

## BAE 146/RJ Open Reports

ASR No 625/05/146	Regn: G CFAH	Date: 04/07/05
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Risk: MEDIUM
Route : NCE - STN
Title:

### BOTH FLIGHT CREW AFFECTED BY SORE THROATS AND OTHER SYMPOMS AFTER FLIGHT

#### Event Description:

After arrival of a non revenue positioning flight to a Contracted Maintenance Facility following an earlier loss of Engine 2 oil contents recorded under 624/05/146, both Flight Crew had sore throats, with one of the Flight Crew suffering minor headache. Medical assistance was unnecessary. These symptoms are suspected by the reporter to have been the result of contamination of the air conditioning system with engine oil. Reporter has since advised that both Flight Crew have subsequently suffered from additional related symptoms, which, it is understood, are consistent with exposure to organophosphates.

#### Controlling Action:

Nil

#### Investigation:

Previous flight reported loss of #2 engine oil while aircraft was on descent. On inspection at FSC by engineering staff the exterior of the engine was found with heavy oil contamination. Three-engine ferry flight performed with #2 engine not operable and therefore no engine bleeds from that source. Last reported event noted on 11/11/04 for a reported smell on the flight deck that occurred after selecting from APU to engine supply and which self cleared in flight. No further report noted post the engine change that occurred after the 3 engine positioning flight to STN. Both pilots have suffered from symptoms including, ulcerated throat, skin rashes, headaches, stomach upsets, nausea, numb, tingling fingers. These are apparently consistent with exposure to organophosphates for approximately 14 days after incident. Both crews have now made a full recovery and returned to flying. SIL 21-045 issued by BAE Nov 04 (issue 4) and covers air quality troubleshooting and advice. Contamination check of the aircraft is carried out in line with the above SIL before 3-engine ferry The only mod embodied on the RJ fleet is the improved duct clamp however this is not directly associated with oil ingress into the air conditioning system. Smells and irritants from burning organic compounds from within the engines are known to produce harmful volatile organic contaminants. Oil leaks within the engine/APU have been noted in the past to be the major cause of the reported contamination. Honeywell are introducing the changes to the bearing seals 1, 2 & 9 and as engines go through the workshop and the areas are opened up, the new bearings will be fitted. All the available modifications to the RJ APU have been carried out with the exception of a revised drain-pipe (49-54-36190A) on G-BXAS, which was not fitted when BA CitiFlyer carried out the retrofit program to their early aircraft. BAe are developing 2 new types of cabin and flight deck filters. A HEPA filter has been developed and is to be on trial with FlyBe later this year to set the time between filter replacement. Although HEPA filters are more effective than the present filters introduced it is advised that these will not remove all harmful volatile organic contaminants (VOC). Therefore BAe are offering a newly patented close "close coupled field technology filter with high air flow" for the cabin and flight deck which will eliminate VOC's, destroys harmful chemicals, bacteria, viruses & mould spores all of which are known to have a health effect on crew and passengers. BACX have shown an interest in the new CCFTF unit and it is hoped to carry out a trial of the unit when it is available in the 4th quarter of 2005. As seen above the completion of the modifications to the engines and a revised filter if both are fully introduced will take some time to complete and a time scale is not available at this time.

Meeting set up with Building Research Establishment on the 8<sup>th</sup> Sept to discuss air quality on the RJ.

#### Closure Statement:

Nil

FTSG Review Date: N/A

Recommendation to FOSB: OPEN      Date: 23 Aug 05

FOSB Comments:

1. FM T&CT to ask ESB to review the procedure of releasing an aircraft to operation following oil contamination of the air conditioning. Suggestion that filters in the contaminated conditioning pack require replacement or that the pack is isolated. BA Powerplant are available for consultaion if required as there have been problems with conditioning air contamination on the 757 Fleet.  
2. FM RJ to progress the introduction of conditioning filters at FTR.

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1. ESB reviewed this event. TFM have issued TI 146-21-02 which defines the inspection process after a reported cabin air quality defect, plus TI 146-72-05 which advises recommendations for 3 engine ferry flights and isolation of air conditioning packs. The recommendations were deemed necessary for the 146/RJ fleets only.  
2. Waiting for air quality sampling equipment from BAE. BAE do not believe that the answer to the problem lies with filters. They feel that an engine seal change is the answer and are conducting trials. The new seals have not yet been used by our powerplant shop. Investigations as to why this is so are ongoing. However, it is felt that fitting of the air quality sampling equipment is still valid as this may detect a failing seal before it is apparent to the crew.  
Blood tests specified in the BAE SIL are not available in the UK. BALPA are investigating and will be supported by the Company.

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