



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

November 4, 2019
NOC-AE-19003691
10 CFR 50.73

Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001


South Texas Project
Unit 2
Docket No. STN 50-499
Licensee Event Report 2019-001-00
Equipment Clearance Order Error Leads to Loss of Primary Containment Integrity

Pursuant to reporting requirements of 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(v)(C), and 10 CFR 50.73(a)(2)(v)(D), STP Nuclear Operating Company hereby submits the attached South Texas Project Unit 2 Licensee Event Report 2019-001-00.

The event did not have an adverse effect on the health and safety of the public.

There are no commitments in this submittal.

If there are any questions, please contact Tim Hammons at 361-972-7347 or me at 361-972-7888.



Michael A. Schaefer
Site Vice President

Attachment: Unit 2 LER 2019-001-00, Equipment Clearance Order Error Leads to Loss of Primary Containment Integrity

STI: 34937611

cc:

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
1600 E. Lamar Boulevard
Arlington, TX 76011-4511

Attachment

Unit 2 LER 2019-001-00

Equipment Clearance Order Error Leads to Loss of Primary Containment Integrity



LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@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 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.

| | | |
|--|------------------------------|-------------------|
| 1. Facility Name South Texas Unit 2 | 2. Docket Number 05000499 | 3. Page 1 of 5 |
|--|------------------------------|-------------------|

4. Title
Equipment Clearance Order Error Leads to Loss of Primary Containment Integrity

| 5. Event Date | | | 6. LER Number | | | 7. Report Date | | | 8. Other Facilities Involved | |
|---------------|-----|------|---------------|-------------------|---------|----------------|-----|------|------------------------------|---------------|
| Month | Day | Year | Year | Sequential Number | Rev No. | Month | Day | Year | Facility Name | Docket Number |
| 09 | 03 | 2019 | 2019 | 001 | 00 | 11 | 04 | 2019 | N/A | 05000 |
| | | | | | | | | | Facility Name | Docket Number |
| | | | | | | | | | N/A | 05000 |

| | | | | |
|-------------------|---|---|--|---|
| 9. Operating Mode | 11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply) | | | |
| 1 | <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| | <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| | <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| | <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| 10. Power Level | <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| 100 | <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| | <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> 73.77(a)(1) |
| | <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(D) | <input type="checkbox"/> 73.77(a)(2)(ii) |
| | <input type="checkbox"/> 20.2203(a)(2)(vi) | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(vii) | <input type="checkbox"/> 73.77(a)(2)(iii) |
| | | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A) | |

| | |
|---|--|
| 12. Licensee Contact for this LER | |
| Licensee Contact Tim Hammons, Licensing Engineer | Telephone Number (Include Area Code) (361) 972-7347 |

| 13. Complete One Line for each Component Failure Described in this Report | | | | | | | | | | | |
|---|--------|-----------|--------------|--------------------|--|------------------------------|--------|-----------|--------------|--------------------|------|
| Cause | System | Component | Manufacturer | Reportable To ICES | | Cause | System | Component | Manufacturer | Reportable To ICES | |
| A | NH | PEN | N/A | Y | | N/A | N/A | N/A | N/A | N/A | |
| 14. Supplemental Report Expected | | | | | | 15. Expected Submission Date | | | Month | Day | Year |
| <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No | | | | | | | | | N/A | N/A | N/A |

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On September 5, 2019, it was discovered that an Equipment Clearance Order (ECO) to replace a degraded containment isolation valve on the outside of the Reactor Containment Building (RCB) had an error that resulted in a violation of Technical Specifications. The ECO incorrectly opened a test connection between the containment wall and a containment isolation valve inside the RCB that was required to be closed for Technical Specification compliance. When the degraded containment isolation valve on the outside of containment was removed, a leakage path out of containment was established. This resulted in a loss of one of the three fission product barriers and a violation of two Technical Specifications. Once the ECO error was recognized, Operations corrected the valve lineup to bring Unit 2 back into compliance with Technical Specifications. The root cause of the event was personnel error related. The two Licensed Senior Reactor Operators involved in the technical review and approval of the ECO failed to recognize at-risk behaviors and apply appropriate human performance tools. Corrective actions planned include procedure changes, as well as modifications to the software that controls the ECO process.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. LER NUMBER | | |
|--------------------|------------------|---------------|-------------------|---------|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| South Texas Unit 2 | 05000-499 | 2019 | - 001 | - 00 |

NARRATIVE**I. Description of Reportable Event****A. Reportable event classification**

This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications. Technical Specifications 3.6.3 (Containment Isolation Valves) and 3.6.1.1 (Primary Containment) were not met because containment penetration M-82D was not isolated within 24 hours as required and primary containment integrity was not restored within 1 hour as required nor was the plant placed in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours as required.

