ABNORMAL SLATS / FLAPS CONFIG

EMERGENCY DESCENT

NAV ADR or IR 1 (2) (3) FAULT

FWS – FWC 1+2 FAULT

PACK 1+2 FAULT

FCU 1+2 FAULT

CAB PR SYSTEM

DC ESS BUS FAULT

ENG RELIGHT IN FLIGHT

ELEC EMER CONFIG

HIGH ENGINE VIBRATIONS

FADEC A OR B FAULT

FADEC OVHT

N1, N2, EGT OR FF DISCREPANCY

ENG LO OIL PR

AVOID RAPID THRUST CHANGES

START FAULT

THRUST LEVER DISAGREE / FAULT

LANDING WITH SLATS / FLAPS JAMMED

ELAC FAULT

SPLR FAULT

FUEL OUTER / INNER TK HI TEMP

HYD YELLOW ELEC PUMP LO PR / OVHT

LANDING WITH ABNORMAL L/G

L/G NOT DOWNLOCKED OR UPLOCKED

L/G SHOCK ABSORBER FAULT

BOMB ON BOARD

TAILSTRIKE

VOLCANIC ASH ENCOUNTER

ADR 1+2+3 FAULT

ALL ADR OFF

IR ALIGNMENT IN ATT MODE

NAV FM/GPS POS DISAGREE

LS TUNING DISAGREE

SMOKE / FUMES REMOVAL

CARGO SMOKE

WING A.ICE FAULT

EMERGENCY EVACUATION

AC ESS BUS SHED

DISCLAIMER
ABNORMAL SLATS / FLAPS CONFIGURATION

FAILURE AT TAKEOFF

Should a flap/slat retraction problem occur at takeoff, the crew will pull the speed knob for selected speed to stop the acceleration and avoid exceeding VFE. The overspeed warning is computed according to the actual slats/flaps position. The landing distance available at the departure airport and the aircraft gross weight will determine the crew’s next course of action.

FAILURE DURING THE APPROACH

The detection of a slat or flap failure occurs with the selection of flap lever during the approach. With A/THR operative, the managed speed target will become the next manoeuvring characteristic speed e.g. S speed when selecting flap lever to 1. At this stage, if a slat or flap failure occurs, the crew will:
- Pull the speed knob for selected speed to avoid further deceleration
- Delay the approach to complete the ECAM procedure
- Refer to LANDING WITH FLAPS OR SLATS JAMMED QRH procedure.
- Update the approach briefing.

EMERGENCY DESCENT

The emergency descent should only be initiated on positive confirmation that cabin altitude and rate of climb are excessive and uncontrollable. However, the flight crew must rely on the CAB PR EXCESS CAB ALT warning, even if not confirmed on the CAB PRESS SD page. The CAB PR EXCESS CAB ALT warning can be triggered by a cabin pressure sensor, different from the one used to control the pressure and display the cabin altitude on the SD.

NAV – ADR or IR 1 (2) (3) FAULT

Note: In case of simultaneous failure of ADR and IR (same ADIRU), apply ADR FAULT procedure before IR FAULT procedure.

In case of ADR 1 fault, the predictive functions of the GPWS are inhibited and GPWS TERR FAULT light comes on. As such, the GPWS TERR pb-sw should be switched OFF.
FWS – FWC 1+2 FAULT

MONITOR SYS
MONITOR OVERHEAD PANEL

That means in case of engine fire there will be no ECAM warning or alert. You will only see the red light on overhead panel. Unlike other aircraft, engine fire is not a memo item since the procedure is to be carried out through ECAM actions. However, in this case there will be no procedure on the ECAM. So, what will you pick up next if you are not doing it by memory and there is nothing on ECAM? QRH right? There is no such thing as engine fire inflight /on ground in QRH! You will have to go to FCOM – Abnormal and Emergency Procedures – ENG – Engine Fire Inflight / On Ground.

PACK 1+2 FAULT

The rate at which the cabin altitude increases may be minimized by closing the FWD CARGO ISOL VALVE, if the cargo freight permits.

