WOLF CREEK
NUCLEAR OPERATING CORPORATION

Terry J. Garrett
Vice President, Engineering

December 14, 2007
ET 07-0062

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Reference: Letter ET 07-0004, dated March 14, 2007, from T. J. Garrett, WCNOC, to USNRC

Subject: Docket No. 50-482: Response to Request for Additional Information Relating to Replacement of the Main Steam and Feedwater Isolation Valves and Controls

Gentlemen:

The Reference provided a license amendment request that proposed revisions to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)" based on a planned modification to replace the MSIVs and associated actuators, MFIVs and associated actuators, and replacement of the Main Steam and Feedwater Isolation System (MSFIS) controls.

The Nuclear Regulatory Commission (NRC) provided by electronic mail on October 23, 2007, a request for additional information from the Operator Licensing and Human Performance Branch related to the human performance aspects of the license amendment. On November 14, 2007, a telecon was conducted with the Operator Licensing and Human Performance Branch to provide clarification of several of the questions in the request for additional information. Attachment I provides a response to the request for additional information.

The additional information provided in the Attachment does not impact the conclusions of the No Significant Hazards Consideration provided in the Reference. In accordance with 10 CFR 50.91, a copy of this submittal is being provided to the designated Kansas State official.

A001
NRR

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4084, or Mr. Kevin Moles at (620) 364-4126.

Sincerely,

Terry J. Garrett

TJG/rlt

Attachment Response to NRC Request for Additional Information

cc: E. E. Collins (NRC), w/a
T. A. Conley (KDHE), w/a
J. N. Donohew (NRC), w/a
V. G. Gaddy (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Terry J. Garrett, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By _____
Terry J. Garrett
Vice President Engineering

SUBSCRIBED and sworn to before me this 14th day of December, 2007.

OFFICIAL SEAL
RHONDA L. TIEMEYER
MY COMMISSION EXPIRES
January 11, 2010

Rhonda L. Tiemeyer
Notary Public

Expiration Date January 11, 2010

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

The Nuclear Regulatory Commission (NRC) provided by electronic mail on October 23, 2007, a request for additional information from the Operator Licensing and Human Performance Branch related to a license amendment request submitted by Wolf Creek Nuclear Operating Corporation (WCNOC) letter ET 07-0004 dated March 14, 2007. Letter ET 07-0004 provided a license amendment request that proposed revisions to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)" based on a planned modification to replace the MSIVs and associated actuators, MFIVs and associated actuators, and replacement of the Main Steam and Feedwater Isolation System (MSFIS) controls. On November 14, 2007, a telecon was conducted with the Operator Licensing and Human Performance Branch to provide clarification of several of the questions in the request for additional information. As a result of this telecon, two questions were withdrawn, and the questions have been renumbered from what was originally provided on October 23, 2007. Provided below are responses to the questions in the request for additional information.

1. *This LAR proposes to incorporate changes to TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," based on a planned modification to replace the MSIVs and associated actuators, MFIVs and associated actuators, and replacement of the Main Steam and Feedwater Isolation System (MSFIS) controls. Identify and describe any changes or additions to human interfaces for control room controls, displays, and alarms that could affect the operator's ability to interpret, read or visually identify the information that they will require from the instrumentation.*

Response: As discussed in letter ET 07-0004, the MSIVs and MFIVs hydraulic actuators are being replaced with system-medium actuators. The existing Main Control Board (MCB) switches, displays, and alarms associated to the hydraulic actuators will be removed. Elimination of the hydraulic actuators will reduce the number of switches and indications that are required for maintaining the hydraulics for the MSIVs and MFIVs. Provided below is the instrumentation being removed from the MCB.

- Hydraulic pressure indicating instruments and selector switches: ABPI65, ABPI76, ABHS77, and ABHS78
- MSIV/MFIV Accumulator Test and Valve Exercise Actuation and Selector Switches: actuation switches ABHS66, ABHS68, ABHS70, and ABHS73 and selector switches ABHS67, ABHS69, ABHS71, and ABHS74
- MSIV/MFIV Exercise Position green indicating lights: ABZL72, belonging to Separation Group 1 and ABZL75 belonging to Separation Group 4

In Figure 1 (see page 7 of 8 of this Attachment), the instrumentation being removed is shown by "clouding."

The existing open/close switches that operate the individual valves remain the same, as well as the manual actuation switches, which close all four MSIVs or MFIVs valves simultaneously.

