

## ICAO changes for minimum and emergency fuel

### Background

The term MINIMUM FUEL has had different connotations globally. In addition, there has been no standard phraseology to be used when it has been determined that an aircraft will infringe upon its final fuel reserves before landing. ICAO has issued amendments to both ICAO Annex 6 Part I and the Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM) (Doc4444) and these will take effect from 15 November 2012.

In summary, there are amendments to the definitions of declaring MINIMUM FUEL and procedures for protecting final fuel reserve. This briefing leaflet sets out those procedures but the reader should note that the full amendment to the ICAO Annex 6, Doc 4444 and the ICAO Doc 9976 Flight Planning and Fuel Management Manual (FPFMM), including example scenarios, can be found at the following links:

- [Adoption of Amendment 36 to Annex 6 Part 1 12 10](#)
- [Procedures for Air Navigations Services Air Traffic Management Flight Planning and Fuel Management Manual](#)

### Amendment 36 to ICAO Annex 6 Part I:

#### Chapter 4

##### ▶ 4.3.7 In-flight fuel management

- ▶ 4.3.7.1 An operator shall establish policies and procedures, approved by the State of the Operator, to ensure that in-flight fuel checks and fuel management are performed.
- ▶ 4.3.7.2 The pilot-in-command shall continually ensure that the amount of usable fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.
  - ▶ 4.3.7.2.1 The pilot-in-command shall request delay information from ATC when unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome.
  - ▶ 4.3.7.2.2 The pilot-in-command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than planned final reserve fuel.

*Note 1.— The declaration of MINIMUM FUEL informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.*

*Note 2.— Guidance on declaring minimum fuel is contained in the Fuel Planning Manual (Doc 9976).*

***It should be noted that Pilots should not expect any form of priority handling as a result of a “MINIMUM FUEL” declaration. ATC will, however, advise the flight crew of any additional expected delays as well as coordinate when transferring control of the aeroplane to ensure other ATC units are aware of the flight’s fuel state.***

- ▶ 4.3.7.2.3 The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY, MAYDAY, MAYDAY, FUEL, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

*Note 1.— The planned final reserve fuel refers to the value calculated in 4.3.6.3 e) 1) or 2) and is the minimum amount of fuel required upon landing at any aerodrome.*

*Note 2.— The words “MAYDAY FUEL” describe the nature of the distress conditions as required in Annex 10, Volume II, 5.3.2.1, b) 3.*

*Note 3.— Guidance on procedures for in-flight fuel management are contained in the Fuel Planning Manual (Doc 9976).*

## Amendment 4 to ICAO PANS ATM (Doc 4444)

The changes in PANS ATM complement those of Annex 6 Part I by providing the appropriate phraseology to be used in a Minimum or Emergency Fuel situation.

### Explanation

These changes can basically be broken down into a 3 step approach whereby the flight crew notifies ATC of the progression of their fuel state when it has been determined by the crew that they are nearing a critical fuel situation. It is important to note that a common element in every scenario is that each time MINIMUM FUEL is declared, the PIC has already committed to land at a specific aerodrome and is concerned that a landing may occur with less than final reserve fuel in the tanks. It is equally important to note that, although the coordinated escalation process (with ATC) related to the protection of final reserve typically occurs in 3 steps, each situation is different, and may be resolved at any stage in the process. The 3 steps in the escalation process are:

<p>• <b>Step 1</b> Request delay information when required (in accordance with 4.3.7.2.1);</p>	<p>Seek information from ATC concerning any expected delays</p>
<p>• <b>Step 2</b> Declare MINIMUM FUEL when committed to land at a specific aerodrome and any change in the existing clearance may result in a landing with less than planned final reserve fuel (in accordance with 4.3.7.2.2);</p>	<p>Declare “Minimum Fuel” which should represent the last lines of defense in a multilayered strategy designed to ensure the protection of final reserve fuel and safe flight completion. Practically speaking, the PIC should declare “MINIMUM FUEL” when, based on the current ATC clearance, the anticipated amount of fuel remaining upon landing at the aerodrome to which the aeroplane is committed is approaching the planned Final Reserve fuel quantity. This declaration is intended to convey to the applicable air traffic controller that so long as the current clearance is not modified, the flight should be able to proceed as cleared without compromising the PIC’s responsibility to protect final reserve fuel.</p>
<p>• <b>Step 3</b> Declare a fuel emergency when the calculated fuel on landing at the nearest suitable aerodrome, where a safe landing can be made, will be less than the planned final reserve fuel (in accordance with 4.3.7.2.3).</p>	<p>Declare Fuel Emergency using “<b>MAYDAY, MAYDAY, MAYDAY, FUEL</b>”. The last in a series of procedural steps to ensure the safe completion of a flight is the declaration of an emergency. Conformance with Annex 6, Part I, 4.3.7.2.3 requires the PIC to declare a situation of emergency by broadcasting MAYDAY, MAYDAY, MAYDAY, FUEL when the calculated usable fuel to be available upon landing at the nearest suitable aerodrome where a safe landing can be made will be less than the planned final reserve fuel. This declaration provides the clearest and most urgent expression of an emergency situation brought about by insufficient usable fuel remaining to protect the planned final reserve. It communicates that immediate action must be taken by the PIC and the air traffic control authority to ensure that the aeroplane can land as soon as possible. The “MAYDAY” declaration is used when all opportunities to protect final reserve fuel have been exploited and in the judgment of the PIC, the flight will now land with less than final reserve fuel remaining in the tanks. The word FUEL is used as part of the declaration simply to convey the nature of the emergency to ATC. It is also important to note an emergency declaration not only opens all options for pilots (e.g. available closed runways, military fields, etc.) but it also allows ATC added flexibility in handling an aeroplane.</p>