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Docket No. 50-321 HL-5884

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

Edwin I. Hatch Nuclear Plant - Unit 1
Licensee Event Report
Improperly Sized Differential Pressure Instruments Lead to
Missed Technical Specifications Action Statements

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning improperly sized differential pressure instruments leading to missed Technical Specifications action statements.

Respectfully submitted,

Lewis Sumner

H. L. Sumner, Jr.

IFL/eb

Enclosure: LER 50-321/2000-001

cc: Southern Nuclear Operating Company
Mr. P. H. Wells, Nuclear Plant General Manager
SNC Document Management (R-Type A02.001)

U.S. Nuclear Regulatory Commission, Washington, D.C.
Mr. L. N. Olshan, Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II
Mr. L. A. Reyes, Regional Administrator
Mr. J. T. Munday, Senior Resident Inspector - Hatch

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NRC FORM 366 (06-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Information and Records Management Branch (T-6 F33), 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. If a document used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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TITLE (4)

Improperly Sized Differential Pressure Instruments Lead to Missed Technical Specifications Action Statements

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)
01	07	2000	2000	001	00	01	31	2000	Plant Hatch, Unit 2	05000-366
										DOCKET NUMBER(S) 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)

	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(vii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(ix)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch	(912) 367-7851

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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-space typewritten lines) (16)

On 1/7/2000 at 1201 EST, Unit 1 was in the Run mode at 2763 CMWt (100 percent rated thermal power) and Unit 2 was in the Run mode at 2706 CMWt (97.9 percent rated thermal power). At that time, licensed personnel in the control room were notified that certain items of instrumentation required by both units' Technical Specifications were inoperable. The instruments were water level sensors in the suppression pool whose function is to initiate a signal on high water level to realign the suction source of the high pressure coolant injection system from the condensate storage tank to the suppression pool. These instruments were declared inoperable because of a design and installation error that resulted in their being calibrated contrary to the vendor's specifications. This condition actually occurred when the instruments were installed under a design change in April, 1997. It was discovered when engineering personnel were looking for records of an evaluation that was performed as a corrective action for LER 50-366/1998-001. Licensed personnel re-aligned the suction source for the high pressure coolant injection system to the suppression pool as required by the Technical Specifications. This event was caused by personnel error and an omission from a procedure. Personnel did not recognize that installation of an internal jumper was necessary for initial setup of the replacement transmitters. This was due to the subtle change associated with the range which the transmitters would monitor for this application. An inadvertent procedure omission occurred in that the instructions for calibrating the pressure transmitter were not adequate, which contributed to the decision to change the pressure transmitters to a different, and incorrect, pressure range. Corrective actions for this event were replacing the affected transmitters, revising calibration procedures, and training personnel.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor
Energy Industry Identification System codes appear in the text as (EIIS Code XX).

DESCRIPTION OF EVENT

On 1/7/2000 at 1201 EST, Unit 1 was in the Run mode at 2763 CMWt (100 percent rated thermal power) and Unit 2 was in the Run mode at 2706 CMWt (97.9 percent rated thermal power). At that time, licensed personnel in the main control room were notified by a condition report that certain items of plant instrumentation were inoperable on both units. Differential pressure instruments 1/2E41-N062B/D are designed to detect high water level in the suppression pool (EIIS Code BL) and provide a signal to the high pressure coolant injection system (HPCI, EIIS Code BJ) to re-align its suction source from the condensate storage tank (CST, EIIS Code KA) to the suppression pool. The Technical Specifications on both units require that, in the event these instruments are inoperable, the HPCI suction source must be aligned to the suppression pool within one hour (TS 3.3.5.1, required action D.2.2). The re-alignment was completed by 1231 EST on Unit 2 and by 1255 EST on Unit 1.

The subject differential pressure instruments were installed in April 1997 as a result of a design change. The design change had been implemented because the previously installed instruments had required excessive maintenance and were vulnerable to spurious actuations. During the course of implementing the design change, instrument and control technicians (I&C techs) had experienced difficulty calibrating the transmitters to read properly at the designed zero point. As a result, the technicians substituted a similar transmitter in a wider pressure range in an attempt to adjust to the correct zero point. Since the range of the transmitter was wider, the allowable zero point adjustment was also larger; hence, the replacement transmitter was able to be calibrated to match the desired process conditions.