This event is reportable pursuant to 10 CFR 50.73(a)(2)(v)(C) and (D) as an event or condition that could have prevented fulfillment of the safety function of structures or systems that are needed to (C) control the release of radioactive material or (D) mitigate the consequences of an accident. Both the inside and outside isolation valves for containment penetration M-82D were inoperable in a required mode. The inoperability was due to one or more personnel errors and no redundant equipment in the same system (individual containment penetration) was operable and available to perform the required safety function of containment isolation.

B. Plant operating conditions prior to event

Prior to the event on September 3, 2019, Unit 2 was operating in Mode 1 at 100% power.

C. Status of structures, systems, and components that were INOPERABLE at the start of the event and that contributed to the event

At the start of the event, Containment Air Sample Outside Reactor Containment Isolation Valve 2-AP-FV-2456 [ISV] was inoperable due to excessive seat leakage.

D. Background information

Primary containment integrity ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the safety analyses. This limits site boundary radiation doses to within federal dose guideline values during accident conditions. Operability of containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment. During MODES 1, 2, 3, and 4 without primary containment integrity, Technical Specification 3.6.1.1 requires restoration of containment integrity within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. During MODES 1, 2, 3, and 4 with one or more containment isolation valve(s) inoperable, Technical Specification 3.6.3 requires that at least one isolation barrier be maintained operable in each affected penetration that is open and within 24 hours restore the inoperable valve or isolate each affected penetration.

E. Narrative summary of the event

Timeline (Note: All times are Central Standard Time):

July 10, 2019 [1515]: Containment Air Sample Outside Reactor Containment Isolation Valve 2-AP-FV-2456 declared inoperable due to excessive seat leakage.

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CONTINUATION SHEET**

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NARRATIVE**E. Narrative summary of the event (continued)**

August 1, 2019: ECO revision prepared for replacement of Containment Isolation Valve 2-AP-FV-2456.

August 26, 2019: ECO revision approved by the Technical Reviewer (Licensed Senior Reactor Operator).

September 2, 2019 [1836]: ECO revision approved by the Issuing Authority (Licensed Senior Reactor Operator). The Technical Reviewer and Issuing Authority are separate individuals.

September 3, 2019 [1300 - 1315]: Event Date. Containment Hydrogen Monitoring Sample Inlet Test Valve 2-CM-0005 [TV] between the containment wall and a containment isolation valve inside the containment building is opened as directed by the ECO. Opening of this valve coupled with the inoperability of Containment Isolation Valve 2-AP-FV-2456 created a breach of containment.

September 5, 2019 [2115]: Discovery Date. Control Room staff discovered Technical Specifications 3.6.3 and 3.6.1.1 associated with containment penetration M-82D were not being met.

September 5, 2019 [2322]: Valve 2-CM-0005 closed and Technical Specification compliance restored.

F. Method of discovery

The event was discovered by a Unit Supervisor approving a release revision (work completion) of the ECO.

II. Component failures**A. Failure Mode, mechanism, and effects of failed component**

The failed component in this event is containment penetration M-82D [PEN]. The safety function (maintain containment integrity) of containment penetration M-82D could not be met with both an inside and outside containment isolation valve open.

B. Cause of component failure

Containment penetration M-82D failure was due to an error in an ECO which went undetected by two utility licensed SROs as a result of their failure to recognize at-risk behaviors and apply appropriate human performance tools.

C. Systems or secondary functions that were affected by failure of components with multiple functions

No additional systems were affected by the containment penetration failure.

D. Failed component information

Reactor Containment Building [NH]
Penetration [PEN]

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CONTINUATION SHEET**

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NARRATIVE**III. Analysis of the event****A. Safety system responses that occurred**

No safety systems were required to respond as a result of this event.

B. Duration of safety system inoperability

The duration of the containment breach was approximately 58 hours [September 3, 2019 (1300) to September 5, 2019 (2322)].