Alarm window (annunciator) 00-125F, FW/MSIV SUPLY AIR PRESSURE LO, provides an alarm due to low air regulator pressure for the MSIV/MFIV actuators. Replacement of the hydraulic actuators with the system-medium actuators will eliminate the need for this alarm. Alarm window 00-125F will be replaced and a new alarm window (00-126F) activated to provide an alarm when a failure is detected in either train A or train B MSFIS cabinets. Figure 2 (see page 8 of 8 of this Attachment) shows the associated alarm windows.

The majority of the changes to the MCB are to eliminate controls and instrumentation associated with the hydraulic actuators. These controls and instrumentation are not required for the replacement valves. As such, the changes to the MCB should not affect the operator's ability to interpret, read or visually identify the information that they will require from the instrumentation.

2. *Concerning TS 3.7.3, the WCNOC's application states that time available for completing the action will increase from 4 hours to 72 hours in the proposed completion time for the revised Required Action F.1. How has the licensee verified that this increase in time available does not introduce any new safety concerns? Does this proposed limiting condition for operation (LCO) require any new operator actions or changes to the operator actions? Is the work environment of the operators affected by the changes? How is this change covered in training for licensed and non-licensed operators? The application states that operators manually activate the MFIVs and the accident analysis credits them with closing on demand. How has the licensee verified the accuracy of proposed manual action? How has the licensee validated the ability of the operators completing this manual action?*

Response: Since there are several questions identified above, the question is repeated with the response to the specific question.

How has the licensee verified that this increase in time available does not introduce any new safety concerns?

In letter ET 07-0004, Attachment I (starting on page 10), the addition of the main feedwater regulating valves (MFRVs) and MFRV bypass valves is described and concludes that these valves are fully capable of reliably mitigating a design-basis event. Based on the capability of these valves to perform the required isolation function (i.e., terminate feedwater flow to the SGs during a feedwater line break) a 72 hour Completion Time is a reasonable period of time to restore one or more MFIVs to an OPERABLE status and does not present any new safety concerns. The 72 hour Completion Time is consistent with NUREG-1431, Revision 3.1, "Standard Technical Specifications Westinghouse Plants." Additionally, a similar extension of the Completion Time was approved for the Callaway Plant in Amendment No. 167 on May 31, 2005.

Does this proposed limiting condition for operation (LCO) require any new operator actions or changes to the operator actions?

As clarified during the telecon on November 14, 2007, the proposed limiting condition for operation (LCO) being referred to is the addition of the MFRVs and MFRV bypass valves to the LCO for TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)." The addition of the MFRVs and MFRV bypass valves to TS 3.7.3 was based on assuming in the accident analyses that

these valves are fully capable of mitigating the design basis event. The accident analyses assumes that the valves close on demand and no operator actions are required for valve closure.

Is the work environment of the operators affected by the changes?

The replacement of the MSIVs, MFIVs, and MSFIS controls does not impact the work environment of the operators.

How is this change covered in training for licensed and non-licensed operators?

Training for licensed and non-licensed operators on license amendments is covered during the requalification training. Additionally, a summary of the amendment is incorporated into licensed operator essential reading at the time of incorporation of the changes into the Technical Specifications.

The application states that operators manually activate the MFIVs and the accident analysis credits them with closing on demand. How has the licensee verified the accuracy of proposed manual action? How has the licensee validated the ability of the operators completing this manual action?

The paragraph in letter ET 07-0004 being referred to is page 11 in Attachment, which states, in part:

> The MFIVs may also be actuated manually. Credit is taken in the accident analysis for the MFIVs to close on demand.

The intent of the paragraph in letter ET 07-0004 was to describe the automatic signals that close the MFIVs, MFRVs, and MFRV bypass valves, that the valves can be closed and opened manually and identifies that accident analysis assumes the valves will close on demand. For the purposes of the accident analysis, the analysis only assumes that the valves close based on a valid automatic signal. The accident analysis does not include any assumptions for manual operator action to close these valves.

3. *Tables 4.5-1 and 4.5-2 of the application display the operator response times associated with steam generator tube rupture (SGTR) for the overfill by the auxiliary feedwater (AFW) system and the stuck open atmospheric relief valve (ARV) scenarios. The times have changed from the operator times in Table 15.6-1 of the Updated Safety Analysis Report for Wolf Creek. Described specific methodology and sampling used to determine these assumed operator response times in the application. Include the number of scenarios and how many crews were used during simulator runs. Also specify if operator subjective judgment was used in determining these operator response times.*

Response:

Steam Generator Tube Rupture (SGTR) with Forced Overfill Event Scenario

The assumption revised from the analysis of record (AOR) for the SGTR with Forced Overfill scenario is discussed below:

Overfill Scenario Assumption 2 (page 43 of Attachment I to ET 07-0004) states "...AFW flow to the intact SGs maintains the narrow range level between 6% and 50% as indicated in the emergency operating procedure EMG E-3." This represents a change as the AOR narrow range level maintained was between 4% and 50%. This revision was identified and evaluated under the WCNOC corrective action program, which determined that the effect of the revision was insignificant. Note: In Assumption 4 (provided in letter ET 07-0004), consistent with the current AOR and Table 4.5-1 of Attachment I to ET 07-0004, the statement should reflect that the primary depressurization is initiated at eight minutes following termination of the Reactor Coolant System (RCS) cooldown.

