ATTACHMENT A

EMPLOYEE CONCERNS
FOR SUBCATEGORY 23000

Attachment A -- lists, by element, each employee concern evaluated in the subcategory. The concern's number is given, along with notation of any other element or category with which the concern is shared; the plant sites to which it could be applicable are noted; and the concern is quoted as received by TVA, and characterized as safety related, not safety related, or safety significant.

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY SQN	WBN	BFN	BLN	CONCERN DESCRIPTION *
230.1	EX-85-027-001	WBN	X	X	X	X	"HVAC dampers in the auxiliary and control buildings (or location given west end of control building - Elev. 713' (?) were tested under actual operating conditions (use of fuse link to release dampers), and the dampers would not latch. Manufacturer (Ruskin) was contacted, and recommended changing of test to use a hand release of dampers, which was done, and dampers latched. CI is concerned that original intent of test (to demonstrate operability under actual conditions) was not met." (SR)
230.2	IN-85-772-003	WBN		X			"There are two floors, elev. 692' & elev. 708' working on one chiller duct, system 31. The rooms on these floors include: battery rooms, public safety, telecommunication rooms, aux instrumentation rooms & computer rooms. In order to keep computer room's temperature down to 55 degrees F, the battery room's temp. also drops to 55 degrees F. Design and location of air handlers & the equipment for the system is wrong. Air handlers, dampers, & filter racks don't work as they are supposed to." (SR)
230.3	IN-85-821-003	WBN		X			"Many HVAC duct systems and duct supports are inadequately designed. Some requiring 100% tightness are designed with mechanical joints, thereby requiring excessive amounts of RTV glue to seal. Some HVAC supports are built excessively heavy to actual field use. Located in control building, reactor buildings 1 & 2." (SS)
230.4	IN-86-198-001	WBN		X			"TVA should redesign Reactor Building domes and steam generator spaces to include a vent at the top to allow hot air to escape. Present design holds in too much heat and the problem will get worse during plant operation; only robots will be able to work in the containment." (NO)
230.5	RII-85-A-0007	SQN	X	X			"An anonymous alleger stated that the vent condenser at the Condensate Demineralizer Building (CDWE) vents noncondensible gases to the duct in the CDWE building where it is discharged to the Auxiliary Building (Aux. Bldg). During an Aux. Bldg isolation the exhaust dampers isolate the CDWE building from the Aux. Bldg and noncondensible gases can build up in the CDWE Bldg. At times, the iodine concentration in the CDWE Bldg are apparently somewhat [high, which renders the CDWEB] inaccessible and [the exhaust dampers] may go unnoticed in the closed position for long periods of time.

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

ELEMENT	CONCERN NUMBER	PLANT LOCATION	APPLICABILITY SQN	WBN	BFN	BLN	CONCERN DESCRIPTION *
230.5 (Cont'd)							"TVA should evaluate this situation and if in fact the problem currently exists, take immediate action to preclude unnecessary exposure of personnel to airborne radioactivity. In addition, TVA should take actions to minimize the airborne problems in the CDWE Bldg. This may include such actions as providing additional filtered ventilation, better access and control of the dampers. The corrective actions should be documented and an expanded followup program performed to determine that the corrective actions solved the problem. The followup program should be documented. This allegation is specific to Sequoyah; however, there are generic implications for other TVA nuclear plants such as Watts Bar." (SR)

* SR/NO/SS indicates safety related, not safety related, or safety significant per determination criteria in the ECTG Program manual and applied by TVA before evaluations.

ATTACHMENT B

SUMMARY OF ISSUES, FINDINGS, AND
CORRECTIVE ACTIONS FOR
SUBCATEGORY 23000

Attachment B -- contains a summary of the element-level evaluations. Each issue is listed, by element number and plant, opposite its corresponding findings and corrective actions. The reader may trace a concern from Attachment A to an issue in Attachment B by using the element number and applicable plant. The reader may relate a corrective action description in Attachment B to causes and significance in Table 3 by using the CATD number which appears in Attachment B in parentheses at the end of the corrective action description.

The term "Peripheral finding" in the issue column refers to a finding that occurred during the course of evaluating a concern but did not stem directly from a employee concern. These are classified as "E" in Tables 1 and 2 of this report

Issues	Findings	Corrective Actions
********** Element 230.1 - Fire Damper Latching Test **********		
SQN	SQN	SQN
a. Fire dampers would not latch when tested under actual operating conditions.	a. Since summer 1982, when this concern arose, fire dampers at WBN and SQN have undergone extensive evaluations, testing, modifications, replacement, and retesting to assure their proper functioning under actual operating conditions. This process was monitored by NRC on various occasions. The fire damper manufacturer (Ruskin) also performed independent tests.	a. None required. (The Ruskin brand fire dampers are identical to the ones at WBN that failed the preoperational closure test Instruction TVA-24, R0. They were therefore included in a generic 10 CFR 21 notice and investigated. Corrective actions consisting of damper replacement, negator spring addition, revision of design criteria and operating instructions were completed before receipt of the concern by TVA.)
b. Test was changed to release dampers by hand.	b. Nuclear Power Experience reports do not indicate a generic problem with fusible links. The CI's statement is, therefore, considered inaccurate as to the cause of damper closure failure. The type of curtain release mechanism (fusible link or manual) does not affect the closure and latching process of the fire dampers.	b. None required. (In response to a request for a potential generic condition evaluation, SQN found before receipt of the concern that the condition does not exist.)
c. Original intent of test to demonstrate operability under actual conditions may not have been met.	c. For 9 of the 12 fire dampers at SQN that failed the post-negator spring modification test under actual operating flow conditions or that could not be tested, system operating instructions were instituted for ventilation air flow interruption in the fire zones. These instructions however are not explicit as to sequence of fire location verification, ventilation flow shutdown, scene assessment, and restart of ventilation flow, if required. Location and identification of controls for ventilation shutdown are not shown. The remaining three fire dampers were acceptable as is because of their limited time in use or their location in walls no longer required as fire barriers per 10 CFR 50, App. R, evaluation.	c. The Operations section will revise SQN AOI-30 so that, in case of fire, operators will take specific ventilating system actions necessary to assure fire damper closure. This revision is scheduled for after the unit 2 cycle 3 refueling because it only enhances the instructions. (CATD 230 01 SQN 01 R1)
d. Peripheral finding.	d. Damper 0-31C-1744 has not been installed and successfully tested or included in the system operating procedure for dampers expected to fail the full flow drop test.	d. The Modification section will install a new 0-31C-1744 damper after the Unit 2 cycle 3 refueling outage. (CATD 230 01 SQN 01 R1)

