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CONDITION MONITORING EXCELLENCE

INTRODUCTION

A large fleet operator experienced 14 IFSDs (In Flight Shut Down) involving a common oil wetted component. At the time the operator was not undertaking routine oil, filter and chip analysis. The non-engine repair cost for each event was approximately \$1.5M. The engine repair cost was covered under a PBH program and the PBH provider paid approximately \$2.5M per event. As a result the operator instigated an oil, filter and chip analysis program with Jet-Care.

ACTION

Within six months five engines were identified with alloys indicating component distress, a sixth engine with a different root cause was also discovered following the implementation of the sampling program. The engines were inspected at an intermediate shop in the U.S. therefore avoiding overseas shipment for repair. Due to the proactive approach the repair turn time was 20 days as opposed to 60 days for a post IFSD repair. An inspection confirmed abnormal condition of the component. No further IFSDs have occurred.

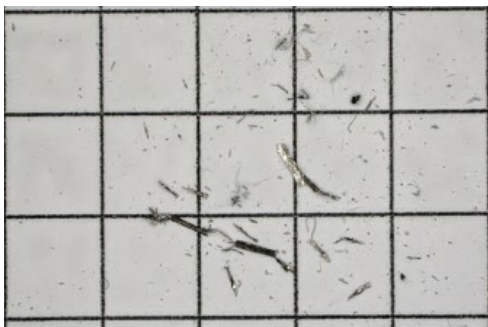
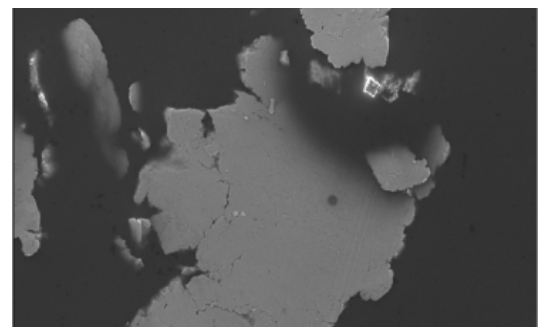


Image of particles removed from chip detector aid analysis of material to provide appropriate recommendation.

Images produced in Jet-Care laboratory using Scanning Electron Microscope (SEM) showing analysis of debris from chip detector



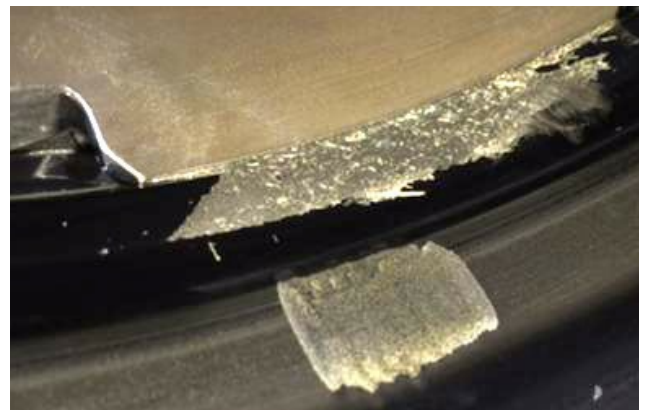
M50 spalled bearing material visible. Shiny appearance indicates recent release.

CONCLUSION

Regular oil, filter and chip analysis is proven to be an effective means of identifying certain failure modes. On this occasion the operator made savings of \$7.5M and the PBH provider \$12M with potential savings of \$54.6M if the program had been implemented prior to first failure.

A mitigation program can help to protect a fleet from:

- IFSD, therefore protecting operator reputation and safety
 - Operational inconvenience
 - Unplanned engine removals
- Improve spare engine availability due to reduced repair time
- Reduce operating costs due to proactive removals
 - Cost containment for the OEM or PBH provider.



The damaged area shows secondary wear which is as a result of primary failure of the component. The identification, form, condition, size and quantity of the primary and secondary wear alloys provide the information necessary to recommend appropriate action.

(Photo supplied by operator)