A review of the SGTR with Forced Overfill scenario with pre-accident iodine spike scenario dose consequence re-analysis results, as presented in Section 4.11 of Attachment I to letter ET 07-0004, reveals that the primary radionuclide contribution (about 82%) of the total thyroid dose is from the flashed break flow released through the direct release path. This flashed break flow provides an indication of the primary dose consequence contribution for the reanalyzed SGTR event scenarios.

The SGTR with Forced Overfill scenario integrated break flow results at the time Safety Injection (SI) is terminated differ from the comparable AOR results by 0.8%. As the assumed operator response times in the re-analysis are unchanged from those assumed in the AOR, the revised MFIV closure characteristics are the primary source of the minor reduction in the integrated mass release from the primary to secondary and by extension the slightly reduced radiological consequences of the transient, and are thus the source of the re-analysis differences as compared to Table 15.6-1 of the Updated Safety Analysis Report (USAR).

SGTR with Stuck-open ARV Event Scenario

The SGTR with Stuck-open ARV scenario re-analysis, includes as a substantive change from the assumptions of the AOR, revised critical operator actions. These revised critical operator action time values, intentionally selected to be more conservative than those of the AOR, were based upon a combination of simulator demonstrations and conservative extrapolations, as developed from experience with the SGTR with Forced Overfill scenario, and operator subjective judgment.

Consistent with Tables 4.5-1 and 4.5-2 of Attachment I to ET 07-0004, and the results presented in the figures, the assumptions reflect the following:

The discharge of contaminated secondary fluid is maximized by assuming an ARV stuck-open for 21.53 minutes, as compared with the AOR assumption of 20 minutes. [Assumption 2, page 44 of Attachment I to ET 07-0004]

RCS depressurization is initiated 5.6 minutes after cooldown is complete, as compared to the AOR assumption of three minutes. [Assumption 5, page 44 of Attachment I to ET 07-0004] Note: The Table 4.5-1 value stated should be 5.6 minutes.

Safety Injection is terminated after a 9.8 minute delay, as compared with the AOR assumption of a three minute delay. [Assumption 6, page 44 of Attachment I to ET 07-0004]

A comparison of the critical operator action time values for the SGTR with Stuck-open ARV re-analysis and the AOR is presented in the following table:

Action	Critical Operator Action Times (min.)	
	Analysis of Record	Re-Analysis
SGTR Begins	0.0	0.0
Reactor Trip	2.37	2.38
Identify/Isolate Faulted SG	22.4	26.38
Initiate Cooldown	36.9	56.28
Terminate Cooldown	50.4	65.4
Initiate Depressurization	53.4	71.00
Terminate Depressurization	56.06	75.42
Terminate SI	59.06	85.23
Equalize Press/Backfill Faulted SG	61.01	115.3

The re-analysis integrated break flow results at the time SI is terminated are reduced nearly 4.2% due to the revised MFIV closure characteristics causing a reduction in the cooldown step time duration, as compared to the results from a case with a combination of the re-analysis revised operator response times and the AOR MFIV closure characteristics. However, the AOR integrated break flow results at the time SI is terminated are nearly 30% less than the comparable results from that same case, due to the less conservative operator response time values assumed in the AOR.

Therefore, as there was no change in the operator action times assumed in the re-analysis of the SGTR with Forced Overfill scenario and the changes to the operator action time response values assumed in the re-analysis of the SGTR with Stuck-open ARV scenario were to more conservative values, the changes are acceptable.

4. *Of the revised accident analyses, other than the SGTR for the overfill by the AFW system and the stuck open ARV addressed in the previous question, that were submitted in the application, which of these accident analyses have different operator response times compared to the analysis of record for the accident. For a change in the operator response time to a less conservative value, described specific methodology and sampling used to determine these assumed operator response times in the application. Include the number of scenarios and how many crews were used during simulator runs. Also specify if operator subjective judgment was used in determining these operator response times.*

Response: As discussed in Attachment I, Sections 4.7 and 4.8 of letter ET 07-0004, the critical increase in mass and energy releases, and by extension an increase in the associated containment pressure and temperature response, attributed to the longer closure times for both

MSIVs and MFIVs, as well as the steam generator (SG0 fluid mass assumed in this analysis due to SG water level uncertainty, is offset in part by revising the operator action credited to re-align the auxiliary feedwater (AFW) System to terminate the flow to the faulted SG, while continuing to feed the intact SGs.