Issues	Findings	Corrective Actions
Element 230.1 - WBN	WBN	WBN
a. Fire dampers would not latch when tested under actual operating conditions (use of fusible link to release dampers).	a. Since summer 1982, curtain-type fire dampers at WBN have undergone extensive testing, evaluation, modification, replacement, and retesting because of a variety of problems, such as improper installation, failure of electrothermal links (ETL), and incomplete closure and latching. This process has been monitored by NRC on various occasions. Original TVA test requirements for closure under air flow were partially based on erroneous vendor information. Fire damper closure under "actual" operating conditions, as meaning "under air flow," is not required by Underwriters Laboratory (UL) standards.	a. None required. (The Ruskin brand fire dampers that failed the preoperational test were later included in the investigation of a generic 10 CFR 21 notice. This investigation resulted in corrective actions to replace dampers, add negator springs and revise design guides and operating instructions. The corrective actions were completed and the adequacy compared to manufacturer's test results as documented by QIR MEB85011 before receipt of the concern by TVA.)
b. Test was changed to release dampers by hand, as recommended by the manufacturer.	b. Per discussion with the fire damper manufacturer, the means of curtain release (fusible link, ETL, CO_2, or hand release by string for testing) does not affect the curtain closing and latching itself. The preoperational fire damper test instruction allows release "by any means deactivating the fusible link holding linkage." Some installation interferences of electrical conduits for ETLs with damper curtains have been corrected. Failures of ETLs were traced to damage from handling or installation. Surveillance instructions for fire detector tests were therefore amended to include post installation testing of the electrical resistance of ETLs. There are no reports of generic fusible link or ETL failures at nuclear power plants.	b. None required. (Some installation interferences of ETL were corrected and surveillance instructions for resistance testing were instituted before receipt of the concern by TVA.)
c. Original intent of test to demonstrate operability under actual conditions may not have been met.	c. Because of persisting closure problems with Ruskin fire dampers under airflow, the TVA preoperational test instructions for the fire dampers were revised to define the "normal mode" for testing as having no air flow. The "General Design Guidelines for Fire Dampers" does not require closure against air flow. The abnormal operating instructions for plant fires and the fire detection system operating instructions were changed to institute manual fan shutdowns in ventilation systems containing curtain-type fire dampers identified as not closing under air flow. The intent of the fire dampers is therefore met under the changed testing requirements, which simulate administratively controllable "actual" plant conditions.	c. None required. (Before receipt of the concern by TVA, operating instructions were revised to require manual fan shutdown in ventilation systems containing fire dampers that may not close under air flow in case of a fire.)

Issues	Findings	Corrective Actions
Element 230.1 - BFN	BFN	BFN
a. Fire dampers would not latch when tested under actual operating conditions (use of fusible link to release dampers).	a. According to the vendor of the fire dampers, the type of release mechanism used does not affect the closure operation itself. No generic failures of fusible links occurred on fire dampers. No ETLs are used at BFN.	a. None required. (In response to a request for a potential generic condition evaluation, BFN found before receipt of the concern that the condition does not exist.)
b. Test was changed to release dampers by hand, as recommended by the manufacturer.	b. The issue of "changed test" does not apply to BFN because no preoperational or later damper closure tests are documented. The surveillance instructions require only visual inspection.	b. None required.
c. Original intent of test to demonstrate operability under actual conditions may not have been met.	c. The lack of records substantiating successful closure testing under actual airflow conditions and/or an evaluation against vendor tests, does not assure prevention of fire spreading. Newly issued HVAC drawing notes require fire damper closure testing without airflow. Administrative procedures to shut down the airflow in case of fire, as alternate means to assure damper closure, are not instituted. The fire protection plan requires operation of the ventilation system during a fire.	c. The Operations Section will review and verify all fire dampers in designated fire barriers as determined in the 10 CFR 50 Appendix R study to determine which dampers may not close against system airflow. By August 8, 1987, the damper closure test results provided by the manufacturer will be compared with the air flows through the installed dampers, and documented. Dampers that will not close, as per this review, will be listed in a condition adverse to quality report (CAQR). Any problem noted in the CAQR will be resolved according to nuclear engineering procedure (NEP) 9.1. Corrective action may consist of damper closure tests against airflow and/or administrative instructions to shut off the ventilation system in the fire affected area where dampers have been determined not to close against airflow. The fire protection plan will be revised to require periodic fire damper closure testing. (CATD 230 01 BFN 01)
d. Peripheral finding.	d. Visual surveillance instructions further contain superseded fire compartmentation drawings and damper lists.	d. In accordance with existing procedures, the Operations Section will revise the surveillance instructions to include the latest fire compartmentation drawings per 10 CFR 50, Appendix R requirements prior to restart. (CATD 230 01 BFN 01)

