



**Entergy
Operations**

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PDR*

Entergy Operations, Inc.
P.O. Box 8
Kilchoa, LA 70066
Tel 504-739-6650

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April 29, 1996

James Leiberman
Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
NRC Inspection Report 95-23
Reply to Notice of Violation

Gentlemen:

In accordance with 10CFR2.201, Entergy hereby submits in Attachment 1 the response to the violations identified in the Notice of Violation and Proposed Imposition of Civil Penalty of the subject Inspection Report. Waterford 3 admits the violations identified and recognizes the significance of the issues. Although the ACCW system is considered to have remained operable, management and personnel performance were unsatisfactory in that numerous opportunities existed to identify and correct the system design susceptibilities. Since discovery, Waterford 3 has taken comprehensive corrective actions to address the ACCW system issues as well as the broader issues identified in our review.

Waterford 3 management has used the lessons learned from these events to reinforce and communicate expectations regarding self-critical, questioning attitudes and Corrective Action Program implementation. Waterford 3 is committed to continuous improvement in ensuring that conditions adverse to quality are promptly identified and effectively corrected to reduce the likelihood of recurrence.

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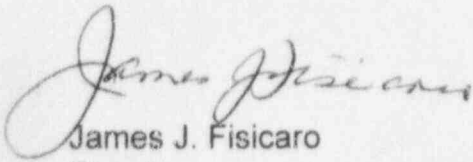
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NRC Inspection Report 95-23
Reply to Notice of Violation
W3F1-96-0052
Page 2
April 29, 1996

Should you have any questions concerning this response, please contact me at (504) 739-6242 or Don Vinci at (504) 739-6370.

Very truly yours,



James J. Fisicaro
Director
Nuclear Safety

JJF/DFL/tjs
Attachment

cc: L.J. Callan (NRC Region IV)
C.P. Patel (NRC-NRR),
R.B. McGehee
N.S. Reynolds
NRC Resident Inspectors' Office
NRC Document Control Desk

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of)
)
Entergy Operations, Incorporated) Docket No. 50-382
Waterford 3 Steam Electric Station)

AFFIDAVIT

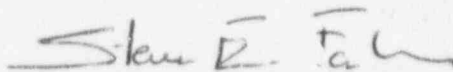
James J. Fisicaro, being duly sworn, hereby deposes and says that he is Director, Nuclear Safety - Waterford 3 of Entergy; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached Reply to Notice of Violation and Proposed Imposition of Civil Penalty; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.



James J. Fisicaro
Director, Nuclear Safety - Waterford 3

STATE OF LOUISIANA)
) ss
PARISH OF ST. CHARLES)

Subscribed and sworn to before me, a Notary Public in and for the Parish and State above named this
29th day of APRIL, 1996.



Notary Public

My Commission expires WITH LIFE.

ATTACHMENT 1

ENTERGY RESPONSE TO THE VIOLATIONS IDENTIFIED IN
THE NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY
OF INSPECTION REPORT 95-23

I. Violation Assessed a Civil Penalty

VIOLATION NO. EA 96-025/01013

Criterion XVI of Appendix B to 10 CFR Part 50 requires, in part, that measures be established to assure that conditions adverse to quality, such as failures and malfunctions, be promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, on several occasions, from March 1986 through December 1995, as discussed in NRC Inspection Report 50-382/95-23, licensee personnel failed to implement corrective actions to preclude repetition of a significant condition adverse to quality in that, on each of those occasions, a known design deficiency, which allowed the development of voids in the ACCW system, was not corrected.

This is a Severity Level III violation (Supplement I).
Civil Penalty - \$50,000.

RESPONSE

(1) Reason for the Violation

Entergy admits this violation and believes that the causes were inadequate performance and review of Root Cause Analyses associated with the discovery of air in the Auxiliary Component Cooling Water (ACCW) system piping, and the failure to verify identified corrective actions were being implemented.

On March 13, 1986, a hydraulic transient, or water hammer, apparently occurred in both trains of the ACCW system. Project Evaluation/ Information Request (PEIR) 10274 was generated to address this event. The Architect Engineer (Ebasco) was requested to walkdown and evaluate both trains of ACCW from the pump discharge to the Component Cooling Water (CCW) Heat Exchanger. The PEIR states that no one witnessed the events, but that

damaged pipe supports were discovered (loose or bent supports, three of which required replacement parts or welding to repair).

