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C-27 SPARTAN MODIFICATION

LAVATORY WET FLOOR

PACIFIC AEROTECH PTY LTD

MODIFICATION OVERVIEW

The recirculating toilet system on the C-27J is prone to leaking. Many spills have occurred across the global fleet causing the aqueous solution in the holding tank to leak into the sub-floor structure of the aircraft.

A Composite Wet Floor prevents spills from the toilet and the urinal from leaking into the aircraft structure. The modification will:

- **Save thousands of maintenance hours** across the fleet.
- **Prevent extensive corrosion** to aircraft structure.
- **Save many engineering hours** for related corrosion repairs.
- **Prevent contamination** of underfloor aircraft systems.
- **Increase aircraft availability**.

The C-27J Lavatory Wet Floor is designed and manufactured in Australia.

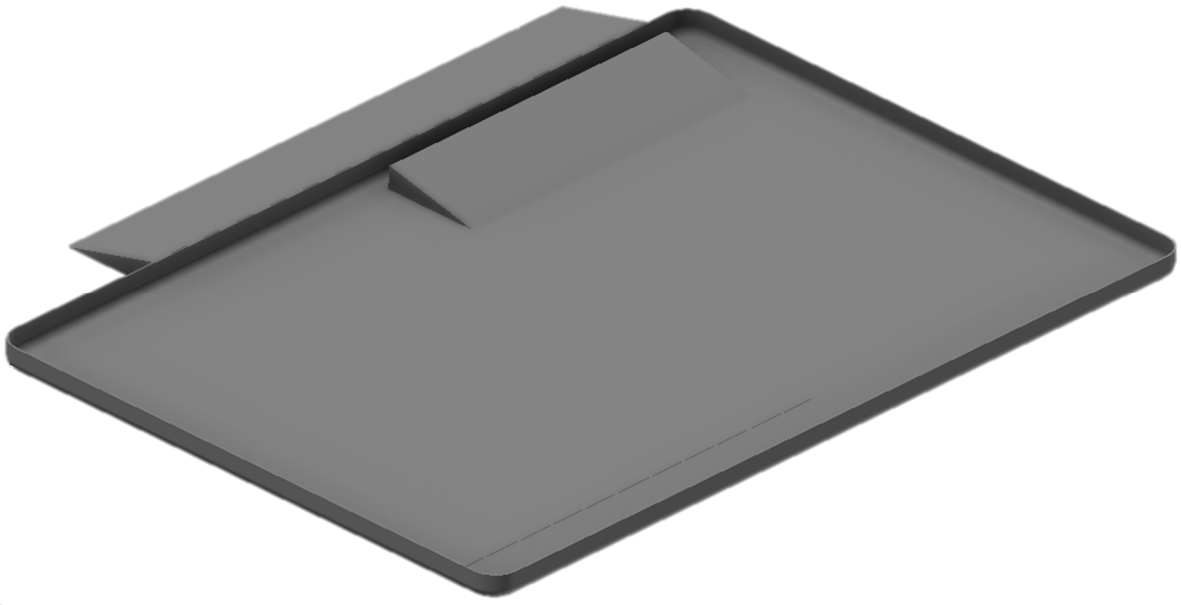

Figure 1: C-27J Lavatory Wet Floor

MAINTENANCE BURDEN

The existing C-27J lavatory floor structure isn't designed to contain a fluid spill. Any spilt fluid (water, urine or Blue-Loo) will seep down into the underfloor structure. This has resulted in Blue-Loo contamination being reported down to the paratroop doors by aircraft operators.

There are many sources of spills in the lavatory area of the C-27J. It contains a urinal, sink and a flushable toilet (with a collection reservoir located underneath the seat).

The contamination is typically concentrated directly under the toilet area and saturates the bleed ducts, cooling ducts and wiring looms.

Extensive corrosion due to the spills has been identified at Frame 9 as well as under the marker beacon, strobe light and antennas installed on the underside of the fuselage.

The spills impose a large maintenance burden on operators, extensive corrosion to the aircraft structure and a reduction in aircraft availability.

Potential causes of spills from the flushable toilet:

- **Over-servicing.** Maintenance error resulting in the addition of too much water to the reservoir tank.
- **Damaged reservoir.** The fibreglass tank is susceptible to cracking if impacted or dropped.
- **Knife valve closed after fitment of tank.** Maintenance error resulting in fluid bypassing the reservoir tank.
- **Knife valve open during removal.** Maintenance error resulting in spills.
- **Mounting screws of toilet reservoir not engaging.** This results in the tank moving during flight causing spills.
- **Mounting rails not engaged properly.** Maintenance error resulting in the tank not sealing against the toilet bowl.

Due to the nature of the lavatory area, other spills of urine, water or Blue-Loo are inevitable over the life of the fleet. This will result in a significant maintenance burden, engineering effort and extensive corrosion to the
airframe if a preventative solution is not implemented.

SOLUTION: WET FLOOR

A composite wet floor installed in the lavatory to contain spills and prevent ingress into the underfloor structure.

Wet Floor Design
The wet floor is situated on top of the existing lavatory floor and has the following features:

- The footprint of the floor encompasses the toilet and urinal.
- A lip (25mm approximately) is built up on all sides to prevent any spilt fluids from escaping during flight manoeuvres.
- The trip hazard created by the lip at the entrance of the lavatory is mitigated by ramps built up on either side of it.
- On three sides a “Y” seal is installed to raise the height of the lip and to ensure a good fit on installation. This prevents fluids from penetrating the underfloor.
- The wet floor is restrained by six screws: four existing fasteners that secure the toilet to the lavatory floor and two new locations. This enables easy removal and reinstallation during maintenance.

