clearance Procedure," was not obtained for the following reasons.

1. The clearance did not adequately establish a boundary of isolation for the protection of the employees performing the work since all valves of the boundary were not tagged.
2. The clearance sheets containing additional boundary-isolation valves were not issued to the responsible craft supervisor responsible for the work nor was he informed of these other clearance sheets.
3. The craft supervisor that requested the clearance relied solely on Operations personnel for safety, and did not personally verify that the system was properly isolated and that protective tags were correctly placed.

##### B. Recommendations

###### 1-85-161-WBN-01 - Discuss and/or Clearance Deficiencies

Discuss these clearance deficiencies with Operations and craft supervisors stressing the importance toward assuring personnel safety, as well as the responsibilities of involved supervisors to that end, as stated in WBN AI-2.12, "Clearance Procedure."

###### 1-85-161-WBN-02 - Increase Surveillance

Increase surveillance by Plant Quality Assurance (PQA) in this area until conformance with the requirements of AI-2.12 is achieved.

###### 1-85-161-WBN-03 - Initiate Maintenance Request

Initiate a Maintenance Request (MR) to inspect and repair as necessary the mixed bed demineralizer (A) resin-discharge valve.

NRC

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : S. Schum, QTC/ERT Program Manager, Watts Bar Nuclear Plant  
FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K  
DATE : NOV 21 1985  
SUBJECT: TRANSMITTAL OF ACCEPTED FINAL REPORTS

The following final reports have been reviewed and accepted by NSRS and are transmitted to you for preparation of employee responses.

✓IN-86-087-002  
✓IN-85-134-001

Original signed by  
M. S. Kidd

\_\_\_\_\_  
K. W. Whitt

Please acknowledge receipt by signing below, copying and returning this form to J. T. Huffstetler, E3B37 C-K.

\_\_\_\_\_  
NAME

\_\_\_\_\_  
DATE

JTH

Attachments

cc (Attachments):

H. N. Culver, W12A19 C-K  
E. R. Ennis, WBN  
W. F. Willis, E12B16 C-K (4)

0047U



TENNESSEE VALLEY AUTHORITY  
NUCLEAR SAFETY REVIEW STAFF  
NSRS INVESTIGATION REPORT NO. I-85-420-WBN  
EMPLOYEE CONCERN IN-86-087-002  
MILESTONE 5

SUBJECT: OA INDEPENDENCE AND PLANT ATTITUDE

DATES OF INVESTIGATION: October 18-November 10, 1985

LEAD INVESTIGATOR: R. N. Russell 11-18-85  
R. N. Russell Date

INVESTIGATOR: P. C. Mann 11-18-85  
P. C. Mann Date

REVIEWED BY: W. D. Steven 11-18-85  
W. D. Steven Date

APPROVED BY: A. A. Harrison 11/19/85  
A. A. Harrison Date

## I. BACKGROUND

NSRS has investigated Employee Concern IN-66-067-002 which was received by Quality Technology Company on August 19, 1985 which stated:

TVA QA department is not sufficiently independent of plant management to perform assigned functions in a proper manner. QA department management does as directed by plant management. WBNF management creates and supports negative employee attitude regarding subject QA departmental functions, which is not good for the plant. Nuclear Power concern.

## II. SCOPE

Documentation related to the quality assurance (QA) functions, duties, and responsibilities was researched to establish the TVA requirement for independence, for reporting chains and responsibilities, and for management controls on quality assurance. Plant employees, management, NRC, and Division of Quality Assurance employees were interviewed to determine actual performance of the onsite QA organization.

## III. SUMMARY OF FINDINGS

### A. QA Department Not Independent of Plant Management

There are no documented requirements for QA independence from plant site management. The Code of Federal Regulations, 10CFR850, Appendix B, states: "Organizations performing quality assurance functions shall report to a management level such that this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided.

. . . the organizational structure for executing the quality assurance program may take various forms provided that the persons and organizations assigned the quality assurance functions have this required authority and organizational freedom." The authority and freedom referred to in the above quotes apply to the ability to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions.

In interviews with a cross-section of ten individuals from plant management, Division of Quality Assurance, NRC, and plant employees only one indicated any problem with QA independence as defined above. This individual believes that quality concerns may not be identified or brought to management attention because of the dominance plant management has over QA management. No problems were identified that related to the performance of functions assigned to plant QA (functions defined in TVA Topical Report, Section 17.0.2.1.2). One of the QA supervisor's peers believes that more issues would be raised by a stronger personality. All others believe that QA properly identifies, recommends, and checks correction of QA problems. There is a general feeling that the QA program at Watts Bar is improving as time goes by and has been for several months since the appointment of the present QA supervisor. One person interviewed believed that QA has not progressed to the point that it should be yet.

8. QA Department Management Does Not Directly Control Management

The TVA Topical Report (TVA-TR75-1A) for quality assurance states in Section 17.1.2.2: "The site director is responsible for the quality of work activities. . . ."

The NRCAM, Part 1, Section 2.1, Paragraph 4.4, states: "A plant quality assurance staff is responsible to perform quality engineering, quality control, and surveillance functions to assist the site directors in achievement of quality." Also Paragraph 4.4 identifies main functions of the QA organization and uses the words "assist plant management," "needs plant management advised of," and "through line management." The organization now in force has the QA department taking functional direction from the site director. This arrangement is in keeping with the NRCAM and TVA Topical Report. Therefore, the plant QA department management does and is required to take direction from site management.

9. Management Creates and Supports Negative Attitude Regarding QA Activities

No evidence of negative attitudes was shown in the personnel interviewed. The same individual that expressed reservations over independence believes that attitude and attitude toward QA are not good. However, there is evidence that the QA organization is being used extensively. The trend toward using QA as a tool is growing and being encouraged by plant management. Plant management stated that they may be using QA for more areas of work than they should. Comments expressed by plant supervision were good concerning the work done in QA in surveillance or distribution review, "Q" list review, and other special projects handled.

D. Effectiveness of QA Management

This employee concerns had an implied concern over the effectiveness of the top QA onsite management. Interviews with managers indicate that the QA manager is an analytical-type individual. He is very careful to ensure that correct work is being put out. This tendency on his part gives the impression to some of his subordinates that he is withholding or bottlenecking quality issues. NCRS Report No. I-85-121-WON documents some problems encountered with the OAR DR system of reporting deficiencies that were originated by the QA manager's policies. However, there is no evidence of the deliberate withholding of deficiencies.

The QA manager received high praise from onsite management, downtown (DOR) management, and a majority of the subordinates interviewed. It is believed that he is directly responsible for developing a positive site attitude about QA. One person interviewed believes that the QA manager's personality needs to be stronger so that he can stand up and say "No" if necessary.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

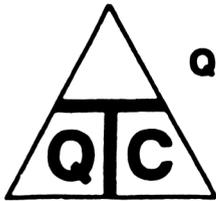
##### Conclusions

The majority of this allegation is unsubstantiated. The part of the concern that states that "QA management does as directed by plant management" is true. However, functional direction by site management is an organizational and upper-tier document requirement. The reasons for unsubstantiation of the remainder of the concern follow.

- A. The Code of Federal Regulations defines independence. TVA documents and interviews with personnel do not indicate personnel or organization violation of this definition or concern over the performance of assigned functions.
- B. Attitudes at Watts Bar concerning the use and effectiveness of the QA organization are generally positive. Use of the QA organization is encouraged by site management. Plant supervisors use the QA organization extensively.
- C. QA management is given high marks by both site and downtown DQA management and by a majority of subordinates interviewed.

