

CONFIDENTIAL

Docket No. 2020001-EI
Cross-Examination
Hearing Exhibit

Exhibit No.: 5C

Proffered by: Public Counsel

Short title: RCE Follow Up Email

Witness(s): FPL-Coffey

Arntson, Gary

From: Kerkes, Randal
Sent: Friday, July 26, 2019 1:11 PM
To: Arntson, Gary; Garmon, Michael; 'Miller, Christopher'; ray.prevallet@siemens.com
Cc: Griffith, Gary; Zoll, Donald
Subject: RE: St Lucie RCA Follow Up

Gary A,

I reviewed the EPU PCM log during initial troubleshooting. Chris Miller provided following summary PCM responses during that review.

The exception is 2-12-000278 for which I do not have a response on file.

Randy Kerkes

2-12-000343 Damage to Coil Insulation in Slot Portion

It was discovered that a coil near the 3 o'clock position appears to have slight surface damage, likely a result of side filler driving. This damage is observable in the slot portion of the coil and is captured on the attached .JPG files.

Q1: Site would like to repair this damage per Section 7.4.1 of FRP 358. Does Engineering concur with this solution? If not, please recommend an alternative solution to this issue.

RESPONSE

A1: After review of the photos attached to the PCM and section 7.4.1 of document FRP-358, engineering agrees with the proposed solution to address the reported insulation damage. The coil must be lifted for inspection of additional damage other than the reported in this PCM.

NOTE: care is required to restore dimensions (width and height) as well as the radius of the coil at all corners to avoid higher than designed electric field stress when the hipot test is performed.

Q2: Site has already installed side filler into this slot (#35) for the bottom coil in question. Site is concerned that lifting said coil will result in additional damage due to the presence of the side filler. Does Engineering still recommend lifting the coil from the slot, and what contingency options for repair are available if such a process does result in additional coil damage?

RESPONSE

A2: Section 7.4.3 of FRP358 can be used as an alternate repair procedure to avoid lifting the coil. Site needs to gently remove any loose material or rough edges including binder to prepare the coil surface for application of the mica paste. Site needs also to mask the stator core surface (slot wall) around the damage area to avoid mica paste on the slot wall that could eventually make it difficult for installation of the top coil and corresponding fillers. Section 7.4.3.4 instructs to apply pressure over the repair surface. A wedge tool can be made with a curvature similar to that of the stator coil corner to avoid introducing a sharp edge at the repair area while pressure is being applied. A heat gun can be used to aid during the cure of the mica paste. Pressure must be applied for at least 8 hours before application of the semi conductive paint. Per section 7.5.3 of FRP358, perform the electrical (hipot) test as describe in FIP315, Table 1, paragraph 7 at the voltage value defined in this section only on the repaired coil. Note that this is being offered as an alternate repair procedure. In parallel site should consider looking at the logistics to get a spare coil in case that the coil fails during hipot.

2-12-000359 Damage to Bottom Coil Insulation During Installation

During the installation of a bottom coil near the 6 o'clock position, the coil nicked the slot which resulted in what appears to be a minor surface blemish. This blemish exists at the straight part of the coil as it exits the slot on the EE. See the attached photographs.

Q1: Site would like to repair this blemish per FRP 358, Section 7.4. Is this repair permissible, or does Engineering recommends an alternative solution?

RESPONSE

A1: For blemish type damages engineering recommends the procedure as described in section 7.4.3 of FRP358. For reference on this repair see PCM 2-12-000343. Note that per the attached photos the subject area is at just outside the stator slot at the end of the semi conductive paint near the corner of the coil.

As described in the reference PCM, site needs to gently remove any loose material or rough edges including binder to prepare to coil surface for application of the mica paste. Section 7.4.3.4 instructs to apply pressure over the repair surface. A wedge tool can be made with a curvature similar to that of the stator coil corner to avoid introducing a sharp edge at the repair area while pressure is being

applied. A heat gun can be used to aid during the cure of the mica paste. Pressure must be applied for at least 8 hours before application of the semi conductive paint. Per section 7.5.3 of FRP358, perform the electrical (hipot) test as describe in FIP315, Table 1, paragraph 7 at the voltage value defined in this section only on the repaired coil. The subject coil should be tested before and after installation to its corresponding stator slot per paragraphs 7.5.2 and 7.5.3.

2-12-000479 Damage to Coil Insulation in Slot Portion

During Night Shift on 1/11, it was reported that the insulation for the coil in slot #42 was damaged during side filler installation. Site has previously experienced a similar issue on PCM 2-12-000343.

