ANSV AGENZIA NAZIONALE PER LA SICUREZZA DEL VOLO

Ref. **1917 / INV / 443 /5 / 05**
Rome, 6 September 2005

SAFETY RECOMMENDATION

Subject: ATR-72, registration marks TS-LBB. Accident occurred on 6 August 2005 offshore Palermo airport (Sicily - Italy).

To: **EASA – European Aviation Safety Agency**
Executive Director – Mr Patrick Goudou
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c.c. **ENAC – Ente Nazionale per l'Aviazione Civile**
President - Prof. Vito Riggio
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On August 6, 2005, a ATR-72-202, registered in Tunisia as TS-LBB and operated by Tuninter as a non-scheduled flight (TUI 1153) from Bari (Italy) to Djerba (Tunisia), experienced a dual engine failure and ditched offshore Palermo (Sicily - Italy).

Airplane took off from Bari at 12.32 UTC with 39 persons on board (35 passengers, 4 crew). 45 minutes after, while cruising at FL 230, the crew experienced the right engine (n. 2) failure and decided to divert to Palermo Punta Raisi airport with only one engine operating. After 3-4 minutes, during the descent required by the operational condition at 17,000 ft ca, left engine (n. 1) also failed. The crew reported that they attempted to relight the engines with no success. After gliding for about 16 minutes, the aircraft was flown to a ditching procedure at approximately 23 NM North-East offshore from Palermo airport. The aircraft broke into three parts at impacting the sea surface. 15 passengers and 1 flight assistant reported fatal injuries; other occupants reported serious and minor injuries.

The aircraft technical documentation available at this stage of the investigation and the wreckage examination, showed that the Fuel Quantity Indicator (FQI) installed in the cockpit of the ATR-72,

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registration marks TS-LBB, was an Intertechnique P/N 749-158, which is one of those applicable to the ATR-42 model.

The FQI provides the crew with the indication of the weight of the fuel contained in each wing tank. The FQI processes the signal coming from the capacitance probes installed in the tanks with an algorithm typical for each aircraft, depending on tank shape and size, and number of the probes installed.

The wing tanks of the ATR-72 and ATR-42 differ in terms of maximum fuel capacity and shape, as well as number of the probes; as a consequence FQIs for the ATR-72 and for the ATR-42 utilize different algorithms to process the input capacitance signals coming from the tank probes and therefore they are not interchangeable (see manufacturer curves in Annex).

Nevertheless the FQIs for the ATR-72 and ATR-42 have the same dimensions and installation interface; this means that an FQI for the ATR-42 could erroneously be installed on a ATR-72 model and viceversa. The only visible difference between the two FQIs is the indication in small white digits of the maximum fuel quantity per tank, which is “2500” for the ATR-72 and “2250” for the ATR-42.

Fuel Quantity Indicator ATR-42

Fuel Quantity Indicator ATR -72

ANSV conducted extensive refuelling tests in order to quantify and assess the effect of an erroneous FQI installation in terms of fuel quantity indication.
More specifically, for a given fuel quantity in the tanks of an ATR-72, FQI readings of an ATR-72 and ATR-42 model have been recorded.
Test results showed that a FQI for the ATR-42 installed on a ATR-72 introduces a non conservative error (i.e. the indicated values of the fuel quantity is greater than the fuel actually present on board),

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which is linearly increasing with the fuel quantity and not less than 900 kg per tank; this means that with zero fuel on board the FQI ATR-42 readings for each tank is 900 kg (e.g. total fuel on board indicated by the FQI is not less than 1800 kg, see figure in Annex).

Based on the above considerations ANSV, still deeply investigating the occurrence, for the time being recommends that European Aviation Safety Agency:

- should require an ATR-72 and ATR-42 fleet inspection in order to verify the installation of the applicable Fuel Quantity Indicator.

  (In reply refer to: ANSV-6/443-05/1/A/05).

- should consider the possibility to mandate a modification of the Fuel Quantity Indicator installation in order to prevent any incorrect fitting.

