

ENGINEERING BULLETIN

Ref Document No.	EB16004	Issue No.	1
Subject	Service life of MONEx equipment		
Release Date	22 nd September 2016		

Purpose – Advise COALTRAM® owners/operators of the recommended service life of MONEx equipment.

Applicability – All in service COALTRAM® model CT108, CT10, CT10LP and CT13.

Background

AS/NZS 2290.1 recommends that intrinsically safe equipment installed on diesel plant be overhauled to AS/NZS 3800 every 4~6 years. Further, the overhaul period “should be defined using OEM supplied information, service history or other means, or a combination thereof.”

The MONEx equipment installed on COALTRAM® machines has been in service for a total duration across the fleet of approximately 700,000 operating hours. Over this time, various information has been gathered that supports the potential extension of the overhaul period beyond 6years. Based on the information available, PPK recommends that the service life of the MONEx equipment can be extended to the next Code D after the initial 6year period, subject to inspection of the equipment by PPK.

PPK is continuing to collect relevant data on the MONEx equipment over time. PPK will reassess this recommendation for a potential further increase in the service life as more information becomes available.

Investigations/Findings

Key Observations

The intrinsically safe protection methods used on MONEx equipment are Ex 'i', Ex 'e' and Ex 'm' per the following table (note, all Ex 'i' equipment, with the exception of the MONEx display, is also encapsulated):

Equipment	Protection Method	Encapsulated
Pressure sensors, temperature sensors, Speed sensors, float level sensors, throttle pedal, Piezo valves	Ex 'i'	Yes
Display	Ex 'i'	No
Injector coils, HEUI coil	Ex 'm'	Yes
Power Manager, Battery, ECUEx	Ex 'i', Ex 'e'	Yes

During the service life of the COALTRAM® machines, a number of MONEx items have been returned to PPK for functional assessment. A representative sample of these items have been inspected for their hazardous area protection. Across the range of MONEx equipment, PPK has found **no** evidence that any of the protection methods (Ex 'i', Ex 'e', Ex 'm') have been invalidated through operation in service.

For equipment certified as Ex 'i', the hazardous area protection is generally achieved via the use of three (3) series Zener diodes, as well as other passive components (e.g. resistors) internal to the device. In each case, the Zener diodes and resistors have measured within the tolerance of their initial manufacture.

Furthermore, where the Ex 'i' components are encapsulated, there have been **no** observed signs of cracking, liqui-fication or loss of integrity of the encapsulation.

System Design

In addition to the above, there are a number of MONEx system design elements that support the long-term integrity of the hazardous area protection:

- 1) The MONEx system consists of a wiring loom with fixed length branches that promotes correct connections with sensors and field devices.
- 2) MONEx devices have only ever been sold for use on COALTRAM® machines. They will never appear on any other equipment.
- 3) Keyed plugs and sockets are unlikely to be connected with other equipment types.
- 4) All intrinsically safe parameters are the same between the MONEx ECUEX, Power Manager and field devices. Erroneous connections will not breach intrinsic safety on MONEx sensors and supplying devices (ECU and Power Manager).
- 5) The MONEx power manager and ECUEX have U_i and U_o parameters nominated for the same inputs/outputs. This indicates that they can withstand incorrect connections within the IS device network.
- 6) All MONEx equipment is rated to operate within a wide ambient temperature range for sensors.

Recommendations

Based on the inspections and assessments conducted to date, PPK recommends that the service life of MONEx equipment can be extended by one (1) Code D interval beyond the 6year period recommended in AS2290.1, subject to inspection of the equipment by PPK.

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