

August 4, 2015

US Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: Reply to a Notice of Nonconformance

Nuclear Regulatory Commission Inspection of Engine  
Systems, Inc., Report No. 99901362/2015-201 and Notice of  
Nonconformance

Dear Sir or Madam:

Engine Systems, Inc. (ESI) is in receipt of the above subject inspection report and the related notice of violation. Following please find ESI's response to the two specific findings identified in the report.

**Nonconformance A:** ESI failed to establish measures to assure that purchased services conform to the procurement documents. Specifically, ESI dedication report D-EMD-8249819-1, stated that critical characteristics for Shell Cyprina RA grease were color, worked cone penetration, dropping point, and four ball wear scar test. In two instances, ESI contracted Herguth Laboratories, Inc. for the testing of the critical characteristics. Herguth did not perform the four ball wear test of grease, and subcontracted performance of the test to a commercial laboratory.

ESI opened our Corrective Action number 2015-21 to address the above condition. The cause of the nonconforming condition was identified as: ESI had never performed commercial grade dedication on greases prior to these orders and this was the first of its kind. The acceptance criteria were developed through correspondence with Herguth Laboratories and guidance from industry standards. Herguth Laboratories did not have the capability to perform a four ball wear test and therefore, this activity was subcontracted to Southwest Research as commercial grade only. Southwest Research was not surveyed by ESI or Herguth for acceptable testing practices. ESI audit report 1-2013 imposed one restriction requiring Herguth to obtain approval of any outside contracted services pertaining to the testing and acceptance of ESI test samples. ESI QA was contacted for approval to utilize a commercial vendor for the four ball wear test. Even though test was to be performed commercial grade it had been determined acceptable due to the fact the test was procured safety related by ESI and the results were supplied under Herguth's safety related program. The results were provided on the same document as those that were performed safety related; however, it clearly noted in a footnote that the four wear test was performed commercial grade. Herguth provided the test results of the tests performed in-house (safety related) and then later revised that same report to add the four ball wear results once they became available.

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NRD

**ESI Reply:** Prior to the NRC finding ESI had requested Herguth to have the grease re-tested. Herguth chose to have the grease re-tested at Chevron. Subsequent to this finding by the NRC, ESI has requested additional information from Herguth. Specifically as it pertains to the four ball testing performed by Chevron for Herguth. Herguth has provided a copy of their commercial grade survey of Chevron as well as the auditor qualifications of the person performing the survey. ESI has reviewed the survey of Chevron and the Lead Auditor qualifications and found them to be acceptable.

Consequently ESI has updated the restriction in our ASL for Herguth to read "Herguth is required to obtain ESI approval for any outside contracted service pertaining to the testing and acceptance of ESI test samples. If performing ASTM D2266 Four Ball Wear test, Herguth is authorized to subcontract this test, and only this test, to the following facility: Chevron Energy Technology Co- 100Chevron Way, Richmond, CA 94802. Herguth must indicate on the test report that Chevron performed the test & that the results are being supplied in accordance with Herguth's 10CFR50 Appendix B Program."

Furthermore, ESI has located an ISO 17025 accredited test lab, whose scope covers ASTM D2266 Four Ball Wear testing, and is in the process of placing them on its approved suppliers list. ESI will have this lab perform the ASTM D2266 four ball wear test on the same samples of grease. Going forward, when required, ESI will use this vendor for performance of four ball wear test to eliminate the possibility of outsourcing.

Additionally, ESI will revise its Testing Services dedication report to include a checklist. This checklist will include provisions for verifying that all testing was performed by the approved vendor and were not outsourced, also that all purchase order restrictions have been adhered too. The checklist will be completed for all purchased commercial grade testing services and will be reviewed by Engineering and Quality.

ESI has reviewed the services purchased from vendors identified on our ASL as Safety Related vendors and found that this is an isolated incident of a commercial grade service being supplied to ESI in the absence of Commercial Grade Dedication either by the Vendor or ESI.

**Noncompliance B:** ESI failed to assure that the causes of significant conditions adverse to quality were determined and that the corrective actions taken would preclude repetition. Specifically;

- A root cause analysis was not performed for Corrective Action (CAR) #2014-04 which was identified by ESI as a Level 1 Significant Condition Adverse to Quality; nor were sufficient corrective actions taken, and as a consequence a similar problem re-occurred. CAR #2014-04 was generated on April 22, 2014, after ESI identified that an order was certified and shipped to Tennessee Valley Authority on September 26, 2013 without the completion of material testing on the generator brush wires. This CAR was closed on May 22, 2014, without the completion of a root cause evaluation. Subsequently, in

March 2015, ESI fulfilled Energy Northwest PO 00337942 for two voltage regulators for Columbia Generating Station without completing specific testing requirements specified in the PO. The PO required that at least one of the voltage regulators be tested on an actual engine prior to shipment.

