H. L. Sumner, Jr.
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SOUTHERN COMPANY
Energy to Serve Your World℠

April 23, 2004

Docket No.: 50-321

NL-04-0652

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant
Licensee Event Report
Air Actuator for Vacuum Breaker Failed LLRT due to Inadequate Design

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning a primary containment isolation device that failed a Local Leak Rate Test (LLRT) due to an inadequate design.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

H. L. Sumner, Jr.

HLS/OCV/daj

Enclosure: LER 50-321/2004-002

cc: Southern Nuclear Operating Company
Mr. J. B. Beasley, Jr., Executive Vice President
Mr. G. R. Frederick, General Manager – Plant Hatch
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. C. Gratton, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

IE22

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7/31/2004

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. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1(@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Edwin I. Hatch Nuclear Plant - Unit 1	05000-321	1 OF 5

4. TITLE

Air Actuator for Vacuum Breaker failed LLRT because of an inadequate design

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
										05000
2	24	2004	2004	002	0	4	23	2004	FACILITY NAME	DOCKET NUMBER(S)
										05000

9. OPERATING MODE (9)	5
10. POWER LEVEL	0

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20-2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER
20-2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	
20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch	(912) 537-5880

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	JM	ISV	H198	Y					

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

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

On 2/24/2004 at 1730 ET, Unit 1 was in the Refueling mode. At that time, an investigation of the As Found Local Leak Rate Test (LLRT) failures on five of the twelve suppression chamber to drywell vacuum breakers' air actuators (replaced during the spring 2002 refueling outage) determined that the internal seal arrangement had been changed. This change resulted in the deletion of the inboard primary containment isolation barriers for this primary containment penetration. This resulted in a condition that was prohibited by the plant's Technical Specifications in that the actions required by TS LCO 3.6.1.3 for a failed PCIV were not taken.

The cause of the event was that design records for the actuators did not contain sufficient detail to describe the required seal arrangement necessary to maintain containment integrity, in that the requirement for the dual/directional seals was not clear on the design drawings. As a result, the vendor was not aware of this requirement. Corrective actions included rebuilding all twelve suppression chamber to drywell vacuum breaker air actuators to restore the inboard primary containment isolation barrier, issuing a design drawing which clearly depicts the correct configuration of the actuator seals, and revising a statement for future procurement documents.

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 2/24/2004 at 1730 ET, Unit 1 was in the Refueling mode. At that time, an investigation of the As Found Local Leak Rate Test (LLRT) failures on five of the twelve suppression chamber to drywell vacuum breakers' air actuators (replaced during the spring 2002 refueling outage) determined that the internal seal arrangement had been changed. This change resulted in the deletion of the inboard primary containment isolation barriers (EIIS JM) for this penetration.

During the spring 2002 refueling outage, all twelve of the Unit 1 suppression chamber to drywell vacuum breakers air actuators (manufactured by Hiller) were replaced with new actuators. The actuators being replaced were dual acting actuators which had two internal seals located on the piston enabling the piston to be driven in either direction depending on the location of the air supply (see attached figure). The actual installation of these actuators at the plant relied on air for moving the piston in only one direction. The air supply moved the piston in a direction that would open the vacuum breaker. The plant installation relied on an internal spring in the actuator to return the piston after the air was isolated thereby allowing the vacuum breaker to close. The unused air supply connection is vented to the primary containment atmosphere inside the torus. Therefore, although the plant did not rely on one of the seals for moving the piston within the actuator, the plant did rely on this seal for a primary containment isolation barrier. Because of previous problems with the vacuum breaker closed position indication not picking up when cycling the vacuum breakers for the required 31 day functional test, these new actuators were being changed to use a heavier return spring. During the change process to install the heavier springs, the vendor increased the length of the actuator. The lengthening of the actuator created an interference with other plant equipment and the new actuators were returned to the vendor to be shortened. In order to shorten the actuators, the vendor reworked the piston seal arrangement and eliminated the seal being relied upon for a primary containment isolation barrier.