Although not a corrective action document, the PEIR addressed the apparent cause of failure and actions to prevent recurrence. The cause of the failure was attributed to "hydraulic transients" caused by leakage at pump discharge check valves, ACC-108 A&B. System integrity was maintained after the event, and no evidence of damage to the piping, pump or heat exchanger was noticed. PEIR 10274 stated that a permanent solution to the hydraulic transient problem will be established after system operation is witnessed. As a temporary measure it was recommended that administrative controls be incorporated to manually close pump discharge valves before starting the pumps at any time. ACCW system operating and surveillance procedures were revised per this recommendation. Additionally, the PEIR stated that Operations shall provide system surveillance by using a temporary pressure indicator to monitor the system fill condition. This would preclude potential adverse system operation during an accident condition pump start. Although no documentation could be found, Systems Engineering personnel from the 1986 time frame were interviewed that recalled this being done. Readings were apparently taken for some period of time that indicated that column separation was not occurring, and the pressure gauge was removed.

In February 1994, during investigation of the cause of CCW Heat Exchanger (CCWHX) 'B' shell side relief valve ACC-121B lifting for Root Cause Investigation (RCI) 94-003, air was discovered in the ACCW piping in the vicinity of the CCWHXs. Analyses of the amount of air found in the ACCW piping showed that both trains would be capable of performing their safety function. The analyses conservatively assumed that the absence of water was due to voiding (water vapor) as opposed to air. The effects of water hammer with voiding present are much more severe than with air because air tends to dampen the hydraulic forces. As part of the evaluation, Design Engineering provided guidelines for the maximum amount of voiding allowed in each train of ACCW based on the analyzed, as-found air pockets.

Three possible mechanisms for air intrusion into the ACCW system were identified:

- air left in the ACCW system following maintenance
- air coming out of solution in the ACCW high points when the system is idle
- air drawn through leaking flanges, valves or packing in the high points of the system when a vacuum develops with the ACCW pump idle

RCI 94-003 attributed the root cause for air intrusion as inadequate venting after system maintenance. Air coming out of solution or being drawn through flanges or valve packing was investigated, however no conclusive evidence was obtained to support these mechanisms. Corrective actions included a requirement to sweep the ACCW system with at least 6000 gpm flow following maintenance activities which could introduce air, and Systems Engineering-Mechanical was tasked with developing a plan to monitor the amount of voiding (or air) in the ACCW system piping in the vicinity of the CCWHXs.

Repetitive Tasks (RT) 021340 and 021341 were initiated on July 26, 1994 to require quarterly ultrasonic (UT) examinations of the ACCW piping in the vicinity of the CCWHXs. The repetitive tasks included the guidelines for the maximum voiding allowed as provided by Design Engineering in the RCI. These tasks, however, were incorrectly assigned to Systems Engineering-Mechanical. The tasks were coded 'PE' for Plant Engineering. This designation would require that the System Engineer convert the repetitive task to a Work Authorization and forward the package to the QA-NDE group for performance of the UT examination. The System Engineer was (1) never made aware of this designation and assignment of responsibility and (2) not equipped to convert repetitive tasks to Work Authorizations. This incorrect coding and assignment resulted in the scheduled RTs for ultrasonic examinations of the ACCW piping not being converted to WAs and therefore not being performed at a scheduled interval. These tasks required action from the System Engineer and Operations QA in the work instructions. Follow-up by either department would have detected their non-performance. The corrective action verification process performed by QA only verified initiation of the repetitive tasks, not actual performance.

