

framatome

December 6, 2018
NRC:18:043

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

10 CFR Part 21 Notification of Existence of a Defect


This letter provides notification of a reportable defect in accordance with 10 CFR Part 21. This defect was reported to the NRC Operations Center by facsimile at 3:57 p.m. EST on December 6, 2018.

The defect concerns the failure of an improperly installed O-ring supplied in a Chesterton pump Seal Cartridge used for a RHR Pump at the Prairie Island Nuclear Generating Plant (PINGP).

Actions already taken to address the defect are provided in the attachment to this letter.

If you have any questions related to this information, please contact Ms. Gayle Elliott, Deputy Director, Licensing and Regulatory Affairs by telephone at (434) 832-3347, or by e-mail at Gayle.Elliott@framatome.com.

Sincerely,



Gary Peters, Director
Licensing & Regulatory Affairs
Framatome Inc.

cc: J. G. Rowley
Project 728

Attachments:

- 1 Attachment A – Notification of 10 CFR 21 Defect
- 2 Attachment B – E-mail from Framatome Inc. to PINGP requesting affected Chesterton Pump Seal Cartridges to be returned for testing/refurbishment as needed.

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NRK

Attachment A

Notice of 10 CFR 21 Defect

Subject:

Notification of 10 CFR 21 Defect

Name and Address of Individual Informing the Commission:

Gayle Elliott
Deputy Director, Licensing & Regulatory Affairs
Framatome Inc.
3315 Old Forest Road
Lynchburg, Va. 24501

Title:

Cut internal O-ring supplied in a Chesterton Pump Seal Cartridge used In Prairie Island RHR Pump discovered during post maintenance testing following installation.

Identification of Basic Activity:

Chesterton Pump Seal Cartridge,
• Manufacturer – A.W. Chesterton Co.
• Manufacturer P/N – SP-C640776
• Manufacturer Model # - 180/OSWB-20 SA CB/TS S AFLAS
• Part Description – Mechanical Seal, 2-1/2 inch, single cartridge, heavy duty, AFLAS O-rings

Basic Activity Supplied By:

Framatome Inc.

Nature of Defect:

As reported to Framatome Inc. by Prairie Island Nuclear Generating Plant (PINGP):

During 1 R31 outage maintenance (fall 2018), the mechanical shaft seal on the 11 RHR Pump was replaced. During subsequent post maintenance testing, it was found that there was significant seal leakage on the pump.

The pump was re-isolated so that the new seal package could be replaced. It was discovered that the adapter O-ring internal to the mechanical seal had been sheared in two places, leaving a -1" section of O-ring material completely separated from the remainder. This O-ring is an internal subcomponent of the mechanical seal package, which is received and installed as a completed assembly.

The defective mechanical seal would have led to a condition where the 11 RHR Pump would have become unable to perform its intended safety functions. The condition of this seal would have created a loss of safety function for the low

pressure injection and recirculation functions. The date the condition was discovered was October 9, 2018. An evaluation was completed to determine that it was a substantial safety hazard on December 4, 2018.

Defect Determination Date:

This issue was determined to be a 10 CFR 21 Defect by PINGP on December 4, 2018.

Number and Location of Basic Components:

Nine Chesterton Seal Cartridges were supplied in 2015 to PINGP after having springs replaced to pass Framatome Inc's (formally AREVA's) commercial dedication program.

- Two of the nine seals are currently installed at PINGP. Both of these seals do not have a similar issue because there has been no leakage identified.
- One of the nine seals is currently installed on a spare pump which is not installed at PINGP.
- Five of the nine seals are in inventory at the PINGP Warehouse.
- One of the nine seals was replaced during scheduled maintenance in October 2018.
- One of the nine seals had the defect which is the subject of this 10CFR21 Notification.

Corrective Actions to Date:

PINGP notified Framatome Inc. of this condition on November 26, 2018. Framatome Inc. determined that this was a Deviation in accordance with 10CFR21 on November 30, 2018. On December 4, 2018, PINGP determined that this was a Defect per the Xcel Energy 10CFR21 Program. This report is being made in accordance with the Framatome Inc. 10CFR21 Program.