Air from the cabin goes via the inlet isolation valve to the forward cargo compartment, driven either by an extraction fan or by differential pressure in flight. A skin-mounted venturi discharges the air overboard via the outlet isolation valve. The cargo ventilation controller controls the operation of the inlet and outlet isolation valves and the extraction fan. When FWD ISOL VALVE is set to OFF, the controller closes the isolation valves and stops the extraction fan, preventing the air from going out and minimizing cabin altitude increase.

FCU 1+2 FAULT

Do not insert the MDA (MDH) value on the MCDU PERF APPR Page (because the PFD altitude is referenced to STD, and not to the correct barometric value).

The weather radar image may be lost. If the image remains displayed it must be disregarded. In all cases, red "WXR RNG" message is displayed.
CAB PR SYS

Manual Swapping

Note: Switching the MODE SEL pb to MAN, for at least 10 s, then returning it to AUTO will select the other system.

SYS 1+2 FAULT

- MODE SEL........................................................................................................MAN
  MAN V/S CTL.................................................................................................. AS RQRD

- It may take 10 s in manual mode before the crew notices a change of the outflow valve position.

DC ESS BUS FAULT

ASSOCIATED PROCEDURES

- FUEL L TANK PUMP 1 LO PR
- FUEL R TANK PUMP 1 LO PR

Note: To shut down the engines on ground, use the ENG FIRE pb-sw.

ENG RELIGHT IN FLIGHT

- If no relight:
  ENG MASTER (affected engine)........................................................................................................OFF

  Wait 30 s before attempting a new start (to drain the engine).

ELEC EMER CONFIG

- IF UNSUCCESSFUL:
  BUS TIE....................................................................................................................... OFF

- Setting BUS TIE pb-sw to OFF segregates both generator channels.

Note: If any generator reset is successful, reset both FAC's.

Note: If there are discrepancies between airspeed indications on the Captain’s PFD and on the STBY indicator, disregard the STBY indication (probe not deiced).

Note: In ELEC EMER configuration, the center tank fuel is unusable.
HIGH ENGINE VIBRATIONS

1. High engine vibration may be accompanied by cockpit and cabin smoke and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.
2. High N1 vibration are generally accompanied by perceivable airframe vibrations. High N2 vibration can occur without perceivable airframe vibrations.

FADEC A OR B FAULT

• For aircraft equipped with CFM engines:

  Note: Some cases of spurious FADEC fault have been experienced at engine start on ground.

  The caution can be considered as spurious, if it disappears after application of the following procedure:
  - Set the master sw to OFF, and wait until N2 speed goes below 5 % (If N2 indication is not available, wait 2 minutes before going to next step).
  - Pull and reset the C/B's of the affected ECU electrical supply (A04 or A05 on 49 VU or R41 or Q40 on 121 VU).
  - Wait 10 s for the ECU power-up sequence, and restart the engine.

FADEC OVHT

• If the ECU TEMP is above 105 °C:

  FADEC OVHT

  Reducing engine power should decrease temperature in the ECU area.
  If overheating is severe enough, ECU failure could result in a significant loss of engine functions.

N1, N2, EGT OR FF DISCREPANCY

This alert triggers when a discrepancy between real and displayed values is detected.
The upper ECAM upper displays a CHECK (or CHK) message below the affected indication.
Normal indication may be recovered by switching from DMC 1 to DMC 3.
If unsuccessful, and if both thrust levers are at the same position, crosscheck with the opposite parameter.

ENG OIL LO PR

If oil pressure is low (< 13 PSI) is indicated only on ENG SD page (red indication) without the ENG OIL LO PR warning, it can be assumed, that the oil pressure transducer is faulty. Flight crew may continue engine operation while monitoring other engine parameters.
AVOID RAPID THRUST CHANGES

In flight:

AVOID RAPID THR CHANGES.

If the A/THR is engaged, adjust the thrust levers to align the thrust lever commands with actual N1 and disconnect A/THR.

START FAULT

On ground (manual start):

ENG MASTER (AFFECTED).................................................................OFF
MAN START (AFFECTED)..............................................................OFF
MODE SEL..................................................................................CRANK
MAN START (AFFECTED)..............................................................ON

Note: ECAM does not display the last two lines of the above procedure.

