

Grant Robinson

Subject: FW: S-76D Engine Shutdown - Request to Enlarge Lower Plenum Drain Hole

From: McConnell, DAVE P [dave.p.mcconnell@lmco.com]
Sent: Tuesday, July 18, 2017 3:12 PM
To: Grant Robinson
Subject: S-76D Engine Shutdown - Request to Enlarge Lower Plenum Drain Hole

Grant

Following is the CSE response to my FTR reporting two engine flameouts at TAS, and requesting modification of the engine lower plenum drain hole.

Case Number: C0065241
Customer: Thai Aviation Services Limited
Aircraft S/N: 761060/761063
Aircraft Model: S-76D
ATA: 71
Case Subject: Engine Flameout During Start After Engine Rinse

Problem Description:

Reference
CCS-76-APL-17-0004

TAS report two recent No. 2 engine flameouts on the ground when advancing speed selectors.

A/C S/N 761063 06 MAY 2017 Approx 1700 Local A/C TT 621.9 Eng S/N PCE-BM0114
A/C S/N 761060 25 JUN 2017 Approx 1815 Local A/C TT 977.0 Eng S/N PCE-BM0117

Neither event resulted in cockpit WCA indications or EPAC status faults.

In the case of the D63 shutdown the crew initially believed that they had induced it by employing the legacy practice of slowly “walking” the SSLs forward from the Ground Idle position. However, upon further review this explanation was discounted. It was determined that the flameout occurred with the SSLs close to the FLY position, and well away from the GI position.

In the case of D60 troubleshooters inspected the engine and engine control systems with no anomalies noted. The A/C was returned to service with no further anomalies.

Further review of the two cases revealed that both flameouts had occurred during start for a drying run after accomplishing an engine rinse.

TAS engineers, suspecting that standing water in the plenum could be a contributing factor inspected all A/C in the fleet and verified the presence on all engines of a drain hole at the six o'clock position of each lower plenum, as called out in Dwg 76302-77005.

Although each engine was found to have a drain hole, it was noted that the hole is extremely small, to the point that it is hard to see by direct visual observation into the plenum through the access door. It is easier to spot by looking into the plenum while shining a flashlight upwards from beneath. The Dwg does not specify exact drain hole location or diameter.

During the fleet check when inspecting the No. 2 engine of D60 maintainers found approximately 0.50 inches of standing water in the plenum about 20 minutes after engine shutdown in heavy rain. Water was observed draining from the drain hole, but at the rate of only about 1 drop per second. The No. 1 engine plenum had no standing water.

A subsequent check for standing water in the plenum of the same engine after an engine rinse of 30-seconds motoring time revealed a standing puddle 8 in. X 6 in. x .375 inch deep. Volume was estimated at 160 ml. One hour after the engine rinse approximately 80 ml remained in the plenum.

TAS asks if the plenum drain hole can be made larger to facilitate efficient drainage. EoM

Problem Resolution:

Sikorsky engineering states that the drain hole cannot be enlarged. Enlargement of the hole has not been approved and is limited for fire certification.

FYI - Yes, residual water can cause a flameout if ingested in a sudden gulp at ground idle power where the bypass flow to separate water is weak, and engine has low inlet flow.

This email notification is provided as the case has been reviewed and does not contain technical data in the resolution.

David P. McConnell

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