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Electromagnetic Interference, Compatibility and Pulse

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The Society for Applied Microwave Electronics Engineering and Research (SAMEER) with its vast experience in the areas of Electromagnetic Interference, Compatibility and Pulse (EMI/EMC/EMP) can help Defence Services, academic institutions, public and private industries to evolve better.

Electromagnetic Pulse (EMP)

- It is a **short burst of electromagnetic energy**.
- A pulse's origin may be a natural or man-made in occurrence.
- It has the potential to disrupt, degrade, and damage technology and critical infrastructure systems.
- At higher energy levels a powerful EMP event such as a lightning strike can damage physical objects such as buildings and aircraft structures.
- It can also affect large geographic areas, disrupting elements critical to the nation's security and economic prosperity and could adversely affect global commerce and stability
- In a world ridden with conflicts, electromagnetism can be **misused and weaponised**.
- **Smart cities** which are run on Information and Communication Technologies are also **extremely vulnerable to EMP**.
- It could also directly or indirectly permeate the **national security establishment**, including the **military and intelligence community**, undermining their ability to respond to the national command authority and provide for the country's security.
- To avert threats like **Electromagnetic Pulse (EMP) attacks**, developing **futuristic defence mechanisms** and **creation of EMP- resistant infrastructure** is necessary.

Electromagnetic Interference (EMI)

- When the radio frequency spectrum is disturbed by an external source it affects an electrical circuit by electromagnetic induction, it is called as Electromagnetic Interference.

- The disturbance may degrade the performance of the circuit or even stop it from functioning.
- Both **man-made and natural sources can be generated by changing electrical currents and voltages** which can create EMI.
- It **can be used intentionally for radio jamming** especially in electronic warfare.

Electromagnetic Compatibility (EMC)

- It is the **ability of electrical equipment and systems to function acceptably in their electromagnetic environment.**
- It works by limiting the unintentional generation, propagation and reception of electromagnetic energy which may cause unwanted effects such as electromagnetic interference (EMI) or even physical damage in operational equipment.
- The goal of EMC is **to maintain regular operation of different equipment in a common electromagnetic environment.**

The Society for Applied Microwave Electronics Engineering and Research (SAMEER)

- It was set up as an autonomous R & D laboratory under the then Department of Electronics, Government of India.
- It aims to undertake R & D work in the areas of Microwave Engineering and Electromagnetic Engineering Technology.
- It has R&D centres at Mumbai, Chennai and Kolkata.
- It has developed:
 - India's first MST Radar which is also the 2nd largest in the world.
 - India's first indigenously developed Linear Accelerator for Cancer treatment.
 - Energy efficient Drying/Heating System for textile, Food, Ceramic, Chemical, Pharma, Rubber applications through RF/Microwave.
 - Microwave dis-infection system for hazardous hospital waste.

Source: PIB