Materials
The wet floor is constructed from engineered materials purposely designed for aircraft use.

- A woven fibreglass layup is moulded to form the wet floor. This allows for a lightweight, rigid unibody design that conforms to the lavatory floor.
- The fibreglass is completely covered in a waterproof and hardwearing elastomeric coating. The coating is stippled to provide a nonslip surface that has excellent abrasion and impact resistance. The underside is also coated to prevent fretting damage and to reduce vibration
- The “Y” seal profile is custom designed to ensure a leak resistant fit.
- All materials used are fire retardant and comply with the flammability requirements of FAR 25.853.

Aircraft Modification
To accommodate the installation of the wet floor, minor modification of existing lavatory components is required:

- Toilet door height requires trimming to provide clearance to the integral lip in the wet floor.
- Replacement toilet mounting brackets are supplied to accommodate the slight change in height of the floor.
- Waste bin is modified to allow for opening (foot-pedal obstructed by floor).

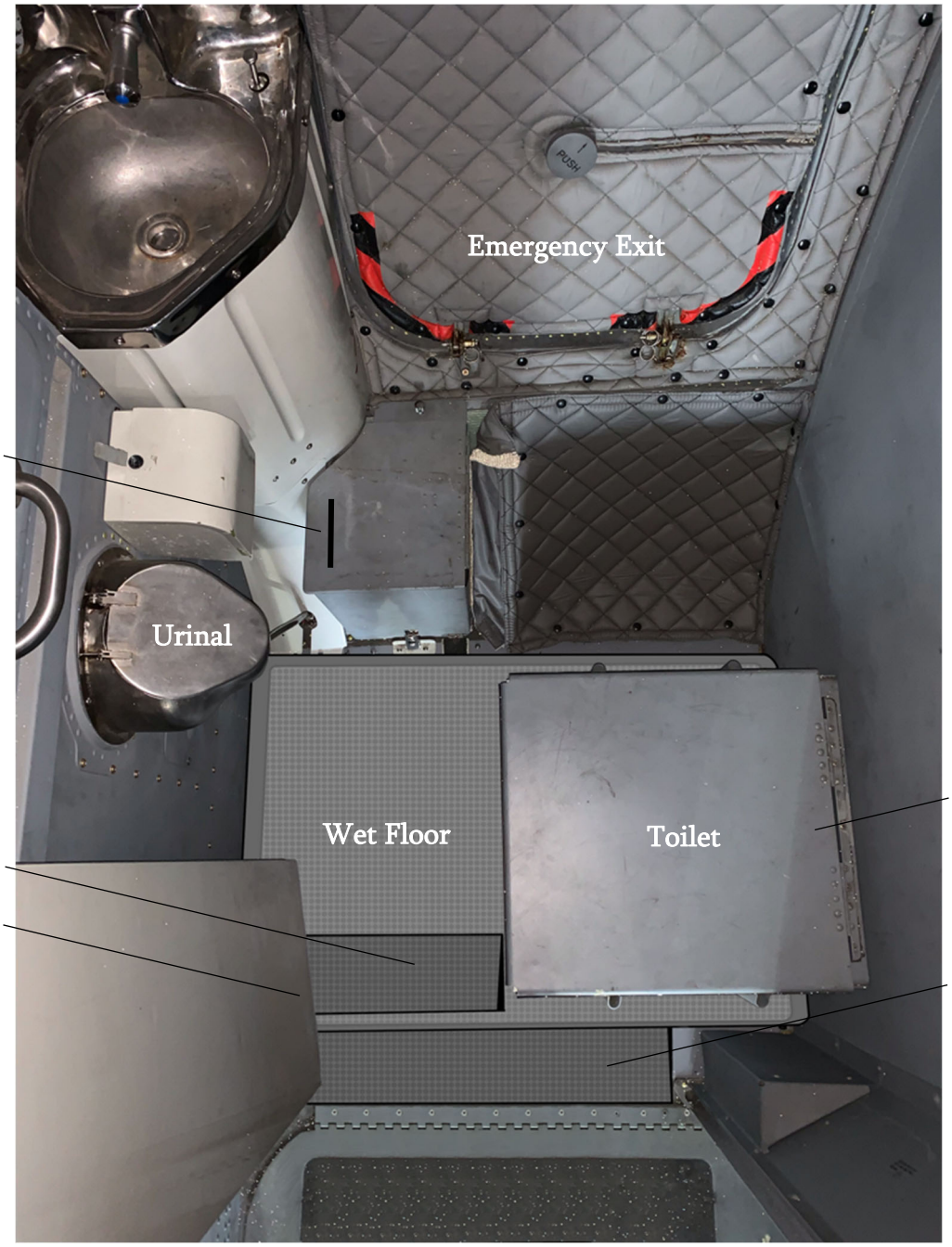

Figure 2: Proposed C-27J Lavatory Wet Floor Installation

MODIFICATION CONTENTS

DOCUMENTS

- SPECIFICATION
- STRUCTURAL SUBSTANTIATION REPORT
- TEST PLAN
- TEST REPORT
- COMPLIANCE REPORT
- C-27J LAVATORY WET FLOOR – STRUCTURAL REPAIR MANUAL
- C-27J LAVATORY WET FLOOR - MODIFICATION ORDER
- PUBLICATION AMENDMENTS
- MODIFICATION DRAWINGS

PARTS

1 x LAVATORY WET FLOOR, COATED

1 x SEAL, LAVATORY WET FLOOR

1 x REAR TOILET BRACKET, MACHINED

4 x REAR TOILET BRACKET, EXTRUSION

HARDWARE

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