Issues	Findings	Corrective Actions
Element 230.1 - BLN	BLN	BLN
a. Fire dampers would not latch when tested under actual operating conditions (use of fusible link to release dampers)	a. Per discussion with the fire damper manufacturer, the means of curtain release (fusible link, ETL, CO_2, or manual by string for testing) does not affect the curtain closing and latching itself. Nuclear Power Experience reports do not show generic fusible link failures on Ruskin or other brand fire dampers. BLN inspected the ETLs for the Control Building and found the resistance values acceptable. Administrative procedures to avoid future problems with ETLs have been implemented or planned.	a. None required. (ETLs for the Control Building were inspected and found acceptable before receipt of concern by TVA; administrative procedures are planned. The General Design Guide for Fire Damper Application, Selection and Installation was revised to include post-installation testing of fusible links to avoid recurrence of failures.)
b. Test was changed to release dampers by hand, as recommended by the manufacturer.	b. The fire dampers were actuated to verify proper installation per a Division of Construction QCP. Acceptance of installation is documented on life-of-plant records. This test, however, is no substitute for the planned preoperational tests required by a General Construction Specification. No change in functional test procedure has been made because fire dampers failed to release or close the curtain. The mechanical design guide for fire damper application, selection, and installation and the standard specification for HVAC system dampers have been revised to avoid recurrence of selection and installation deficiencies.	b. None required. (The design guide for fire damper application, selection, and installation was revised before receipt of the concern by TVA.)
c. Original intent of test to demonstrate operability under actual conditions may not have been met.	c. Preoperational test procedures for curtain-type fire damper closure under actual airflow have not yet been issued. Dampers that will not close under airflow have been identified by analysis against vendor test data. Negator springs were added to dampers not already so equipped. System descriptions and system operating instructions for air mover shutdown in systems where dampers will not close under airflow were committed to NRC for completion six months prior to unit 1 and unit 2 fuel load, respectively. These instructions must comply with the sequence required by NRC for the same subject at WBN. The Technical Specifications and Surveillance Instructions for fire damper closure and latching and ETL resistance tests have not yet been issued. The completion of these open items is tracked by the TVA Tracking of Open Items (TROI) system.	c. None required. (Hardware changes were implemented before receipt of the concern by TVA; procedures, instructions, and tests are planned.)

Issues	Findings	Corrective Actions
********** Element 230.2 - Computer Room/Battery Room Temperatures **********		
SQN (N/A) WBN	SQN (N/A) WBN	SQN (N/A) WBN
a. In order to keep the computer room temperature below 55 degrees Fahrenheit, the battery room temperature also drops to 55 degrees Fahrenheit.	a. The computer room is maintained at 70°F; there is no requirement to keep the room at 55°F. The 250 V and 48/24 V nonsafety-related battery rooms are supplied with air from a corridor, which, in turn, collects the electrical board room exhaust air. These electrical board rooms are supplied by the electrical board room air handling units (AHU) and are maintained at approximately 75°F with the aid of an electric duct heater. One of the specific problems investigated in the design study discussed in Finding "c" was overheating of the computer room.	a. None required.
b. The design and location of the air handling units (AHU) for this system is inadequate.	b. Review of the equipment location drawings and air flow diagrams did not reveal unusual layout of this system. In the absence of specifics, no further investigation was attempted. Inadequate design of certain equipment has been discovered in the design study investigation of HVAC equipment failures discussed in Finding "c."	b. None required.
c. AHUs, dampers, and filter racks are not working correctly.	c. The Mechanical Maintenance section requested a design study (DSR-021) of plant HVAC equipment because of continuous failures after repair or replacements have been made. The design study was completed and the results transmitted to the WBN site design service manager on April 29, 1986. These results contained suggested solutions for all HVAC equipment problems, including AHUs, dampers, and filters of the electrical board room HVAC system. Overheating of the computer room was related to fouled cooling coils. The corrective actions suggested in the design study are now in progress.	c. The Mechanical Maintenance section will follow up on the Phase I work of Design Study Request DSR-021 by having the cooling coils of the air handling units cleaned by a contractor. This work will also be scheduled by the Maintenance section. In addition, the Mechanical Maintenance section has submitted a design change request (DCR-692) to the change control board to approve corrective action work per Phase II of DSR-021. The DCR includes corrective actions for all other equipment deficiencies identified as causing frequent maintenance outages of

Issues	Findings	Corrective Actions
Element 230.2 - WBN (Continued)		
		the electrical board room HVAC system. Because the Phase II items of DSR-021 are modified for reduced maintenance rather than operability, these changes are scheduled for completion after fuel loading. The completed corrective actions by the Maintenance section, as proposed by TVA ONE, will resolve the concern as perceived by this evaluation. (CATD 230 02 WBN 01)
BFN	BFN	BFN
(N/A)	(N/A)	(N/A)
BLN	BLN	BLN
(N/A)	(N/A)	(N/A)
********** Element 230.3 - Leak Tightness of Duct Seals **********		
SQN	SQN	SQN
(N/A)	(N/A)	(N/A)
WBN	WBN	WBN
a. Many HVAC duct systems do not meet the design requirements for leak tightness.	a. Extensive review of NRC, TVA, and ANSI design standards did not establish a requirement for 100 percent HVAC duct leak tightness as claimed in the concern. The existing systems meet the WBN design requirements for leak tightness (1 percent of flow for engineered safety feature systems) as verified for safety-related systems by leak tests in 1981. Testing requirements were reviewed and found adequate. The WBN leak tightness requirements are less stringent than current NRC guidelines (less than 0.5 percent of flow for ESF systems, or less than 0.1 percent of flow for control rooms), but they were found to be acceptable by the NRC because the duct locations are inside the secondary containment and because most ductwork will be subject to in-leakage rather than out-leakage.	a. None required.

Issues	Findings	Corrective Actions
Element 230.3 - WBN (Continued)		
b. Some HVAC supports are built excessively heavy.	b. Duct supports are designed with appropriate margins for seismic rigidity as well as normal weight loadings. These design bases may make them appear to be excessively heavy for normal duct load support purposes. This condition, however, is not the result of unacceptable designs, nor is it a condition which needs to be corrected because it does not affect the health and safety of the public.	b. None required.
c. Mechanical joints require excessive amounts of RTV glue to seal.	c. The mechanical joints and the RTV glue sealants used for the HVAC ductwork were acceptable design practices for WBN. The judgment of what constitutes "excessive" glue is a subjective one. However, the use of the glue will not result in unacceptable operations, and does in fact enable the ductwork leakage to be reduced to an acceptable level.	c. None required.
BFN	BFN	BFN
(N/A)	(N/A)	(N/A)
BLN	BLN	BLN
(N/A)	(N/A)	(N/A)
********** Element 230.4 - Heat Buildup in Containment Dome **********		
SQN	SQN	SQN
(N/A)	(N/A)	(N/A)
WBN	WBN	WBN
a. Excess heat buildup in the upper portions of the reactor building and steam generator compartments will severely limit personnel accessibility.	a. The areas mentioned in the employee concern are not intended to be accessed by personnel during plant operation. Ventilation system design criteria are based on equipment environmental qualifications for these areas. The FSAR committed to pre-operational testing of the system components, including the temperature controlling devices.	a. None required.