- ESI failed to issue a CAR to promptly identify and correct a disparity between their own laboratory results and the contracted laboratory to determine which of the two tests were valid or what caused the different material testing results. ESI issued nonconformance report (NCR) #8983 dated April 3, 2015, to document a nonconforming material (carbon content) in the commercial grade dedication of a spring seat for an emergency diesel generator air start motor. Material analyses performed by ESI's on-site laboratory yielded low out-of-specification results. As a result, ESI contracted an outside laboratory to re-perform the analysis. The same sample tested high out-of-specification. The NCR evaluation stated that the Chemical Test Report received from the outside laboratory was acceptable. ESI accepted the material because, even though carbon was slightly high, all other chemical elements compositions were correct. However, ESI failed to consider the effects of out-of specification carbon on the properties of the alloy, or how a failure of the spring seat would impact the ability of the air start motor to perform its safety-related function in accordance with the dedication process.

**ESI Reply:** The first item above has been addressed in part by revision of ESI Procedure QCP-301 titled "CONTROL OF NONCONFORMING CONDITIONS AND CORRECTIVE ACTIONS AND 10CFR21 REPORTABLE CONDITIONS". The revision was made on July 7 to include a Corrective Action checklist which is to be completed when a Corrective Action is closed to ensure that the problem is adequately identified, the determination of severity is correct and that if a separate root cause analysis is required that it as well as any potential Part 21 report are generated. In addition to the additional steps required by procedure, ESI has established a CAR, NCR Warranty review meeting that currently occurs on a weekly basis. The topics of discussion are any new items issued as well as progress and responsible persons for open issues. Finally the Manager, Quality Assurance, reports to management in a formal management meeting the status of open Corrective Actions on a monthly basis providing updates on recently closed corrective actions as well as newly opened corrective actions and the status of items that remain open. ESI is currently in the process of reviewing all Corrective Actions for the past three years to ensure that the issues identified above are addressed. The above items are also being addressed through ESI Corrective Action 2015-19 This Corrective Action has already resulted in some changes to ESI's procedures and as additional research is performed there may be additional changes deemed appropriate to strengthen the program.

The cause of the above issues can be attributed to inadequate checks and balances. This has been addressed by the review checklist and also the weekly review meetings described above.

To address the Energy Northwest incident above, ESI opened Corrective Action 2015-20. It should be pointed out that the PO from Energy Northwest stated that "IT IS REQUIRED THAT ALL THE VOLTAGE REGULATORS BE BENCHED TESTED AFTER REPAIR, AND REQUESTED THAT AT LEAST ONE VOLTAGE REGULATOR BE FUNCTIONALLY TESTED ON A DIESEL GENERATOR SET IF AT ALL POSSIBLE." ESI informed Energy Northwest that it would not be possible to test the voltage regulator on a diesel generator in an e-mail that also contained the cost of repairs. Energy Northwest issued a change order to revise the price for the repairs, however, did not remove the testing requirement statement. To determine the extent of condition, ESI sampled 50 of 256 closed repair and return orders from a three year period to determine if there were additional instances of this type of occurrence. The sampling revealed that there were no other instances of customer PO requirements not being met. Additionally ESI has re-trained the Customer Service Personnel to be sure that they are aware of the necessity of meeting all customer requirements and also to be sure that those customer requirements are clearly stated and not left open to interpretation.

To address NCR #8983 ESI has opened Corrective Action 2015-22. The result of the analysis of cause has been stated as; "The original out of tolerance condition was lacking, though the engineer performing the evaluation gave consideration to the impact on the part, he neglected to fully document those considerations." ESI is in the process of revising our procedure PSP-303 (In-House Material Testing) to provide guidance to instruct engineers on considerations that need to be made when engineering evaluation is required.

It is ESI's intent to have the four indicated Corrective Actions, 2015-19 through 2015-22, associated with both nonconformances above, closed by September 18<sup>th</sup> 2015.

Sincerely,  
Engine Systems, Inc.



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