PART 4

CHAPTER 2—EMERGENCY PROCEDURES

Contents

General

1. Although system malfunctions are covered elsewhere in the text of this Manual and in the FRC, considerations to be borne in mind and background information in respect of certain emergencies are given in this Chapter.

ENGINE AND REHEAT FIRES

Indications

2. A FIRE 1 or FIRE 2 caption indicates an engine fire in the respective engine bay; a RHT 1 or RHT 2 warning indicates an excessive temperature or fire in the jet pipe area. These warnings are indicated on the SWP and are accompanied by the flashing attention-getters and audio warning. A FIRE 1 or FIRE 2 warning also causes the appropriate fire extinguisher button light to come on.

3. If AC changeover occurs while any of these captions is still being displayed, the audio warning and attention-getters are re-activated.

4. *Titanium Fires.* A titanium fire caused by mechanical failure in the engine compressor may not be contained within the engine casing. This could cause the FFFD firewire to be burnt through so quickly that no fire warning is given; however, a falling RPM and rapidly rising JPT would be indicated. If these symptoms are experienced in the absence of compressor stall or mechanical failure, a titanium fire must be suspected and the **Engine Fire** drill in the FRC carried out. Because of the absence of a fire warning light initially, the actions under *'If fire warning remains on'* must also be carried out.

Safe Height and Speed

5. It is essential that a safe height is achieved and maintained as soon as possible after any fire warning has occurred. Normally 5000 feet AGL should be considered the minimum safe height to fly. This height ensures that the pilot has sufficient time for a safe ejection should the aircraft adopt any sudden, uncontrollable attitude or high rate of descent.

6. Although there is no speed limitation on the use of the engine fire extinguisher, for fuel economy and ejection reasons 250 knots should be achieved and maintained as soon as practicable.

7. Use gentle manoeuvres only, avoiding negative g.

Fire Drills

8. The engine, reheat and double reheat fire drills are given in the FRC. The drills are similar in content. It is essential that the defective engine is shut down immediately, thereby cooling the engine and its surrounds quickly. The fuel supply must be cut off promptly by switching off the appropriate fuel cock and DC pumps switch and selecting the AAR switch to FL REFUEL (ON, T Mk 5). If practicable, bring the non-affected engine to idle/fast idle while carrying out the fire drill, thereby achieving optimum cooling of the external surfaces of the live engine. There is no fire extinguisher available for the reheat zone.

9. If the initial actions for a FIRE 1 or FIRE 2 cause the warning to go out and remain out, the aircraft should be landed ASAP.

10. If a RHT 1 or RHT 2 warning occurs, the aircraft is to be flown at or above the minimum safe height for as long as possible (minimum five minutes) *whether or not the warning goes out.* The same procedure applies to a persistent FIRE 1 or FIRE 2 warning. During the waiting period, a visual inspection is to be obtained if possible and the performance of the flying controls monitored carefully.

11. The time required to cool the firewire sufficiently to put out the warning caption when a fire has been extinguished depends on the type of overheating experienced and the level beyond the warning threshold to which the firewire was heated. This reset time may be up to two minutes or even more.

Persistent and Recurrent Warnings

12. If, after taking the initial actions for a fire, the warning persists, or, after a period with the warning light out the warning recurs, it must be presumed that the fire has not been extinguished. It is therefore essential to remain at a safe height until it can be ascertained whether or not the warning is spurious. The following symptoms indicate a persistent fire:

a. Tailplane control damage.

b. Fuel system warnings.

c. Total electrical failure.

d. Hydraulic malfunctions.

e. Hook lowering indication without selection (F Mk 6).

f. Loss of rudder control.

13. Although the tailplane control rods are resistant to fire, distortion of the airframe or carbonisation of the control bearing lubricant may result in:

a. Loss of tailplane effectiveness about the neutral position.

b. Loss of feel.

c. Increased friction or stiffening of the tailplane control.

14. Complete loss of tailplane effectiveness is unlikely before other malfunctions necessitate ejection. However, a persistent fire is highly likely to produce some indications of tailplane malfunction within five minutes of the fire starting. These malfunctions can be detected by making small fore and aft control column movements. Consequently, the absence of any tailplane malfunction after an elapsed period of 15 minutes strongly suggests that the fire warning was spurious unless other malfunctions are present.

15. If, after a period with a fire warning out, the warning recurs, the waiting period must be started again, since recurrence of the warning is, in itself, indicative of a persistent fire.

Single Reheat Warning

16. After a single reheat warning, complete the drill in the FRC. Even if a single reheat warning goes out, a safe height is to be maintained for at least five

minutes because a reheat fire can cause the FFFD to malfunction after the initial warning.

Double Reheat Warnings

17. Double reheat fire warnings usually result in the ultimate loss of the aircraft, although immediate ejection is not always necessary. Complete the drill in the FRC if practicable while positioning for possible ejection.

