



## National Anti-Drone Guidelines

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Recently, the Indian government has finalized National Counter Rogue Drone Guidelines for handling the **threats from Unmanned Aircraft Systems**.

- The genesis of the counter rogue drone guidelines lies in the **rising number of drone-related safety incidents** across the world including in India.
  - Recent incidents of the utilization of drones to target **VVIPs in Venezuela** and **Saudi Aramco drone attacks** are a stark reminder of the threat level from rogue drones.
  - India has an estimated **over 6 lakh rogue or unregulated Unmanned Aerial Vehicles** (UAVs) of various sizes and capacities
- To handle the above scenario the **Ministry of Civil Aviation** has suggested a **counter-rogue drone deployment plan**, categorized across **three models**, based on the **sensitivity of vital assets and installations**.

- The **strategic installations differ** from state to state and place to place, **based on their geographical condition**, criticality and construction type but standard categorization would be:
  - **Full-scale model :**
    - It will work for the protection of vital assets of critical **national importance** like Rashtrapati Bhawan, Parliament House, nuclear installations, major airports, etc;
    - Counter-Unmanned Aircraft System(C-UAS) with primary and passive detection means like radar, Radio Frequency (RF) detectors, electro-optical, and infrared cameras to be installed.
  - **Mid-segment model:**
    - It will protect installations like metro airports, oil refineries, ports, and power plants, etc
    - A lower level of threat mitigation techniques(compared to the full-scale model) to be installed with Counter-Unmanned Aircraft System(C-UAS).
  - **Basic model:**
    - Aims to protect state secretariats, important official premises, monuments of national importance etc.
    - The basic threat mitigation technology to be used.
- A **realistic vulnerability analysis** of identified **vital areas/vital points** by specialist security agencies based on **impact assessment** from a different category of drones, natural camouflage, and local security scenario would help to establish Counter-Unmanned Aircraft System(C-UAS).

- The Counter-Unmanned Aircraft System(C-UAS) includes the following modern weapons:
  - **Sky Fence:**

It aims to block a lethal drone that uses a range of signal disruptors to jam the flight path and prevent them from entering their target, a sensitive installation or event venue.
  - **Drone gun:**
    - It is capable of jamming the radio, a global positioning system (GPS) and a mobile signal between the drone and the pilot.
    - Further, it forces the drone to the ground in good time before it could wreak any damage.
    - Australia has already designed such kind of weapon with an effective range of 2 km.
  - **Advanced Test High Energy Asset (ATHENA):**
    - It works by firing a high energy laser beam on a rogue drone resulting in its complete destruction in the air.
    - It is a very costly technology and is currently being tested by the US army.
  - **Drone Catcher:**
    - It swiftly approaches an enemy drone and grabs it by throwing a net around it.
    - Such a tool is required when a rogue drone is needed to be captured safely to extract incriminating evidence from it
  - **Skywall 100:**

It is the ground version of the 'drone catcher' and it works by bringing down a UAV using a parachute that is hurled through a net from 100 meters distance.
- In addition to the counter rogue drone deployment models, the civil aviation ministry has also suggested a set of **legal procedures to handle rogue drones**.
  - The legislation needs to address the **risk-based use** of Counter-UAS authority and **coordination among relevant departments** and agencies.
  - It shall also aim to **mitigate adverse impacts of anti-drone guidelines** on the safety, efficiency, and accessibility to the Indian airspace to the maximum extent feasible.
  - The law shall state a **legal framework for authorized use of C-UAS systems** by security agencies for protecting vital assets, safeguarding manned aviation, supporting law enforcement activities, protecting national borders and conducting operations.

## Radio Frequency (RF)

- It refers to the **electromagnetic radio waves** in the range of 3 kHz to 300 GHz, as well as the alternating currents carrying the radio signals.

- This is the frequency band that is used for wireless communications transmission and broadcasting.
- The frequency band is being divided into different parts, which are then assigned to different technology industries. This is known as the radio spectrum. For example, the Very High Frequency(VHF) band, which ranges from 30-300 MHz, is being used for FM radio, TV broadcasts, and amateur radio and its counterparts.

**Source:IE**