AMATEUR RADIO FACT SHEET / DISCUSSION POINTS

TOPIC: Congressional EMP Commission

- U.S. Congress commissioned report on EMP vulnerabilities in 2001. First report released in full in 2004. Follow-on report commissioned, described catastrophe in one system after another: national power grid, transportation system, financial systems, etc., 2008

- Woolsey & Pry, in a *Wall Street Journal* op-ed, stated the 2008 Commission had estimated a die-off of up to 90% [i]

- EMP is a complicated result of an atomic explosion (does not require an H thermonuclear bomb) in the higher portions of our atmosphere. Although theorized at the development of the fission bomb during World War II, experiments by the United States and Russia in the early 1960's brought the first real data on the destructiveness.

- EMP produces three waves, named E1, E2 and E3 from different physical interactions.

- E1 produces a blanket wave covering huge land mass visible territory for only nanoseconds, but reaches 25 kV/meter field strength. Any unprotected semiconductor device connected to more than a small footage of wire is expected to be permanently destroyed. E2 is a weaker version of E1.
- E1 simulations involved hundreds of thousands of volts and amperes for brief moments.
- There is a military specification for EMP testing of equipment.
- Some equipment is hardened against EMP
- Information on how to protect HF radios from EMP was published publicly in the 1980's.

- E3 is the result of the shoving-aside of the earth's magnetic field, lasts minutes, and induces huge currents in wires on the earth's surface that are miles long --- power lines, for example. These huge currents are predicted to drive custom high voltage grid interconnection transformers into lossy saturation regions, resulting in over-temperature, and combustion failure.

- CME is a natural phenomena caused by charged particle emanations of the Sun. It mimics E3 but lasts hours to days. The most famous CME event happened in 1859 (“Carrington event”) before the era of power grids, but damaged telegraph lines and caused fires. Weaker events have happened since the advent of power grids and have damaged power systems in Canda, the US and England. DHS has taken some beginning steps to mitigate this risk. U.S. Government has begun to track solar weather

[i] R. James Woolsey and Peter Vincent Pry, The Growing Threat From an EMP Attack, Wall Street Journal, Aug 12, 2014. Accessed at: http://www.wsj.com/articles/james-woolsey-and-peter-vincent-pry-the-growing-threat-from-an-emp-attack-1407885281