##### Recommendations

None.



**QUALITY  
TECHNOLOGY  
COMPANY**

P.O. BOX 600  
Sweetwater, TN  
37874

ERT INVESTIGATION REPORT

PAGE 1 OF 3

CONCERN NO. IN-85-134-001

CONCERN: The Ice Deck Seal Stud welds did not meet visual inspection acceptance criteria. When notified of this fact the shift QC supervisor waived inspection requirement and allowed work to proceed.

INVESTIGATION

PERFORMED BY: W. M. Kemp, Jr.

---

DETAILS

PERSONNEL CONTACTED: Confidential

DOCUMENTS REVIEWED

WBNP-QCP 4.17 Rev. 0 (12/9/77) Rev. 1 (10/30/80) Ice Deck Seal  
Inspection  
Rev. 2 Inactivated 5/11/82  
G29C Civil Specification for Weld Inspection  
Attachment 1 to QCP 4.17 Ice Condenser Seal Inspection Sheet  
Drawing 44W290-1 & 2  
QCI 1.08 Rev. 11 - Quality Assurance Records  
QCI 1.40 Rev. 7 - Records Accountability Program

SUMMARY OF INVESTIGATION

The concern is not substantiated. The required inspections per QCP 4.17 Rev. 1 were conducted and documented in 1979/1980. In December of 1981 the documentation was retrieved per QCI 1.8, Quality Assurance Records, and received Engineering Evaluation Test No. 40A. These records are considered Life of Plant (LOP) per QCI 1.1, Records Accountability Program.

FINDINGS:

The following requirements pertain to the stud weld inspection for the Ice Condenser Seal Inspection:

CONCERN NO. IN-85-134-001

---

**DETAILS, continued****FINDINGS, continued**

QCP 4.17 Rev. 2 paragraph 6.9 states: "Welding inspection shall be verified by welding engineering unit (WEU) on Attachment 1." (Attachment 1 is the Ice Condenser Seal Inspection Sheet)

Para 8.0 states: "All documentation shall be accomplished on Attachment 1. Upon completion, Attachment 1 shall be sent to QC&R for review and filing."

Attachment 1 is the Ice Condenser Seal Inspection Sheet which is a Life of Plant document. The Ice Condenser Seal Inspection Sheet addresses "weld inspection verification".

From a programmatic aspect, the specifications and procedures established the necessary controls for the inspection and fabrication of the Ice Condenser Seal, and check lists for verification of construction were established. There is no evidence that the QC Supervisor waived the inspections required. All inspections were conducted per QCP 4.17 Rev 1.

As per QCP 4.17 Rev. 2, The Ice Condenser Seal Inspection Sheet "shall be sent to QC&R for review and filed" and will be a "Life of Plant" document. The search of DCU for the records using QCP 4.17 turned up no records. However, using a combination of QCI 1.8 QA Records and QCI 1.4 Records Accountability Program the documentation per QCI 4.17 (checklist) were located in DCU and were in a LOP Record, the actual (original) records documented the Ice Deck Seal Stud weld inspection for Unit 1 & 2.

NCR 6448 was issued when the documentation was not located initially. However, when documentation was located via records accountability program the NCR was voided.

CONCERN NO. IN-85-134-001

---

DETAILS, continued

CONCLUSIONS:

This concern is not substantiated.

Based on the investigation it has been determined that the seal stud welds were inspected and documented and the check list per QCP 4.17 were not retained as a "LOP" Record.

PREPARED BY:

*DM Kemp*

*11/16/85*

DATE

REVIEWED BY:

*OH Hess*

*11/16/85*

DATE

*Report reviewed & accepted:  
No recommendations.*

*[Signature]*  
*11/22/85*  
*NSES*

REQUEST FOR REPORTABILITY EVALUATION

1. Request No. IN-85-134-001 (ERT Concern No.) (ID No., if reported)
2. Identification of Item Involved: Retention of Documentation (Nomenclature, system, manuf., SN, Model, etc.)
3. Description of Problem (Attach related documents, photos, sketches, etc.)  
The ice deck seal stud welds did not meet visual inspection acceptance  
criteria. When notified of this fact the shift QC supervisor waived  
inspection requirements and allowed work to proceed.
4. Reason for Reportability: (Use supplemental sheets if necessary)
- A. This design or construction deficiency, were it to have remained uncorrected, could have affected adversely the safety of operations of the nuclear power plant at any time throughout the expected lifetime of the plant.  
No  Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_
- AND
- B. This deficiency represents a significant breakdown in any portion of the quality assurance program conducted in accordance with the requirements of Appendix B.  
No  Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_
- OR
- C. This deficiency represents a significant deficiency in final design as approved and released for construction such that the design does not conform to the criteria bases stated in the safety analysis report or construction permit.  
No  Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_
- OR

REQUEST FOR REPORTABILITY EVALUATION

D. This deficiency represents a significant deficiency in construction of or significant damage to a structure, system or component which will require extensive evaluation, extensive redesign, or extensive repair to meet the criteria and bases stated in the safety analysis report or construction permit or to otherwise establish the adequacy of the structure, system, or component to perform its intended safety function.

No  Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_

OR

E. This deficiency represents a significant deviation from the performance specifications which will require extensive evaluation, extensive redesign, or extensive repair to establish the adequacy of the structure, system, or component to perform its intended safety function.

No  Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_

IF ITEM 4A, AND 4B OR 4C OR 4D OR 4E ARE MARKED "YES", IMMEDIATELY HAND-CARRY THIS REQUEST AND SUPPORTING DOCUMENTATION TO NSRS.

This Condition was Identified by:

*Od Shew*  
ERT Group Manager

*365-4464*  
Phone Ext.

*Od Shew fa*  
ERT Project Manager

*365-4414*  
Phone Ext.

Acknowledgment of receipt by NSRS

*[Signature]*  
Signer

Date *1/22/85*

Time *08:00*

*NRC*

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : S. Schum, QTC/ERT Program Manager, Watts Bar Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : NOV 26 1985

SUBJECT: TRANSMITTAL OF ACCEPTED FINAL REPORTS

The following final reports have been reviewed and accepted by NSRS and are transmitted to you for preparation of employee responses.

I-85-612-WBN/SQN (XX-85-020-001)

I-85-723-WBN (IN-85-630-003, IN-85-630-004,  
WI-85-040-001, WI-85-040-002)

Original signed by  
M. S. Kidd

\_\_\_\_\_  
K. W. Whitt

Please acknowledge receipt by signing below, copying and returning this form to J. T. Huffstetler, E3B37 C-K.

\_\_\_\_\_  
NAME

\_\_\_\_\_  
DATE

JTH

Attachments

cc (Attachments):

H. N. Culver, W12A19 C-K

E. R. Ennis, WBN

W. F. Willis, E12B16 C-K (4)

0047U



TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-612-WBN/SGN

EMPLOYEE CONCERN XX-85-020-001

MILESTONE 1

SUBJECT: EGN EGN APPLICABILITY

DATES OF INVESTIGATION: November 12-18, 1985

INVESTIGATOR:

*J. D. Gilbreath*  
-----  
J. D. Gilbreath

*11/19/85*  
-----  
Date

REVIEWED BY:

*W. D. Stevens*  
-----  
W. D. Stevens

*11/19/85*  
-----  
Date

APPROVED BY:

*A. A. Harrison*  
-----  
A. A. Harrison

*11/19/85*  
-----  
Date

## I. BACKGROUND

NSRS has investigated Employee Concern XX-65-020-001 which was communicated to the Quality Technology Company (QTC) in response to the Watts Bar Employee Concern Program. The specific concern analyzed and discussed in this report was expressed to QTC as follows:

An ECN #5971 was issued at Sequoyah in 1979 that required a bypass of the over-torque limit switches on certain limitorque operators. It was recently discovered (3-4 months ago) that this had not been accomplished for SIS valve #332 and 333. CI is concerned about ECN's applicability to WBNP.