This information was communicated to the site modification engineer and to the architect/engineer (A/E). Engineering personnel then revised the design documents to show that the wide range pressure transmitter was being used. At this point, an error occurred in that the wide range pressure transmitter was designed for a minimum allowable calibration of span of 0 - 125 in-H_2O whereas the actual calibration span of the instrument was 0 - 100 in-H_2O. Since the actual calibration span was below the allowable for this instrument, the instrument accuracy could not be guaranteed by the manufacturer. Therefore, it could not be assured that the pressure transmitters would provide a trip signal if the suppression pool level reached 154 inches. The design engineers did not realize that this error existed. Therefore, the design documents were revised (incorporating the error) and the wide range pressure transmitter was installed.

In January 1998, an event occurred and was reported in LER 50-366/1998-001, dated February 26, 1998. In that event, a spurious actuation of the wide range pressure transmitter resulted in an unplanned maintenance activity on the HPCI system. A cause of that event was that the installed transmitter had a

quick enough response time to detect and trip on waves in the suppression pool. Consequently, one of the corrective actions for that event was an evaluation of the wide range transmitter to see if it would be feasible to install a slightly slower-acting transmitter.

In January 2000, the NRC conducted an audit of the plant's corrective action program. In so doing, the inspectors asked to see records of the evaluation committed to in the LER mentioned above. While an engineer from the A/E was searching for documentation of the evaluation, he noted a discrepancy on the instrument data sheets for 1/2E41-N062B/D. When it became apparent that the discrepancy had resulted in the wide range instruments being inoperable, this condition was reported to licensed personnel in the control room as mentioned previously.

CAUSES OF EVENT

This event resulted from an inadvertent omission in an instrument calibration procedure, and personnel error on the part of engineering personnel which further resulted in a design error.

An omission from a procedure contributed to this event when I&C techs attempted to implement the design change in April, 1997. At that time, the I&C techs experienced difficulty getting the instrument to read correctly at its zero point. It is now known that this was caused by the physical elevation of the instrument being too low for the factory-supplied zero range. In such cases, the correct response is to install a jumper on the transmitter's amplifier board which provides an extended adjustment range for the zero point. However, the calibration procedure in use at the time did not reflect this capability. The I&C techs therefore responded by installing, on a trial basis, a wide range transmitter. Because of its wider range, the transmitter had a correspondingly larger zero point adjustment. The larger zero point adjustment was within the span of the actual process conditions, allowing the transmitter to be calibrated.

Once it was known that the wide range transmitter could be calibrated, the I&C techs communicated this information back to the site modification engineer. The design drawings were revised to show that the wide range transmitter had been installed. In this revision, he annotated the minimum allowable calibration range as being 0 - 125 in-H_2O. He then annotated the actual calibration range as being 0 - 100 in-H_2O. This was an error because the actual was less than the minimum allowable; however, the mistake was not recognized. The revised calibration data were then returned to the site and incorporated into the appropriate instrument calibration procedures.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event must be reported per 10 CFR 50.73(a)(2)(i) because the plant was operated in a condition which was prohibited by the Technical Specifications. Specifically, the instrumentation installed to protect the upper limit on suppression pool level was installed and calibrated in such a manner that its accuracy could

not be guaranteed by the manufacturer. Therefore, it could not be assured to trip within the required range. Since this condition has existed since the instruments were installed in April, 1997, and compensatory actions required by the Technical Specifications were not carried out, the plant was in a condition prohibited by the Technical Specifications.