On January 13, 1995 after a scheduled component outage on ACCW train 'A', a UT examination revealed a 21 inch arc of air on the shell side outlet piping of CCWHX 'A'. ACCW pump 'A' was manually started to sweep the air out. A subsequent UT examination showed that the piping was full. CR 95-0059 was initiated and a Root Cause Analysis was performed. In the course of investigating the January 1995 event, the 'A' outlet pipe was trended over a six day period from January 27, 1995 to February 2, 1995. The UT measurement taken January 30, 1995 showed a 13 inch arc that held steady through February 2, 1995. This event immediately followed maintenance on the shell (ACCW) side of the CCWHX in which the heat exchanger and associated piping were drained to effect repairs to a drain valve, ACC-120A. The unchanged 13 inch arc on February 2, 1995 indicated that in-leakage was not occurring. The RCA concluded that the air intrusion mechanism was maintenance activities and that previous corrective actions had been ineffective in removing air post-maintenance.

The root cause determination focused on the fact that although the previous corrective action of proceduralizing sweeping the system at 6000 gpm after maintenance was implemented and followed, no verification of the effectiveness of this action was included in the implemented corrective actions. Since there is no practical method to determine that sufficient sweeping has occurred to remove all the air other than performing a UT, the corrective action was intended to ensure a UT was performed in all post-maintenance cases by proceduralizing the performance of the UT in the fill and vent section of OP-002-001, the ACCW System Operating Procedure. Additionally, in order to ensure that this measure was taken prior to declaring the system operable after maintenance, a corrective action was issued to perform the UT prior to the ACCW pump operability run in procedure OP-903-050, "CCW and ACCW Pump and Valve Operability Test." This action, the proceduralization of the performance of a UT prior to the ACCW pump operability run, was not carried out however. In a July 17, 1995 corrective action completion notice, Operations responded that this proceduralization of a UT would be considered an "Operations Work Around" and therefore would not be implemented. The notice went on to state that the intent of this corrective action was believed to be "ensuring the ACCW piping is full at all times". At the request of Operations, the corrective action was changed to revising the periodicity of the UT repetitive tasks 021340 and 021341 from quarterly to monthly. However, the tasks remained incorrectly assigned and no verification of task performance was accomplished.

While attempting to quantify air introduction due to in-leakage or air coming out of solution, corrective actions from Root Cause Investigation 94-003 and Root Cause Analysis 95-0059 were not adequate to prevent recurrence from mechanisms other than air introduction due to maintenance and did not address the column separation potential that was recognized to exist in the system. It has also been determined that the Root Cause Analysis and Corrective Action Plan approval process in place in 1994/1995 employed a narrow review cycle that is limited to specific department management and Quality Assurance. This method did not provide the desired synergistic effect that is gained in the front end of the CR process through the Condition Review Board.

(2) Corrective Steps That Have Been Taken and the Results Achieved

On December 4, 1995, Condition Report 95-1259 was initiated when it was discovered that Repetitive Tasks 021340 and 021341 were not being performed in accordance with their required interval. When this was discovered, Quality Assurance Non-Destructive Examination (QA-NDE) personnel were not onsite (due to outage support at River Bend) to verify that

the amount of air in the ACCW piping was within limits, therefore, the Operations Shift Supervisor directed that both ACCW trains be operated in order to sweep any entrapped air out that might be present. Previous experience has shown that if the ACCW pumps are operated at ≥ 6000 gpm, entrapped air should be swept out. Additionally Repetitive Task 021340 had been completed successfully on October 4, 1995 and Repetitive Task 021341 had been completed successfully on 10/28/95. Therefore reasonable assurance existed that if any air was present, it had been removed.

Ultrasonic examinations and acoustic surveys were performed from December 11, 1995 through December 14, 1995 to quantify the rate of air intrusion, if any, into the ACCW piping. This monitoring revealed a trend of air in-leakage into the ACCW "A" HX outlet piping. Based on the results of the UT examinations and the preliminary acoustic survey, it was concluded that air pockets forming in the ACCW piping were primarily the result of air intrusion from flange leaks. Several options were considered to maintain the operability of the ACCW system until a permanent solution to air intrusion could be implemented. It was decided that the ACCW pumps would be run continuously until more permanent corrective actions could be implemented. The ACCW pumps are operating continuously on minimum recirculation or greater flow as conditions allow to keep the system pressurized to preclude air intrusion or column separation. Pump and motor bearing temperatures and vibration are being closely monitored.

Operations began venting both trains of ACCW on a daily basis to verify the effectiveness of continuously running the ACCW pumps. When no air was detected after approximately two weeks of venting, this requirement was reduced to weekly.

