

Unit 2

System Status: NOPR ORAS OSTs  
User Status: CRTD MRC STA ESCP  
ACRC DNC

SONGS

Notification: NN 200692347



Description: 2A0619 - "C" load bottle flange cracked

Created on: 12/04/2009 Reported By:

Responsible:

Priority: 4 Medium

Required Start: 01/23/2010 14:59

End: 05/22/2010 14:59

Order No: 800420681

Code:

Task Exists? [Y]

Func.Loc.: S2.4KVS.2A0619 2A0619 2A06 TO 3A06 TIE BREAKER

Equipment:

Assembly:

Quality Class: II

Location: CB

Room: 302A

Elevation: 050

Column: 16.0K3

Planner Group:

WorkCenter: EM\_EE Electrical Engrg

Plant: 1000 SONGS - Services

Reliability Classification: CRITICAL-B

ARC Review Status: C Completed

Feedback Req'd? []

M Rule:

Sig Level: 4 Low Level Issue

Breakdown []

Malfunction Start: 12/07/2009 12:29

Breakdown Duration: H

End:

Description:

- \* 12/04/2009 02:15:58 (b)(6) Phone (b)(6)
- \* During visual inspection (WO#800418972) of the load side bottles of
- \* cubicle 2A0619 (Bus XTie to 3A06) a possible hairline crack was
- \* discovered on the mounting flange of the "C" Phase load side bottle.
- \* This was discovered after taking the backside lower bottle covers from
- \* the rear cubicle of 2A0619. The suspected crack goes from the bottom
- \* of the barrel of the bottle to the bottom mounting bolt approx. 3/4"
- \* long. Further investigation is necessary to verify if it is indeed a
- \* crack and thus making replacement of the bottle necessary.
- \*
- \*
- \*
- \*
- \*
- \*
- \*
- \* Supervisors (b)(6) and (b)(6) have been notified as has
- \* Engineering.
- \*
- \* This notification needs to be directed to Engineering and Planning to

Print Date: 12/11/2009

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SONGS

Notification Continued

SONGS

**Notification:** NN 200692347

**Description:** 2A0619 - "C" load bottle flange cracked

**Description Continued:**

\* schedule further evaluation.

\*

\*

\* 12/04/2009 04:26:14

See pictures attached.

(b)(6)

Phone

(b)(6)

SONGS

**Notification: NN 200692347**

**Func.Loc.:** S2.4KVS.2A0619 2A0619 2A06 TO 3A06 TIE BREAKER

**Location:** CB **Room:** 302A **Elevation:** 050 **Column:** 16.0K3

Sort No.: 0001	<p><b>Code Group:</b> N-TS-IOD Immediate Operability Determination</p> <p><b>Short Text:</b> DNC,800420681</p> <p><b>Task Code:</b> NO30 IOD-Equipment OPERABLE</p> <p><b>WorkCenter:</b> EM_SYE Electrical/I&amp;C Systems</p> <p><b>Responsible:</b> (b)(6)</p>
Sort No.: 0002	<p><b>Code Group:</b> N-POD Prompt Operability Determination</p> <p><b>Short Text:</b></p> <p><b>Task Code:</b> PO40 POD Closed</p> <p><b>WorkCenter:</b> EM_E Electrical/Controls Engrg</p> <p><b>Responsible:</b> (b)(6)</p>
Sort No.: 0003	<p><b>Code Group:</b> N-EOC Extent of Condition Assessment</p> <p><b>Short Text:</b></p> <p><b>Task Code:</b> E010 Provide Initial Estimate</p> <p><b>WorkCenter:</b> EM_E Electrical/Controls Engrg</p> <p><b>Responsible:</b> (b)(6)</p>
Sort No.: 0004	<p><b>Code Group:</b> N-RPT Reportability Assessment</p> <p><b>Short Text:</b> Perform Reportability assessment</p> <p><b>Task Code:</b> RP20 RPT Engineering review</p> <p><b>WorkCenter:</b> EM_EE Electrical Engrg</p> <p><b>Responsible:</b> (b)(6)</p>

