April 18, 1996

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Catawba Nuclear Station
Docket No. 50-414
LER 414/96-002

Gentlemen:

Attached is Licensee Event Report **Technical Specification Violation for Redundant Hydrogen Igniters Inoperable in the Same Region.**

This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

W. R. McCollum, Jr.

Attachment

cc: Mr. S.D. Ebneter
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NC MPA-1	
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PMPA	
SREC	

J. W. Glenn	CN05SR (with Enclosures)
K. E. Nicholson	CN01RC (with Enclosures)
SRG File	CN05SR (with Enclosures)
Electronic Library	EC050 (with Enclosures)
Master File	CN02DC CN-815.04 (with Enclosures)

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 04/30/98
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)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Catawba Nuclear Station	05000414	1 of 6

TITLE (4)
Technical Specification Violation For Redundant Hydrogen Igniters Inoperable in the Same Region

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
									N/A	05000
03	18	96	96	- 002	- 00	04	17	96		05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more of the following) (11)			
POWER LEVEL (10)	100	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 (Specify in
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Abstract below and
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	in Text, NRC Form
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
D. P. Kimball, Safety Review Group Manager	(803)	831-3743

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	

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 fifteen single-space typewritten lines)* (16)

Unit Status: Unit 2 - Mode 1 (Power Operation) at 100 percent power.

Event Description: A violation of Technical Specification 3.6.4.3 occurred on March 18, 1996, when there were two inoperable hydrogen igniters on redundant circuits which provide coverage for the same region. The test current reading for one igniter on B train was found below its baseline current on March 8. On March 18, while performing the A train test, the technical specification violation occurred when the fuse was removed from the circuit, making the A train inoperable including the igniter that provided the same coverage as the inoperable B train igniter. Engineering identified this event during a documentation review on March 22.

Event Cause: This event occurred because Operations was not notified of the failure of the igniter on March 8 and therefore no Technical Specification Action Item Log entry was made. There are two causes for this breakdown. First, there were no programmatic requirements in place directing Maintenance to perform this communication. Second, when the test was completed, Maintenance did not directly communicate the test results to Engineering.

Corrective Action: Subsequent corrective action was to restore the A train hydrogen mitigation system to operable. Planned corrective action is to revise IP/1(2)/A/3170/03A(B) to ensure appropriate groups are notified, replace the inoperable B train igniter during the next unit shutdown, and ensure all Maintenance supervisors know that a personal contact with Operations and Engineering is required when the acceptance requirements of a technical specification (T/S) surveillance are not met. T/S 3.6.4.3 change has been submitted to adopt the standard T/S for the Hydrogen Ignition System which allows having two igniters inoperable in the same region for up to seven days.

BACKGROUND

The Hydrogen Mitigation (EHM) [EIIS:BB] system consists of 70 glow plug ignition devices (igniters) distributed throughout the various regions of containment in which hydrogen could be released or to which it could flow in significant quantities. The EHM system is based on the concept of controlled ignition using thermal igniters, designed to be capable of functioning in a post accident environment, seismically supported, and capable of actuation from the control room [EIIS:NA]. The igniters are arranged in two independent trains, train A and B, such that each containment region has at least two igniters, one from each train, controlled and powered redundantly so that ignition would occur in each region even if one train failed to energize.

When the EHM system is initiated, the igniter elements are energized and heat up to a surface temperature greater than or equal to 1700 degrees Fahrenheit. At this temperature, hydrogen gas that is present in the airspace in the vicinity of the igniter ignites. Hydrogen ignition in the vicinity of the igniters is assumed to occur when the local hydrogen concentration reaches 8.5 volume percent and results in 100 percent of the hydrogen present being consumed in a controlled manner as it accumulates following a degraded core accident.

Technical Specification 3.6.4.3 states that both trains of the EHM system shall be operable in Modes 1 - Power Operation and 2 - Startup. Per surveillance requirement 4.6.4.3, each train of the EHM system shall be demonstrated operable per the following:

- At least once per 92 days by energizing the supply breakers [EIIS:52] and verifying that at least 34 of 35 igniters are energized, * and

- At least once per 18 months by verifying the temperature of each igniter is a minimum of 1700 degrees Fahrenheit.

The footnote for the asterisk (*) in the first surveillance requirement states that inoperable igniters must not be on corresponding redundant circuits which provide coverage for the same region.

IP/1(2)/A/3170/03A(B), Hydrogen Mitigation System Train A(B) Quarterly Check, is used to perform the quarterly functional test on the EHM system by measuring the current for each igniter circuit.

EVENT DESCRIPTION

March 8, 1996

0745 hours EHM system train B was declared inoperable and entered in the technical specification action item log (TSAIL) to perform the quarterly surveillance test.

During completion of procedure IP/2/A/3170/03B current reading for control panel [EIIS:PL] 2ELCP0279, breaker 2B, did not meet the baseline current referenced in the procedure data sheet. With 34 of the 35 igniters operating the system remained operable. This information was forwarded to Engineering.

1345 hours EHM system train B was declared operable and removed from TSAIL.

