



## SAU Operations Briefing Note

Number 10. 12<sup>th</sup>. July 2006

### State Fleet Aircraft and Call When Needed Aircraft Refuelling Equipment

#### For Information:

During a recent aerial firefighting operation in the Bendigo area a turbine powered fixed wing fire bomber was being "cold" hand refuelled from 200 litre drums at the Bendigo Airport when an occurrence took place.

A ground support crew was conducting the refuelling operation under the supervision of the pilot when the crewmembers experienced significant static electricity discharge during the procedure. The ground support crew immediately ceased the operation and reviewed the procedure and the components used in the refuelling process including the earth bonding requirements.

The review indicated that the procedure employed by the ground crew was correct.

The ground support crew then supplemented the earth bonding process with additional earthing connections and completed the operation with reduced fuel flow through the refuelling pump and hose.

An investigation by the ground support crewmembers revealed that the fuel dispensing hose connected to the refuelling pump was a *non approved hose* type for the refuelling of aircraft. The subject hose is described as "Drum Pump Hose", only suitable for general use with fuels and oils. The hose did not have adequate earthing wire braid within the wall of the hose. The absence of the appropriate earthing wire braid did not allow an earth bond between the pump unit, the hose and the nozzle and the aircraft.

The subject hose was replaced immediately by the pilot when the aircraft returned to the nominated operational base.

An investigation by the SAU has revealed that rubber based refuelling hose used in the process of refuelling aircraft should comply with the following Australian and International standards:

1. **AS 2683—2000 Australian Standard™** Hose and hose assemblies for distribution of petroleum and petroleum products (excepting LPG).
2. **API 1529— 2005 American Petroleum Institute:** Aviation refuelling hose and hose assemblies.
3. **BS 3158 2004 British Standards:** Rubber hoses and hose assemblies for aviation fuel handling Specification.

The approved aviation refuelling hose should have the above Australian and International Standards embossed into the outer layer of the hose and is either marked with yellow bands at 4 metre intervals and can have a distinct yellow corporate marking refer to Figure 3. In addition there are minimum standards and specifications for the connection of hose fittings and securing devices for aircraft refuelling hose. The recommended fittings are male threaded hose tails constructed of either hot stamped brass or stainless steel and are secured to the approved hose by pinned safety clamps of hot stamped aluminium with stainless steel tension pins, refer to Figure 4 next page. Various connectors can be screwed onto the threaded fittings that can attach the approved hose and connectors to the refuelling pump and dispensing nozzle, ie. Camlock fittings.



Figure 1.

Shows on the outer casing of refuelling hose the embossed Australian Standard AS 2683, example is ELAFLEX Type HD-C; AS 2683; API 1529; BS 3158.



Figure 2.

Shows the construction of an approved refuelling hose, example is ELAFLEX Type HD-C; AS 2683; API 1529; BS 3158. (Note embossed Standard upper left.)



Figure 3.

Shows on the outer casing of the refuelling hose, example is Semperit; AS 2683; API 1529; BS 3158. (Note also the yellow bands at intervals.)



Figure 4.

Shows an example of a male threaded hose tail and the approved pinned safety clamps.

Contract State fleet aircraft both rotary and fixed wing, and approved Call When Needed aircraft are required to carry refuelling equipment which complies with aviation standards.

### Actions

- Agency personnel who assist or who are requested to assist in aircraft refuelling operations are strongly advised to inspect and check the status and confirm the standard of the refuelling hose prior to the commencement of all refuelling operations.
- Contract State fleet aircraft both rotary and fixed wing and approved Call When Needed aircraft providers are requested to inspect and confirm the status of their specified refuelling equipment and replace non compliant components.
- Agency personnel and Contract State fleet aircraft and approved Call When Needed aircraft providers are reminded that all refuelling operations are to be conducted in accordance with the provisions of the Air Operations Manual, Aviation Fuel and Aircraft Refuelling Operations.

### References:

Australian Standards Association, American Petroleum Institute, British Standards Association, Liquip International Australia.

If you have any queries in relation to this matter please contact the State Aircraft Unit, telephone 03 94124888.