  (In reply refer to: ANSV-7/443-05/2/A/05).

Original signed
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ANSV President

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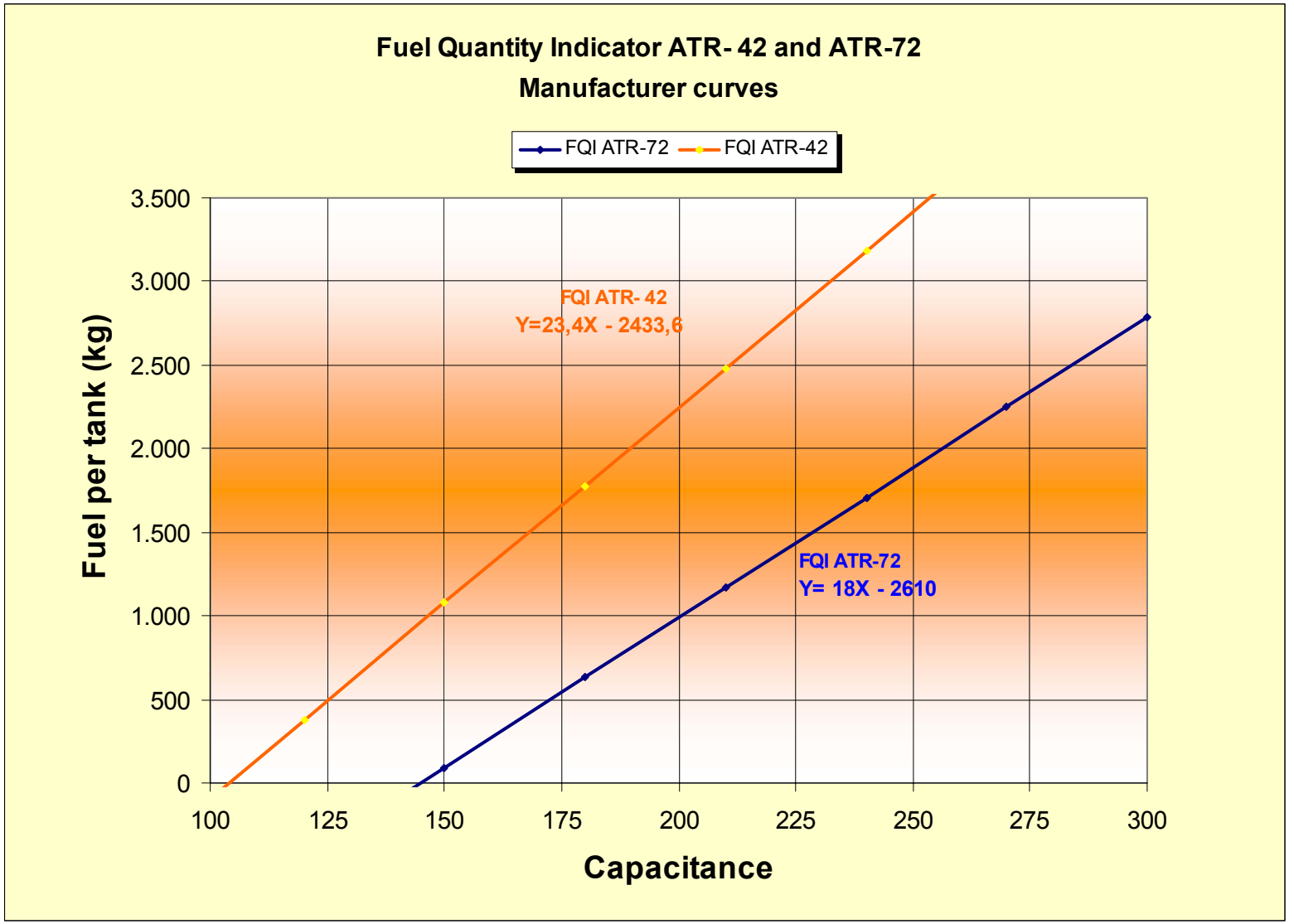