Issues	Findings	Corrective Actions
Element 230.4 - WBN (Continued)		
b. Additional ventilation connections should be provided at the tops of these areas.	b. Further, modifications to the system to provide more cooling, as proposed in the EC, would significantly degrade plant safety, by requiring the addition of large penetrations, with isolation valves, in either major compartments within containment, or in the containment itself.	b. None required.
BFN	BFN	BFN
(N/A)	(N/A)	(N/A)
BLN	BLN	BLN
(N/A)	(N/A)	(N/A)
********** Element 230.5 - Airborne Radioactivity in CDWE Building **********		
SQN	SQN	SQN
a. The vent gas cooler of the condensate demineralizer waste evaporator (CDWE) condenser in the CDWE building vents noncondensible gases into the duct leading to the auxiliary building.	a. ECNs and DCRs confirm routing of the vent gas cooler and other CDWE package vents into the ventilation duct leading to the auxiliary building. The evaporator vendor drawings and TVA drawings have not been revised to reflect these changes.	a. MEB will issue an ECN to revise the involved drawings in order to reflect the existing configuration of the CDWE vent lines per SQ-DCR-L-1941. The flow sheet from HPD will also be corrected to show the vent gas cooler noncondensible flow rate per later HPD letter. (CATD 230 05 SQN 01)
b. During auxiliary building isolation, noncondensible gases build up in the CDWE building and iodine concentrations may be unacceptable because isolation dampers could remain unnoticed in a closed position for long periods.	b. There is a remote potential for backup of radioactive contaminants in the vent duct during periods of auxiliary building isolation and simultaneous abnormal evaporator operation. The expected contaminant level is negligible during normal evaporator operation. This is evidenced by isotopic release rates shown in the original FSAR for radwaste evaporator noncondensible vents.	b. None required.

Issues	Findings	Corrective Actions
Element 230.5 - SQN (Continued)		
c. TVA should take immediate corrective action to preclude unnecessary exposure of personnel to airborne radioactivity and minimize airborne radioactivity in the CDWE building.	c. Past history indicates that erroneous isolation of the auxiliary building and associated automatic closing of the isolation dampers in the ventilation ducts can be expected. The potential for radioactive exposure to personnel because of this is negligible since the CDWE System Operating Instructions (SOI) include references to a SOI for recovery from ABI, which limits the time period of CDWE operation with concurrent ABI. Manual override switches are provided, allowing opening of the isolation dampers for exhausting CDWEB air.	c. None required.
d. The corrective actions should be documented and a followup program performed and documented.	d. Since no immediate corrective actions are necessary, no documentation is required. If the current TVA review of the CDWE vent activity rates suggests adding an area or continuous air monitor to the CDWEB, it will be documented under the as-low-as-reasonably-achievable (ALARA) program.	d. NEB will evaluate and document ALARA concerns in the CDWEB. (CATD 230 05 SQN 02)
WBN	**WBN**	**WBN**
a. The vent gas cooler of the condensate demineralizer waste evaporator (CDWE) condenser in the CDWE building vents noncondensible gases into the duct leading to the auxiliary building.	a. A site inspection confirmed the routing of the vent gas cooler and bottoms tank vent lines of the Condensate Demineralizer Waste Evaporator (CDWE) package per TVA and CDWE supplier (Horton Process Design Inc. [HPDI]) drawings. These lines are connected to the CDWE building exhaust ventilation duct. Actual routing of the blowdown tank vent line through the CDWE building roof to the atmosphere also agrees with the drawings.	a. None required.
b. During auxiliary building isolation, noncondensible gases build up in the CDWE building and iodine concentrations may be unacceptable because isolation dampers could remain unnoticed in a closed position for long periods.	b. The CDWE building ventilation ducts are connected to the auxiliary building ventilation system and double isolation dampers at the building boundaries close upon receiving an auxiliary building isolation (ABI) signal. An ABI is alarmed in the main control room. The radioactivity of the CDWE noncondensible vent gas is normally negligible and the flow rate low, but the radioactivity could increase under abnormal CDWE operation. In case of an ABI, the vent gases will back up in the ventilation duct and into the CDWE building atmosphere.	b. None required. (The auxiliary building isolation signal, which causes closure of the CDWEB ventilation dampers, also causes the heating steam supply valves FCV-12-79 and FCV-12-82, arranged in series, to close [see drawing 47W611-12-1]. These valves admit steam from the auxiliary boiler to all plant evaporators. In a telephone conversation, the CDWE supplier gave assurance that emission of noncondensibles from the vent gas cooler will cease within seconds of heating steam shutoff. The drop in temperature when adding and recirculating unheated waste liquid in the standby mode, to prevent crystallization, will prevent noncondensible evolution.