Systems-Engineering-Mechanical has provided Operations with guidance recommending that the CCW System may be operated at temperatures as low as 65°F without adverse effects in order to minimize ACCW pump run time at minimum recirculation flows.

The Operations Shift Supervisors have been briefed on the susceptibilities of the ACCW system to hydraulic transients. Additionally, the ACCW pump control switches have been caution tagged to alert control room Operators to the susceptibilities of the system to hydraulic transients.

Root Cause Analyses have been performed under CRs 95-1300, 95-1259, 95-1329, and 96-0055 to identify causes and corrective actions for ACCW air intrusion and related issues.

Planning and Scheduling is currently providing a planner function for Systems Engineering in order to carry out the repetitive task responsibilities for tasks currently assigned to Systems Engineering.

Systems Engineering-Mechanical has re-assigned tasks 021340 and 021341 to the Operations-QA (NDE) group, incorporating updated operability limits and changing the periodicity to "on demand" and the task designation to "Mandatory Preventive Maintenance (MPM)".

Design Engineering has reviewed other safety related fluid systems for (1) susceptibility to potentially damaging hydraulic transients caused by column separation and (2) susceptibility to air intrusion due to vacuum conditions utilizing EPRI NP-6766, "Water Hammer Prevention, Mitigation and Accommodation" and NUREG -0582, "Water Hammer in Nuclear Power Plants" as guidance. The review found no significant potential for water hammer due to column separation or air intrusion. Although several susceptibilities were identified for off-normal system configurations, operational requirements in place are adequate to prevent water hammer.

The Maintenance Department has revised administrative procedure UNT-005-012, "Repetitive Task Identification" to 1) stipulate that a department or group must have a planner established prior to creating a SIMS task, 2) define a methodology for assigning responsibility of tasks to a department, and 3) address planning functions instead of positions.

The Planning & Scheduling Department has developed a system to monitor task late dates as an oversight function. The Scheduling Supervisor is monitoring task late dates weekly. The Maintenance Department has changed administrative procedure UNT-005-012 to include requirements for Planning & Scheduling to provide these reviews.

The Electrical, Mechanical, I&C, Operations, Chemistry, Emergency Planning, Environmental, Health Physics, Maintenance Reliability Engineering, Design Engineering, Systems Engineering, Nuclear Reactor Safety, Radwaste, Reactor Engineering and Performance and STA supervisors reviewed tasks assigned to their department and verified any late tasks are in compliance with UNT-005-012, "Repetitive Task Identification," Section 5.7.

The Root Cause Analysis (CR-95-1300) for this event has been routed to Systems Engineering, Maintenance Planners and Ops-QA personnel for required reading.

Quality Assurance has disseminated information to Operations, Systems Engineering and QA personnel to review Root Cause Analysis lessons learned from the outcome of this event.

Root Cause Analyses and their associated corrective action plans for Significant Adverse Conditions and others, as deemed appropriate, will be presented to the Condition Review Board for approval. This added review barrier should provide additional assurance that root causes are adequately identified and corrective action plans are aggressive in preventing recurrence. Procedure UNT-006-011, "Condition Report," has been revised to delineate this requirement.

Procedure UNT-006-011 has been revised to include prompts to responsible organizations regarding the need to identify and implement interim actions at various stages of the Corrective Action process.

All organizations currently responsible for open CRs affecting safety related equipment have been directed to review the individual CRs to determine the need for interim actions necessary to preclude recurrence of the problem and to promptly document and communicate those required actions.

Quality Assurance has evaluated CR trend data to identify other previous significant conditions with potentially errant cause analysis/corrective action. This review identified 12 issues of potentially errant cause analyses and/or corrective action. These issues have been reviewed by responsible departments. No other errant cause analysis/corrective actions were identified per this review.

(3) Corrective Steps Which Will Be Taken to Avoid Further Violations

Design Change DC-3470 has been initiated. This design change will evaluate a motor or air operator on the ACCW pump discharge valve, which will function to preclude excessive dynamic loads from air intrusion or column separation. This will preclude the requirement to manually close the discharge valve prior to starting an ACCW pump. This design change will be ready to install by September 30, 1996, and will be implemented by the end of the next refueling outage (Refuel 8 - scheduled for April, 1997), or the next forced outage of sufficient duration.