A successful LLRT was performed after the installation of these new actuators during the spring 2002 refueling outage. Discussions with the vendor concerning the successful results of this LLRT concluded that they passed because of the close tolerance fit of the piston in the new actuators along with the lubricating oil applied to the piston. A review by the plant concluded that the method of testing this barrier is acceptable and that it adequately simulates the conditions for which primary containment is designed. Although it can not be positively determined when the primary containment barrier would have failed to meet its ability to isolate primary containment atmosphere, it most likely did occur sometime early in the operating cycle (on 4/18/2002 at 1226 ET the plant entered mode 2 from the spring 2002 refueling outage) after stroking the vacuum breakers several times.

A review of procurement and design documentation was performed concerning this change to the actuators. This review determined that:

1) Information concerning the change to the design of the piston actuator assembly was not incorporated into the procurement documents governing the purchase of the actuator assemblies, and

2) What was ultimately shipped to the site by the vendor was not in accordance with the provisions of the original purchase order, and

3) The plant's design records did not clearly describe the primary containment isolation barrier function for this actuator, in that design assembly drawings were not available to the plant staff depicting the required dual seal arrangement. Thus, the focus of the change was on the requirement for the heavier spring. An Equivalency Determination (ED) was performed for the new actuators but this ED only addressed the change to a heavier spring.

A review of the Unit 2 air actuators determined that they are made by a different manufacturer and do not have this problem.

CAUSE OF EVENT

The cause of the event was that design records did not clearly specify the dual seal arrangement of the component being purchased. The focus of the change was therefore on the need for a heavier spring and, consequently, there was insufficient information for the vendor to understand that the second seal was a required design feature for these actuators. Thus, the vendor eliminated the second seal and, as a consequence, the primary containment isolation barrier.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73(a)(2)(i)(B) because a condition existed that was prohibited by the plant's Technical Specifications in that the actions required by TS LCO 3.6.1.3 for a failed PCIV were not taken. Although the actuator seal is not a valve and the LLRT testing performed for this device is a type 'B' test, the TS Bases background for LCO 3.6.1.3 states that, with respect to PCIVs, 'these isolation devices are either passive or active (automatic).' Examples of passive devices include closed systems and blind flanges. Based on the examples of passive devices that are listed, it is concluded that this actuator seal meets the intent of a PCIV passive device.

Unit 1 FSAR 5.2.2.5.4.2 states, in part, that these twelve lines penetrate the torus shell to supply air to piston operators on the vacuum breaker valves. These lines meet the requirements of Safety Guide 11, since they do not penetrate the RCPB and do not open to the primary containment atmosphere. One solenoid valve for each line is located close to the penetration outside the torus shell. The valves are manually controlled from the MCR. With this seal absent in these actuators, the lines would in fact communicate with the primary containment atmosphere.

In this event, because all of the outboard PCIVs associated with these actuators successfully passed their as found LLRT this outage, the minimum-pathway leakage for each of these penetrations was acceptable throughout the operating cycle. Additionally, the outboard PCIVs remained closed throughout the cycle except to perform the required TS Surveillance (SR) 3.6.1.8.2. This SR calls for performing a functional test of each required vacuum breaker every 31 days. If the outboard PCIV would have been inadvertently left open, then the associated vacuum breaker would have opened and Hatch Unit 1 would have been required to enter TS LCO 3.6.1.8, Condition B which requires the vacuum breaker to be closed within 2 hours. Therefore, all of the actions required by the TS action for an INOPERABLE PCIV were met with the exception of the requirement to deactivate (i.e., pulling a fuse) the outboard PCIVs. Because the outboard PCIVs were maintained closed with the exception of opening them for required TS surveillance testing it may be concluded that this event did not adversely impact nuclear safety or the health and safety of the public and did not represent a substantial safety hazard.

CORRECTIVE ACTIONS

All of the twelve suppression chamber to drywell vacuum breakers air actuators were rebuilt during the spring 2004 refueling outage to install the two internal seals restoring the inboard primary containment isolation barrier. These rebuilt actuators all successfully passed LLRT.

A statement has been added to the existing standard procurement paragraph which discusses vendor notifications of exceptions and changes to items. The statement clarifies that if a vendor is required to make additional changes to an item, these changes will be approved by Southern Nuclear prior to shipment of the item, and that the vendor not ship items which do not agree with the requirements/description stated in the purchase order.

Following discussions between the vendor and the plant staff, a detailed design drawing was obtained from the vendor depicting the configuration of the replacement actuator and actuator seals. This drawing has been associated with the plant equipment via the plant's configuration control procedures.