Issues	Findings	Corrective Actions
Element 230.5 - WBN (Continued)		
		During an ABI, therefore, no potentially radioactive noncondensibles will back up into the atmosphere of the CDWEB, and it is not necessary to indicate in the CDWE operating instructions a time limit of operation during an ABI.)
c. TVA should take immediate corrective action to preclude unnecessary exposure of personnel to airborne radioactivity and minimize airborne radioactivity in the CDWE building.	c. The CDWE building operator areas are zoned for regulated access; however, no area radiation monitors or airborne particulate activity monitors are installed. The system operating procedures for recovery from an ABI and for the CDWE do not caution against or set a time limit for CDWE operation during an ABI. Past history at SQN suggests that erroneous ABIs can be expected at WBN. The system operating instructions for the auxiliary building general supply and exhaust fans do not list the CDWE building exhaust duct dampers in the damper alignment list.	c. The CDWE system operating instructions, SOI 77.1D1, will be revised to include the blowdown tank, which was added to the system later, and to show the operating status of the associated valves. This valve status list will further be corrected to delete the manual vent gas cooler vent valve, 77-790. This valve was removed from the line during rerouting of the vent gas cooler vent line to the CDWEB ventilation duct. In addition, the CDWE system operating instructions will be revised to include implementation of SOI 30.5A, Auxiliary Building General Supply Fans and Exhaust Fans, and SOI 30.5B, Fuel Handling Area Exhaust Fans, in their entirety as conditions of operation. These instructions will be referenced to ensure ventilation dampers are open and air is circulating through the CDWEB while the evaporator is in operation. This corrective action resolves the issue of potentially radioactive noncondensible release into the CDWEB during an ABI (accident condition). In addition, the WBN Operations Section will initiate a Design Study Request (DSR) for DNE to examine the necessity and feasibility of including the CDWEB in the auxiliary building secondary containment enclosure. (CATD 230 05 WBN 01)

Issues	Findings	Corrective Actions
Element 230.5 - WBN (Continued)		
d. The corrective actions should be documented and a followup program performed and documented.	d. Any changes to system operating instructions are documented by established procedures. The air change frequency in the CDWE is less than specified in TVA Mechanical Design Guide DG-M18.7.1, Radiation Protection (ALARA) Design Guidelines. If the current TVA review of the CDWE vent activity rates suggests adding an area radiation monitor or airborne particulate activity monitor in the CDWE building, it will be documented under the as-low-as-reasonably-achievable (ALARA) program.	d. TVA's corrective action plan will determine compliance with ALARA guidelines and the necessity of placing airborne particulate monitors in the CDWE building. TVA has issued Quality Information Request (QIR) MEB 87045 for an ALARA review of the CDWE during normal operation prior to fuel loading of unit 1. The evaluation team concurs with the TVA corrective action plan described above. (CATD 230 05 WBN 02)
BFN	BFN	BFN
(N/A)	(N/A)	(N/A)
BLN	BLN	BLN
(N/A)	(N/A)	(N/A)

ATTACHMENT C

REFERENCES

1. Telephone call from W. Blumer, Bechtel, to T. Arnold, Ruskin, IOM 351, (10/27/86)

2. Telephone call from H. A Mahlman/G. Silver/S. Doak/J. Castleman/ D. Price, TVA, to W. Blumer, Bechtel, IOM 922, (04/22/87)

3. Telecopy from H. A Mahlman, TVA, to W. Blumer, Bechtel, transmitting comments to ECSP Report 230.1(C), IOM 923, (04/20/87)

4. Nuclear Power Experience, published by The S. M. Stoller Corp., (through 08/86), Volume PWR-2, VII Safety Systems, E. Miscellaneous Reports 94, 127, 140, 241; XIV, Buildings and Containment, B. Miscellaneous Report 379; Volume BWR-2, VII Safety Systems, F. Miscellaneous, Report 108; XIV, Buildings and Containment, A. Penetrations, Report 54

5. NCR W-210-P including Attachment A, [WBN 850118 110], (11/28/84)

6. TVA Surveillance Instruction SI-L601, R9, Fire Detector Test - Panel L601, Units 1 and 2

7. TVA General Design Guidelines, "Fire Damper Application, Selection and Installation," DG-M18.2.15, R1, [B42 850823 512], (08/12/85)

8. WBN ECN 5523, Data Sheets 1, R1; 2, RO; 3, R1; 4, RO; Attachments 1, 2, and 3, [B26 850305 520], (02/26/85)

9. TVA memo from J. C. Standifer to G. Wadewitz, Final Disposition of NCR W-220-P, [MEB 850227 018], (02/27/85)

10. TVA memo from C. A. Chandley to J. S. Belk, "Potential Generic Condition Evaluation," [B44 850315 002], (03/15/85)

11. TVA memo from J. S. Belk to C. A. Chandley, [B21 850716 003], (07/16/85)

12. TVA memo from L. S. Cox to R. M. Hodges, [C20 850607 465], (06/07/85)

13. TVA BNP-QCP-1.3, R8, Preventive Maintenance, [C20 860129 460], (02/03/86)

14. TVA memo from C. A. Chandley to H. E. Crisler, Potential Generic Condition Evaluation, [B44 850315 002], (03/15/85)

15. TVA memo from H. E. Crisler to C. A. Chandley, [B22 850719 002], (07/19/85)

16. TVA Calculation BFEP-M2-ETLEV-1, R0, Evaluation of Fire and Smoke Dampers, [B22 850719 101], (07/18/85)

17. TVA memo from J. P. Vineyard to J. A. Raulston, "NRC-OIE Reportability Information Distribution - WBN NCR 5036 - Applicability to SQN," [PWP 831018 006], (10/18/83)

18. TVA memo from Rankin to Vineyard, SQN 10CFR50 Appendix R - Fire Dampers, [SQ1 850501 843], (05/06/85)

19. TVA memo from C. A. Chandley to J. C. Standifer, "SQN and WBN - Fire Damper Negator Spring Kits," [MEB 830217 018], (02/17/83)

20. TVA WBN Preop Test Instruction TVA-24, Fire Dampers, R0, (09/08/78) and changes 3, 5, 9, 11, 12, 14, 15, 17, 18, 19, and 20

21. TVA NCR WBNMEB8203, [MEB 821015 015], (10/13/82), and R1 [MEB 830630 001], including completion sheet [MEB 830705 020]

22. TVA Standard Specification, "Technical Specification for Heating, Ventilating, and Air-conditioning System Dampers for TVA Projects," MEB-SS-10.3, R1

23. ECN 3761 [SWP 830512 007], (03/18/83)

24. TVA Contract 83K71-832769, [MED 821227 503], (12/23/82)

25. Ruskin Manufacturing Company, Quality Assurance Procedure 20483A, R1 (02/18/83)

26. NRC IE Information Notice 83-69, "Improperly Installed Fire Dampers at Nuclear Power Plants," [A02 831027 002], (10/21/83)

