Threat to UK infrastructure from Electro-Magnetic Pulse Activity

As you know, the Defence Select Committee has published a report entitled ‘Developing Threats: Electro-Magnetic Pulses (EMP)’. We have considered the threat both from naturally-occurring events and a deliberate high-altitude electro-magnetic pulse attack (HEMP) as a result of the detonation of a nuclear weapon in the upper atmosphere.

The key findings of the Report on the threat of deliberate attack are: that even if there is currently no state with both a hostile intent towards the UK and the means to launch an HEMP attack that may change; that the potential impact of the use of such a weapon on the infrastructure and society of the UK would be devastating; that the Government cannot afford to be complacent about the threat and must keep its assessment of the risk under review; and that it is important that the work of the hardening of UK infrastructure is improved urgently.

Whether or not these threats are imminent the consequences, were the threat to materialise, would probably be catastrophic. For example, the electric grid would be jeopardised, the water and sewerage systems would break down (with immediate widespread threat to life) and financial and communications systems could cease to operate.

In order to bring about the catastrophe referred to above, a country—or a terrorist organisation—would need to have:

- a nuclear weapon of a similar size to that exploded at Hiroshima
- a missile large enough to carry that heavy warhead to anything upwards of perhaps 30 kilometers above the Earth’s surface (no accurate guidance is needed and the extent of the area affected would vary according to the height of the detonation)
- a ship or other platform capable of launching that missile

To the extent that these ingredients do not already co-exist in a potentially hostile organisation, they are likely to do so shortly. North Korea already has its nuclear bomb. Iran, according to Defense
Secretary Panetta (see The Times, 21st December 2011) could have one in months, although the USA will do all it can to stop it. Iran already has the capability to deliver a large missile over 1,000 kilometres in horizontal distance.

We also draw attention in our report to a similar threat posed not by the deliberate actions of a hostile state but by extreme space weather. Since the Carrington Event of 1859 (the largest space weather event recorded and one which, evidence suggests, can be expected every few hundred years), the world has become immeasurably more dependent on electricity. Even a much lesser event, such as the one which occurred in 1989, could cause widespread and long-lasting black-outs. Such events can, to some extent, be forecast, but cannot be prevented. It would appear that National Grid policy is to rely on replacing transformers that fail rather than on ensuring that failure does not occur.

To date the UK’s policy has been to rely on deterrence to avert the threat of deliberate attack and on restoration of the system following damage caused by severe space weather. With nuclear proliferation rising, and the consequences of a failure of deterrence being so catastrophic (and with solar weather being in any case impervious to deterrence), we recommend that urgent action be taken to improve the resilience of the UK’s electronic infrastructure. This need not be particularly expensive (relative to the threat reduced) if it is carried out during the ordinary course of maintenance of that infrastructure. The geographic extent of the threat may, however, require discussion between governments and throughout the providers of essential services and utilities. The development of agreed standards, and the possible need for legislation to secure the necessary resilience, needs consideration by the National Security Council, civil contingency planning structures and industry.

In view of the seriousness of the threats the Committee would be grateful for an opportunity to meet you to discuss what can be done to ensure that they are taken seriously and that urgent action is taken.

CHAIR