Site would like to apply the same repair as provided on PCM 2-12-000343 (employ FRP 358 Section 7.4.1 or 7.4.3 as applicable without lifting the coil from the slot). Site is concerned that any attempts to lift the coil in question will result in additional damage due to the existing installation of side filler in the corresponding slot.

Photographs are attached.

Q1: Does Engineering concur with the application of the recommendation described in PCM 2-12-000343 for the event given in this PCM? If not, please provide an alternative recommendation.

RESPONSE

A1: Since it is reported from site that all bottom coils are installed with pumped hoses and diamond spacers, Orlando recommends performing repairs with the coil in place per FRP358, section 7.4.3. As described in the reference PCM, site needs to gently remove any loose material or rough edges including binder to prepare to coil surface for application of the mica paste. Site needs also to mask the stator core surface (slot wall) around the damage area to avoid mica paste on the slot wall that could eventually make it difficult for installation of the top coil and corresponding fillers. Section 7.4.3.4 of FRP358 instructs to apply pressure over the repair surface. A wedge tool can be made with a curvature similar to that of the stator coil corner to avoid introducing a sharp edge at the repair area while pressure is being applied. A heat gun can be used to aid during the cure of the mica paste. Pressure must be applied for at least 8 hours before application of the semi conductive paint. Per section 7.5.3 of FRP358, perform the electrical (hipot) test as describe in FIP315, Table 1, paragraph 7 at the voltage value defined in this section only on the repaired coil. As recommended in the reference PCM, site should consider looking at the logistics to procure spare coils in case that individual coils fail during hipot.

2-12-001450 Final EI CID

Siemens is on site at St Lucie 1 conducting a full stator rewind; including a donut core replacement.

The final EL CID test was conducted earlier this evening and the results are attached for engineering review.

For reference: An EL CID test was performed before winding, but after the donut core installation, and was submitted as PCM 2-12-000069. Additionally a thermo graphic inspection was performed on the core and was submitted as PCM 2-12-000121

Please note that EL CID indications were found on some donuts at Charlotte before they were installed at site. These indications are detailed in MDRs 778881, 778909 and 778540. Please consider the above mentioned PCMs and MDRs when evaluating the data gathered by site.

Site can be contacted at 772-465-3550 extension 3196 or 914-400-4443 with any questions.

There are ELCID indications above the Siemens acceptance criterion of 100 mA in a number of slots around the circumference of the core at approximately 55 to 60 inches and at approximately 170 to 180 inches from the exciter end of the machine. The slot pattern of these indications varies from the before winding test.

Since no visual indication of surface damage was reported in the PCM in the areas of the ELCID indications, Generator Service Engineering recommends performing a loop test with thermographic inspection to determine the severity of the ELCID indications for the final wound core assessment.

From: Arntson, Gary <Gary.Arntson@fpl.com>

Sent: Friday, July 26, 2019 12:57 PM

To: Garmon, Michael <michael.garmon@siemens.com>; 'Miller, Christopher' <miller.christopher@siemens.com>; ray.prevallet@siemens.com

Cc: Griffith, Gary <Gary.Griffith@fpl.com>; Kerkes, Randal <Randal.Kerkes@fpl.com>; Zoll, Donald <Donald.Zoll@fpl.com>

Subject: St Lucie RCA Follow Up

Michael,

Can you provide any clarification on the below item from the 2012 rewind report regarding some repair during bottom coil installations and related PCM(s)? Did this involve BC 17 in any way? I am trying to close out an item on the support/refute matrix regarding installation and need to close the loop.

trimming the nose ends. The nose ends were treated with resin after trimming.

The resins were all machine mixed to ensure correct and uniform mixing of resin & catalyst. The ratio of resin to catalyst was checked and documented routinely.

In parallel to winding the bottom coils, side filler was being driven per Siemens Pr Specification. Upon completion, contact resistance measurements were taken and All values were within Siemens specifications. During installation of the sidefiller, two coils which had minor damage to the outer binder. These areas were repaired per existing specifications and a Siemens PCM response.

2-12-000187	Gaps between Donuts 11 and 12 after Core Consolidation
2-12-000220	Pantleg Washer Orientation on Mod 05
2-12-000234	Damaged Building Bolt Threads
2-12-000245	Damaged Bolt Threads
2-12-000278	Bottom Coil Shipping Box Damage
2-12-000343	Damage to Coil Insulation in Slot Portion
2-12-000359	Damage to Bottom Coil Insulation During installation
2-12-000479	Damage to Coil Insulation in Slot portion.
2-12-000477	Green Glass Sidefiller Driving Wedge Bifurcated in Slot
2-12-000567	Gas Discharge RTD



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