## II. SCOPE

The scope of this investigation consisted of reviewing the subject ECN to determine if similar changes were performed or necessary at Watts Bar.

A. During the course of this investigation, discussions were held with pertinent personnel in the WBNP Support Services Staff and Electrical Maintenance Section, and the Office of Engineering in Knoxville.

B. In addition, the following documents were reviewed.

1. ECN 45971 for SQN
2. ECNs 4551 and 4552 and Workplans 4555 and 5012
3. Quality Maintenance Data Sheets (QMDS) for 1-FCV-63-172, 1-FCV-62-332, and 1-FCV-62-333
4. Electrical Equipment Environmental Qualification Report (EEEEOR)
5. NCR W-293-F

## III. SUMMARY OF FINDINGS

A review of ECN 45971 revealed that the subject matter of the ECN was not consistent with the concern as stated. While this concern involved installation of a bypass on the overtorque-limit switches for certain valves, the ECN involved the replacement of valve-motor operators because of inadequate motor insulation as required for environmental qualification. However, the valves were the same. Accordingly, both subjects were addressed.

A review of the EEEEEOR and appropriate QMDSs indicated that the valves for WBN were procured with the proper motor insulation and qualified for their requisite accident environment, contrary to the apparent situation at Sequoyah.

For the bypass installation, discussions with personnel in CE revealed that EON 4551 for Unit 1 and EON 4552 for Unit 2 were issued to require a bypass on the overtorque-limit switches of the subject valves. These EONs were implemented at WBN through Work Plans 4055 and 5012. However, further discussions revealed that contrary to EON 4551, drawing 45W1758-28-5 R15 does not conform to the field installation or TVA drawings 45W1758-2 R10 and 45W1758-3 R9. Nonconforming Condition Report W-293-R has been issued to document this discrepancy.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

The concern that the same modifications required for the subject EON overtorque-limit switches were necessary for WBN is a valid one. The modifications had, however, been accomplished, and the concern is therefore unsubstantiated.

##### B. Recommendations

None.

3. The SQN FSAR 8.1.5, "Design Criteria and Standards," stated that "Although the design of the electric power system for the SQN preceded the publication of the standards and regulatory guides referenced below, it is TVA's belief that the design meets the intent of those standards and guides." IEEE 450-1972, "IEEE Recommended Practice for Maintenance, Testing, and Replacement - Large Stationary Type Power Plant and Substation Lead Storage Batteries," is one of those standards referenced.
4. The SQN Safety Evaluation Report (SER), NUREG-0011, dated March 1979 under section 8.3.2, "Direct Current Power System," stated that "Our review determined that the applicant had not provided performance test or service test requirements and criteria for Class 1E batteries. As the result, the applicant has agreed to load test these batteries according to the requirements of IEEE 450-1972. He has further stated that, in the performance of these tests, the actual loads supplied by the battery under the worst-case discharge conditions will be used. We found this acceptable."
5. Electrical Design Standard DS-E3.1.1, "Direct Current Systems - Batteries and Chargers - Definitions and Capacities," R0, dated May 21, 1976 and R1, dated April 30, 1982, both established compliance with the latest edition of IEEE 450 in effect at the time of the design.
6. The SQN-DC-V-11.1, "General Design Criteria for Additional Diesel Generator System," R0 dated May 16, 1980, required equipment compliance with IEEE 450.
7. SQN Surveillance Instruction SI-238.2, "Diesel Generator Battery Capacity Test" for units 1 and 2 was originally issued on February 27, 1981, and the latest revision, R4, was issued on July 15, 1984. This surveillance instruction outlined the test method for battery capacity testing of Diesel Generator Batteries (C & D Batteries Division 3DCU-9 batteries). It required performance of required capacity testing within the first two years of service and at five years intervals thereafter. This surveillance instruction further stated that ". . . it was written in accordance with IEEE 450-1975."
8. IEEE 450-1972, Section 4, "CAPACITY TEST SCHEDULE," identified the following schedule of capacity tests:
  - a. An acceptance test made at the factory or upon initial installation as determined by the user.
  - b. A performance test made within the first two years of service. Additional performance tests of each Class 1E battery at three year intervals until it shows signs of degradation.

## I. BACKGROUND

The Nuclear Safety Review Staff (NSRS) investigated employee concerns IN-85-630-003, IN-85-630-004, WI-85-040-001, and WI-85-040-002 which Quality Technology Company (QTC) had identified during the Watts Bar Employee Concern Program. The concerns were worded as follows:

### IN-85-630-003

Emergency Raw Cooling Water (ERCW) intake lines were improperly installed by the subcontractor. Several nonconformance reports were written, all of which came back dispositioned as 'No significant problems.' CI disagrees with these dispositions. Construction department concern. CI has no further information."

### IN-85-630-004

"Contractor (known) for the lining installation on the Emergency Raw Cooling Water (ERCW) intake line was required by contract, to maintain appropriate documentation relative to work performed. A Nonconformance Report was written, and dispositioned 'use as is' after the contractor twice failed to produce the required documentation. Construction department concern. CI has no further information."

### WI-85-040-001

"NCR (number known) was written on ERCW line in '81 (Nov.), to document non-conforming condition with cement mortar patches on lining. CI questions the validity of the disposition of this NCR because it was signed off under duress. Supervisor's name known. Details known to QTC, withheld due to confidentiality. Construction department concern."

### WI-85-040-002

"ERCW cement mortar lining was installed using an inadequate procedure and inspection plan which resulted in bad workmanship and a number of NCRs in 1982. Details known to QTC, withheld due to confidentiality. Construction department concern. CI has no further information."

During the course of this investigation, an attempt was made through QTC to verify that the subject of Employee Concern IN-85-630-003 was the cement-mortar lining installed in the ERCW system. This was confirmed by QTC.

## II. SCOPE

See NSRS Investigation Report No. I-85-166-WBN.

## III. SUMMARY OF FINDINGS

See NSRS Investigation Report No. I-85-166-WBN.

## IV. CONCLUSIONS AND RECOMMENDATIONS

See NSRS Investigation Report No. I-85-166-WBN.

UNITED STATES GOVERNMENT

## Memorandum

TENNESSEE VALLEY AUTHORITY

TO : H. G. Parris, Manager of Power and Engineering (Nuclear), MR 6N 11B-C

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : November 21, 1985

SUBJECT: INVESTIGATION OF ALLEGED FAILURE TO TEST DIESEL GENERATOR REPLACEMENT BATTERIES AT SEQUOYAH NUCLEAR PLANT - NUCLEAR SAFETY REVIEW STAFF REPORT NO. I-85-109-SQN

The Nuclear Safety Review Staff (NSRS) investigated an employee concern in August 1985 at Sequoyah Nuclear Plant (SQN). The employee had alleged that the replacement batteries for the Diesel Generators had not been tested per commitments to the IEEE-450 requirements since receipt by TVA.

The NSRS investigation of the employee's allegation conclusively substantiated the failure to test the Diesel Generator batteries at SQN per IEEE-450 requirements.