## SONGS

**Notification: NN 200692347****Func. Loc.: S2.4KVS.2A0619 2A0619 2A06 TO 3A06 TIE BREAKER**

Part: \_\_\_\_\_

Damage: \_\_\_\_\_

Cause: \_\_\_\_\_

Activity: \_\_\_\_\_

Part: \_\_\_\_\_

Damage: \_\_\_\_\_

Cause: \_\_\_\_\_

Activity: \_\_\_\_\_

Part: \_\_\_\_\_

Damage: \_\_\_\_\_

Cause: \_\_\_\_\_

Activity: \_\_\_\_\_

Part: \_\_\_\_\_

Damage: \_\_\_\_\_

Cause: \_\_\_\_\_

Activity: \_\_\_\_\_

Task Details

SONGS

**Notification: NN 200692347**

**Func.Loc.:** S2.4KVS.2A0619 2A0619 2A06 TO 3A06 TIE BREAKER

**Location:** CB **Room:** 302A **Elevation:** 050 **Column:** 16.OK3

Task Details:

**Sort No.:** 0001 **Code Group:** N-TS-IOD Immediate Operability Determination  
**Short Text:** DNC.800420681  
**Task Code:** NO30 IOD-Equipment OPERABLE  
**WorkCenter:** EM\_SYE Electrical/I&C Systems  
**Responsible:** (b)(6)  
**Status:** TSRI  
**Planned Start:** 01/10/2010  
**Planned End:** 01/24/2010  
**Complete:**

**Task Long Text:**

Based upon satisfactory POD, this IOD has been changed from cat 40 (inop) to cat 30 (Operable). (b)(6)

NN 200692347

**NOTES:**

- 1) Parts 1 through 4 will be completed by the STA.
- 2) Part 5 may be completed by Operations (STA) or Engineering (Responsible Engineer) when the SSC has been restored to a fully qualified status. IOD (Immediate Operability Determination)

This is an Immediate Operability Determination (IOD).

1. Deficiency Identified and the Affected Functional Location:

S2.4KVS.2A0619

During visual inspection (WO#800418972) of the load side bottles of cubicle 2A0619 (Bus XTie to 3A06) a possible hairline crack was discovered on the mounting flange of the "C" Phase load side bottle. This was discovered after taking the backside lower bottle covers from the rear cubicle of 2A0619. The suspected crack goes from the bottom of the barrel of the bottle to the bottom mounting bolt approx. 3/4" long. Further investigation is necessary to verify if it is indeed a crack and thus making replacement of the bottle necessary.

2. Identify the Specified Safety Function(s); include mission time (if applicable):

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**Notification:** NN 200692347

**Description:** 2A0619 - "C" load bottle flange cracked

(Not required per Note 4 of Section 6.5 S0123-XV-52)

3. Conclusion:

Determine OPERABLE/INOPERABLE

\_\_\_\_\_ Operable

\_\_\_\_XX\_\_\_\_\_ Inoperable

Basis (provide discussion):

The breaker position is inoperable due to the cracked flanges on the cubicle bottles.

POD to Engineering to investigate further.

4. Extent of Condition (Required for Inoperable)

EOC Created (YES or NO)? Yes

Describe "other train/other unit" findings (if performed):

5. IOD Closure Information

The C Phase bottle needs to be replaced. There is no NMO in place at present.

(b)(6)

2/4/09

## SONGS

**Notification: NN 200692347**

Func.Loc.: S2.4KVS.2A0619 2A0619 2A06 TO 3A06 TIE BREAKER

Location: CB Room: 302A Elevation:050 Column: 16.0K3

Task Details:

Sort No.: 0002 Code Group: N-POD Prompt Operability Determination  
Short Text:  
Task Code: PO40 POD Closed  
WorkCenter: EM E Electrical/Controls Engrg  
Responsible: (b)(6)  
Status: TSCO  
Planned Start: 12/04/2009 15:00  
Planned End: 12/04/2009 15:00  
Complete: 12/04/2009 15:00

**Task Long Text:**

POD closed/not required as the repair is to be performed during the maintenance window.