The 30 minute operator response time to re-align the AFW System to terminate the flow to the faulted SG assumed in the AOR was changed to a less conservative 20 minute operator response time value in the main steamline break (MSLB) re-analysis.

As stated in the USAR, Section 6.2.1.4.3.3, " Actual termination of AFW flow to the affected steam generator due to operator action is expected to occur prior to 600 seconds (10 minutes), ..." Simulator scenario measurements for the six crews have confirmed that the operator response time to terminate the AFW flow to the affected SG during a MSLB is between six to seven minutes.

Although the operator response time to re-align the AFW System to terminate the flow to the faulted SG during a MSLB was changed to a less conservative value of 20 minutes in the re-analysis, it remains more conservative than the 10 minute operator response time stated in the USAR and the simulator scenario measurement times of between six to seven minutes. Thus, the change to the operator response times is justified, as the value remains conservative and applicable to MSLB conditions.

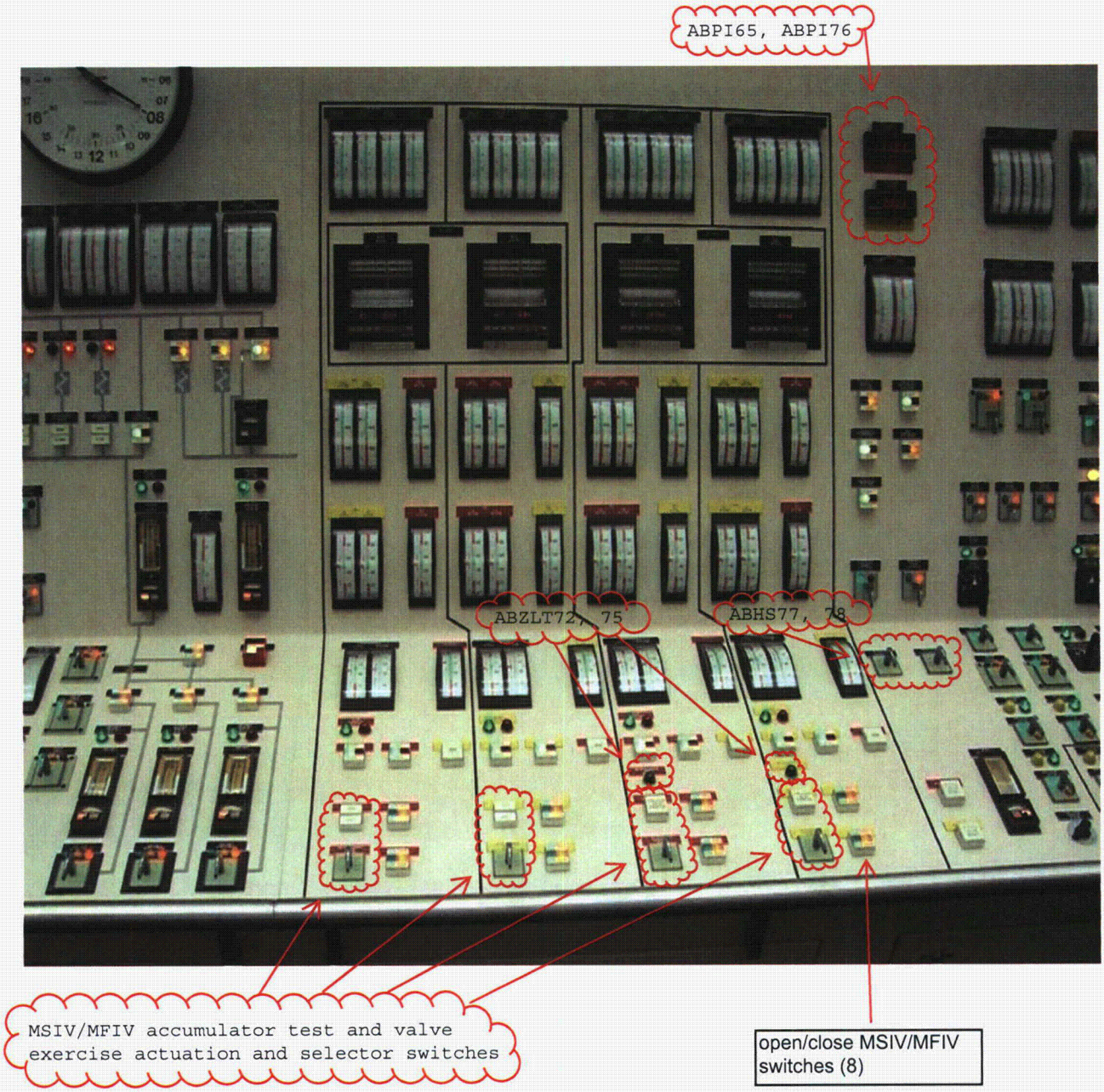
ABPI65, ABPI76
ABZLT72, 75
ABHS77, 78
MSIV/MFIV accumulator test and valve exercise actuation and selector switches
open/close MSIV/MFIV switches (8)