As noted previously in our draft report transmittal memorandum, the investigators experienced difficulty in making arrangements to promptly and confidentially interview Electrical Engineering Branch (EEB) personnel. Initially, EEB management requested from NSRS a listing of the names of those to be interviewed. Later on investigators were assured that all that was required by EEB management was for the immediate supervisor to know the whereabouts of their personnel. And finally the immediate supervisor was insisting on being present while their personnel were being interviewed. Although, after two weeks of delay, an agreement was reached so that employees could be interviewed privately, nonetheless this case illustrates the need for re-emphasizing the importance of the confidentiality of the investigation process throughout the Office of Engineering. R. W. Cantrell's memorandum to Those listed on November 1, 1985, should help alleviate future problems of this nature. Continued attention to this will be appreciated.

The attached report documents the NSRS conclusions and contains six recommendations. The general nature of the findings were communicated to SQN management on September 18, 1985. NSRS is fully aware of your August 26, 1985 memorandum which established the distribution requirement for the NSRS reports. This report would have been transmitted to the SQN Site Director and OE Manager had it not been for I-85-109-SQN-05, Battery Program Recommendation. This item suggested performance of a comprehensive battery program review for all nuclear plants and as such it is being brought to your attention. The draft report requested your response by October 31, 1985. Subsequently, a week extension was requested by SQN personnel and approved by NSRS. As of this date NSRS has not yet received any response to this report. Please determine the cause of this delay and provide us with your response.



2

H. G. Parris  
November 21, 1985

INVESTIGATION OF ALLEGED FAILURE TO TEST DIESEL GENERATOR REPLACE-  
MENT BATTERIES AT SEQUOYAH NUCLEAR PLANT - NUCLEAR SAFETY REVIEW  
STAFF REPORT NO. I-85-109-SQN

If you have any questions concerning the content of the report, please  
contact Mansour Guity at extension 2206 in Knoxville.

  
K. W. Whitt

*MS  
MB  
11/21/85  
TNR*

MSK:MG:WCS

Attachment

cc (Attachment):

H. L. Abercrombie, Sequoyah  
R. W. Cantrell, W12A12 C-K  
W. T. Cottle, MR6N46 B-C  
J. P. Darling, MR6N45 C-K  
E. R. Ennis, Watts Bar  
W. F. Willis, E12B16 C-K (4)

bc: H. N. Culver, W12A19 C-K  
QTC/ERT, CONST-WBN

REPO7A:J

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-109-SQN

EMPLOYEE CONCERN: XX-85-001-001

SUBJECT: Diesel Generator Battery Testing

DATES OF INVESTIGATION: August 5 through August 19, 1985

INVESTIGATOR  
LEAD:

*Mansour Guity*  
Mansour Guity *f*

*11/13/85*  
Date

INVESTIGATOR:

*ja* *Mansour Guity*  
Douglas J. Hornstra *f*

*11/13/85*  
Date

REVIEWED BY:

*P. C. Sauer*  
P. C. Sauer

*11/13/85*  
Date

APPROVED BY:

*M. S. Kidd*  
M. S. Kidd

*11/18/85*  
Date

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## I. BACKGROUND

A TVA employee had expressed a concern that the Sequoyah Nuclear Plant (SQN) Diesel Generator (DG) replacement batteries have not been initially tested per Institute of Electrical and Electronic Engineering (IEEE) 450 since installation.

It was later learned that the concern expressed by the employee also included periodic testing per IEEE 450, and as a result the scope was broadened to include initial and subsequent periodic testing per IEEE 450.

## II. SCOPE

This investigation was conducted to determine SQN's commitment to IEEE 450 testing requirements, in particular, acceptance test and initial and periodic capacity tests (performance test). The investigators interviewed SQN and Office of Engineering (OE) personnel as well as making telephone inquiries to Office of Nuclear Power (NUC PR) licensing and Watts Bar Nuclear Plant (WBN) personnel. Applicable procedures, instructions, and industry standards as well as appropriate portions of the SQN Final Safety Analysis Report (FSAR) and Safety Evaluation Report (SER) were reviewed.

## III. SUMMARY OF FINDINGS

### A. Program Requirements

1. The SQN FSAR chapter 8.3 describes the ONSITE POWER SYSTEM. Section 2 of this chapter (8.3.2) describes the Direct Current (DC) Power System. This section is subdivided into two distinct segments. Subsection 1 (8.3.2.1.1) describes the Vital 125V DC Control Power System, Class 1E System, which is comprised of battery boards, vital chargers, vital batteries, and diesel generator batteries (NSRS underlining). Subsection 2 (8.3.2.1.2) describes the nonsafety-related dc power systems.

Although the terms such as "vital DC system," and "DC power system" are used in 8.3.2.1.1 and might be somewhat vague and possibly open to other interpretation at first, the above stated terms in 8.3.2.1.1 have been used synonymously and were intended to reference the Vital 125V DC Control Power System. This system as described in the FSAR is considered to be Class 1E system and as such all the batteries within this system are Class 1E batteries.

2. The SQN FSAR 8.3.2.1.1 page 8.3-66, "Tests and Inspections," stated that "Prior to placing the vital DC system in operation, the system components were tested to ensure proper operation. The batteries are tested during the preoperational testing by discharging them with a load which simulates their loading during an AC power outage. The test is performed in accordance with IEEE 450,..."

3. The SQN FSAR 8.1.5, "Design Criteria and Standards," stated that "Although the design of the electric power system for the SQN preceded the publication of the standards and regulatory guides referenced below, it is TVA's belief that the design meets the intent of those standards and guides." IEEE 450-1972, "IEEE Recommended Practice for Maintenance, Testing, and Replacement - Large Stationary Type Power Plant and Substation Lead Storage Batteries," is one of those standards referenced.
4. The SQN Safety Evaluation Report (SER), NUREG-0011, dated March 1979 under section 8.3.2, "Direct Current Power System," stated that "Our review determined that the applicant had not provided performance test or service test requirements and criteria for Class 1E batteries. As the result, the applicant has agreed to load test these batteries according to the requirements of IEEE 450-1972. He has further stated that, in the performance of these tests, the actual loads supplied by the battery under the worst-case discharge conditions will be used. We found this acceptable."
5. Electrical Design Standard DS-E3.1.1, "Direct Current Systems - Batteries and Chargers - Definitions and Capacities," R0, dated May 21, 1976 and R1, dated April 30, 1982, both established compliance with the latest edition of IEEE 450 in effect at the time of the design.
6. The SQN-DC-V-11.1, "General Design Criteria for Additional Diesel Generator System," R0 dated May 16, 1980, required equipment compliance with IEEE 450.
7. SQN Surveillance Instruction SI-238.2, "Diesel Generator Battery Capacity Test" for units 1 and 2 was originally issued on February 27, 1981, and the latest revision, R4, was issued on July 15, 1984. This surveillance instruction outlined the test method for battery capacity testing of Diesel Generator Batteries (C & D Batteries Division 3DCU-9 batteries). It required performance of required capacity testing within the first two years of service and at five years intervals thereafter. This surveillance instruction further stated that ". . .it was written in accordance with IEEE 450-1975."
8. IEEE 450-1972, Section 4, "CAPACITY TEST SCHEDULE," identified the following schedule of capacity tests:
  - a. An acceptance test made at the factory or upon initial installation as determined by the user.
  - b. A performance test made within the first two years of service. Additional performance tests of each Class 1E battery at three year intervals until it shows signs of degradation.