27. TVA NCR 5036, R0, [WBN 830819 104], (08/19/83); R1, [WBN 830926 013], (09/23/83); R3, [WBN 840203 114], (02/03/84)

28. ECN 4297, Data Sheets 1, R3; 2, R0; Attachment 1, [WBP 831128 518], (09/26/83)

29. TVA ECN 5379 [WBP 850102 503], (12/20/84)

30. TVA memo from J. C. Standifer to G. Wadewitz, NCR 5036, R1 [WBP 831117 004], (11/17/83)

31. Purchase Contract 84K71-834574, Fire Dampers, [MED 831207 510], (11/02/83), and R1, [MEB 831114 401], (11/14/83)

32. Air Movement and Control Association (AMCA) Standard 500-83

33. Ruskin Manufacturing Division letter to TVA, [MEB 841113 517], (11/06/84)

34. Underwriters Laboratories Inc. Standard for Safety, Fire Dampers and Ceiling Dampers UL 555, Third Ed., Rev. 05/86

35. Ruskin Manufacturing Division letter transmitting Generic Test Reports (01/08/85 and 02/11/85) for Horizontal and Vertical Mounted Fire Dampers, [MEB 850215 522], (02/12/85)

36. TVA NCR WBNMEB8513, [B44 850301 014], (02/28/85)

37. TVA memo from J. C. Standifer to E. R. Ennis [MEB 840824 044],

38. NCR WBNMEB8513, "Determination of Reportability Information Worksheet for 10 CFR 50.55(e)," [B45 850307 269], (03/04/85)

39. TVA Quality Information Release (QIR) MEB 85005, Administrative Controls to Assure Fire Damper Closure [B44 850311 005], (03/06/85)

40. TVA Quality Information Release (QIR) MEB 85011, System Fire Damper Data, for Administrative Controls, [B44 850424 003], (04/18/85)

41. Meeting minutes by T. J. Kenyon, "WBN-Ruskin Fire Dampers," [L44 850429 597], (04/18/85)

42. Letter from D. K. McCloud, TVA, to K. Adensam, NRC, [L44 850328 806], (03/28/85)

43. WBN Abnormal Operating Instruction, AOI-30, R6, "Plant Fires"

44. WBN System Operating Instruction, SOI-13.1, R4, "Fire Detection System"

45. TVA NCR, Sequoyah, SQNMEB8207, [MEB 821206 018], (12/06/82)

46. ECN L5847 including Workplan 10483 and TACF 1-84-039-31, [SWP 830318 801], (03/04/83)

47. Telephone call from W. Blumer, Bechtel, to J. T. Herd, TVA Sequoyah, IOM 417, (11/20/86)

48. TVA memo from J. H. Sullivan to Appendix R Project Files, "Appendix R - Fire Dampers," [SOI 850430 833], (04/30/85)

49. SQN System Operating Instruction, SOI-26.2, R3, "Fire Interaction Manual"

50. TVA memo from N. R. Beasley to G. R. Hall, BFN-Ruskin Fire Dampers, 10 CFR 21 Report, [B44 850313 009], (03/14/85)

51. TVA memo from J. A. Coffey to R. W. Cantrell requesting implementation of BF-DCR 2949, HVAC-Fire Dampers, [DES 840330 007], (03/29/84)

52. TVA memo from B. F. Crosslin to MEB Files, BFN Appendix R Compliance - Fire Damper Installation Walkdown and Inspection [B44 850806 002], (08/06/85)

53. TVA drawing, Reactor Building Unit 2, Mechanical HVAC General Notes, 67M 47A2920-2, R0, (01/16/87)

54. NCR BLN MEB8403 [MEB 840406 014], (04/04/84)

55. ECN 2945, HVAC Fire Dampers, [BLP 840608 043], (06/08/84), closed 04/08/85

56. TVA drawings series 88M3BB0900-00 - Mechanical Heating, Ventilating, and Air Conditioning Sheet Metal Details: -35, R1; -36, R4; -37, R6; -38, R4; -39, R2; -43, R2; -44, R2; -45, R4; -46, R4; -47, R2; -48, R2; -49, R2; -50, R1; -51, R1; -52, R2; -53, R1; -54, R1; -55, R2; and -57, R1

57. National Fire Protection Agency (NFPA) Standards 90A and 90B

58. Letter from R. L. Gridley, TVA, to Dr. J. N. Grace, NRC, [L44 860528 803], (05/28/86), or TVA memo C. A. Chandley to F. E. Gilbert, Report 2 (final) to BLN MEB8403, [B44 860512 004], (05/12/86)

59. TVA Tracking of Open Items (TROI) for NCR BLN-MEB 8403, (06/05/87)

60. TVA Contract 85KM8-836361, "Negator Closure Spring Kits for HVAC System Fire Dampers," Ruskin Manufacturing Division, [IMS 841127 508], (11/20/84)

61. TVA Contract 85KM8-836360, "Negator Closure Spring Kits for HVAC System Fire Dampers," American Warming and Ventilating, Inc., [TAS 850117 518], (01/04/85)

62. TVA OE Calculation BLN-VA-D052, FSG-KTM-021986, R1, "Fire Dampers with Abnormal Velocities," [B44 861022 007], (10/21/86)

63. TVA Specification 2929, "Grilles, Ceiling Diffusers, and Dampers for Reactor and Control Buildings," (Contract 71-820434)

64. TVA Quality Control Procedure BNP-QCP-6.4, R9, HVAC Ductwork, [C26 870812 459], (02/26/87), (R1 issued 12/27/76)

65. TVA General Construction Specification G-73, R1, "Inspection, Testing, and Documentation Requirements for Fire Protection Systems and Features," (03/14/84), R0, (03/16/82)