Dry crank the engine for 30 s. The start valve automatically reopens when N2 is below 20%.

After the starter cools, and for any subsequent attempt to start the engine, the flight crew must perform a manual start, or must report the “no start condition” to maintenance for appropriate action.

THRUST LEVER DISAGREE / FAULT

This alert is triggered when a discrepancy between both resolvers of a thrust lever is detected. What is a resolver?

TLA (thrust lever angle) indicates the position of the thrust lever in control stand from a reference point, usually this is 0 degrees when thrust lever is at idle and increases up to 40 deg when thrust lever is advanced to take-off position. This thrust lever is connected by mechanical linkages to an electrical resolver synchro sensor called thrust lever angle resolver. The resolver has a stator and rotor, the angle of the rotor with respect to stator reference point changes as thrust lever is moved, this angle is called thrust lever resolver angle (TRA). This resolver is connected to electronic engine control (EEC) to control engine thrust for different positions of the thrust lever. Normally when thrust lever is at idle (TLA=0) then TRA may be 38 deg. TRA may increase to 85 deg when thrust lever is at take-off position. The exact values you can get in AMM. You have to rig the resolver to get correct angle when you install a new resolver, adjustment nuts will be provided on the linkages to do this. AMM gives the correct procedure. (courtesy: pprune.org)

So basically, in this case the TLA angle sensors are not in agreement. That means FADEC does not know the exact TLA angle. That means it cannot give the exact required thrust. Therefore, in different conditions it fixes the thrust to a fixed logical value e.g.
On Ground: If both TLA not at TOGA or FLX/MCT then it automatically selects Idle.

During Takeoff: If both TLA are above idle then it selects one of the takeoff’s thrust.

In Cruise: With no slats, if thrust lever is between Idle and MCT, it sets thrust for larger TLA power but not more than CLB thrust.

In Approach: When slats are extended, it sets idle thrust on affected engine when TLA is at or below MCT. Thrust will now be idle, even for go around. So, if you are doing a single engine approach and this thrust lever disagree failure comes in then don’t select slats otherwise there will be no thrust left.

For any case of thrust lever disagree (TO, FLEX, or between Idle and MCT), the FADEC will command idle thrust for the approach when slats are extended (or when the Mach number is less than 0.47, if associated EIU is failed). It is independent of the autothrust condition. The affected engine’s thrust remains definitively at idle, even for go-around.

In case of a THRUST LEVER FAULT, both resolvers fail. Since this is a case of failure and not discrepancy, TLA angle is not known at all.

The same precaution as mentioned above also holds true in this case too.

**LANDING WITH SLATS / FLAPS JAMMED**

- If FLAPS jammed > 0:
  MAINTAIN SLAT/FLAP CONFIGURATION
  Recommended speed for diversion: MAX SPEED - 10 kt

*Note: In case of a go-around with CONF FULL selected, the \*L/G NOT DOWN warning is triggered at landing gear retraction.*

**INCREASED FUEL CONSUMPTION**

**CAUTION**
For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by the applicable Fuel Penalty Factor provided in the QRH, to obtain the fuel penalty required to reach the destination in the current configuration. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table.

QRH/Inflight Performance/All Engines Operative/Quick Determination of Alternate Flight Planning

**OR**

Refer to PER-FPL-FLP-ALN-20 ALTERNATE PLANNING ISA
ELAC FAULT

This alert triggers when there is a failure of ELAC (FAULT it on ELAC pb), or when one sidestick transducer is faulty.

ELAC (AFFECTED)........................................................................................................................OFF THEN ON

Note: 1. In some sidestick transducer failure cases, ELAC 1(2) FAULT is triggered without the procedure, and FAULT it on associated pb does not come on.

STATUS

CAT 3 SINGLE ONLY
FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

INOP SYS

ELAC 1(2)
CAT 3 DUAL

Disregard FMS fuel predictions and refer to QRH/OPS chapter in order to find the applicable Fuel Penalty Factor.