- c. A service test as required by the user to meet a specific application requirement.
9. IEEE 450-1975, Section 4, "CAPACITY TEST SCHEDULE," identified the following changes to the IEEE 450-1972 schedule for capacity tests:
    - a. Additional performance tests at five year intervals until it shows signs of degradation.
    - b. A service test performed for Class 1E batteries as part of the preoperational and periodic dc system tests described in IEEE 308-1974.
  10. Division Procedural Manual (DPM) N73M13, "Battery Installation and Maintenance Procedures," paragraph IV.C.13 dated July 20, 1979, specified that "When required, a performance or service discharge test shall be conducted in accordance with IEEE Standard No. 450-1972. . . .The Electrical Maintenance Group will assist in discharge testing and specifying duration of tests, etc." Furthermore, paragraph V.A established battery replacement criteria based upon battery capacity as determined by performance discharge test or service discharge test.
  11. DPM N79M9, "Nuclear Plants - Battery Capacity Analysis," dated July 29, 1985, required the notification of "the Component Engineering Group in Chattanooga when any safety related battery discharge test indicated less than 100-percent capacity." The attachment to N79M9 included the SQN Diesel Generator Batteries.

B. Diesel Generator Battery History

1. The initial DG batteries (DG 1A-A, 1B-B, 2A-A, 2B-B) were Exide batteries. These were capacity tested during the preoperational testing per procedure TVA-14E, which was in accordance with IEEE 450-1975.
2. C & D 3DCU-9 batteries were purchased as replacement batteries for DG 1A-A, 2A-A, 1B-B, 2B-B. Three of the four batteries were purchased to IEEE 450-1975 with the vendor performing an IEEE 450 acceptance test. The fourth battery (for DG 1A-A) was transferred from Browns Ferry Nuclear Plant (BFN).
3. The fifth DG and associated batteries were purchased from Power Systems Division of Morrison Knudson Corporation with a C & D 3DCU-9 battery.
4. Activities related to the five DG batteries are summarized in Table 1, "DG Battery History."

TABLE 1 DG BATTERY HISTORY

	<u>DG 1A-A BATTERY</u>	<u>LTA</u>	<u>DG 1B-B, 2A-A, 2B-B BATTERIES</u>	<u>LTA</u>	<u>FIFTH DG BATTERY</u>	<u>LTA</u>
?	BFNP rec'd battery	1	- - -		- - -	
8/12/80	SQN rec'd 60 Cells (3DCU-9) from BFN (BFM 80-011)	2	- - -		- - -	
8/14/80	Work Plan Spec 8798 pre- pared for installation		- - -		- - -	
8/14/80	Battery test (With charger off one hour - start diesel) delet- ed from WP Spec 8798		- - -		- - -	
8/14/80	6 Cells (3DCU-9) shipped from WBN to SQN - rec'd 8/15/80 (TR 10344) - (cells had been placed in spares 5/21/80 from DG Battery Banks - initially rec'd at WBN on PO 77K64- 821165 on 11/24/76	3	- - -		- - -	
8/17/80	Temp. change requested (80-1616) to WP 8798 to delete battery test (with charger off one hour - start diesel) and replace with inspection in accor- dance with MI 10.2, SI-238	4	- - -		- - -	
8/17/80	60 Cells on float - S.G. range 1.195 - 1.225	5	- - -		- - -	

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<u>DG 1A-A BATTERY</u>		<u>LTA</u>	<u>DG 1B-B, 2A-A, 2B-B BATTERIES</u>		<u>LTA</u>	<u>FIFTH DG BATTERY</u>		<u>LTA</u>
8/18/80	Temp. Change (expected duration of 14 days) 80-1616 app'd	4	- - -			- - -		
8/18/80	WP 8798 signed off complete - including post-modification tests	6	- - -			- - -		
- - -			1/06/81	SQN rec'd 57 Cells (3DCU-9) from C&D SQN-81-0852		- - -		
- - -			3/20/81	SQN rec'd 57 Cells, (3DCU-9) & 54 Cells, (3DCU-9) from C&D SQN-81-1294		- - -		
- - -			- - -			4/1/81	SQN rec'd 57 Cells (3DCUC-9) from C&D (SNP-81-1410) NCR 2686 written based upon high S.G.	
- - -			6/9/81	3 Battery banks transferred to NUC PR mod sect (168 cells) from CONST		- - -		
- - -			09/24/81	WP Spec 9119 Prepared - post mod test specified performance of SI 238.2		- - -		
- - -			<u>?</u>	3 Battery Banks placed on charge	8	12/30/81	Battery placed on charge (per TVA response to NRC)	
- - -			<u>?</u>	6 Cells transf. out	9	01/29/82	C&D rep. lowered S.G. (per NRC notice of violation)	
- - -			02/02/82	SI-238 Performed on stored batteries (162 cells inspected)		- - -		

<u>DG 1A-A BATTERY</u>	<u>LTA</u>	<u>DG 1B-B, 2A-A, 2B-B BATTERIES</u>	<u>LTA</u>	<u>FIFTH DG BATTERY</u>	<u>LTA</u>
- - -		- - -		6/01/82	First Const. Insp. to II-19
- - -		- - -		11/16/82	C&D continued dilution (per NRC notice of violation)
- - -		04/23/82		- - -	
		Although performance of SI-238.2 was specified, the "Post-modification test required" block was checked <u>NO</u>			
- - -		04/27/82		- - -	
		WP Spec 9119R1 signed off by elect. maint with change to work plan instruction to delete SI-238.2, and add SI-238 inspection			
- - -		<u>?</u>		- - -	
		9 Cells added	10		
<u>?</u>		05/06/82		- - -	
3 Cells removed from DG 1A-A	7	After 30 minutes with charger off, DG 2B-B started (57 cells)			
- - -		05/13/82		- - -	
		After 30 minutes with charger off, DG 1B-B started (57 cells)			
- - -		05/27/82		- - -	
		SI-238 Performed on 1B-B, 2B-B (57 cells each)			
06/16/82		07/27/82		- - -	
Performed SI-238 on DG 1A-A (57 cells). After 30 min battery charger off, started DG 1A-A		SI-238 Performed on 2A-A (57 cells)			
		07/30/82		- - -	
		After 30 min battery charger off, started DG 2A-A (57 cells)			

DG 1A-A BATTERY

- - -

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- - -

LTADG 1B-B, 2A-A, 2B-B BATTERIES

- - -

- - -

- - -

- - -

LTAFIFTH DG BATTERYLTA

06/14/83 OE allowed SQN-CONST  
to dilute using ven-  
dor procedure (per  
NRC notice of vio-  
lation

? 3 Cells transferred 11  
out to

07/15/83 Cells at correct S. G.  
(Per NRC notice of  
violation) (now consi-  
dered 3 DCU-9)

10/18/83 Emergency Tranfer of 12  
54 Cells to NUC PR  
from SQN-CONST TRF  
943331 - "Necessary  
to prevent shutdown  
of units 1 and 2," Per  
transfer request

