ORPS Operating Experience Report

ORPS contains 58217 OR(s) with 61527 occurrences(s) as of 3/19/2018 4:00:21 AM
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1)Report Number: SC--SSO-SU-SLAC-2018-0001 **Post 2017 Redesign**
Secretarial Office: Science
Lab/Site/Org: SLAC National Accelerator Laboratory
Facility Name: SLAC National Accelerator Laboratory
Subject/Title: Non-Conforming Eyebolts Installed on LCLS-II RF Solid State Amplifiers
Date/Time Discovered: 02/14/2018 15:18 (PTZ)
Date/Time Categorized: 03/15/2018 08:40 (PTZ)
Report Type: Final
Report Dates:

Notification Type	Notification Date	Notification Time
Notification	03/16/2018	15:07 (ETZ)
Initial Update	03/16/2018	15:07 (ETZ)
Latest Update	03/16/2018	15:07 (ETZ)
Final	03/16/2018	15:07 (ETZ)

Reporting Level: I
Reporting Criteria: 10(1) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern for that facility or other facilities or activities in the DOE complex.
Cause Codes:
ISM: 6) N/A (Not applicable to ISM Core Functions as determined by management review.)
Subcontractor Involved: No
Occurrence Description: Synopsis:
On February 14, 2018, a DOE employee from the JLab site office identified a potential suspect/counterfeit issue regarding eyebolts used on the LCLS-II RF Solid State Amplifier (SSA) units located at JLab. The eyebolts did not appear to be marked with the manufacturer's name or identification mark as required by ASME B30.26 (Rigging Hardware), which made them appear "suspect" and subject of further review to verify their quality traceability.

Follow-up investigation by the SLAC LCLS-II project team and the SSA supplier, R&K Company, Ltd., determined that the eyebolts used on the SSA racks were manufactured in Japan by Shizuka Industry Co., and bear the manufacturer's marking "SI" on the base of the bolts. Fifteen prototype SSA racks used M22 size bolts with a rated load of 7.35 kN, while all the production SSA racks used M20 size bolts with a rated load of 6.18 kN. Third-party test data was obtained to verify that the design factor of both the M22 and M20 size bolts well exceeds the minimum of 5 required by ASME B30.26. (Design Factor = Ratio between nominal or minimum breaking strength and the rated load of the eyebolt.) Follow-up investigations and

discussions with R&K were concluded on March 9, 2018. Based on this information, the LCLS-II project determined that the eyebolts are capable of performing their intended function and are not considered "counterfeit" or "suspect."

Although the quality traceability for all of the SSA eyebolts was established, the M22 size eyebolts used on the fifteen prototype SSA racks were not marked with the rated load as required by ASME B30.26. Of the fifteen prototype SSA racks, seven were shipped to JLab, seven were shipped to Fermilab, and one was shipped to SLAC. Although the lack of rated load marking on the bolts does not affect the ability of the bolts to perform their intended function, it represents a non-conformance to project design requirements, as the LCLS-II Engineering Specification Document used to procure the SSA units requires the eyebolts to meet ASME B30.26. SLAC owns the overall responsibility for ensuring that receipt inspection occurs and working with the other Laboratories to ensure that effective inspections are performed. The failure to identify the non-conformance of the eyebolts to ASME B30.26 upon receipt inspection was categorized as an ORPS-reportable "Management Concern" on March 15, 2018.

Details:
LCLS-II RF Solid State Amplifiers (SSA) were procured in accordance with LCLS-II Engineering Specification Document (ESD) RF Solid State Amplifier (SSA), LCLSII-2.4-ES-0150. Section 3, Table 1, Applicable Documents, requires eyebolts to meet the requirements of ASME B30.26, Rigging Hardware.

The SSA supplier, R&K Company, Ltd, subcontracted the fabrication of fifteen prototype SSA racks that included the eyebolts, to Hoshi Seisakusyo Co., Ltd.

