

Part 21 (PAR)

Event # 52403

<b>Rep Org:</b> ATC NUCLEAR		<b>Notification Date / Time:</b> 12/01/2016 13:18 (EST)	
<b>Supplier:</b> ATC NUCLEAR		<b>Event Date / Time:</b> 12/08/2015 (EST)	
<b>Last Modification:</b> 12/01/2016			
<b>Region:</b> 1	<b>Docket #:</b>		
<b>City:</b> OAK RIDGE	<b>Agreement State:</b>	Yes	
<b>County:</b>	<b>License #:</b>		
<b>State:</b> TN			
<b>NRC Notified by:</b> RAY CHALIFOUX		<b>Notifications:</b> GERALD MCCOY	R2DO
<b>HQ Ops Officer:</b> JEFF HERRERA		PART 21/50.55 REACTORS	EMAIL
<b>Emergency Class:</b> NON EMERGENCY			
<b>10 CFR Section:</b>			
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE			

## PART 21 - PAWL FASTENERS FAILED TO PROVIDE SUFFICIENT STRUCTURAL SUPPORT

The following is an excerpt of a Part 21 received via email:

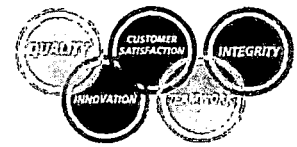
"On December 8, 2015, ATC Nuclear performed seismic qualification testing on an ATC Nuclear Assembly with a W-2 Electroschwitch Switch, Part Number W2-45B640-84 and W2-45B640-85, for TVA Watts Bar 2. During the first Safe Shutdown Earthquake (SSE) test run, the pawl fasteners used to secure the assembly in a test fixture failed to provide sufficient structural support, rendering the switch assembly non-captive.

"Based on the testing and analysis, ATC Nuclear concluded that the minimum force required to maintain structural integrity cannot be achieved with the existing pawl fasteners installed in the ATC Nuclear Assembly. This condition, if left uncorrected, could potentially cause a failure of the switch assembly to maintain its mounting configuration during a seismic event. This information provides the basis to establish a deviation in the pawl fasteners provided with the ATC Nuclear assembly that could be considered a potential defect as defined in 10 CFR Part 21. It is worth noting that there have been no failures identified by customers associated with this potential defect.

"If you have any questions or need additional information regarding this matter, please contact Ray Chalifoux at (865) 384-0124."

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IE19  
NRR



# FAX

To: NRC Operations Center

From: Ray Chalifoux, ATC Nuclear

Fax: (301) 816-5151

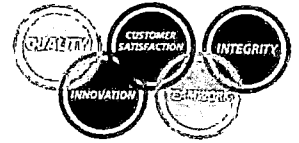
Pages: 5

Date: 12/1/2016

Re: 10CFR Part 21 Written Notification of Potential Defect  
ATC Nuclear Assembly with a W-2 Electros witch Switch, Part Number W2-45B640-84  
and W2-45B640-85.

*A Division of Argo Turboserve Corporation*

777 Emory Valley Rd • Oak Ridge, TN 37830 • 865-966-5330 • Fax 865-675-5399 • [www.argoturbo.com](http://www.argoturbo.com)



December 1, 2016.

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

Subject: 10CFR Part 21 Written Notification of Potential Defect  
ATC Nuclear Assembly with a W-2 Electros witch Switch,  
Part Number W2-45B640-84 and W2-45B640-85.

Pursuant to 10CFR 21.21(d)(3)(ii), ATC Nuclear is providing the required written notification of a potential defect on the ATC Nuclear Assembly with a W-2 Electros witch Switch, Part Number W2-45B640-84 and W2-45B640-85. This notification was initially reported to the NRC Operations Center on December 1, 2016. The enclosure to this letter provides the information required by 10CFR 21.21(d)(4).

If you have any questions or need additional information regarding this matter, please contact Ray Chalifoux at (865) 384-0124.

Sincerely,

A handwritten signature in cursive script that reads "Ray Chalifoux".

Ray Chalifoux  
Vice-President QA, ATC Nuclear

**WRITTEN REPORT PER 10CFR 21.21(d)(4):**

**(i) Name and address of the individual or individuals informing the Commission.**

Ray Chalifoux  
ATC Nuclear  
777 Emory Valley Road,  
Oak Ridge, TN 37830.

**(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.**

The basic component which is the subject of this notification is identified as ATC Nuclear Assembly with a W-2 Electroschwitch Switch, Part Number W2-45B640-84 and W2-45B640-85, which has been provided to TVA Watts Bar 2.

**(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.**

ATC Nuclear, 777 Emory Valley Road, Oak Ridge, TN 37830.