No.	Description of Less Than Adequate (LTA)
1	<ul style="list-style-type: none"> <li>◦ Receipt date?</li> <li>◦ Contract number?</li> <li>◦ Vendor test info.?</li> <li>◦ Number of cells?</li> </ul>
2	<ul style="list-style-type: none"> <li>◦ Specific identification of transferred cells?</li> </ul>
3	<ul style="list-style-type: none"> <li>◦ Specific identification of transferred cells?</li> <li>◦ Initial change date at WBN?</li> </ul>
4	<ul style="list-style-type: none"> <li>◦ Temp. change requested 3 days after change made, why?</li> <li>◦ Temp. change approved 4 days after change made, why?</li> </ul>
5	<ul style="list-style-type: none"> <li>◦ Specific identification of 60 cells versus 66 cells rec'd.?</li> </ul>
6	<ul style="list-style-type: none"> <li>◦ WP signed off as complete with a temp. change still in effect</li> <li>◦ Post Mod. test did not include functional test</li> </ul>
7	<ul style="list-style-type: none"> <li>◦ Removal date of 3 cells?</li> <li>◦ Specific identification of the 3 removed cells?</li> <li>◦ Disposition of the 3 removed cells?</li> </ul>
8	<ul style="list-style-type: none"> <li>◦ Date of placement on charge?</li> </ul>
9	<ul style="list-style-type: none"> <li>◦ Transferred out date for the 6 cells?</li> <li>◦ Specific identification of the 6 cells transferred out?</li> <li>◦ Disposition of the 6 cells?</li> </ul>
10	<ul style="list-style-type: none"> <li>◦ Date of the addition of 9 cells?</li> <li>◦ Specific identification of the 9 cells?</li> </ul>
11	<ul style="list-style-type: none"> <li>◦ Transferred out date of the 3 cells?</li> <li>◦ Specific identification of the 3 cells?</li> <li>◦ Dispositior of the 3 cells?</li> </ul>
12	<ul style="list-style-type: none"> <li>◦ Number of required cells for 5th diesel?</li> </ul>

This listing of LTAs describes some of the questionable practices/missing information as determined by the investigators. This listing should not be construed as an all inclusive listing of findings.

## C. Program Implementation

### 1. Performance Test

SI-238.2 required that a performance capacity test be conducted within two years of placing the battery in service per IEEE 450-1975, with subsequent testing at 60 month intervals. Since the receipt of the DG batteries, no testing has been conducted in accordance with SI-238.2.

SI-238.2 was initially released in February 1981, six months after the modification of the DG 1A-A battery. It has subsequently been revised four times. However, the Electrical Maintenance Section has never provided an input to plant scheduling to include this SI.

### 2. Service Test

Procedures/instructions for the performance of a service test on the DG batteries, in accordance with IEEE 450-1972 as discussed in the Safety Evaluation Report, NUREG-0011, have not been developed.

### 3. SI-238.2 Content

IEEE 450-1972, Section 4, "Capacity Test Schedule" stated that "It is desirable. . . that the performance tests be similar in duration to the battery acceptance test." Furthermore, the IEEE 450-1972, Section 5.4, "Acceptance and Performance Test Description," stated that the discharge rate be maintained "until the battery terminal voltage falls to a value equal to the minimum specified average voltage per cell (usually 1.75) times the number of cells."

The IEEE 450-1975 acceptance test performed by the vendor was conducted at the 30-minute discharge rate to approximately 105 volts (1.84 volts per cell). SI-238.2 specified a two-hour discharge rate to 100 volts (1.75 volts per cell) without a basis for this lower final voltage. However, it was noted that if the battery consisted of 60 cells (as initially installed for DG 1A-A), 1.75 volts per cell would have yielded a final battery voltage of 105 volts.

### 4. Equalizing Charge

IEEE-450-1972, Section 3.4, required performance of an equalizing charge if the average specific gravity of all cells drops more than .010 from the acceptance test value. SQN personnel could not have met this requirement since the acceptance test data was not available. Furthermore, the present SQN program does not require com-

parison of the average of the specific gravity of all cells as a basis for performing an equalizing charge.

5. Post Modification Testing

- a. A functional test was not specified in Work Plan (WP) 8798 for the DG 1A-A battery following the battery modification.
- b. The DG start test performed in WP9119 R1 (with the battery charger disconnected for 30 minutes prior to the start) was different from the worst-case start test of preop test TVA-14D.

6. Traceability of Pertinent Manufacturer's Data to Specific Batteries

Battery cells have been added to the battery banks and deleted from banks while in storage with no traceability maintained. The following paragraphs a and b illustrate questionable program implementation issues in addition to those discussed in Table 1.

- a. Of the batteries received for DG 1B-B, 2A-A, 2B-B, the vendor supplied two banks of 57 and one bank of 54 cells. However, vendor test data for one of the 57 cell delivered batteries had been performed with 60 cells. The 54-cell battery had been tested at the vendor with 57 cells. No traceability of specific cells to the vendor test was provided.
- b. Of the 168 cells received for DG 1B-B, 2A-A and 2B-B, only 162 cells were present when the cells were inspected (SI-238) on February 2, 1982. SI-238 did not document which cells belonged to which battery banks.

7. Post-Modification Test Requirements/Determination

EN DES-EP 6.03, "Post-Modification Testing Documents - EN DES Processing After Issuance of An Operating License," R3, stated that EN DES NEB Nuclear Safety Systems Group (NSA) determined whether a post-modification test scoping document was required. The footnote to Section 2.1 stated that:

"This determination is based on whether or not the DCR/ECN impacts a system(s), structure(s), or component(s) in such a way that routine post-modification testing (wire checks, component operability check, non-destructive examinations, etc.) as performed by NUC PR is not sufficient to adequately test all the aspects and/or impacts of the DCR/ECN."

SQN AI-19, "Plant Modification After Licensing," paragraph 4.1.2, required that work plan specification section entitled "Post-Modification Test Required" shall be completed as follows:

This test is specified in the OE scoping document issued by OE (if specified on the ECN cover sheet). All other tests as defined by the cognizant engineer are considered normal modification checkout (functional tests, etc.).

SQN AI-19, paragraph 4.1.2.13.d(2), "Functional Tests," described the action required by the cognizant engineer (or systems engineer). This procedure required that the functional test be comprehensive enough to ensure that the new components perform their intended function.

The preparer of WP8798 originally required performance of a limited functional test (not worst-case) of the DG 1A-A battery. This work plan required the start of the DG after the charger had been off for one hour, which was less severe than Pre-Op Test TVA-14D. However, this test was deleted by temporary change 80-1616 because the ECN did not specifically require it. Furthermore, the temporary change stated that it did not alter the intent of WP8798. SQN personnel indicated that a service capacity test had not been conducted upon installation of the battery because Engineering had not written a test scoping document.

The OE procedure references routine post-modification testing, whereas the NUC PR procedure references normal post-modification testing. Neither of the organizations have clearly delineated what tests are considered routine/ normal. Therefore the intent of one could have not been clearly understood by the other as indicated in this case.

D. Internal Correspondence on the Performance of Battery Capacity Tests

1. The memorandum from M. N. Sprouse to J. R. Calhoun dated October 27, 1980 (EEB 801024 940), required NUC PR (SQN) to perform an acceptance test on the new batteries per IEEE 450-1975 and forward the results to EN DES (now OE) for evaluation and further reference. This memorandum stated that the acceptance test requirement per IEEE 450-1975 is satisfied during preoperational testing. It further stated that a performance test of battery capacity is accomplished during preoperational testing. The investigators noted the following:
  - a. SQN had not been committed to IEEE 450-1975 as referred to in this memorandum. The commitment was to IEEE 450-1972.

