

Senior Design Project Description for FALL 2016

Project Title: OBOGS Water Removal System (NAV_OBOGS)

Supporter: Navair

Supporter Technical Representative: ASSIGNED

Faculty Mentor: ASSIGNED TBD (check one)

Single Team Dual Team (check one)

Personnel (EN/ET): 1 E, Cp, Cv, 4 M, SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

Description of Project:

The F-18 utilizes an On Board Oxygen Generating System (OBOGS) to provide breathing oxygen to the aircrew during flight. The OBOGS receives engine bleed air from the Environmental Control System (ECS). The OBOGS Concentrator uses a molecular sieve system to strip nitrogen from the engine bleed air, dumping the nitrogen overboard and passing the remaining oxygen downstream to the aircrew. The engine bleed air supplied by the ECS can contain significant moisture, which is known to degrade the efficiency of the OBOGS Concentrator. A stand alone water removal system could be used to prevent moisture contamination of the OBOGS Concentrator.

Initial Project Requirements (e.g. weight, size, etc.):

The water removal system would need to be lightweight (less than 10 lbs) and compact (less than 12x12x15 inches) so as to fit on the aircraft. The system will need to have inlet and outlet air duct interface connections that are standard number 8 (1/2 inch diameter) AN fittings. The system can tie into 28 VDC aircraft power.

The system must accept inlet air at the following conditions:

Moisture: 100% Humidity (saturated air)

Pressure: 8 to 250 psig

Temperature: -15 to 250 degrees F

Flow at 80 F: Max of 60 lb/hr at 25 psig

Max of 180 lb/hr at 250 psig

Proof Press: Static proof pressure of 280 psig with no damage

The system should produce low moisture air at the following outlet parameters:

Moisture: As low as possible

Pressure: 8 to 60 psig

Temperature: 50 to 150 degrees F

Flow at Temp: 1.5 to 3 lb/min at pressure

Removed moisture will be ported overboard via 1/4 inch tubing. Corrosion resistance should be a priority due to high moisture environment.



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Expected Deliverables/Results:

The deliverables for this project include:

- Model of the physical configuration for the system
- A proof of concept prototype of the system
- All related design/development notes

List here any specific skills or knowledge needed or suggested (If none please state none):

Project members must be US Citizens