Systems Engineering will review the adequacy and application of existing fill and vent procedures for safety related and trip sensitive fluid systems. The review should focus on two areas: (1) venting following maintenance involving draining of systems or portions of systems, and (2) periodic venting

of components and sections of piping subject to air coming out of solution. The review should include a consideration of the adequacy and location of vent valves. This review will be completed by December 31, 1996. Where the need for additional vent valves is identified, appropriate configuration change documents will be initiated to result in the installation of the vent valves. Additional corrective actions will be assigned to track these actions as necessary through design and installation. Where the need for additional administrative controls such as procedures or tasks are identified for fluid system venting, Operations will initiate, prepare and approve the necessary changes.

Operations will complete a review of Operations Surveillance procedures to identify any proceduralized "work-arounds" and implement appropriate corrective actions. This review will be completed by June 1, 1996.

The Operational Experience Engineering Department will complete an independent review of Operations Surveillance procedures to identify any proceduralized "work-arounds". This review will be completed by June 1, 1996.

The Training Department will develop lesson plans on air intrusion and column separation based on the events documented in this RCA and other industry reviews, such as NUREG-0582 and EPRI NP-6766, and include this training in the next round of Operations Requalification and Engineering Support Personnel training. The Operations Requalification portion of this training will also include a review of this event in order to improve the identification of "work-arounds". This training will be completed by June 1, 1996.

Plant Management will develop a case study of this event to be reviewed with all Management and Supervisory personnel. This action will be completed by April 30, 1996.

Systems Engineering and Design Engineering will review this event with all Engineering personnel. This action will be completed by April 30, 1996.

Quality Assurance will perform follow-up assessments to verify effectiveness of corrective actions for significant CRs. Procedure UNT-006-011, "Condition Report," has been revised to delineate this requirement.

An independent review of the previously discussed CR trend data of past significant conditions with potentially errant cause analysis/corrective action will be performed by on and offsite personnel. This action will be completed by May 31, 1996.

Annual training will be provided to site root cause evaluators to reinforce expectations on root cause evaluations.

A Management/Supervisor meeting was held on March 6, 1996 to discuss and emphasize the expectations of having a self-critical and questioning attitude along with developing a "defense-in-depth" barrier mentality. All-Hands Meetings have followed and Departmental Meetings are ongoing to further emphasize these expectations. The Departmental Meetings will be completed by June 1, 1996.

(4) Date When Full Compliance Will Be Achieved

Waterford 3 will be in full compliance by June 1, 1996. Annual training of root cause evaluators is an ongoing action.

II. Violations Not Assessed a Civil Penalty

VIOLATION NO. EA 96-025/02014

Technical Specification 6.8.1.a states, in part, that written procedures shall be implemented covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, February 1978.

Paragraph 9.a Appendix A to Regulatory Guide 1.33 states, in part, that procedures for performing maintenance that can affect the performance of safety-related equipment should be performed in accordance with written procedures appropriate to the circumstances.

Section 5.6 of Procedure UNT-005-015, "Work Authorization Preparation and Implementation," stated, in part, that the work authorization affected by a change in scope or intent shall be reviewed by the original reviewers.

Contrary to the above, a change in the scope or intent of a work authorization was performed and the changes were not reviewed by the original reviewers in that:

1. On October 27, 1995, the system engineer entered "N/A" for the requirement specified in Work Authorization 01135214 for performance of a valve differential pressure test. The original reviewers did not review the change to the test requirements.

2. On November 25, 1995, a maintenance planner marked "N/A" for the post maintenance test specified in Work Authorization 01135214. The original reviewers did not review the change to the post maintenance test.

This is a Severity Level IV violation (Supplement 1).