SPLR FAULT

APPR PROC: If one or more spoilers are fully extended:

In clean configuration, if VLS is above VFE NEXT, the flight crew should deselect A/THR, decelerate to VFE NEXT, and select CONF 1 when below VFE NEXT. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.

FUEL OUTER / INNER TK HI TEMP

This caution may spuriously trigger due to interference from communication equipment. Therefore, the flight crew should wait 2 min while the fuel temperature measurement is updated. After 2 min, if the ECAM caution has not disappeared, then apply the procedure.

HYD YELLOW ELEC PUMP LO PR OR OVHT

ASSOCIATED PROCEDURES

Y SYS LO PR
BRK Y ACCU PR MONITOR

This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is the normal braking using green pressure, the parking brake should not be used since it is not available and the chocks should be in place before engine 1 shutdown.
LANDING WITH ABNORMAL L/G

At flare, touchdown and rollout: Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls. Engine pumps continue to supply adequate hydraulic pressure for 30 s after engine shutdown.

L/G NOT DOWNLOCKED OR UPLOCKED

The active LGCIU changes when the landing gear is recycled. Perform the following actions:

- Move the landing gear lever up or down as required.
- Wait for the landing gear to uplock or downlock (as applicable) and for the landing gear doors to close and simultaneously monitor the WHEEL page on the System Display (SD).
- Move the landing gear lever down or up (as required).

If the flight is continued (to destination or to alternate) with landing gear extended:

- Disregard FMS fuel predictions and refer to QRH/OPS Fuel Penalty Factors.
- Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise.
- Do not use the managed speed mode (except in approach).
- Do not use the CLB and the DES autopilot modes.
- Refer to PRO-NOR-SUP-L/G- Flight with Gear Down.

L/G SHOCK ABSORBER FAULT

Shock absorber not extended after liftoff: In few cases, autothrust and autopilot may also be lost. If WHEEL N.W. STEER FAULT is also displayed, then the nose wheels may be at maximum deflection (turned 90° from center). During landing, delay nose wheel touchdown for as long as possible. Automatic roll out is not permitted in N.W. STRG FAULT.

BOMB ON BOARD

Meaning of “Maintain Cabin Altitude” in the QRH procedure according to FCOM:

```
MAINTAIN CAB ALT

Use MAN V/S CTL selector to maintain the cabin altitude at the value it had when the bomb was discovered.
```

Moreover, QRH procedure has limited information. Do consult FCOM for complete information and better management of the situation (same for “Ditching”).

TAILSTRIKE

Recommended rate of climb is 500 ft/min and rate of descent limited to 1000 ft/min, except for the final approach that must be performed normally.
**VOLCANIC ASH ENCOUNTER**

If EGT exceeds limits, it may become necessary to consider a precautionary engine shutdown. In this case, restart when clear of the volcanic ash cloud. Switch off wing anti ice before engine restart. The engine may accelerate very slowly, this is not a failure to start. Compressor and turbine blades may have been eroded so avoid sudden changes in thrust. Fuel flow and EGT may increase.

**ADR 1+2+3 FAULT**

<table>
<thead>
<tr>
<th>[QRH] ADR 1+2+3 FAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable to: MSN 02155-02274</td>
</tr>
</tbody>
</table>

In case of a triple ADR failure, ECAM only displays dual ADR alerts. All dual ADR alerts trigger: **NAV ADR 1+2 FAULT**, and **NAV ADR 1+3 FAULT**, and **NAV ADR 2+3 FAULT**.

<table>
<thead>
<tr>
<th>FL</th>
<th>390</th>
<th>370</th>
<th>350</th>
<th>330</th>
<th>310</th>
<th>290</th>
<th>280 and below</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX SPEED (kt)</td>
<td>252</td>
<td>265</td>
<td>278</td>
<td>290</td>
<td>305</td>
<td>315</td>
<td>320</td>
</tr>
</tbody>
</table>

*This table provides IAS/MACH 0.82 relationship at or above FL 280.*

For go-around, max speed 215 knots in CONF 1+F, due to loss of flap auto retraction to CONF 1.

Check that outflow valve is fully open and cabin altitude is at airfield elevation before opening the doors.