March 18, 1996

1040 hours EHM system train A was declared inoperable and entered in TSAIL to perform the quarterly surveillance test.

The A train quarterly check was terminated when a blown fuse [EIIS:FU] was found in one of the electrical circuits. Corrective work order #96023872-01 was written to replace the blown fuse.

March 19, 1996

Fuse FU-5 was replaced and A train was functionally verified operable. Maintenance proceeded to complete the A train quarterly surveillance test.

0858 hours EHM system train A was declared operable and the TSAIL entry was closed.

March 22, 1996

During the review of A and B train quarterly surveillance test data Engineering determined that two igniters on corresponding redundant circuits which provide coverage for the area near the pressurizer [EIIS:PZR] relief tank [EIIS:TK] (PRT) were inoperable on March 18, 1996. Troubleshooting identified the inoperable igniter on B train of EHM to be 2EHM0072.

1615 hours TSAIL entry was made to track the inoperability of hydrogen igniter 2EHM0072 on B train.

CONCLUSION

During a review of the quarterly surveillance test data for both A and B trains on March 22, 1996, Engineering discovered that two igniters on redundant trains in the same region were inoperable on March 18, 1996 for approximately twenty-two hours. When the fuse was removed for the A train igniter for testing, the T/S violation occurred. The A train igniter was returned to operability when a blown fuse was replaced and surveillance completed on March 19, 1996. The B train igniter will remain inoperable until the next unit two shutdown, because of its location and the amount of radiation dose that would be received if replaced at power.

This event occurred because Operations was not notified of the failure of the B train igniter on March 8 which did not result in EHM train B being entered into TSAIL for tracking purposes. There were two opportunities for this notification to occur; therefore two root causes have been assigned to this event. First, there were no programmatic requirements in place that directed Maintenance to notify Operations of the failed igniter. Therefore, when the work order was signed off by Operations they were not aware of the failed igniter and did not know of the need to place EHM train B in TSAIL for tracking of the failed igniter. Second, when Maintenance completed the train B test on March 8 the procedure directed them to notify Engineering of any items that did not meet the test acceptance requirements. This was accomplished by placing the test results at the Engineers' work location when the Engineer was not available. Had the Engineer been directly notified, it's likely the communication to Operations would have taken place.

Corrective action included completion of the A train hydrogen mitigation system and technical specification action item list entry to track the inoperable B train igniter. Planned corrective action is to revise IP/1(2)/A/3170/03A(B) to ensure appropriate groups are notified, replace the inoperable B train igniter during the next unit 2 shutdown, and make sure all Maintenance supervisors know that a personal contact with Operations and Engineering is required when the acceptance requirements of a technical specification surveillance have not been met. T/S 3.6.4.3 change has been submitted to adopt the standard T/S for the Hydrogen Ignition System which allows having two igniters inoperable in the same region for up to seven days.

A review of the operating experience database for the twenty four months preceding this event did not identify any events in which T/S surveillance

4.6.4.3 had been violated. Additionally, this review did not identify any similar events with the same cause. This event is not considered recurring.

CORRECTIVE ACTION

SUBSEQUENT

1) Blown fuse in A train was replaced per corrective work order 96023872 01. Subsequent testing determined that A train EHM was operable.

2) TSAIL entry made to track the train B inoperable igniter 2EHM0072.

PLANNED

1) Procedures IP/1(2)/A/3170/03A(B) will be revised to clearly define the actions necessary when a hydrogen igniter(s) is found below its baseline current.

2) Corrective work order 96025349 01 was written to replace hydrogen igniter 2EHM0072 and will be tracked to completion.

3) Maintenance management will ensure that all supervisors know that a personal contact with Operations and Engineering is required when the acceptance requirements of a technical specification surveillance have not been met.

4) Regulatory Compliance to track the T/S submittal for final approval.

SAFETY ANALYSIS

The hydrogen mitigation system relies on 70 igniters (35 per train) distributed throughout containment to provide a means for the controlled ignition of hydrogen accumulated following a beyond design basis event. In this LER, two igniters in the same location (near the pressurizer relief tank) were inoperable at the same time. These igniters are located in the lower containment inside the primary shield wall.

There are 10 other igniters (5 pairs) located in lower containment inside the primary shield wall and 24 additional igniters (12 pairs) located in other areas of lower containment. In particular, igniters 35 and 36 are in locations that have similar radial and azimuthal positions to the inoperable igniters, but are located at a higher elevation near the top of the compartment.

The ice condenser [EIIS:COND] containment design relies on redundant air return fans [EIIS:FAN] to draw air from the upper containment and discharge this air into the lower compartment. This forced ventilation results in a well mixed containment atmosphere in any of the non dead-ended compartments. Lower containment is expected to be a well mixed region with turbulent air flow. This provides an ideal environment for efficient combustion in the lower compartment from ignition anywhere in the compartment. This mixing in combination with the abundance of igniters in other lower compartment locations provides adequate coverage of the region around the pressurizer relief tank for the twenty-two hours that both igniters were unavailable. This presented no safety concerns.

The health and safety of the public were not affected by this event.