

Mechanical Engineering Update

Non-reporting of failed ExDES components

Background

Any overhaul, Code D, or repair of the explosion protected (Ex) properties of a diesel engine system (DES) is required to be carried out by a recognised service facility (RSF) See Legislation Update LU10-01.

Mine Safety is currently auditing all RSF's and has identified that some components that form part of the Ex properties of the DES have failed testing. This means they may have been in operation at an underground coal mine in a non-explosion protected state.

Clause 56(1)(m) of the *CMHS Regulation 2006* imposes an obligation on the coal mine 'operator' to report all 'in-service failures of explosion protected characteristics of explosion –protected plant', see [Safety Bulletin SB08-05](#). These failed components at RSF's are not being appropriately reported.

Recognised service facility audits

Part of the RSF auditing process is to undertake the witnessing of testing and/or inspections of various DES components. During these audits, it has been identified that some service providers, whether they are an RSF or other, may not be notifying the operator of the failure of these components in a manner that brings it to the attention of the operator.

Generally these failed components have included:

1. Service exchange turbo chargers.
2. Service exchange heat sensors.
3. Service exchange strangler valves.
4. Machined components that showed tracking of gases.
5. Other service exchange components relating to the ExDES.

Requirements

1. All service exchange components are considered as being 'overhauled'. This means the overhaul is required to be done by an RSF, see LU10-01. This does not prevent an RSF subcontracting overhaul work in accordance with the RSF quality systems.
2. All service exchange/overhauled components are required to be:
 - a. Calibrated, if the component is a sensor, with a copy of the calibration or verification certificate being supplied to the end user and a copy maintained in the safety file. See clause 3.5.3 of AS/NZS 3584.3:2012.
 - b. Appropriately marked, where possible. Marking should identify the repairer, test report and RSF number. See conditions of RSF recognition and Section 5 of AS/NZS 3584.3:2012.

3. RSF facilities should carry out a pre-Code D inspection of all Ex components. The results of this inspection should be provided as part of the Code D documentation. The objective is for there to be no failed Ex components between each code D.
4. Where a component has failed testing and/or inspection in situ - or when pulled apart - the RSF is required to notify the owner of the failure in writing. Subsequently, if the owner is not a mine operator and the DES was recently in service in underground parts of a coal mine, the owner is required to notify the mine operator in writing.
5. Where a mine operator is notified of a failed component, the operator is required to complete a coal notification incident form (CNIF) and DES ancillary form, reporting the failed DES component to their local Mine Safety office, see [Safety Bulletin SB08-05](#).
6. Where in-service components are replaced with new components, the new components need to be verified by the design registration holder as conforming to the design registration specifications.
7. Where components are replaced with service exchange components, as part of the mine's periodic maintenance system, these replaced components should be appropriately tested and examined in situ, to verify they are functioning as intended.

For example; some service exchange temperature sensors have failed in service due to poor fitting of the nipple, which has bottomed out on the sensor's actuation spindle, preventing movement. The benefit of an in situ test is that it validates the safety function in the control circuit, not only the sensor function as done on a test bench.
8. At the completion of the Code D, all components, including sensors, should be tested in situ in the DES for final validation of functionality.
9. Reports of overhauled components are required to be included as part of Code D documentation.
10. Plant safety files are required to be kept for the life of the DES. All testing and inspection results are required to be documented in the plant safety file. See clause 2.4 of AS/NZS 3584.3:2012.
11. Where a new item of design registered ExDES is being supplied to the industry all safety systems must be tested prior to delivery to ensure they are operating as intended. See conditions of design registration and AS/NZS 3584.2:2008. Testing should be in situ.

Signed



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NOTE: Please ensure all relevant mechanical people in your organisation receive a copy of this update and are informed of its content. This update should be processed in a systematic manner through the mine's information and communication process.

DISCLAIMER

The information contained in this publication is based on knowledge and understanding at the time of writing. (September 2013) However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date and to check the currency of the information with the appropriate officer of the NSW Department of Trade and Investment, Regional Infrastructure and Services or the user's independent advisor.