

May 31, 2019

Document Control Center
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: 10 CFR Part 21 Report of Defect GS2 Terry Turbine Introl Positioners

To whom this may concern:

- a) Individual informing NRC and address:
Ray Chalifoux
Paragon Energy Solutions LLC
777 Emory Valley Road
Oak Ridge, TN 37830
- b) Basic component supplied which contains a defect:
GS2 Terry Turbine Introl Positioners P/N: 890265-010
- c) Supplier of the Basic Component:
ATC-Nuclear (now Paragon Energy Solutions, LLC)
- d) Nature of defect:

Introl Positioners used by stations in GS2 Terry Turbine control applications have the potential to contain a latent defect. The defect is the result of internal corrosion which has been identified in TI Operational Amplifiers Part No. TL084CN on the SL3EX Controller Boards of the turbine throttle valve positioner. It is believed the likely cause is associated with the ingress of solder flux into the IC Chip package on the controller board due to delamination caused by the soldering process during fabrication. The corrosion over time can result in intermittent open circuiting and high resistance in the aluminum metallization. Chlorine ionic contamination can also result in high leakage currents within the component circuitry. Failures may be manifested by a reduced valve position signal disproportional to the expected demand condition, no actuation signal i.e. throttle valve remaining full open, or other anomalous unexpected behavior. There are three TL084CN chips on each SL3EX Controller Board within the positioner assembly. There have been two documented failures to date occurring in 2015 and 2019 in installed systems.
- e) Date determination made:
May 29, 2019
- f) Number and location of these components:
Attachment 1 identifies positioners provided to stations. Positioners provided to Farley Station and SONGS were not dedicated by ATC-Nuclear.
- g) Corrective action taken:
Paragon Energy Solutions replaced the TL084CN Chips on the failed positioner as directed by Curtiss-Wright SAS and the Licensee. Curtiss-Wright SAS has identified the list of Introl Positioners provided to licensees.
- h) Any advice related to the defect:
Licensees should coordinate through Curtiss-Wright SAS (formerly Dresser Rand) to implement repair strategies.

Additional Background

ATC-Nuclear (now Paragon Energy Solutions) originally dedicated 35 Introl assemblies from 2011 to 2013 for Dresser Rand (now Curtiss-Wright SAS) as part of a terry turbine digital control system upgrade utilizing the Introl Positioner product line. Recently, Paragon was contracted by Curtiss-Wright SAS under Purchased Order 17029549 to evaluate a Shearon Harris positioner failure. Two units were provided to Paragon under the purchase order listed above for evaluation. The licensee assembly, S/N 01046M13, was installed and had been in service at the station since October 2016. This unit failed prompting this evaluation. Following identification of the failure as described above, corrosion internal to other TL084CN Chip packages in the second positioner provided by Curtiss-Wright SAS was identified. This positioner, however, did not fail and continued to operate normally. A previous failure of a TL084CN Chip was also identified in 2015.

The analyses and evaluations performed by Paragon do not consider purchasers and/or licensee application-specific information as it only focuses on the functional performance of the positioner. On this basis, Paragon does not have the capability to complete the 10CFR Part 21 evaluation to determine whether the condition reported could cause a substantial safety hazard. This notification serves to inform purchaser(s) and/or affected licensees of this determination, so they may evaluate the identified condition, pursuant to §10CFR 21.21(a).

Stations are advised to work directly with Curtiss-Wright SAS via the technical contacts below.

Randy F. Iantorno Project Manager, T: 585.596.3831, M: 585.596.9248, email riantorno@curtisswright.com

or

Justin Pierce 585.596.3866, email jpierce@curtisswright.com



Ray Chalifoux, VP QA - Paragon ES
T: 865.384.0124 or email rchalifoux@paragones.com

Attachment 1: Affected Facilities

Client / End User	3rd Party Engineering Firm	Description - HPCI/RCIC Aux	Turbine Serial #	CW Project #	Shipment Year	Installed / Commissioned
Alabama Power Farley	Bechtel	GS-2 - Aux	37858A	343670	January-08	May-10
Alabama Power Farley	Bechtel	GS-2 - Aux	37858B	343670	January-08	May-10
Southern California Edison - SONGS	Bechtel	GS-2 - Aux	40101A	375259	June-09	January-10
Southern California Edison - SONGS	Bechtel	GS-2 - Aux	40101B	375259	June-09	January-10
Cooper / NPPD	Engineering Solutions	GS-1 RCIC	35939A	478937	September-15	October-18
CNAT / Almaraz		GS-2 - Aux	38467A	501197	March-15	July-17
CNAT / Almaraz		GS-2 - Aux	38467B	501197	March-15	January-17
Clinton	Engineering Solutions	GS-2 RCIC	38187A	513114	December-12	To Be Determined
Duke Energy / Shearon Harris	Engineering Solutions	GS-2 - Aux	41056A	C34778	December-14	October-16
Wolf Creek	Hurst Technologies	GS-2 - Aux	40177A	C34590	December-12	March-13
NEXTERA ENERGY Point Beach	Sargent Lundy	GS-2 - Aux	D6729	C34587	September-13	September-14
NEXTERA ENERGY Point Beach	Sargent Lundy	GS-2 - Aux	D6730	C34587	September-13	September-14
Georgia Power Hatch	Bechtel	GS-1 RCIC	36681A	142513	March-16	To Be Determined
Georgia Power Hatch	Bechtel	GS-1 RCIC	37121A	142513	March-16	To Be Determined
Tennessee Valley Authority WB-1	Engineering Solutions	GS-2 AUX	38677A	146320	January-17	April-17
Tennessee Valley Authority WB-2	Engineering Solutions	GS-2 AUX	38677B	146320	May-17	November-17

Tennessee Valley
Authority SQ-1

Engineering
Solutions

GS-2 AUX

37480A

160361

August-18

October-19
(Scheduled)

Tennessee Valley
Authority SQ-1

Engineering
Solutions

GS-2 AUX

37480B

160361

September-18

April-20
(Scheduled)