ADDITIONAL INFORMATION

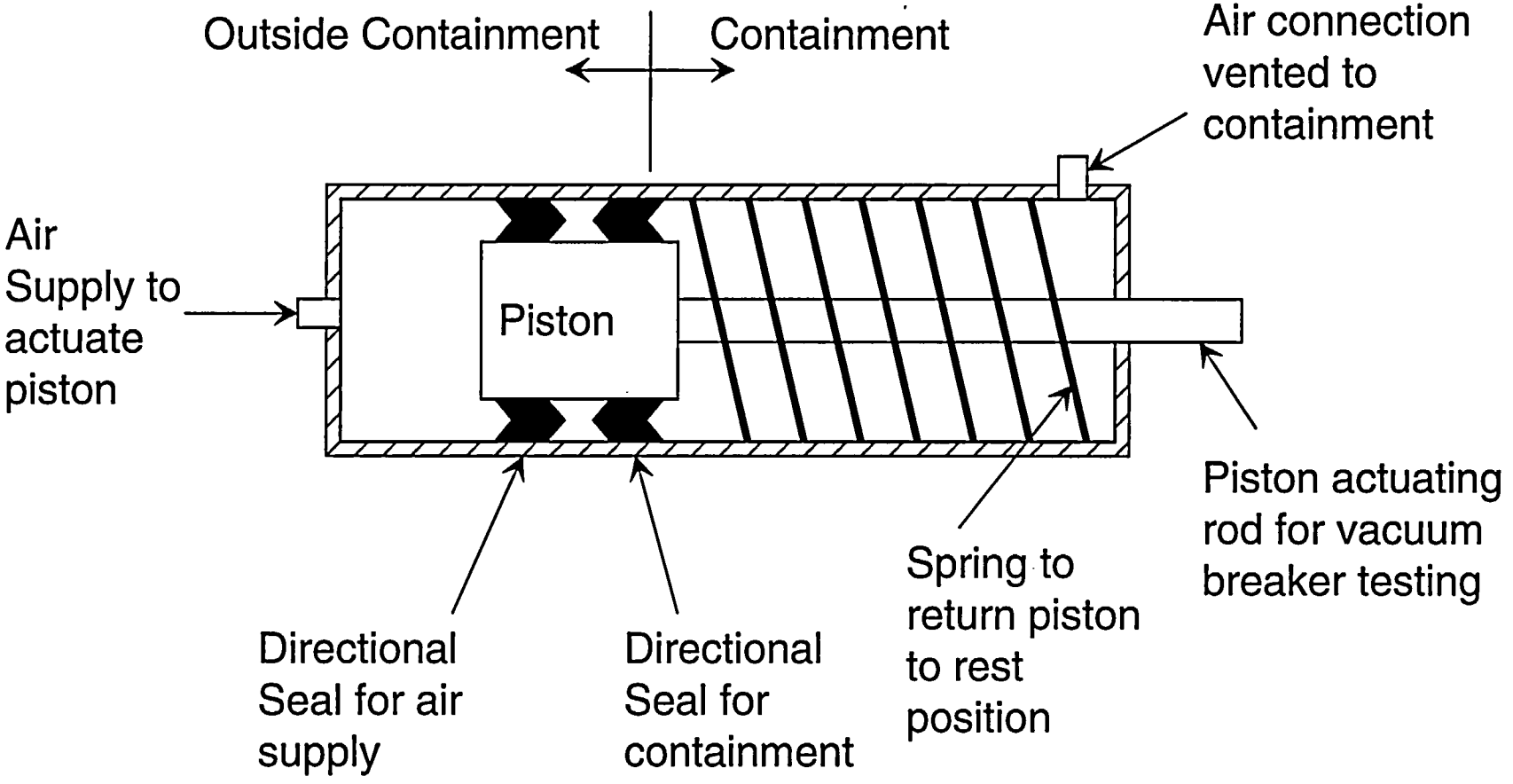
No systems other than those previously described in this report were affected by this event.

This LER does not contain any permanent licensing commitments.

There were no previous similar events reported in the past two years in which the plant entered a condition prohibited by Technical Specifications as the result of design and procurement records not clearly depicting the required configuration of the component being purchased.