PROMPT OPERABILITY DETERMINATION TEMPLATE  
(Refer to SO123-XV-52)

**PART 1: DEGRADED/NONCONFORMING/UNANALYZED CONDITION**

A. Describe the as-found condition and the equipment affected, assuring that the problem and scope have been clearly identified.

On 12/04/2009 during EOC inspection of 2A0619 an indication of a crack at the C phase bottom mounting bolt slot of the mounting flange that holds the bottle in place on the bus was noted. The "A" and "B" phases were inspected and no indication of any crack was noted.

B. If it is confirmed at this stage that no degraded, nonconforming or unanalyzed condition exists, record as such and provide justification.

**PART 2: SPECIFIED SAFETY FUNCTION(S) OF THE AFFECTED SSC**

The Switchgear 2A06 is part of the Class 1E 4.16 KV System that distributes power to the safety related ESF 4.16 KV loads under normal and accident conditions. Specifically 2A0619 provides Class 1E power to Unit 3 via the cross tie.

**PART 3: BASIS FOR DETERMINING IMPACT ON SPECIFIED SAFETY FUNCTION(S)**

## SONGS

**Notification:** NN 200692347**Description:** 2A0619 - "C" load bottle flange cracked

## A. Technical Basis

The bottle continues to be mechanically restrained/aligned and seismically qualified for the following reasons:

Based on previous observation of the cracked collar on removed bottle at 2A0609, the crack runs similarly radially in the collar between two bolts, the crack as observed by the eye, will have a small impact on the stiffness of the assembly i.e., the bolts capability to sustain earthquake is unimpacted provided that bolts are in place. (The cabinet back to front frequency is 15HZ, such as the earth quake magnitude is only 1g. During a seismic event, the resultant load of the bottle remains unchanged, ie no magnification due to seismic acceleration.)

There is no degradation of the bottle's ability to conduct design rated current due to this indication of a crack on the mounting flange. As state above for the mechanical integrity, the indication will not change the alignment of the bottle and thus the electrical connection will be maintained.

Conservatively, in the event if the mounting flange failed, the bottle is held in place between the bus bars and the breaker stabs and will retain its ability to carry design rated current.

The analysis for the bottles at 2A0609 determined that due to the relatively small seismic load, the bus assembly is sufficiently stiff to keep the bottle engaged within 1/8" of the acceptance criteria for engagement of 1/2 " to 3/4" if the mounting flange failed.

By comparison, the bus structure for 2A0619 has 2 supports on the vertical buss whereas the analytical model below assumed one. This arrangement is more rigid than the analysis and would have even less deflection and is bounded by the original analysis for 2A0609.

Analysis by DEO for 2A0609:

A simplified finite element model is used for the estimation of the flexibility of the bus using conservative assumptions. The following is a summary of the modeling assumptions and the results obtained:



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**Notification: NN 200692347****Description:** 2A0619 - "C" load bottle flange cracked

1. Bus material is assumed to be pure copper, and its thickness is 3/8". This is conservative since the actual thickness may be larger.
2. Dimensions of the steel bar supporting the three buses inside the cabinet: 26" long, 1.5" wide and 1/4" thick.
3. The force required to engage the tulip and the bottle is 50 lbs.

## FINITE ELEMENT ANALYSIS

Results of the FE analysis show that the displacement at the bus-bottle connection is less than 0.10 inch.

This is considered bounding to the seismic loading due to relatively low seismic loads based on the following:

## SEISMIC

The following information is provided for the estimation of the 4KV switchgear horizontal displacements. Only the front-to-back direction is the concern based on the bus configuration and the discovered crack on the support ring for the bus component at the rear of the 4KV cubicle.

The lowest front-to-back frequency for the 4 KV switchgear was reported to be 15 Hz in the seismic qualification report from ITE Imperial Corporation (SO23-302-2-112). The DBE spectral acceleration at this frequency is 1.0g horizontal according to drawing 20701.

At the frequency of 15 Hz and an acceleration of 1.0g, the seismic displacement of panel is about 0.04 inch.

