NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fort Calhoun Station Unit No. 1	05000285	1 OF 5

TITLE (4)
Ventilation Mode Requirement Not Met While Toxic Gas Monitors Inoperable

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
12	30	93	93	-- 020 --	01	02	16	94	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(iv)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Kevin R. Boston, Shift Technical Advisor	(402) 533-6477

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
E	IS	DET	M028	N						

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On December 29, 1993 at 2155, Toxic Gas Monitor YIT-6286A ran out of chemically impregnated paper tape, rendering it inoperable. On December 30, 1993 at 0015, Monitor YIT-6286B also ran out of tape and Technical Specifications thus required that the Recirculation mode of the Control Room Ventilation System be initiated within one hour, and maintained. Train 'A' of the ventilation system was placed in Recirculation mode, but it was presumed that this would not be necessary for Train 'B', due to the Train 'B' air conditioning unit being tagged-out for maintenance. At 0359, a Ventilation Isolation Actuation Signal (VIAS), generated as a part of a routine surveillance test, started the Train 'B' air supply fan, directing filtered outside air into the Control Room. At 0405, the fan was secured and Train 'B' was placed in Recirculation mode.

The root cause of the event was determined to be failure to complete procedural requirements.

Corrective actions include conducting briefings of operating crews, assessing the adequacy of the training lesson plan addressing the Control Room Ventilation System, revising the operating instruction on Control Room Ventilation System recirculation operation, and improving scheduling controls for replacement of toxic gas monitor tape.

BACKGROUND

The Fort Calhoun Station (FCS) Control Room Ventilation System consists of two air conditioning units (VA-46A/B), two High Efficiency Particulate Air (HEPA)/charcoal filter units (VA-64A/B) with associated air supply fans (VA-63A/B), and several motorized dampers. There are also six toxic gas monitors, two each of hydrochloric/sulfuric acid detectors (YIT-6286A/B), chlorine detectors (YIT-6288A/B), and hydrazine/ammonia detectors (YIS-6287A/B). The air conditioning units are each rated to circulate air at 18000 cfm, and share a common intake plenum which can be supplied by either HEPA/charcoal filter unit. The ventilation system has three operating modes: NORMAL, Recirculation (RECIRC), and FILTERED.

In NORMAL mode the air conditioning units draw 1000 cfm of outside air and 17000 cfm of recirculated air. In FILTERED mode 1000 cfm of outside air is directed through the HEPA/charcoal filter units with the aid of VA-63A or VA-63B. RECIRC mode restricts the entry of outside air by closing all the outside air dampers and by stopping or inhibiting the starting of VA-63A and VA-63B.

Technical Specification (TS) 2.22 requires the monitoring of the fresh air intake for toxic gases in all plant modes. Limiting Conditions for Operation (LCOs) for the toxic gas monitors allow one of the two monitors of each type to be unavailable for up to seven days, after which the Control Room Ventilation System is to be placed in the Recirculation mode. If both monitors of the same type are unavailable, then the Recirculation mode is to be initiated within one hour, and maintained.

Monitors YIT-6286A/B and YIT-6288A/B are equipped with chemically impregnated paper tape cassettes (chemcassettes) which contain a seven-day supply of paper tape. If a monitor runs out of tape, an alarm occurs and shuts down the operating ventilation equipment. An operator can manually reset and restart the system. In the event of an individual monitor failure, the monitor can be placed in Bypass and the ventilation system restarted.

EVENT DESCRIPTION

On Wednesday, December 22, 1993, the four chemcassettes for YIT-6286A/B and YIT-6288A/B were replaced. The chemcassettes are ordinarily replaced on Thursdays, however, the replacements were moved up to Wednesday due to the holidays (Thursday, December 23, 1993 was a holiday for OPPD support personnel). On Wednesday, December 29, 1993 at 2155, with the plant in Mode 1 at 100 percent power, the chemcassette for YIT-6286A ran out of tape, approximately seven days and eight hours after installation. The monitor was placed in Bypass and the TS 2.22, seven-day LCO was entered. Monitor YIT-6288B subsequently ran out of tape at 2311.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Fort Calhoun Station Unit No. 1	05000285	93	-- 020 --	01	3 OF 5

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

At 0015 on December 30, 1993, the shift Licensed Senior Operator (LSO) responded to a toxic gas monitor trouble alarm from YIT-6286B which had also run out of tape. The LSO recognized that this failure required that the Control Room Ventilation System be placed in the Recirculation mode within one hour, per TS 2.22, due to both of one type of monitor (YIT-6286A and YIT-6286B) being inoperable.

To place the Control Room Ventilation System in the Recirculation mode, the LSO moved the Train 'A' Control Room Ventilation System mode selector switch (HC-VA-46A-1) from NORMAL to RECIRC mode and restarted VA-46A. The LSO noted that a maintenance-related danger tag was hanging on the control switch for VA-46B (HC-VA-46B-2). The LSO presumed that with VA-46B tagged-out, and therefore unavailable, it would not be necessary to place the Train 'B' mode selector switch (HC-VA-46B-1) in the RECIRC mode. (The label for the switch read, "CONT RM A/C ALIGNMENT HC-VA-46B-1".) The Train 'B' mode selector switch was therefore left in NORMAL mode. The LSO then contacted the Shift Supervisor to discuss and verify the correct positioning of one of the system dampers, however, the LSO's decision to leave the Train 'B' mode selector switch in NORMAL was not discussed.

