Fuel Switch

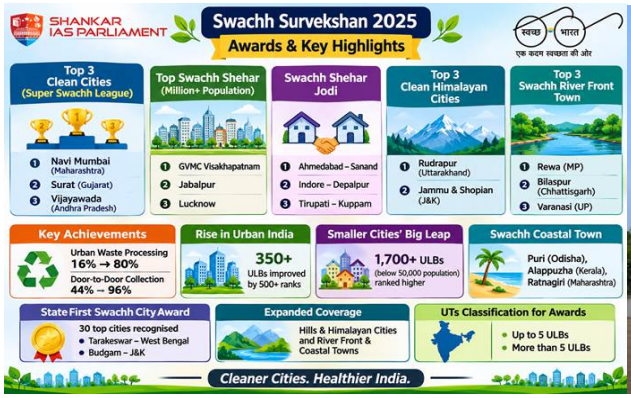
Prelims: *Current Events of National and International Importance*

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]

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