FIGURE 1

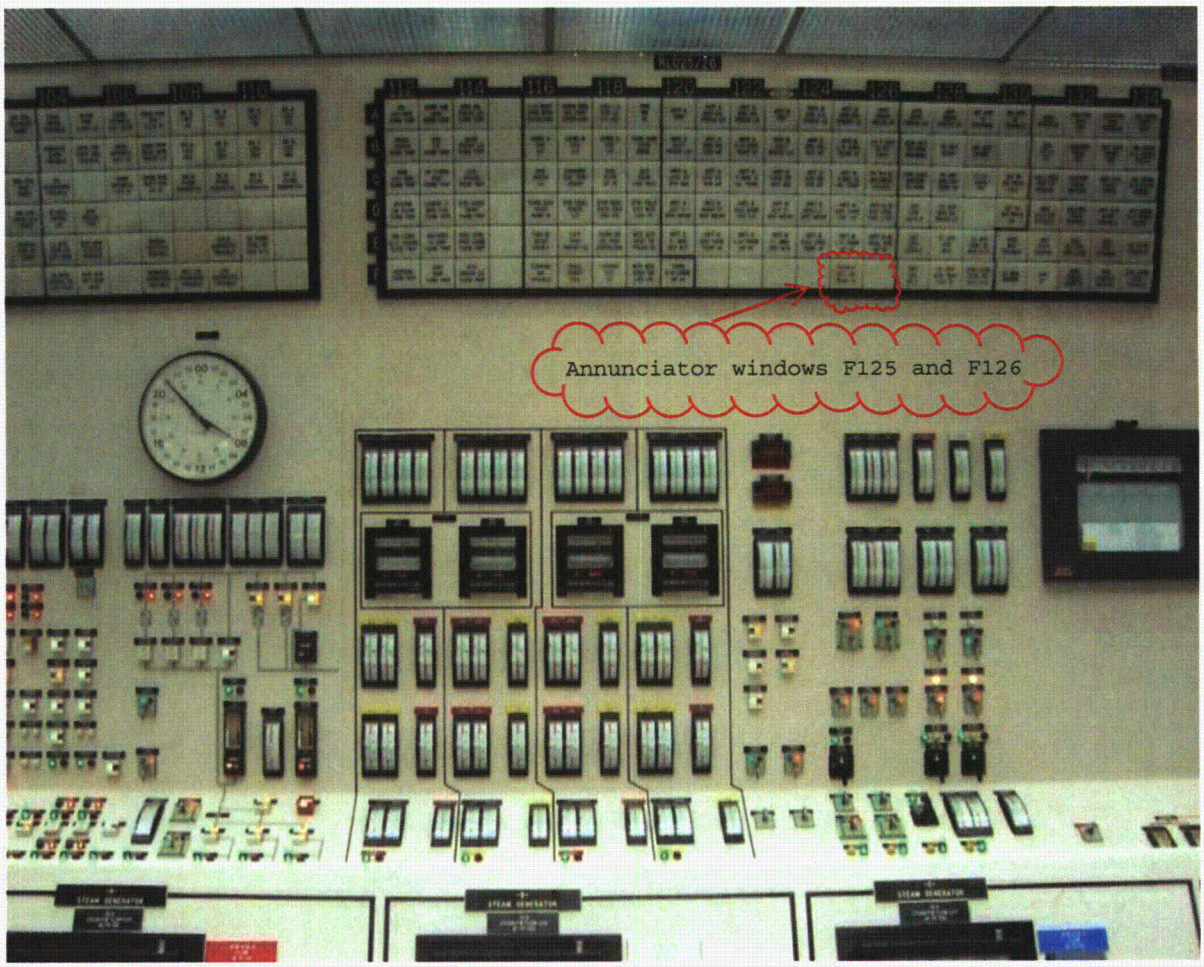

FIGURE 2