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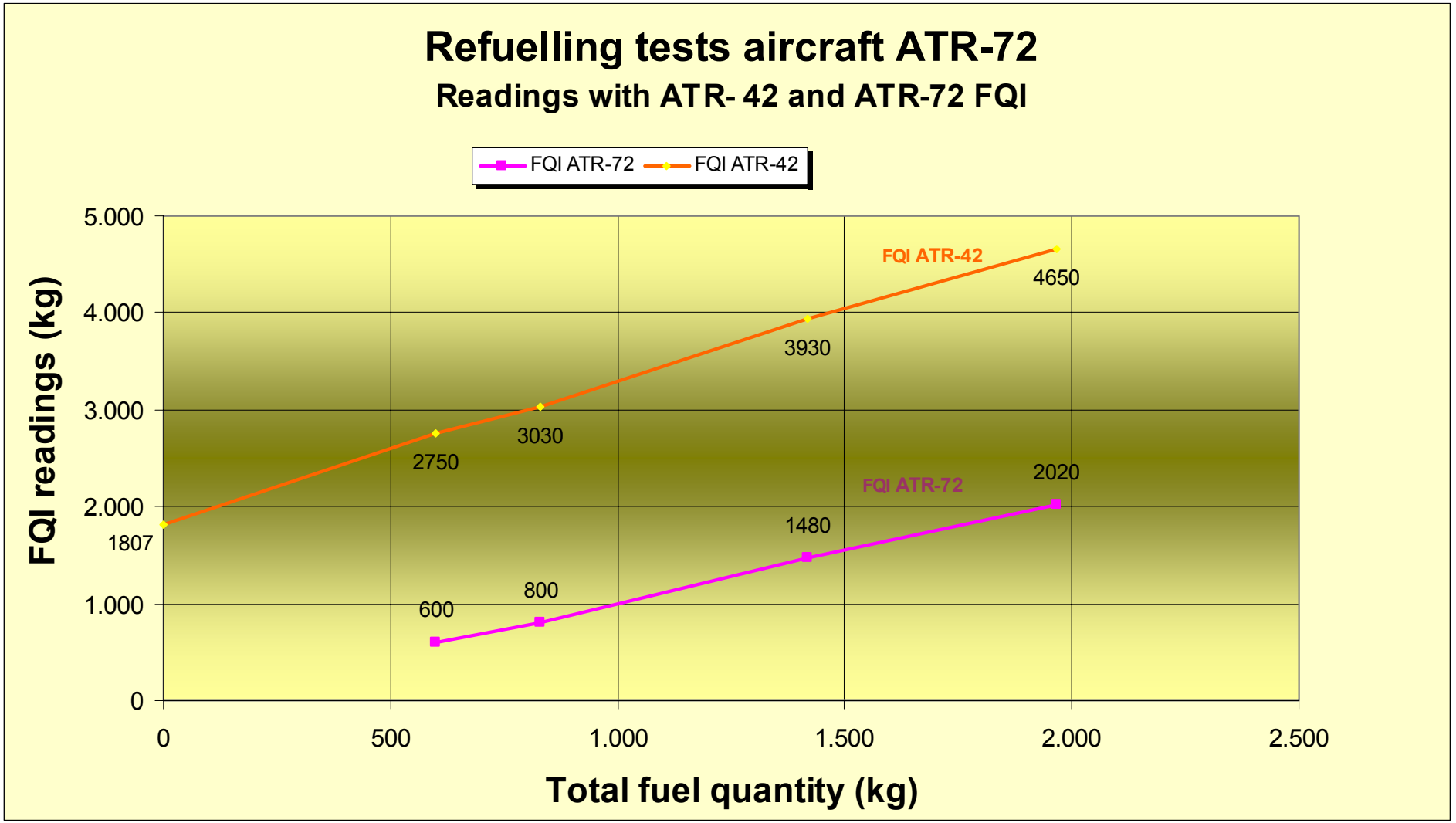

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