66. NCR 4099, R1, "Fire Damper Fails to Close Properly Upon Actuation," [G20 850402 136], (07/08/86)

67. OVC-MDMP-368-N, Damper Installation Inspection Card Test 93

68. Technical Specification for BFN units 1 and 2, Section 3.11/4.11, (03/11/83)

69. Surveillance Instructions SI 4.11.E.2, R0, Visual Inspection of Fire Dampers, (07/25/86)

70. Fire Protection - 10 CFR 50, Appendix R, Fire Area Compartmentation and Zone Drawings, Series 67M47W216-51; R1, and -56, -57, -59, -60, and -61, R0

71. BFN Fire Protection Plan (BF-FPP), R3, p. 97, (03/27/87)

72. NRC letter to TVA, summary of meeting to discuss Ruskin fire dampers at the Watts Bar Nuclear plant, units 1 and 2, [L44 850429 597], (04/18/85)

73. SQN Abnormal Operating Instruction AOI-30, R4, "Plant Fires"

74. TVA drawing 47W866-4, R22, Control Building Flow Diagram, HVAC Air Flow (FSAR Fig. 9.4-1)

75. TVA drawing 47W610-31-1, R10, Control Building Electrical Air Conditioning Control Diagram (FSAR Fig. 9.4-4)

76. TVA drawing 47W611-31-1, R7, Control Building Electrical Logic Diagram, Air Conditioning System (FSAR Fig. 9.4-6)

77. TVA memo from T. E. Collins to MEB files, WBN-HVAC equipment maintenance coordination meeting, [B44 860227 010], (02/27/86)

78. TVA memo from D. W. Wilson to J. C. Standifer, WBN-DSR Number 21 - Investigation of HVAC equipment failures, [T15 860219 842], (02/19/86)

79. TVA memo from J. C. Standifer to D. W. Wilson, WBN-DSR-021 - Investigation of electrical board room air handling units' cooling coil problems, [B44 860310 010], (03/10/86)

80. TVA memo from J. C. Standifer to D. W. Wilson, WBN-DSR-021 - Investigation of electrical board room air handling units' cooling coils problem (transmittal of Trane proposal), [B26 860423 011], (04/23/86)

81. TVA memo from J. C. Standifer to D. W. Wilson, WBN-DSR-021 - Investigation of electrical board room air handling units' bearings, dampers, filters, and motor adjustment problems, [B26 860429 016], (04/29/86)

82. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATD 230 02 WBN 01, TCAB-238, (03/05/87)

83. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) publication, High Velocity Duct Construction Standards, Second Edition, 1969

84. ORNL-NSIC-65, Design, Construction and Testing of High-Efficiency Air Filtration Systems for Nuclear Application, Oak Ridge National Laboratory, January 1970

85. NRC Regulatory Guide 1.52, Design, Testing and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants, Rev. 2, March, 1978. (Note that this regulatory guide was issued after the WBNP HVAC systems were designed. TVA documented its degree of compliance with RG 1.52 in FSAR Section 6.5.)

86. American National Standard ANSI/ASME N509-1976, "Nuclear Power Plant Air Cleaning Units and Components," 1976

87. TVA Design Criteria WB-DC-40-36.1, The Classification of Heating, Ventilating and Air Conditioning Systems, R1, [ESB 831121 206], (11/15/83)

88. TVA General Construction Specification G-37, Testing and Balancing of Heating, Ventilating and Air-Conditioning Systems, R3, [B42 850620 501], (07/23/85)

89. NRC Safety Evaluation Report for WBNP, Section 6.5

90. TVA memo H. B. Bounds to J. A. McDonald, "Watts Bar Nuclear Plant - Units 1 and 2 - Safety-Related HVAC Duct Welding 10 CFR 50.55(e) Report 1 (Interim) - SCR WBN7077, WBNMEB8714, WBNMEB8721, and WBNMEB8722," [B26 870408 003], (04/09/87)

91. Telecon, J. Dodds, Bechtel, to O. Cingilli, TVA, Scope of TVA HVAC Review Program, 04/02/87, (IOM 837)

92. TVA drawing 85M47E235-17, R2, Control Building Environmental Data, Environment - Mild, El. 708.0

93. TVA drawing 47W200-13, R4, "Equipment, Reactor Building Section," (FSAR Figure 1.2-13)

94. TVA drawing 47W200-11, R6, "Equipment, Reactor Building Plan," (FSAR Figure 1.2-22)

95. WBNP FSAR Sections 1.2, 3.2, 6.2, 6.4, 6.5, 9.4, 9.4.1, 9.4.3, 9.4.7, 9.4.8, 10.4.6, 11.2, 12.2, and 12.3 through Amendment 57

96. TVA drawing 47W866-1, R19, "Reactor Building Flow Diagram, Heating, and Ventilating Air Flow," (FSAR Figure 9.4-28)

97. TVA memo from Cantrell to Thompson, "Response to IN-86-198-001," (no RIMS number), (12/19/85)

98. Horton Process Design (HPD) Inc. Drawings (TVA Contract #77K64-821338):

101, R901	Hourly Process Flowsheet CDWE SNP
102, R3	P&ID, CDWE SNP
103, R906	P&ID, CDWE SNP
104, R902	P&ID, CDWE SNP
105, R4	P&ID, CDWE SNP
106, R902	P&ID and Process Flowsheet for CDWE for Blowdown Tank and Distillate Test System SNP
300, R902	General Arrangement Plans CDWE SNP
301, R901	General Arrangement Elevations CDWE SNP
302, R902	General Arrangement Elevations CDWE SNP
407, R908	Small Piping CDWE SNP

99. Horton Process Design (HPD) Inc. Drawings (TVA Contract #77K64-821338):

101, R901	Hourly Process Flowsheet CDWE WBN
102, R904	P&ID, CDWE WBN
103, R905	P&ID, CDWE WBN
104, R908	P&ID, CDWE WBN
105, R907	P&ID, CDWE WBN
106, R904	P&ID and Process Flowsheet for CDWE for Blowdown Tank and Distillate Test System WBN
300, R903	General Arrangement Plans CDWE WBN
301, R903	General Arrangement Elevations CDWE WBN
302, R903	General Arrangement Elevations CDWE WBN
402, R912	Small Piping CDWE WBN
403, R912	Small Piping CDWE WBN
407, R909	Small Piping CDWE WBN
408, R907	Distillate Skid CDWE WBN