The defective seal cartridge was taken apart by Prairie Island Personnel who discovered that an internal O-ring was cut. Investigation by Framatome and interviews with Chesterton revealed that the cause of the cut O-ring was improper installation when the Chesterton Technician reassembled the seal cartridge after replacing the cartridge springs before supplying the seal cartridges to PINGP in 2015.

Advice related to the Defect:

Framatome provided an e-mail (Attachment B) to the PINGP on December 6, 2018 requesting that the five Chesterton seals that are in spares at PINGP and the one installed on a spare pump not at PINGP (if determined that it has not been tested) to be shipped to back to Framatome Inc. so Chesterton can test them to ensure the O-rings were installed properly. Testing will be under the Framatome Inc. 10CFR50 Appendix B program.

Appendix B

From: ELSISHANS Mark (FRA-IB)
Sent: Thursday, December 06, 2018 3:42 PM
To: Connors, Jeffrey J.; Larimore, Brett D.; Sollom, Stephen
Cc: CONNELL Trevor (FRA-IB); ZACH Kip (FRA-IB); OPSAL Philip (FRA-DTI)
Subject: Remedy: Framatome 10CFR21 Chesterton Mechanical Seal Cartridges

Jeff, Brett, and Stephen,

On November 26, 2018, Framatome was contacted by the Prairie Island Nuclear Generating Plant (PINGP) in regards to a leaking Chesterton mechanical pump seal that was supplied to PINGP by Areva (now Framatome) as a safety-related component under PINGP Purchase Order 56845. According to the information that was provided to Framatome, PINGP installed the mechanical seal on their Unit 1 RHR Pump during their Fall 1R31 outage, and during PMT testing of the pump, leakage was identified from the seal. The pump was then disassembled and the leaking seal was removed and replaced with a different seal. An internal evaluation of the leaking seal was conducted at PINGP, and a draft copy of the evaluation was supplied to Framatome. Within that draft evaluation were pictures of the seal that exhibited leakage in a disassembled state. The pictures showed an adapter O-ring that was severed and was the likely cause of the leakage witnessed during PMT testing of the RHR pump.

An internal investigation was conducted in regards to the mechanical pump seal leakage that was brought to the attention of Framatome. It was discovered that during the commercial grade dedication of the seals that the internal springs (14/seal) did not meet the acceptance criteria for material of construction. The findings are documented within Framatome Condition Report 2015-5563; Areva (at the time) worked with Chesterton to resolve the material issue identified for the internal springs. The resolution was that Chesterton changed all (14) springs in each of the mechanical seals that were supplied to PINGP as safety-related components under PINGP Purchase Order 56845. The replacement springs were deemed acceptable for material of construction. The work to change the seal springs was conducted by a Chesterton representative at the Areva Lynchburg facility under the Areva 10CFR50 Appendix B program.

Conversations were held with the Chesterton representative who replaced the mechanical seal springs. Based upon those conversations, it is likely that during the re-assembly of the mechanical seals (after the internal springs were changed) that the adapter O-ring was likely severed at that time. The design of this mechanical seal is such that the adapter O-ring is not visible 100% of the time during assembly of the seal and not visible at all once the seal is fully assembled. The O-rings of each seal were inspected by the Chesterton representative prior to re-assembly of the seals, and they were found to be acceptable. The PINGP evaluation supplied to Framatome states that the mechanical seal was not disassembled prior to installation on their Unit 1 RHR Pump. As such, it has

been concluded that the O-ring which was identified as severed in the PINGP evaluation was damaged during the re-assembly of the seals by Chesterton. O-ring damage such as that pictured in the PINGP evaluation would exhibit leakage.

To remedy the situation, Framatome will work with PINGP to have the remaining mechanical pump seals supplied to them under PO 56845 returned to Framatome, so that they can be pressure or vacuum tested by Chesterton to verify that there are no damaged O-rings internal to the seals. Per communications with PINGP, there are (5) mechanical seals in their inventory which will be returned for testing and potentially a sixth seal which has been installed on a spare pump. Framatome will work with PINGP to identify the correct number of seals for pressure or vacuum testing. Other mechanical seals supplied for PINGP PO 56845 which are currently installed on operational equipment and do not exhibit leakage, are acceptable and shall not be addressed.

Thanks,

Mark Elsishans, PE
Manager of Engineering & Technical Operations, Products Engineering Services

Framatome

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