The subject differential pressure transmitters were installed with the intent of satisfying the instrumentation requirements of Unit 1 and Unit Technical Specifications table 3.3.5.1-1, item 3.e. This item is intended to ensure an upper limit on suppression pool level of 154 inches of water. The instruments sense suppression pool level, and if high level occurs, they supply a signal to HPCI system to re-align the suction source from the CST to the suppression pool. The suppression pool is a large volume of water stored in a toroidal tank below the reactor vessel. The tank forms part of the boundary for the primary containment, although its atmosphere is normally isolated from the atmosphere of the drywell. The suppression pool has several accident functions. One purpose is to condense steam should there be a rapid discharge of reactor coolant into the drywell from a postulated design basis accident. This steam would be routed via downcomers to spargers located within the suppression pool, beneath the water surface. The suppression pool also provides a source of water for the HPCI system and other emergency core cooling systems. Although the HPCI system is normally aligned to draw from the CST, the emergency or accident alignment draws water from the suppression pool for injection into the reactor. The volume above the water in the suppression pool is important for condensing steam also. Consequently, a certain volume for the free space is stated in the Final Safety Analysis Report along with a minimum submergence for lines entering the water.

A comparison of the actual suppression pool water level instrument performance with other instruments reading the same parameter shows that the suppression pool had not actually been overfilled. However, in the unlikely event that all the measurement uncertainties had combined in the worst possible way, it is possible that the suppression pool could have been slightly overfilled. Per each unit's FSAR, the Unit 1 suppression pool contains a maximum water volume of 659,626 gallons, and the Unit 2 suppression pool contains a maximum water volume of 670,680 gallons. This figure assumes the maximum water level of 150 inches per Technical Specifications section 3.6.2.2. The trip setpoint for the instruments involved in this event is 154 inches. This would allow a theoretical maximum water level in the suppression pool of 683,353 gallons on Unit 1 and 694,407 gallons on Unit 2, at which point the HPCI system is designed to shift its suction source to the suppression pool.

Actual performance data based on daily suppression pool level readings were analyzed by the A/E. Typically, the instruments have indicated higher-than-actual suppression pool level. This is conservative, because it would result in the HPCI system shifting to its accident alignment sooner, rather than later, in a condition of increasing suppression pool level. Hence, it is concluded that there was no actual occurrence of overfilling the suppression pool.

The worst observed instrument error since the installation of these instruments was 4.6 inches with the affected instrument reading higher than actual level. On the conservative assumption that an error of this magnitude had existed in the opposite direction, and also assuming that the suppression pool level was at its

maximum of 150 inches at the onset of an accident, this could have resulted in the suppression pool level rising to 154.6 inches, or 0.6 inches above the theoretical maximum. This would result in the addition of about 3600 gallons of water to the suppression pool above its maximum, which is a negligible amount given the size of the suppression pool (0.4 percent of total volume). This would have had no significant impact on the ability of the suppression pool to perform its intended function, nor would it have adversely affected other systems related to the suppression pool, such as the main steamline safety/relief valves.

Based on this analysis, it is concluded that this event had no adverse impact on nuclear safety. This analysis bounds all operating conditions. A more detailed, confirmatory analysis will be performed as noted below in the section enumerating corrective actions.

CORRECTIVE ACTIONS

1. The affected water level instruments on both units have been replaced with the correct range differential pressure transmitters. This action is completed on both units.

2. The A/E has performed a review of instrument data sheets for differential pressure transmitters to see whether a similar instrument range error might have occurred in other applications. No similar problem has been found. This action is completed for both units.

3. I&C personnel will be familiarized with the event and the appropriate methods for installing, setting up and calibrating the affected differential pressure transmitters in Tool Box Meetings by March 4, 2000. Training for engineering personnel will be completed by March 4, 2000.

4. Procedures for installing, setting up, and calibrating the involved differential pressure transmitters will be revised. This will be completed on both unit's procedures before the next refueling outage, currently scheduled to begin March 4, 2000.

5. An analysis of the effect of this event on the suppression pool will be performed. This action will be completed by March 15, 2000.

ADDITIONAL INFORMATION

1. Other Systems Affected: No systems were affected by this event other than those which have already been mentioned in this report.

2. Failed Components Information: No failed components either contributed to or resulted from this event.

3. Commitments Information: This report does not create any permanent licensing commitments.

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

4. Previous Similar Events: No other events have been reported in the past two years in which instruments have been installed with the wrong calibration range. One event was reported involving the generic issue of design error. That event was reported in LER 50-366/1999-006, Revision 1, dated 10/26/1999. The design-related corrective action in that event was to conduct a review of the design change process. That corrective action would not have prevented the event which is the subject of this report because the initial error occurred in April 1997, prior to the design review.