100. TVA memo from D. R. Patterson to R. M. Pierce (MEB 791113 122), (11/13/79)

101. Letter from A. M. Washburn (HPD) to C. Chandley (TVA), (10/23/86), contract 77K64-821338, CDWE noncondensible flowrate (transmitted by TTB 140/5)

102. SQN ECN 2744 [SWP 791217 518], (12/11/79)

103. TVA Drawings:

45M4 47W803-7, R9	Mechanical, Flow Diagram, Waste Disposal System
45M4 47W560-23, R3	Mechanical Waste Disposal System
45M4 47W560-22, R7	Mechanical, Waste Disposal System

104. WBN ECN 2257 [791211 528], (12/07/79)

105. TVA Drawings:

85M 47W830-7, R14	Mechanical, Flow Diagram, Waste Disposal System
85M 47W560-23, R10	Mechanical, Waste Disposal System
85M 47W560-22, R9	Mechanical, Waste Disposal System

106. TVA memo from J. C. Standifer to G. Wadewitz, (MEB 831222 010), (12/22/83)

107. TVA memo from G. Wadewitz to J. C. Standifer, (WBN 830928 905), (09/28/83)

108. WBN ECN 4598 [WBP 840302], (02/12/84)

109. Memo with attached sketches from E. Croft, Bechtel at WBN to W. Blumer, Bechtel, IOM 1338, (02/07/87)

110. Memo, with attached sketch from E. Croft, Bechtel at WBN to W. Blumer, Bechtel, IOM 1339, (02/11/87)

111. SNP FSAR Table 11.2.2-2, Original

112. Telephone call from W. Blumer, Bechtel to G. R. McNutt/H. A. Mahlman/ G. Gibbs, TVA, IOM 461, (12/17/86)

113. TVA General Design Guidelines (GDC) DG-M18.7.1, R0, "Radiation Protection (ALARA) Design Guidelines," (11/20/81)

114. WBN System Operating Instruction SOI-77.1D1 - Units 1 and 2, R9, "Condensate Demineralizer Waste Evaporator"

115. WBN System Operating Instruction SOI-30.5D - Units 1 and 2, page 35, R10, "Recovery from Auxiliary Building Isolation"

116. SQN System Operating Instruction SOI-30.5D - Units 1 and 2, R27, "Recovery from Auxiliary Building Isolation"

117. WBN System Operating Instruction SOI-30.5A - Units 1 and 2, R10, "Auxiliary Building General Supply Fans and Exhaust Fans"

118. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATD 230 01 BFN 01, TCAB-463, (07/26/87)

119. Letters from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATD 230 01 SQN 01 and R1, TCAB-036, (12/19/86) and TCAB-058, (01/15/87)

120. Nuclear Operating Experience Inc. Reports published by the S. M. Stoller Corp., Volume PWR-2, Section XIV, "Buildings and Containment," B. Miscellaneous, Articles 352 and 353 (Sequoyah)

121. TVA drawing 85E 17W611-12, R7, Powerhouse Units 1 and 2, "Electrical Logic Diagram Auxiliary Boiler"

122. Telephone call from A. Washburn, HPD, to O. Cingilli/H. Harvey/ D. Drouhard, TVA, and W. Blumer, Bechtel, IOM 752, (03/09/87)

123. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATD 230 05 WBN 01, R1, TCAB-266, (03/12/87)

124. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATD 230 05 WBN 02, TCAB 242, (03/06/87)

125. WBN System Operating Instruction SOI-30.5B - Units 1 and 2, R7, "Fuel Handling Area Exhaust Fans"

126. TVA QIR MEB 87045, "Radiation Levels Inside the CDWE Building," [B26 870304 200], (03/04/87)

127. TVA memo from H. J. Green to M. N. Sprouse, [DES 831117 001], (11/09/83)

128. SQ-DCR-L-1941, (06/08/83)

129. Memo with attached sketch from E. Croft, Bechtel SQN to W. Blumer, Bechtel, IOM 1629, (01/03/87)

130. Updated SNP FSAR and Amendments 2 and 3, Sections 1.2, 6.2, 9.4.2, 9.4.9, 10.4.6, 11.2, 11.4, 12.1.3, and 12.1.4

131. SQN System Operating Instruction SOI-77.1B3 - Unit 0, R42, "Condensate Demineralizer Waste Evaporator"

132. TVA General Design Criteria SQN-DC-V-22.0, R2, "Liquid Radwaste Disposal System Modification"

133. TVA drawing 45M4 47W611-12-1, R7, "Powerhouse Units 1 and 2, Mechanical Logic Diagram Auxiliary Boiler"

134. Telephone conversation from H. A. Mahlman, TVA, to W. Blumer, Bechtel, (10/31/86), IOM 368

135. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATDs 230 05 SQN 01 and 02, TCAB-018, (12/05/86)

136. TVA SQN Surveillance Instruction SI-233, R15, "Visual Inspections of Penetration Fire Barriers and Fire Stops" (cancelled to be divided into five different instructions)

137. TVA memo from J. C. Key to C. A. Chandley, [B25 850513 006], (05/13/85)

138. Letter from G. L. Parkinson, Bechtel, to G. R. McNutt, TVA, "Notice of Immediate Action for Potential Problem Relating to Browns Ferry Control Room HVAC Supply Duct Leakage," BLT-165, (03/31/87)

139. Letter from G. R. McNutt, TVA, to G. L. Parkinson, Bechtel, transmitting CATD 200 BFN 01, TCAB-493, (08/19/87)

140. Letter from G. L. Parkinson, Bechtel, to G. R. McNutt, TVA, "Browns Ferry Nuclear Plant Corrective Action Plan 200 BFN 01," BLT-446, (08/28/87)

141. Letter from G. R. McNutt, TVA to G. L. Parkinson, Bechtel, transmitting CATD 200-BFN-01 (revised CAP), TCAB-493, (08/19/87)