**ALL ADR OFF**

Fly within the green area of the BUSS. For slats/flaps retraction, it is better to fly at the top of the green area and for extending slats/flaps, it is better to fly straight and level at the bottom of the green area.

**IR ALIGNMENT IN ATT MODE**

For alignment through ADIRS panel, to enter heading e.g. 320°, dial 3, 2, 0, 0 then press ENT. Heading will be displayed on the associated ND. “HDG–ATT MODE” will be displayed on CDU.

**NAV FM/GPS POS DISAGREE**

**ECAM:** A/C POS..................................................................................................................CHECK

The complete procedure is not displayed on ECAM, it is in the QRH or FCOM.
SMOKE / FUMES REMOVAL

- In case of fuel vapors, cabin fans are turned on because the recirculating air ventilates the air mixer bay and other fuselage area. This prevents fuel vapors from accumulating and the risk of explosion. Passenger health is not affected. If fuel vapors are not an issue then cabin fans are turned off to prevent smoke from entering the cockpit.

- In case of fire, do not shut down the packs or reduce ventilation in an attempt to smother the fire. Do not deploy oxygen masks, if fire is suspected in the cabin.

- The most effective means of smoke removal is use of ram air. Therefore, descent is initiated to FL 100 or the MEA-MORA, while the cabin altitude is increased to 10 000 ft or the MEA-MORA.

- In electrical emergency configuration, when the APU MASTER sw is ON, the battery contactors will automatically close for a maximum of 3 min. This will enable the flight crew to manually control the outflow valve that is powered by the DC BAT BUS.
CARGO SMOKE

- Expect the smoke warning to remain after agent discharge, even if the smoke source is extinguished. Gases from the smoke source are not evacuated, and smoke detectors are also sensitive to the extinguishing agent.

- For aircraft equipped with cargo ventilation, if warning has been displayed temporarily, and agent has not been discharged, normal cargo ventilation may be recovered for livestock transportation. See FCOM > ABNORMAL AND EMERGENCY PROCEDURES > SMOKE section.

WING A.ICE SYS FAULT

**Condition:** Wing anti-ice turned on after one engine shutdown or after loss of one bleed.

**ECAM:** Calls for opening of X BLEED.

**Note:** The affected pack has to be selected OFF due to precooler performance.

EMERGENCY EVACUATION

After shutting down the engines and pushing all (ENG & APU) fire push buttons, the use of agents is according to requirement which is display of the message ENG or APU fire. However, **Engine Agent 2 is not available**, because squibs for fire bottle 2 for both engines are supplied by DC BUS 2 which will not be powered in this case. Squibs for fire bottle 1 are supplied by the HOT BAT BUS.

AC ESS BUS SHED

This alert triggers when AC SHED ESS busbar is not supplied. Only action to be done on ECAM is:

```
ATC/XPDR..............................................................SYS 2
```

The ECAM Status will show the following INOP systems:

<table>
<thead>
<tr>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INOP SYS</td>
</tr>
<tr>
<td>CAPT AOA</td>
</tr>
<tr>
<td>ATC 1 or ATC/XPDR 1</td>
</tr>
</tbody>
</table>

However, the FCOM also lists some other INOP systems. Among the list is the “Passenger Oxygen Mask Deployment” system. Both AUTO & MASK MAN OVRD features are lost and it will not be possible to continue the flight at high altitudes in this condition (safeguarding passengers from depressurization).

**Note:** The warning may be caused by a failure in a sub BUS. Consequently only a part of the systems listed above may be lost.
If you have time, it is recommended to consult FCOM after a failure for background & additional information even though you’ve done the ECAM. This will greatly help in decision making and overall management of the situation. However, don’t think you nailed it! Some information is neither in ECAM nor FCOM, its in the FCTM e.g. The AVIONICS SMOKE ECAM procedure should be applied only IF SMOKE IS PERCEPTIBLE, if not then consider a spurious warning and therefore stop the AVIONICS SMOKE procedure.

Disclaimer: “A320 Abnormal Notes” are personal notes of the undersigned for training only. These notes do not sanction any pilot to violate his/her Company’s Standard Operating Procedures, Aircraft Manuals or Manufacturer’s Recommendations.