Part 21 (PAR) Event # 48564

Rep Org: ENGINE SYSTEMS, INC		**Notification Date / Time:** 12/06/2012 11:01	(EST)
Supplier: ENGINE SYSTEMS, INC		**Event Date / Time:** 12/06/2012	(EST)
		Last Modification: 12/06/2012	
Region: 1		**Docket #:**	
City: ROCKY MOUNT		**Agreement State:** Yes	
County:		**License #:**	
State: NC			
NRC Notified by: TOM HORNER	**Notifications:**	ALAN BLAMEY	R2DO
HQ Ops Officer: BILL HUFFMAN		RICK DEESE	R4DO
Emergency Class: NON EMERGENCY		PART 21 GROUP	E-MAIL
10 CFR Section:			
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE			

ESI REFURBISHED EMERGENCY DIESEL GENERATOR CYLINDER HEAD WITH FOREIGN MATERIAL IN INTAKE PORT

The following information is a summary of a Part 21 Report from Engine Systems, Inc. (ESI) concerning a condition reportable under 10 CFR 21.

ESI reports that they received notification about foreign material found within a refurbished cylinder head supplied to the Cooper Nuclear Station by ESI. Specifically, Cooper discovered two hand tools (picks) within the intake port on the cylinder head. The tools were discovered by Cooper after installation of the head onto the diesel engine and while attempting to adjust the intake valve backlash.

ESI supplied the refurbished cylinder head for a Cooper-Bessemer KSV engine to Cooper Nuclear Station (Part Number 13-KSV-11-6, Serial Number 6K2201) in August 2010. The refurbishment activity was performed at the Cameron Compression (OEM) facility in Casper, Wyoming.

The most likely scenario is that the cylinder head was oriented with the inlet port facing up during installation of the valve spring keeper seals. After installation of the seals, the tools were placed on top of the cylinder head. It is presumed the tools fell into the inlet port and settled in the intake valve seating area. The tools are small in size (approximately 5 inches long with a 5/8 inch handle) and were not visible from the exterior of the head.

ESI considers this occurrence to be an isolated incident and that Cooper Nuclear Station is the only affected customer. Previous shipments of similar cylinder heads are not suspect.

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IE19
NRR

ENGINE SYSTEMS, INC.
175 Freight Road
Rocky Mount, NC 27804
Telephone: 252/977-2720
Fax: 252/446-1134

TELEFAX

Date:	December 6, 2012
Company:	NRC Operations Center
Fax Number:	301/816-5151
Verification No.:	301/816-5100
Reference:	Report No. 10CFR21-0107, Rev. 0
From:	Tom Horner
Page:	1 of 5

Dear Sir:

Following this cover is a copy of our report 10CFR21-0107, Rev. 0, for a 10CFR21 reportable notification on a KSV cylinder head with foreign material in intake port for Nebraska Public Power District – Cooper Nuclear Station, P/N 13-KSV-11-6-RR.

A copy of this report will be mailed to the NRC Document Control Desk and to our affected nuclear customer.

Should you have questions, please let us know.

Sincerely,

ENGINE SYSTEMS, INC.

Tom Horner
Quality Assurance Manager

ENGINE SYSTEMS, INC.
175 Freight Road, Rocky Mount, NC 27804
Telephone: 252/977-2720
Fax: 252/446-1134

Report No. **10CFR21-0107**
Rev. 0: 12/06/12

10CFR21 REPORTING OF DEFECTS AND NON-COMPLIANCE

COMPONENT: KSV Cylinder Head with Foreign Material in Intake Port
Part Number 13-KSV-11-6-RR

SYSTEM: Emergency Diesel Generator

CONCLUSION: Reportable in Accordance With 10CFR21

Prepared By: _____ Date: 12/6/12
Engineering Manager

Reviewed By: _____ Date: 12-6-12
Quality Assurance Manager

Report No. 10CFR21-0107

Record of Revisions
Page: 1 of 1

REV	DATE	PAGE	DESCRIPTION
0	12/06/12		Initial issue.

Report No. 10CFR21-0107
Revision: 0
Date: 12/06/12
Page: 1 of 2

Component:

KSV Cylinder Head with Foreign Material in Intake Port, part number 13-KSV-11-6-RR

Summary:

Engine Systems Inc. (ESI) began a 10CFR21 evaluation on 10/23/2012 after receiving notification from NPPD-Cooper Station relative to foreign material (FM) found within a refurbished cylinder head. NPPD discovered two (2) small hand tools (picks) within the intake port on a cylinder head that was refurbished by ESI. After installation of the head into the diesel engine and while attempting to adjust the intake valve lash, the tools were discovered (reference Entergy condition report CR-CNS-2012-07786).