- b. This memorandum had mistakenly used the acceptance test and performance test interchangeably. Preoperational testing of the batteries done by TVA satisfies the performance test per IEEE 450-1972 and not the acceptance test as indicated in this memorandum. An acceptance test is performed either at the factory or upon initial installation, whereas a performance test is the test conducted within the first two years of service. Therefore, since preoperational tests are not conducted right after the initial installations and in most all cases are done later than a couple of years after the initial installation, they could not satisfy the requirements of IEEE 450-1972 acceptance test. They do in fact satisfy the performance test requirements.
  - c. It is unclear as to what the Electrical Engineering Branch (EEB) intended to do with the test results once they were forwarded to them. EEB does not have a program to utilize this information for the purpose of trending the degradation of batteries during their life expectancy. This function has traditionally been the responsibility of NUC PR as delineated in TVA DPM N79M9, which provided direction to the nuclear plant management to forward the capacity test results to Component Engineering Group, Chattanooga.
- 2. The memorandum from H. J. Green to M. N. Sprouse dated August 12, 1981 (L23 810810 820), responding to OE's request for capacity test data stated that as soon as the new battery banks have been installed capacity tests will be performed and the results forwarded to OE.
  - 3. The memorandum from M. N. Sprouse to H. J. Green dated September 10, 1981 (EEB 810910 902), required performance test of the new batteries to be done per IEEE 450-1980.

Quite clearly each time OE corresponded with NUC PR a newer edition of IEEE 450 was recommended for the performance of the testing, disregarding the original commitment which was to IEEE 450-1972 edition.

- 4. Potentially Reportable Occurrence (PRO) 184-129 dated April 17, 1985, identified that a discharge/capacity test had not been performed on DG 1A-A battery.

Although the compliance engineer originally indicated that the PRO appeared to be potentially reportable, he made a subsequent determination that:

- a. Based upon a review of the technical specification, the FSAR, and 10CFR50 Appendix A, no commitment on the part of Sequoyah exists to meet the testing requirements of IEEE 450.

- b. Failure to capacity test the batteries for DG 1A-A was not reportable.
- c. Battery manufacturer's documentation of capacity and the preoperational tests completed on the diesels . . . met the design basis of FSAR section 8.3. [Note: The investigators' request for manufacturer's capacity data for the DG 1A-A was not met as the information was not available.]

The determination made by SQN compliance was without the knowledge of the related SQN NRC safety evaluation report (NUREG 0011). SQN compliance did not have a copy of NUREG 0011 prior to the initial contact during this investigation.

#### E. Specific Related Findings

- 1. The investigators contacted OE NEB/NLS and NUC PR licensing to locate the TVA correspondence to NRC-NRR which had predicated the agreement on performing battery load tests per IEEE 450-1972. Neither of the two groups was able to locate any document other than FSAR amendments.
- 2. Electrical Design Standard DS-E3.1.1, "Direct Current Systems - Batteries and Chargers - Definitions and Capacities," is applicable to all batteries, Class 1E and non-Class 1E. This standard required compliance with the latest edition of IEEE 450 in effect at the time of design.
- 3. There was conflicting information on the initial date the DG battery 1A-A was placed on charge. NRC inspection report Nos. 50-327/84-33 and 50-328/84-33 indicated that the batteries may have been placed on charge during January 1982. The TVA response to the notice of violation (L44 850118 806) stated that the battery was placed on charge on December 30, 1981. The documents provided to the investigators indicated that they were first placed on charge as early as May 5, 1982.

#### IV. CONCLUSION/RECOMMENDATION

##### A. I-85-109-SQN-01, IEEE 450-1972 Commitment

###### Conclusion

The investigators substantiated the employee's concern. It was concluded that SQN was in fact committed to IEEE 450-1972. Part of this commitment required performance of "IEEE 450 PERFORMANCE TEST." The initial performance test must be done within the first two years after the batteries had been placed in service. The subsequent frequency of the performance test is once every three years. The investigators concluded that a performance test - initial as well as subsequent test - had

not yet been performed for the replacement batteries and the fifth DG batteries.

The investigators did not find any evidence that DG batteries were excluded from this commitment.

#### Recommendation

Conduct a performance test per IEEE 450-1972 requirement. Continue to conduct this test per required frequency.

- B. I-85-109-SQN-02, Availability of Documentation Supporting Traceability of Batteries to Manufacturer's Test Data as Well as TVA's Preventive Maintenance Surveillances

#### Conclusions

The investigators were provided documentation relating to the batteries after a week long search by SQN personnel. The information obtained was not conclusive and a number of important pieces of data were either not available to SQN personnel or were not provided to the investigators. Traceability of pertinent manufacturer's data to specific batteries has not been maintained.

#### Recommendation

- a. Establish a program which provides and maintains traceability of manufacturer's and TVA's test data to specific batteries.
  - b. Review purchase document, manufacturer's documents, intersite transfer documents, battery cell exchange documents, or other pertinent data to disseminate pertinent test information that can be related to the battery installed for each DG.
- C. I-85-109-SQN-03, Availability of IEEE 450-1972 Acceptance Test Data for DG 1A-A and Fifth DG Batteries

#### Conclusion

The documentation recording the acceptance capacity test results for DG 1A-A and fifth DG batteries were either nonexistent or not provided to the investigators. Without these documents, item 2 (specific gravity variation) of section 3.4 of IEEE 450-1972 cannot be satisfied.

#### Recommendation

Acceptance capacity test documents should be searched out for DG 1A-A and fifth DG batteries. If the search should fail to locate the acceptance test data, a test should be conducted by

TVA equivalent to IEEE 450-1972 section 4.1 to determine that these batteries meet manufacturer's specifications and/or ratings.

D. I-85-109-SQN-04, Performance of Service Test as Committed to Per SER of March 1979

Conclusion

Objective evidence supporting performance of "service test" in accordance with IEEE 450-1972 was not available.

Recommendation

Perform service test per IEEE 450-1972.

E. I-85-109-SQN-05, Battery Program

Conclusion

NSRS, while investigating this particular employee concern, discovered a number of other items that were questionable and at best appeared to indicate programmatic as well as implementation problems (see detail III.C).

Recommendations

NSRS recommends performance of a comprehensive battery program review for all nuclear plants. NSRS further recommends consideration for expansion of this review to non-class 1E station batteries.

F. I-85-109-SQN-06, Post-Modification Test Requirement Program

Conclusion

A potential contributing cause of failure to perform the battery capacity tests was the ambiguity in the program for specifying post-modification testing requirements. EN DES EP 6.03 allowed some range of interpretability regarding what routine testing would have been completed by NUC PR without additional specification by Engineering. SQN deleted testing from the WP 8798 while specifically stating that this testing was not required by the ECN. While the actual motivation for not conducting capacity test could not be determined, the split of responsibility between Engineering (with its determination for nonroutine post-modification test requirements - EN DES-EP 6.03) and NUC PR (with its determination of functional post-modification test requirements) provided an opportunity to justify not performing the test.

Recommendation

Provide a policy statement on organizational responsibility. Full responsibility of determining post-modification test

requirements should be placed upon the operating plant management. Although Engineering may advise the plant management of the need to perform special tests, the need to determine that the equipment still meets its licensing commitments and design bases rests with the plant management.

NRC

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : E. R. Ennis, Acting Site Director, Watts Bar Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : NOV 27 1985

SUBJECT: CORRECTIVE ACTION RESPONSE EVALUATION

REPORT NO. : I-85-125-WBN

SUBJECT : PERSONNEL QUALIFICATIONS

CONCERN NO.: IN-85-393-003

( X ) ACCEPT ( ) REJECT

Original signed by  
M. S. Kidd

\_\_\_\_\_  
K. W. Whitt

BFS:JTH  
cc (Attachment):  
H. N. Culver, W12A19 C-K  
E. K. Sliger, E12B13 C-K  
W. F. Willis, E12B16 C-K (4)  
QTC/ERT, CONST-WBN--For response to employee.

Principally Prepared by Bruce F. Siefken.

