

Key messages: Japan

- The UK Government has taken a calm and measured approach following the events in Japan.
Quotes: *Prime Minister* - 'Nuclear power should be part of the mix in the future, as it is part of the mix right now'.
Chris Huhne – 'We should not rush to judgment. It is important we have the full facts at our disposal. I have asked the Chief Nuclear Inspector for a full report so that the implications for the UK are clear. Safety is and will continue to be the number one priority'.
- Chief Nuclear Inspector, Dr. Mike Weightman's interim report is due in May.
- EU leaders have already agreed to run "stress tests" on all nuclear power plants and the industry will make any changes necessary as a result of these tests.
- The UK's current nuclear fleet has an excellent safety record and is a crucial part of our low-carbon power supply. 18-20% of our electricity comes from nuclear and for the EU as a whole it's 30%. Nuclear power stations are some of the most robust buildings ever built and are designed to safely withstand extreme events, both man-made and natural. In Japan, half of all nuclear power stations are still operating as normal, despite the earthquake and tsunami. Units 1 and 3 of Fukushima NPP are boiling water reactors (BWR-3 and BWR-4) that came into operation in 1970 and 1976 respectively. There are currently eighteen BWR reactors operating in Europe but none in the UK.

Protection

- An earthquake the size of the one in Japan is not credible in the UK. Largest earthquake in the UK occurred in 1931, 100km into the North Sea (6.1 on the Richter scale). Japanese earthquake on 11 March (8.9 on the Richter scale). The energy from the UK earthquake was 130,000 times smaller than the Japanese earthquake so there is no chance of a tsunami from a British earthquake.
- Earthquakes of the size of the Japanese one can only occur in zones where the tectonic plates collide. The UK is located in the middle of a tectonic plate with the nearest place to where plates meet being thousands of kilometres away.
- UK plants are protected against the effects of a 1 in 10,000 year earthquake. If they were hit by the worst storm, tsunami or flood that could be expected in 10,000 years our plants would be safe. For example, at Sizewell the worst case scenario for extreme high tide and tsunami is 2.3m. The plant is designed to withstand a wave of 7.6m.

Safety

- It is part of the safety-case licensing programme, overseen by the NII (now the Office for Nuclear Regulation - ONR), that all UK nuclear plants are robust enough to withstand the most extreme conditions including earthquake. Regulation is provided by both the ONR and the Environment Agency, (SEPA in Scotland).
- Emergency arrangements are regularly tested at all UK nuclear plants and local populations briefed on safety issues and emergency arrangements. Various countermeasures can be taken, including evacuation, sheltering and administering iodine tablets.
- The tsunami at Fukushima took out power supplies for core cooling systems. As a result the cores have overheated and it now seems sure that some damage has resulted for three of the reactor cores. The word 'meltdown' means that these cores have entirely melted and gone all the way through the reactor vessel as well as the containment to the concrete floor of the building, as happened at Chernobyl. This is not that case here,

where we expect to find partial melting of the cores, but within the important safety barriers of the reactor vessel and containment.

- The latest reactor designs are even safer than previous ones, but that does not mean that our existing plants are unsafe. Every 10 years in a Periodic Safety Review (PSR), assessments are made of what better options there are and improvements are back fitted as necessary.
- Serious nuclear events in the UK
 - Level 5 INES event, Windscale Reactor Fire, October 1957
 - Level 4 INES event, Windscale reprocessing plant September 1973
- The reclassification of the event at Fukushima to INES Level 7 does not mean that it is comparable with Chernobyl. The INES scale is concerned with emissions rather than their distribution. At Chernobyl the explosive force of the incident was key to the widespread distribution of radioactive material. This hasn't and cannot happen at Fukushima due to the design of the reactors. Of course, the release of any radioactive material into the environment is very serious but the impact of the Fukushima event is much more localized.

Radiation

Radiation people are exposed to in everyday life (in millisieverts)

- 0.002 Annual dose received when in the vicinity of a nuclear power plant
- 0.006 Dose received during a dental panoramic radiograph
- 0.03 Dose received during a flight from London to New York
- 0.3 Dose received during a lung/chest radiograph/x-ray
- 0.3 Annual dose received due to natural radioactivity in food and water
- 2.5 Average annual dose background dose
- 8.0 Average annual background dose in areas of Cornwall due to the granite rock

Levels at which radiation becomes harmful

- 100 Dose at which the first biological effects appear
- 500 Dose causing long term effects
- 1 000 Dose causing immediate clinical effects
- 4 000 Dose that is lethal if not treated in 50% of cases
- 7 000 Dose that is lethal in a few hours

Nuclear new build

Until we understand clearly what has occurred at the Fukushima Daiichi nuclear power plants, and any consequences, it is difficult to speculate about the long-term impact on nuclear new build plans in Europe.