

Fuel Switch

Prelims: Current Events of National and International Importance

Why in news?

Fuel control switches on Boeing 787-8 aircraft have come under scrutiny after Air India plane crash in Ahmedabad, prompting discussions about their design, operation & potential role in aviation incidents.

Fuel switch

- **Function** Fuel switch controls are critical in cockpit, by which the fuel supply to the 2 engines is regulated.
- **Primary purpose** During the aircraft ground operation the switch is used to start or shut down the engines.
 - In the event of an inflight emergency like engine failure or fire, switches are used to manually stop or restart an engine.
- **Switch location** Placed inside the cockpit, directly below and behind throttle levers between pilots' seats.
 - **Positioned** where pilots' hands rest easily during critical flight phases.



- **Metal Guard brackets** Deployed to prevent accidental contact or movement.
- **Spring-locking system** To move a switch from RUN to CUTOFF it require lifting of switch before sliding, designed to prevent accidents.
- Operation sequence Engine starts by moving switches to RUN mode on ground.
 - During flight Switches remain in RUN unless an engine fire or severe failure occurs.
 - Switches moved to CUTOFF after landing or during maintenance.
- Consequences of CUTOFF Immediately stops fuel flow to the corresponding

- engine, causing it to shut down, lose thrust, and disable engine-driven generators, potentially impacting electrical systems.
- **Emergency use** In case of fire or critical fault, a red light cue illuminates, signaling the crew to shut down the engine immediately.
 - Moving to CUTOFF instantly stops fuel flow and disables engine generators, impacting the electrical systems
- **Redundant systems** are powered and wired separately, so one failure doesn't compromise the backup.
 - **Example** Multiple independent circuits allow safe operation even if one fails.
 - **Power supply** Redundant generators/ Accelerated Processing Unit (APU)/Ram Air turbine keep critical systems running.
 - **Flight controls** Multiple computers compare inputs, override faulty data automatically.
- **Reactivation** If switch accidentally turned off by the pilot, the aircraft's systems try attempt an **automatic engine** relight and reintroduce fuel when switch turns to RUN.
- Accident causing Is highly unlikely due to safeguards, but possible under human stress or miscommunication.
- **Industry practice** Most airlines, including Air India, comply with existing safety features unless directed otherwise by regulators.

Reference

The Hindu| Fuel Switches In Aircrafts