**(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.**

On December 8, 2015, ATC Nuclear performed seismic qualification testing on an ATC Nuclear Assembly with a W-2 Electroschwitch Switch, Part Number W2-45B640-84 and W2-45B640-85, for TVA Watts Bar 2. During the first Safe Shutdown Earthquake (SSE) test run, the pawl fasteners used to secure the assembly in a test fixture failed to provide sufficient structural support, rendering the switch assembly non-captive. The resulting impact of the switch assembly into the fixture and the seismic test table drove the table into a test abort in the Y axis. ATC Nuclear engineering staff embarked upon an investigation to determine the cause of the pawl fastener failure. Each pawl fastener is comprised of a bracket, cam, spring, latching tab, and cam retainer. As part of the investigation, it was noted that the configuration of the switch assembly was of sufficient weight and length to result in a high level of stress experienced by the pawl fasteners, primarily due to the cantilever of the weight in regard to the mounting of the assembly. Specifically, the bracket, latching tab, and cam within the pawl fasteners were observed with signs of deformation after the seismic qualification testing. From these findings, ATC Nuclear Engineering staff preliminarily determined that a more robust pawl fastener would be needed in this application. ATC Nuclear Engineering staff inspected other pre-qualified (PQ) specimens in an effort to obtain additional evidence to substantiate the failure of the pawl fasteners. In parallel, ATC Nuclear Engineering staff conducted a search of pawl fastener manufacturer catalogs to attempt to select a more robust pawl fastener. The size of available pawl fasteners with increased strength would no longer fit in the design application, requiring the fabrication of several prototype pawl fasteners and additional testing and analyses. From March 28 through July 14, 2016, ATC Nuclear performed additional testing and analyses of upgraded pawl fasteners and developed calculations to assure their

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suitability and fit-up. Calculations were produced that showed the actual force present on the latching tabs of the pawl fasteners when the assembly is subject to seismic testing. From the calculation results, ATC Nuclear Engineering staff determined that the force being transmitted to the latching tab within the pawl fasteners during a simulated seismic event was in excess of the published data from the manufacturer.

Based on the testing and analysis described above, ATC Nuclear concluded that the minimum force required to maintain structural integrity cannot be achieved with the existing pawl fasteners installed in the ATC Nuclear assembly. This condition, if left uncorrected, could potentially cause a failure of the switch assembly to maintain its mounting configuration during a seismic event. This information provides the basis to establish a *deviation* in the pawl fasteners provided with the ATC Nuclear assembly that could be considered a potential *defect* as defined in 10 CFR Part 21. It is worth noting that there have been no failures identified by customers associated with this potential *defect*.

The analyses and evaluations performed by ATC Nuclear do not consider purchasers and/or licensee application-specific information as it only focuses on the functional performance of ATC Nuclear assembly when subjected to a simulated seismic event. On this basis, ATC Nuclear does not have the capability to complete the 10 CFR Part 21 evaluation to determine whether this potential *defect* could cause a substantial safety hazard, so we are informing the purchasers and/or affected licensees of this determination so that the purchasers and/or affected licensees may evaluate the identified potential *defect* pursuant to §10 CFR 21.21(a). ATC Nuclear recommends that the affected licensees evaluate their specific application of the ATC Nuclear assembly and determine whether the potential *defect* described in this notice affects their design basis. If the licensee determines that it does, the licensee should contact ATC Nuclear to determine appropriate corrective action.

**(v) The date on which the information of such defect or failure to comply was obtained.**

On July 14, 2016, ATC Nuclear concluded that the identified *deviation* could be considered a potential *defect* on the pawl fasteners installed in the W-2 Electros witch assemblies. However, ATC Nuclear determined it does not have the capability to complete the 10 CFR Part 21 evaluation to determine if a substantial safety hazard exists.

**(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.**

A total of 3 units with P/Ns identified below have been supplied to customers by ATC Nuclear since 2010.

TVA PO Number	Line Item Number	ATC Nuclear Job Number	Item ID	Part Number	Qty Supplied	UNID	Number of Contacts per Train
39541	6	PA4225	CPV151K	W2-45B640-84	1	2-HS-1-22A	4
39541	7	PA4225	CPV153K	W2-45B640-85	1	2-(RT-1)	4
61610	11	PA4297	CPV153K	W2-45B640-85	1	2-(RT-1)*	4

**(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.**

ATC Nuclear has successfully qualified an upgraded pawl fastener for use in these switch assemblies, as documented in CAR 15T-46. In addition, ATC Nuclear Engineering is providing three (3) options for correcting the above listed deviation with regard to switches in the field.

- Option 1: The customer can at their earliest convenience send the affected switch assemblies to ATC Nuclear's Oak Ridge, TN location for refurbishment with the upgraded pawl fasteners. ATC Nuclear will dismantle the affected switch assemblies to the point that the defective pawl fasteners can be removed, the new upgraded pawl fasteners can be installed, the switch assembly reassembled, and switch function verified prior to shipment back to the customer.
- Option 2: The customer may elect to have a representative of ATC Nuclear come to the customer site with a sufficient quantity of the upgraded pawl fasteners to remove and replace the defective pawl fasteners with the upgraded pawl fasteners.
- Option 3: ATC Nuclear can provide the customer with upgraded pawl fasteners and a set of work instructions that the customer may use to remove the defective pawl fasteners and install the replacement upgraded pawl fasteners at their earliest convenience.

Furthermore, it is the position of ATC Nuclear that switch assemblies provided in the future shall have the upgraded pawl fasteners installed to prevent a possible recurrence of this deviation.

**(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.**

None at this time.

**(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.**

Not applicable.