## B. Status (As Found)

Specified Safety Function(s) Satisfied

Specified Safety Function(s) NOT Satisfied

## PART 4: CONTINUED DEGRADATION

## PART 5: COMPENSATORY MEASURES

N/A

Included (describe)

## SONGS

**Notification: NN 200692347****Description:** 2A0619 - "C" load bottle flange cracked**PART 6: EXTENT OF CONDITION (Required for Inoperable)**

EOC Created (YES or NO)? Yes

Describe "other train/other unit" findings (if performed): N/A

POD Performed by (b)(6), Qualified T3EN13 9/25/2010

Peer checked by (b)(6) Qualified T3EN13 thru 11/6/2010

## SONGS

**Notification: NN 200692347****Func.Loc.:** S2.4KVS.2A0619

2A0619 2A06 TO 3A06 TIE BREAKER

**Location:** CB**Room:** 302A**Elevation:** 050**Column:** 16.0K3**Task Details:****Sort No.:** 0003**Code Group:** N-EOC**Extent of Condition Assessment****Short Text:****Task Code:** E010

Provide Initial Estimate

**WorkCenter:** EM\_E

Electrical/Controls Engrg

**Responsible:** (b)(6)**Status:** TSRL**Planned Start:** 01/10/2010**Planned End:** 01/23/2010**Complete:****Task Long Text:**

EOC (Extent of Condition Assessment)

Perform an Extent of Condition (EOC) evaluation for an identified deficiency to determine if the deficiency currently exists elsewhere. Do not use this method to determine cause; use a DCE, ACE or RCE as appropriate to determine the cause.

If the EOC is being used to not delay completion of an Immediate Operability Determination or a Prompt Operability Determination, consider only "other train / other unit" applications.

For all other EOC uses, determine and evaluate scope as necessary.

Refer to SO123-XV-52 and SO123-XV-50 CAP-3.

1. Affected Equipment (See deficiency description or, if the deficiency description is incomplete or incorrect, describe)
2. Deficiency Identification (See description or, if the description is incomplete or incorrect, describe)
3. Discussion of findings, including the basis for the conclusion:

## SONGS

**Notification: NN 200692347****Func.Loc.:** S2.4KVS.2A0619 2A0619 2A06 TO 3A06 TIE BREAKER**Location:** CB **Room:** 302A **Elevation:** 050 **Column:** 16.0K3**Task Details:**

**Sort No.:** 0004      **Code Group:** N-RPT      **Reportability Assessment**  
**Short Text:** Perform Reportability assessment  
**Task Code:** RP20      **RPT Engineering review**  
**WorkCenter:** EM EE      **Electrical Engrg**  
**Responsible:** (b)(6)  
**Status:** TSR  
**Planned Start:**  
**Planned End:** 01/07/2010  
**Complete:**

**Task Long Text:****REPORTABILITY ASSESSMENT TEMPLATE**

**NOTE:** Timely assessment for reportability consideration is important.

RPT assignment due date as a function of priority is as follows based on system defaults: Pri 2/3A (7 days), Pri 3B (30 days), Pri 3C (60 days)

Reference Procedure SO123-XV-52, Attachments 14 and 15 - Engineering Elements.

Questions 1 through 4 and Engineering Peer Review, to be performed by Engineering.

1. When did the SSC fail or first become degraded (break, code not met, out of SR range, etc.)? An SSC can be considered "failed when found" only if there is no compelling evidence of earlier failure.

2. What was the apparent cause (use engineering judgment to determine, if necessary - but also describe the basis for your judgment) of the failure or degraded condition? If appropriate, generate a cause evaluation assignment.

3. Would the SSC have been able to fulfill all its intended safety function(s) as defined in the UFSAR (reference specific sections) since the failure (Operable)? Consider all plant operating Modes and the status of other equipment. If yes, why?

4. Did the failure or failure mode affect or potentially affect another SSC or the other unit?

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**Description:** 2A0619 - "C" load bottle flange cracked

Engineering Peer Review (comments):

Engineering Peer Review performed by:

5. (BY Encode qualified personnel - see Encode 270QC7: Assessing Events for Reportability) Reportability assessment summary (include references as appropriate):