0123U



UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

FROM : E. R. Ennis, Plant Manager, Watts Bar Nuclear Plant P&E (Nuclear)

DATE : November 21, 1985

SUBJECT: WATTS BAR NUCLEAR PLANT - EMPLOYEE CONCERN IN-85-125-WBN - OPEN ITEM NUMBER I-85-125-WBN-02

Reference: Your memorandum to me dated October 30, 1985 on the above subject

Standard practice WB 2.2.1 prescribes various requirements that must be considered in making personnel selections at the site. This standard practice was revised on September 26, 1985 to add the Final Safety Analysis Report (FSAR) and American National Standard Institute (ANSI) N18.1 to the listing of applicable requirements that must be considered in making future selections. This revision will ensure that consistency is maintained for future personnel selections in applicable positions.

*E. R. Ennis*  
 E. R. Ennis

MKJ:NC

This memorandum was principally prepared by M. K. Jones.

✓  
NOV 25 '85

Handls	Noted
Whitt	
<i>mkj</i>	<i>mkj</i>
LML	
BJN	
WCS	
JTH	
<i>AKC</i>	<i>AKC</i>
IRG	
TARG	
VI	JTH



UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : S. Schum, QTC/ERT Program Manager, Watts Bar Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : NOV 27 1985

SUBJECT: TRANSMITTAL OF ACCEPTED FINAL REPORTS

The following final reports have been reviewed and accepted by NSRS and are transmitted to you for preparation of employee responses.

- ✓I-85-172-WBN (IN-85-463-007)
- ✓I-85-414-WBN (IN-86-055-002)
- ✓I-85-606-WBN (WI-85-054-003)

Original signed by  
M. S. Kidd

\_\_\_\_\_  
K. W. Whitt

Please acknowledge receipt by signing below, copying and returning this form to J. T. Huffstetler, E3B37 C-K.

\_\_\_\_\_  
NAME

\_\_\_\_\_  
DATE

JTH  
 Attachments  
 cc (Attachments):  
 H. N. Culver, W12A19 C-K  
 E. R. Ennis, WBN  
 W. F. Willis, E12B16 C-K (4)

0047U



TENNESSEE VALLEY AUTHORITY  
NUCLEAR SAFETY REVIEW STAFF  
NSRS INVESTIGATION REPORT NO. I-85-172-WBN  
EMPLOYEE CONCERN IN-85-463-007  
MILESTONE 3

SUBJECT: DELAY IN DOCUMENTS AND DRAWINGS

DATES OF INVESTIGATION: October 3-29, 1985

INVESTIGATOR:

Fredrick J. Slagle  
F. J. Slagle

11/20/85  
Date

REVIEWED BY:

J. D. Smith  
J. D. Smith

11/20/85  
Date

APPROVED BY:

A. Harrison  
A. Harrison

11/22/85  
Date

## I. BACKGROUND

The Nuclear Safety Review Staff (NSRS) investigated Employee Concern IN-85-463-007 which Quality Technology Company (QTC) had identified during the Watts Bar Employee Concern Program. The concern was worded:

Instrument dedicated for a particular unit or system are frequently sent to another unit, system, or even plant, i.e. Watts Bar to Sequoyah. The drawings and other applicable documentation is not revised for months if ever.

Prior to initiation of this investigation, an attempt was made through QTC to obtain additional information from the concerned individual. The concerned individual could provide no examples but stated that the contract number is not updated on the Missing Instrument List and Instrument Tabulations when an instrument is replaced with one procured on a different contract or by a different manufacturer's product.

## II. SCOPE

NSRS has examined the Missing Instrument List and has contacted the personnel responsible for maintaining and updating the Missing Instrument List and initiating updates to the Instrument Tabulations.

## III. SUMMARY OF FINDINGS

An examination of the Missing Instrument List was conducted by NSRS. This examination revealed that approximately 1400 instruments have been placed on the list since its origin. Approximately 600 instruments remain on the list; therefore, approximately 800 instruments have been reprocured and received onsite for installation.

Interviews were conducted with personnel responsible for maintaining and updating the Missing Instrument List and initiating updates to the Instrument Tabulations. The Missing Instrument List is a tracking program for Watts Bar Unit 2 equipment that is utilized to ensure that instrumentation transferred to another location is reprocured. The Missing Instrument List is not a procedurally controlled document but is only a tracking program utilized to monitor the reprocurement status of instruments not available for service on Watts Bar Unit 2.

The methodology utilized to identify missing instruments is as follows. The Office of Construction (OC) cognizant systems engineer identifies instruments to be placed on the Missing Instrument List. These instruments or equivalent replacements are procured by the Office of Engineering (OE). When the replacement instrument is procured on a contract different from the original, the contract numbers on the Instrument Tabulation, which is a controlled drawing, require revision.

The GC systems engineer transmits a Field Change Request (FCR) to OE requesting revision of the applicable documentation. Engineering Change Notices (ECN) are utilized by OE to update the contract numbers on the Instrument Tabulations. ECN 5509 is used for this purpose. This Missing Instrument List is also updated to show that the contract number has been changed on the Instrument Tabulations by placing an "I" as an identifier in the ECN column on the Missing Instrument List after the ECN number: i.e., 5509 I. An additional check of this process occurs when GC Quality Control inspects the installation of the replacement instrument. They verify that the FCR was sent to OE and that the contract number has been changed on the Instrument Tabulations. All personnel contacted stated that contract numbers were updated at required intervals on the Missing Instrument List. These personnel also stated that they were not aware of any examples of contract numbers not being updated but that this could have happened.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### Conclusions

Interviews with personnel responsible for maintaining and updating the Missing Instrument List and initiating updates to the Instrument Tabulations and examinations of the Missing Instrument List revealed no instances where contract numbers were not updated on the Missing Instrument List and Instrument Tabulations as required. The employee concern was not substantiated because no examples of failures to update instrument contract numbers when required on the Missing Instrument List and subsequently the Instrument Tabulations were identified by the NGRS investigation of the concerned individual. Based on the results of this investigation, the Missing Instrument List appears to be an effective method of reprocuring missing instruments.

##### Recommendations

None.

TENNESSEE VALLEY AUTHORITY  
NUCLEAR SAFETY REVIEW STAFF  
NSRS INVESTIGATION REPORT NO. I-85-414-WBN  
EMPLOYEE CONCERN IN-86-055-002  
MILESTONE 3

SUBJECT: LEAKING PIPE

DATES OF INVESTIGATION: October 23-November 20, 1985

INVESTIGATOR:   
R. J. Outshaw 11/22/85  
Date

REVIEWED BY:   
W. D. Stevens 11/22/85  
Date

APPROVED BY:   
W. A. Harrison 11/22/85  
Date

## I. BACKGROUND

A concern was received by the Quality Technology Company (QTC) Employee Response Team that stated:

Leaking pipe on 692 elev., Aux Bldg., Unit #1. CI has no further information. Time Frame: Current.

## II. SCOPE

The scope of this investigation was defined by the concern of record:

- A. To determine if there was a leaking pipe in the stated location.
- B. To identify the involved system (if substantiated), assess the nuclear-safety impact, and recommend corrective action.

## III. SUMMARY OF FINDINGS

- A. Additional identifying information was requested from QTC. QTC responded that no further information was available.
- B. Two walkdowns were performed of the auxiliary building on elevation 692'. No indications of an existing pipe leak were found.

## IV. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

The concern of record was not substantiated in that no evidence was found of a pipe leak in the area in question.

Without the benefit of further specific identifying information, it must be assumed that the alleged leak had been corrected prior to the walkdowns or was too small to have provided visible indicators during the walkdown.

### Recommendations

None.