At 0340, the chemcassette for YIT-6288A ran out of tape, the monitor alarmed, and the monitor was placed in Bypass. A Control Room Log entry was made, and no further actions were taken.

At approximately 0351, the routine monthly performance of Surveillance Test OP-ST-ESF-0023, "S2-2 Automatic Load Sequencer Test," was initiated. Part of the test initiates a partial Containment Spray Actuation Signal (CSAS), which in turn initiates a Ventilation Isolation Actuation Signal (VIAS). One function of a VIAS is to initiate the FILTERED mode of the Control Room Ventilation System. At 0359, in response to the VIAS initiated by the surveillance test, the Train 'B' Control Room Ventilation System mode automatically changed from NORMAL to FILTERED. The associated air supply fan (VA-63B) started, directing outside air through the HEPA/carbon filter (VA-64B), and into the common intake plenum for the air conditioning units (VA-46A and VA-46B). Although the tag-out prevented VA-46B from starting, VA-46A was running. As a result, filtered outside air supplied by VA-63B was circulated through the Control Room.

The Control Room crew observed the change in ventilation system mode that occurred during performance of the surveillance test and the TS 2.22 one-hour LCO was re-entered. Air supply fan VA-63B was then secured and the Train 'B' mode selector switch (HC-VA-46B-1) was placed in RECIRC. At 0405, the TS 2.22 one-hour LCO was cleared.

This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B), due to the failure to properly initiate and maintain the Control Room Ventilation System in the Recirculation mode as required by TS 2.22.

SAFETY SIGNIFICANCE

TS 2.22 allows one hour for initiation of the Recirculation mode of the Control Room Ventilation System, if both toxic gas monitors of a type are inoperable. During this event, a period of just under four hours passed before this requirement was fully satisfied with respect to the hydrochloric/sulfuric acid detectors (YIT-6286A/B). During this time, if a toxic chemical accident had occurred, potentially toxic filtered outside air could have been circulated through the Control Room upon receipt of a ViAS. When a VIAS did actually occur (which was initiated as a part of a surveillance test), the situation was recognized and corrected within approximately six minutes. Both chlorine detectors (YIT-6288A/B) also became inoperable during this event, however, the Control Room Ventilation System was placed in Recirculation mode within approximately 25 minutes of the inoperability of the second chlorine detector. This was within the one hour allowed by Technical Specifications.

The recently completed Phase I Individual Plant Examination for External Events (IPEEE) concludes that the core damage frequency associated with potential events involving off-site hydrochloric/sulfuric acid and chlorine sources is negligible. With respect to on-site hazards, the on-site volume of hydrochloric acid is sufficiently low that it is not significant. A review of on-site sulfuric acid demonstrates that it does not present a significant toxic gas hazard, due in part to the greater than 250 degree F temperature required to vaporize it in the event of a release. Also, chlorine cylinders, which had previously presented a potential on-site hazard, were not on-site during the event (the cylinders had been removed following a modification of the on-site water treatment process). Based on the information above, it has been determined that the event had minimal safety significance.

CONCLUSIONS

A Root Cause Analysis was performed. The root cause of this event was determined to be a failure to complete procedural requirements. Specifically, Operating Instruction OI-VA-3, "Control Room Ventilation System Normal Operation," Attachment 4, "Recirculation (RECIRC) Operation," specified steps to be taken to initiate the RECIRC mode of operation, including placing both mode selector switches in RECIRC. Standing Order G-7, "Operating Manual," specifies rules for designating a step of an Operating Instruction as 'Not Applicable' (N/A), however, the decision to not place the Train 'B' mode selector switch in RECIRC was not documented in accordance with these rules.

The following issues were identified as contributing causes:

- inadequate knowledge of the ventilation system, in that the LSO involved believed that the VA-46B tag-out defeated the operational use of the ventilation mode selector switch,
- lack of specific instructions referencing TS 2.22 in OI-VA-3, Attachment 4,
- lack of adequate scheduling controls for toxic gas monitor chemcassette replacement, and
- deficient labeling of the Control Room Ventilation System mode selector switches.

CORRECTIVE ACTIONS

The following corrective actions have been or will be completed:

1. Briefings were held with the operating crews in regard to the importance of utilizing procedures. These briefings were conducted by plant management.
2. The ventilation system training lesson plan will be assessed to ensure that Control Room Ventilation System control logic and TS 2.22 requirements are adequately addressed by February 25, 1994. Additional training on this system and TS 2.22 will be included in the next Licensed Operator training rotation scheduled to be completed on April 15, 1994.
3. Operating Instruction OI-VA-3, Attachment 4 will be revised by March 31, 1994 to better reference and address TS 2.22 requirements.
4. Improved scheduling controls will be implemented for replacement of toxic gas monitor chemcassettes, in order to minimize the occurrence of entries into the TS 2.22 one-hour LCO. This action will be completed by March 31, 1994.
5. The labels for the Control Room Ventilation System mode selector switches will be revised by March 31, 1994 to more accurately describe their function.

PREVIOUS SIMILAR EVENTS

LER 89-010 reported a previous event involving violation of TS 2.22 during inoperability of toxic gas monitors. That violation, however, was not associated with the process of placing the Control Room Ventilation System in Recirculation mode.