C. Safety consequences and implications

This event had insignificant safety consequences because the containment breach was disconnected from the Reactor Coolant System (RCS) by a series of closed valves for the duration of the event. Additionally, the lines to the vent and test connection valves which were found to be open, as well as the main line connecting them and passing through 2-FV-2456, all have a one-inch inner diameter. Containment breaches of less than a three-inch diameter do not lead to a large radiation release. The event did not result in any offsite release of radioactivity or increase of offsite dose rates, and there were no personnel injuries or damage to any other safety-related equipment associated with this event.

Therefore, there was no adverse effect on the health and safety of the public.

IV. Cause of the event

The root cause of the event was personnel error related. Individuals involved in the technical review and approval of the ECO failed to recognize at-risk behaviors and apply appropriate Human Performance (HU) tools. At-risk behaviors not considered include:

Making assumptions - The Issuing Authority stopped when the individual saw "Swap Tag" in a note field on a line item of the ECO revision and did not perform a detailed review of the remaining ECO line items. As a result, the Issuing Authority made a wrong assumption that an inside containment isolation valve would remain closed.

Believing the source of information is absolutely reliable - The Technical Reviewer (new to this assignment) assumed that ECOs would be technically sound and that the technical review would be more of a higher-level review.

Thinking the task is routine or simple - Both the Technical Reviewer and Approver of the ECO stated they viewed the ECO as routine or simple.

Appropriate error reduction tools not used by both individuals include Questioning Attitude and Peer Review/Collaboration.

V. Corrective actions

Completed - Closed valve 2-CM-0005 to restore containment integrity and implemented the site consistency matrix (disciplinary) process for responsible personnel.

Planned - Procedure changes and modification to the software that controls the ECO process. The procedure changes will:

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CONTINUATION SHEET**

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NARRATIVE**V. Corrective actions (continued)**

(1) Require that the Technical Reviewer and the Issuing Authority be separate SROs for the issuance (initial) of all ECOs that ensure Technical Specification compliance.

(2) Add guidance to require SROs that use ECOs to ensure Technical Specification compliance on Operability Assessments to sign on to the ECO as an Acceptor specifically for Technical Specification compliance.

(3) Include steps and acceptor checklist items for the ECO job acceptor function for Operations use when ensuring initial and continuing Technical Specification compliance. The ECO acceptor SHALL be a separate SRO from the SRO who is the Issuing Authority and their sole function / purpose is to ensure Technical Specification compliance. Also include direction to ensure the ECO is designated as being used for Technical Specification compliance.

The software modifications will implement a business rule in the ECO application to ensure that the ECO acceptor is a separate SRO from the SRO who is the Issuing Authority for ECOs used to maintain Technical Specification compliance.

VI. Previous similar events

An operating experience review identified a similar event at South Texas Unit 2 on June 28, 2000. Licensee Event Report (LER) 2000-003-00, Reactor Containment Building Penetration M-85 Not Properly Isolated, was attributed to failure to meet management expectations associated with work practices. The Shift and Unit Supervisors are ultimately responsible for maintaining the unit in compliance with Technical Specifications. In the LER 2000-003-00 event, neither the Shift nor the Unit Supervisor verified the ECO to ensure Technical Specification compliance due to overconfidence in the Work Start Authority's capability. The fact that the valve was already tagged to comply with Technical Specifications caused the Shift and Unit Supervisors to perceive this activity to be a low-risk evolution. In addition, the Shift and Unit Supervisors are responsible for ensuring the use of peer checks for Technical Specification compliance and no peer checks for the ECO were performed. Corrective actions included Operations management reinforcing expectations to Operations personnel regarding roles and responsibilities for Technical Specification compliance, peer checking, and the use of error reduction tools.

The LER 2000-003-00 event is very similar to the event depicted in this LER. Both events are attributed to human performance errors. Each event involves inadequate reviews of an ECO resulting in non-compliance with Technical Specifications. The ECO review inadequacies in each event are attributed to not using proper error reduction or human performance tools, including peer checking. LER 2000-003-00 corrective actions were exclusively focused on behavior-based solutions (i.e., management reinforcing expectations to subordinates), whereas corrective actions for this event are focused on both behavior-based solutions (counseling and disciplinary action) and process-based solutions (procedure and software changes).