RESPONSE

(1) Reason for the Violation

Entergy admits this violation and believes that the root cause was personnel error due to inattention to detail by both the system engineer and the maintenance planner. On October 7, 1995, the system engineer marked N/A for the differential pressure (D/P) test specified in Work Authorizations (WA) 01135213 and 01135214 for valves CS-125 A&B, respectively. This was an agreed upon decision following discussion with appropriate parties and management. This decision was based on the fact that the valves were inspected and a design feature was in place to ensure the valves would not experience a high D/P during accident conditions. However, the engineer did not obtain the appropriate re-reviews of the work package for the scope change as required by UNT-005-015, "Work Authorization Preparation and Implementation."

On November 25, 1995, a maintenance planner marked N/A for the post maintenance retest requirement of WAs 01135213 and 01135214. This was based on the fact that Operations had successfully performed an operability stroke time test under these WAs on October 30, 1995. The planner took credit for the stroke test by verifying with Operations personnel that it met the requirements of the maintenance retest. Taking alternate credit such as this is only an acceptable practice if the Operations test documents satisfactory completion of all the requirements of the maintenance test. Otherwise, the N/A is considered a scope change. Since the Operations stroke test did not document satisfactory completion of all the requirements of the maintenance test, the N/As are considered a scope change. The maintenance planner did not obtain the appropriate re-reviews of the work package for the scope change as required by UNT-005-015.

(2) Corrective Steps That Have Been Taken and the Results Achieved

On January 10, 1996 and January 11, 1996, a D/P test was successfully performed on CS-125 A&B, respectively, verifying the operability of the valves.

A reminder of the procedural requirement of re-reviews for WA scope changes was sent to personnel involved with WA packages on 01/10/96.

Systems Engineering and Maintenance have discussed retest and scope change requirements at staff meetings and shop meetings.

Quality Assurance performed a sampling review of Refuel 7 work packages, including WAs planned by the individual who N/A'd the CS-125 retests, for similar conditions. No other examples of improperly N/A'd retests were identified.

Procedure UNT-005-015 has been revised to clarify the retest change and scope change requirements.

(3) Corrective Steps Which Will Be Taken to Avoid Further Violations

There is no additional corrective action required as the above corrective actions adequately address this violation.

(4) Date When Full Compliance Will Be Achieved

Waterford 3 is currently in full compliance.

VIOLATION NO. EA 96-025/03014

Criterion XI of Appendix B to 10 CFR Part 50 specifies, in part, that all testing required to demonstrate that systems will perform satisfactorily in service is performed in accordance with written test procedures which incorporated the requirements contained in applicable design documents.

Section 7.3 of the Updated Final Safety Analysis Report an applicable design document, states, in part, that the ESF [engineered safety feature] components automatically actuated by signals from ESFAS [engineered safety feature actuation system] are identified in Table 7.3-5. The ACCW system is listed in Table 7.3-5.

The licensee has established through the issuance of System Operating Procedure OP-002-001, "Auxiliary Component Cooling Water," that the normal system lineup requires that the ACCW pump discharge valve be fully opened when the system is in standby and prepared to respond to an automatic actuation signal.

Contrary to the above, the licensee failed to provide a written procedure to test the ACCW system in accordance with requirements of the applicable design documents in that surveillance procedures required that the ACCW pump discharge valve be shut during testing, which represented a position different from the normal, automatic system actuation lineup.

This is a Severity Level IV violation (Supplement I).

RESPONSE

Entergy agrees with this violation in that past surveillance testing of the ACCW system was inadequate due to the proceduralization of a work around. The reason for the violation, corrective steps that have been taken, and the corrective actions which will be taken to avoid further violations are documented in Licensee Event Report 96-004-00 dated March 28, 1996. As discussed in the LER, closing the ACCW pumps discharge valves prior to starting the pumps was originally intended as an interim action until a permanent solution could be reached. However, no long term solution was reached and the closure of the discharge valves continued. Although past ACCW system surveillances are considered inadequate, and may have masked the potential for hydraulic transients, Waterford 3 is confident that the ACCW system remained capable of performing its safety function. This is discussed in the Safety Significance section of the LER. The ACCW system is being run continuously to prevent the potential for hydraulic transients until a permanent solution can be implemented. All actions to prevent recurrence in LER 96-004 are included in the response to Violation No. EA 96-025/01013. Waterford 3 will be in full compliance by June 1, 1996, when the reviews of Operations surveillance procedures and training of Operations and Engineering personnel are completed.