FAILED COMPONENT INFORMATION:

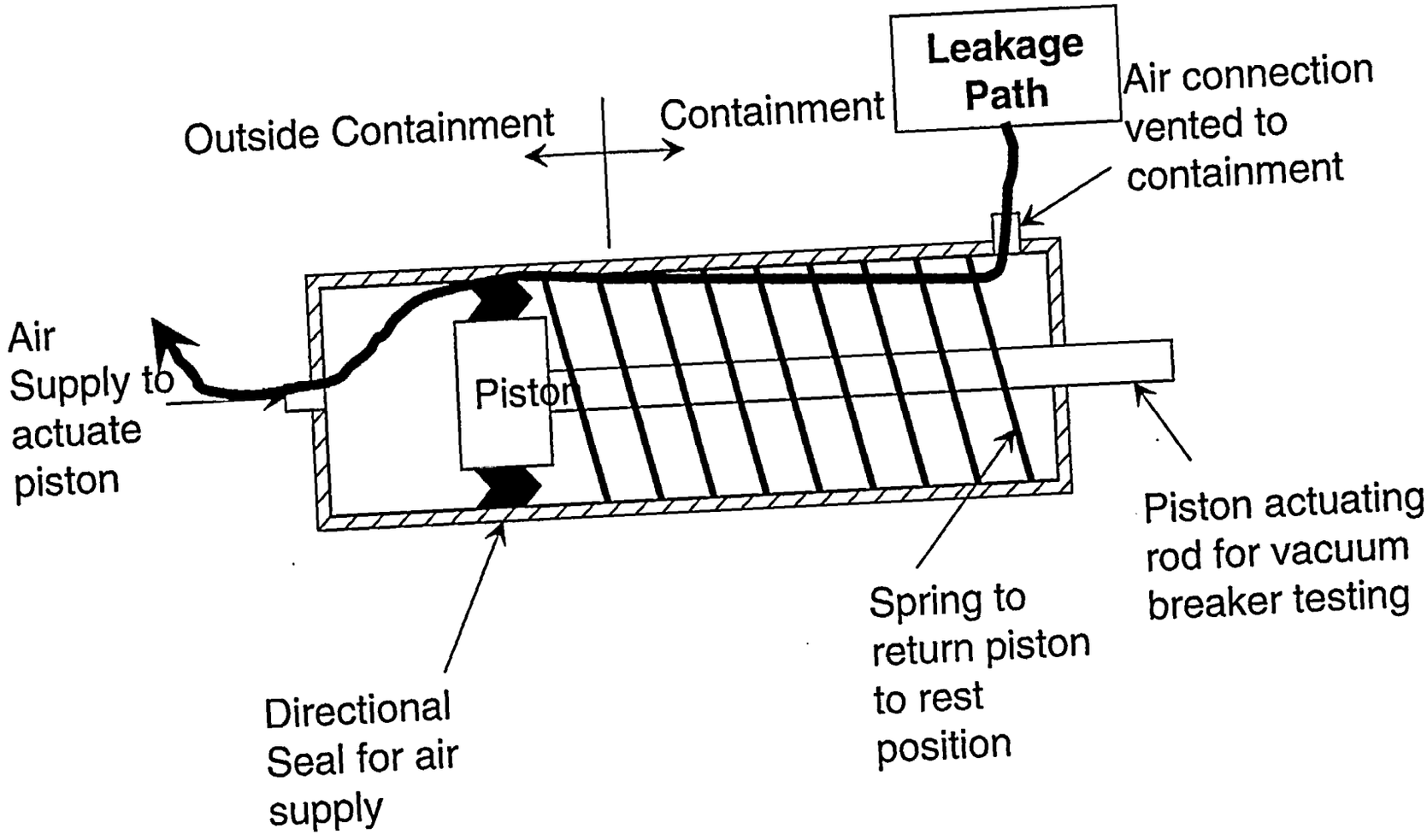
Master Parts List: 1T48-F323A-L
Manufacturer: Hiller
Manufacturer Code: H198
Model Number: 2 ½ SA-A041
Type: Air Cylinder / Coil Spring Actuator
EIIS System Code: JM
EIIS Component Code: ISV
Root Cause Code: B
Reportable to EPIX: Yes



Sectional view of vacuum breaker actuator

Required configuration

LER 2004-002, rev. 0, Figure, pg. 1 of 2



Sectional view of vacuum breaker actuator

Shorter Piston and Containment Seal Missing

LER 2004-002, rev. 0, Figure, pg. 2 of 2