Hoshi Seisakusyo Co. Ltd. procured sixty M22 size eyebolts from Takigen Mfg. Co., Ltd., a distributor for the eyebolts. Hoshi Seisakusyo Co., Ltd., procured eyebolts in accordance with Japanese Industrial Standard, JIS B 1168, Eyebolts. (The JIS B 1168 standard differs from the ASME B30.26 standard in that it does not require the rated load to be marked on the eyebolts.)

Takigen Mfg. Co., Ltd. purchased the sixty M22 size eyebolts from Shizuka Industry Co., Ltd., the manufacturer of the eyebolts. A test certification was submitted with the eyebolt shipment. The eyebolt test certification was generated by Japan Quality Assurance Organization (JQA), a third-party testing agency. The certification demonstrates traceability to the eyebolt model number description and compliance with specification mechanical property requirements.

The sixty eyebolts were used on SSA prototype unit serial numbers, shipped by R&K to the following locations:

JLab: SL-9001, SL-0001, SL-0003, SL-0011, SL-0012, SL-0013, SL-0014

Fermilab: SL-0004, SL-0005, SL-0006, SL-0007, SL-0008, SL-0009, SL-0010
SLAC: SL-0002

Cause Description:

Operating Conditions:

Activity Category:

Immediate Action(s): The SSA supplier, R&K Company, Ltd., has taken responsibility to provide new eyebolts fully compliant with ASME B30.26 and directly equivalent to the existing M22 ones found on the fifteen prototype SSA units at JLab, Fermilab, and SLAC (15 SSAs x 4 eyebolts each = 60 eyebolts). The new eyebolts will be purchased and delivered by R&K's business partner in the United States, Cornes Technologies. SLAC is in the process of determining whether the bolts are actually required in the prototype SSAs, and based on the determination, whether to replace the bolts with the properly marked bolts or have all existing bolts removed from the prototype SSAs.

FM Evaluation:

Facility Representative or Designated DOE Representative Input:

DOE Program Manager Input:

Further Evaluation is Required: NA

Division or Project: LCLS-II

Plant Area: SLAC, JLab, Fermilab

System/Building/Equipment: LCLS-II RF Solid State Amplifiers

Facility Function: Accelerators

Corrective Action:

Lessons(s) Learned: 1. Procurement technical specifications need to take into account potential ramifications of specifying specific industry standard designations when foreign suppliers may be involved. A statement of "equivalency" may be prudent to allow use of compatible standards. In the case of the SSA procurement statement of work, there was a failure to confirm compliance with the specific requirement associated with ASME B30.26. Future LCLS-II procurement specifications need to clearly state the responsibility of suppliers to flow-down contractual requirements to subcontractors. Communication with the SSA supplier is in-process to ensure corrective actions are being implemented accordingly. In addition, technical exchange meetings with suppliers need to ensure compliance with key flow-down requirements.

2. Attention to detail is extremely important for all aspects of supply chain management including procurement technical specification development, supplier oversight and communication, and receiving inspection activities. While the SSA prototype eyebolts meet all specification mechanical property requirements, because markings were not compliant with ASME B30.26, a great deal of effort was required to verify conformance with mechanical requirements. Communication is in-progress with project

technical representatives to ensure this lesson learned is embraced.

3. SSA receiving inspection processes at each place of delivery were not adequate to determine conformance to requirements. Acceptance criteria documentation needs to clearly identify the acceptance/rejection criterial for "key" hardware such as these eyebolts. Efforts are also underway to implement more robust receiving inspection processes when components are finally delivered. Also, the receiving inspection and verification processes needs to be completed in a timely manner shortly after the product is delivered. Partner Labs should also be contacted to assure that the same verifications were successfully performed at their facilities as well.

HQ Keywords:

HQ Summary:

Similar OR Report Number:

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HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
03/15/2018	10:00 (PTZ)	Scott Wenholz	SSO
03/15/2018	11:30 (PTZ)	Ralph Kerwin	SLAC

Authorized Classifier(AC):