



September 23, 2021
NRC:21:029

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

Long Term Solution for 10 CFR Part 21 Defect

Ref. 1: Letter, Mr. Gary Peters (Framatome Inc.) to Document Control Desk (NRC), "10 CFR Part 21 Notification of Existence of a Defect," NRC:21:023, June 2, 2021.

Framatome provided notification of a reportable defect in accordance with 10 CFR Part 21 in Reference 1. The reportable defect concerned vacuum breakers that were observed to exhibit sporadic failure to close upon both electrical and mechanical closure signal. The initial notification provided an interim solution as the long-term solution was being developed. Attachment 1 identifies the long-term solution to correct the defect. The affected customer has been notified of the solution.

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,

A handwritten signature in black ink, appearing to read "G. Peters".

Gary Peters, Director
Licensing & Regulatory Affairs
Framatome Inc.

cc: N. Otto
Project 728

Attachment:

1. Notification of 10 CFR 21 Defect

Attachment 1

Notice of 10 CFR 21 Defect

Subject:

Changes are highlighted in yellow.

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:

Breakers Failure to Close

Identification of Basic Activity:

Siemens 5kV 1200A Vacuum Breakers - 5-DPU-350-1200-78

Basic Activity Supplied By:

Framatome Inc.

Nature of Defect:

During dedication testing/inspection of the second Framatome batch of 5-DPU-350-1200-78 MV vacuum breakers, they were observed to exhibit sporadic failure to close upon closure signal: both electrical and mechanical closure signal. An 8D was opened in our Corrective Action Program and troubleshooting and testing was completed at the Siemens manufacturing facility. 8D and troubleshooting with a high speed camera determined the close latch does not have sufficient torsional force to consistently maintain the breaker close latch in the closed position during the closing cycle. As a result, in some sporadic instances the breaker will receive a close signal and the close latch will not maintain the breaker in a closed position and the breaker will fail to close. It has been observed in testing that this condition is sporadic and that subsequent attempts to close the breaker will result in a closed breaker. The identified issue has no impact on the ability for the breakers to open. Likewise, the identified issue has no impact on the breakers staying closed once they have successfully closed.

Defect Determination Date:

This issue was determined to be a 10 CFR 21 Defect on May 28, 2021.

Number and Location of Basic Components:

The extent of condition determined that the applicability of the reportable defect is similar to design on the 22 breakers delivered and 19 installed in St. Lucie Unit 1, Cycle 30.

Corrective Actions to Date:

The preliminary evaluation determined a modification of the breakers was required to increase the torsion spring force acting on the close latch. Framatome worked with Siemens to develop an interim and long-term solution. The interim solution utilized a revised spring retaining bracket that could be deployed near-term. The original long-term solution was a new torsion spring design which applied approximately 40% more torsional force on the trip latch.

Following a reoccurrence of the failure-to-close issue, Framatome and Siemens identified the root cause of the trip latch bounce and to determine the associated corrective actions. The solution developed will mitigate all main failure to close causes (low power to the closing mechanism, insufficient time for the trip latch to drop, and improper trip latch to jackshaft interaction) for the 5kV replacement circuit breakers. The solution consists of the following:

- 1) Circuit breakers comply with the following revised design performance parameters
 - a. Jackshaft rotational speed (C speed #2)
 - b. Jackshaft overtravel
 - c. Jackshaft overtravel duration
- 2) Circuit breakers have the new torsion spring installed
- 3) Circuit breakers meet the revised bump stop gap

By increasing the bump stop gap, the jackshaft is now able to rotate further before it hits the bump stop. This reduces the amount of force transferred to the bump stop and in turn the operating mechanism. This reduction significantly reduces the amount of latch bounce for this breaker design.

St. Lucie was first notified of this 10CFR21 reportable defect on May 28, 2021 by Framatome Inc. via telephone and email.

Advice related to the Defect:

Framatome provided a letter, Letter# F.504896-C-02-0117 to the customer, St. Lucie, on May 28, 2021 to advise of this issue. Framatome is responding to technical questions from St. Lucie as requested.