The evaluation was concluded on 12/5/2012 and it was determined that this issue is a reportable defect as defined by 10CFR21. The tools prevented one of the intake valves from closing completely. This condition could have impacted operability of the diesel generator and prevented it from performing its safety related function.

Discussion:

ESI supplied a refurbished cylinder head for a Cooper-Bessemer KSV diesel engine to the Cooper Nuclear Station (part number 13-KSV-11-6, serial number 6K2201) in August 2010. On October 22, 2012, the customer was installing the cylinder head and was not able to properly adjust intake valve lash. Upon further inspection, two (2) small tools were discovered in the intake port of the cylinder head. The tools were between one of the intake valves and the valve seat, thereby preventing the intake valve from closing completely.

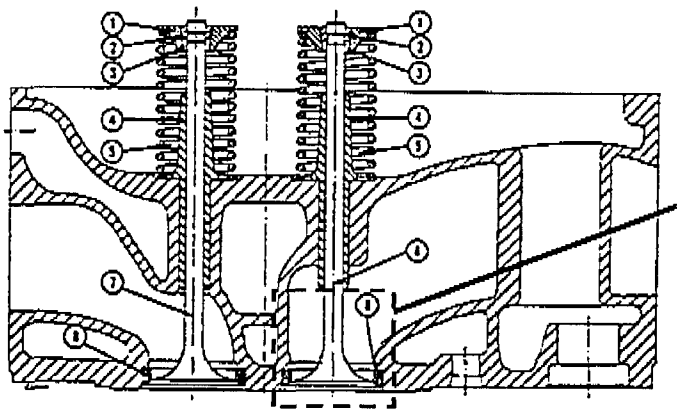
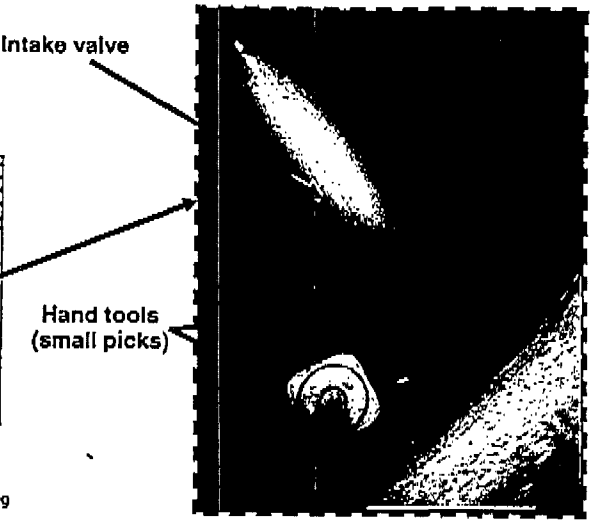


FIGURE 1: KSV CYLINDER HEAD CROSS SECTION



LOCATION OF HAND TOOLS

The picks found within the cylinder head are the type used to position the valve spring keeper seals (item 2 of Figure 1) during assembly of the valves within the head. The refurbishment activity was performed at the OEM's facility (Cameron Compression) in Casper, Wyoming. The most likely scenario is that the cylinder head was oriented with the inlet port facing up during installation of the valve spring keeper seals. After installation of the seals, the tools were placed on top of the cylinder head (in this case, the inlet port surface). It is presumed the tools fell into the inlet port and settled near the intake valve seating area. Because of the geometry of the intake port, the tools remained in this area after the head was rotated. The tools are small in size (approx. 5" long with 5/8" wide handles) and therefore they remained within the intake port cavity and were not visible from the exterior of the head.

Impact on Operability:

The presence of the tools in the intake port interfered with operation of an intake valve; specifically the valve was not allowed to close completely. This would have reduced the available compression in the affected cylinder thereby reducing the load carrying capability of the emergency diesel generator. If the tools were to have become dislodged during engine operation, it is possible that cylinder components could have been damaged, resulting in engine shutdown. In either scenario, the ability of the diesel generator to perform its safety related function could have been impacted.

Affected Users:

This occurrence is considered to be an isolated incident and therefore Cooper Nuclear Station is the only affected customer. Previous shipments of similar cylinder heads are not suspect.

Corrective Action:

This condition was discovered during installation of the cylinder head and was subsequently corrected by the customer prior to completing the diesel generator maintenance activity; therefore, no further action is required by the customer.

To prevent recurrence of this issue, ESI has added a step to the dedication process to perform an inspection of the cylinder head intake and exhaust ports upon completion of the assembly process and just prior to covering the ports for shipment.