Recovery and Landing

18. Although there may be evidence of tailplane control damage, provided a minimum safe height is being maintained the aircraft is safe to fly until the extent of the fire damage has been established. The decision to land or eject depends upon the symptoms remaining at the end of the waiting period. Use the minimum power settings possible during recovery.

19. Do not attempt to land if there are positive signs of an unextinguished fire.

20. The rate at which control damage can arise is such that it may be dangerous to attempt to land even though the warning occurs when in close proximity to a suitable airfield. Therefore, unless the warning occurs during the last stages of an approach, from which position a landing is likely to be safer than an overshoot, the pilot is to overshoot and climb to the minimum safe height while carrying out the appropriate fire drill.

FAILURE TO OBTAIN THREE GREEN UC LIGHTS

Indications and Actions

21. When the undercarriage is lowered, there is a distinctive noise as each wheel locks down.

22. If a red light indication remains after an undercarriage DOWN selection, carry out the **Nosewheel Red** or **Mainwheel Red** drill in the FRC as appropriate.

23. Should one or more undercarriage lights remain out after a DOWN selection (ie no red or green indication for a particular leg), carry out the **Two Green Lights Only** drill in the FRC. The absence of a light indication for a particular leg is probably an electrical fault in the indicating circuit. Whether or not the appropriate red light came on during the lowering sequence, the undercarriage is probably down, especially if the three distinct thumps of the undercarriage locking down were noted. However, a visual inspection is to be obtained if possible.

24. If the undercarriage appears to be fully down and locked, operate the emergency undercarriage selector as an additional safeguard and land when practicable. If a part of the undercarriage appears not to be down and locked, proceed with the appropriate **Mainwheel Red** or **Nosewheel Red** drill in FRC.

Note: If the nosewheel fails to lower or unsafe indications are present and a nosewheel-up landing is to be made, carry out the **Undercarriage Fails to Lower** drill in the FRC. However, the decision to use the braking parachute must be made after considering the prevailing wind conditions. Wheelbrakes must not be used until the nose has been lowered onto the runway: therefore directional control may be lost in strong wind conditions after streaming the braking parachute.

LOSS OF RUDDER IN FLIGHT

Actions

25. If the rudder becomes detached in flight, recover to a runway with a crosswind component of less than 10 knots. However, if this is not possible, a landing in crosswind components of up to 20 knots can be made without difficulty.

ARRESTING CABLE ENGAGEMENT (F Mk 6)

General

26. Because of the likelihood of structural failure of the aircraft if a high-speed cable engagement is carried out (see Part 2, Chapter 1), and the possibility of the hook jumping over the cable owing to runway surface irregularities, do not attempt an approach-end engagement unless there are no alternative methods of stopping the aircraft safely.

Engagement Considerations

27. If centreline lighting is installed on the runway, aim to engage the cable slightly off centre, thereby minimising the risk of hook bounce causing a missed engagement.

28. The aircraft is liable to swing off-line if the cable is not engaged close to the centreline or if it is not taken at 90°. The swing caused by oblique engagement is more pronounced than that caused by off-centre engagement. Therefore, if an off-centre engagement is unavoidable, ensure that the cable is engaged at 90°.

29. The severity of any swing is likely to be greater at lower engagement speeds, down to 30 knots. If the cable is engaged more than 40 feet off centre, the aircraft may be swung off the runway.

Approach and Landing

30. Carry out the **Arresting Cable Engagement—***Before Landing* checks in the FRC. Make a precautionary landing and delay hook lowering until the aircraft is firmly on the ground. Release the brakes just before engaging the cable.

31. If the cable is not engaged and it is necessary to become airborne again after the hook has been lowered, do not exceed 250 knots. Because of wear on the hook, anticipate possible hook failure on subsequent cable engagement.

After Engagement

32. Having released the brakes before reaching the cable, do not re-apply them until the aircraft finally comes to a halt. The deceleration after engagement is smooth and progressive. After a RHAG engagement close to the limiting speed, or when taking any other type of cable, the aircraft may be pulled backwards as the cable detensions. Do not apply the brakes at this stage because that is likely to cause the nose to lift and the tail to strike the runway. If the pull-back is violent, use engine power to check the rearward movement and apply the brakes only when the aircraft is stationary with the engines at idle/idle.

DIVERSION — ENGINE/FUEL MANAGEMENT

Fuel Transfer Technique

33. If a low level diversion is to be made when fuel reserves are critically low, the best use of available fuel is achieved by transferring as much fuel as possible to one side.

34. Therefore, fly at range speed with No 1 engine at idle while transferring fuel from the No 2 side to the No 1 side. The DC pumps of the No 2 side are likely to become uncovered when the indicated fuel on that side has dropped to 400 lb. At that stage, set No 1 engine to cruise power, set No 2 engine at idle, and switch off the No 2 engine DC pumps. This will cause a PUMPS S warning; do not carry out the PUMPS S drill. Provided nose-down attitudes and fast rates of descent are avoided, No 2 engine will continue to run and some of the remaining No 2 fuel will transfer. However, be prepared for No 2 engine to flame out subsequently since, at very low readings, the fuel gauges are unreliable.