

Official

ONR NGO Forum – 7 November 2019	
Title	Briefing paper – Climate Change and ONR Regulatory Approach
From	ONR External Hazards Specialism
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1 Purpose

- 1.1 This paper has been prepared in response to three questions received by the Forum, via the co-chair (Dr Jill Sutcliffe) in relation to climate change and the long term security and safety of reactors and waste stores.

2 Questions and Answers

Q1 The phrase “occurs once in every 10,000 years” appears in safety cases – How does that equate to the occurrence of the once in 70 years of the Fukushima tidal wave disaster?

- 2.1 As set out in ONR’s Safety Assessment Principles (SAPs) for nuclear facilities, the design basis for natural external hazards is based on events that conservatively have a predicted frequency of being exceeded of less than one in 10,000 per annum. The design basis event should be derived conservatively to take account of data and model uncertainties.
- 2.2 In addition, there should be a demonstration that there is no disproportionate increase in risk beyond this frequency, ie no “cliff-edge” effect. This means that a small change in design basis fault or event assumptions should not lead to a disproportionate increase in radiological consequences.
- 2.3 Expert opinion now generally agrees that the tsunami that occurred at Fukushima should have been considered within the design basis and specifically designed against. However, it is unlikely that the return period for this event would have been as frequent as one in 70 years. The UK regulatory regime requires that external hazards such as tsunamis be considered for their potential effects on nuclear licensed sites.
- 2.4 ONR’s Safety Assessment Principles (SAPs) were updated in 2014 to incorporate our expectations based on lessons learned post-Fukushima, as set out in the Technical Assessment Guidance (TAG) on External Hazards, Appendix 1 – Fukushima - NS-TAST-GD-013 Revision 7.

Q2 - The ONR in their TAG document frequently uses phrases “reasonably foreseeable effects of climate change” and “managed adaptive approach”. Can you explain how the Licensee can change 2 working reactors, sitting on a concrete base, next door to ponds holding nuclear fuel rods, within 50ms of the shoreline from a foreseeable rise in sea level of 7-20 ms (UKCP18) within the lifetime of that reactor?

- 2.5 For dutyholders in the nuclear industry, the impacts of climate change on hazard magnitude and frequency for some natural hazards could be significant over the lifetime of nuclear sites. ONR’s SAPs state that: “The reasonably foreseeable effects of climate change over the lifetime of the facility should be taken into account”. Climate change science is a fast-moving area of research and ONR encourages licensees to account for the uncertainty surrounding future climate change by adopting the “managed adaptive approach”.
- 2.6 The managed adaptive approach, as set out in ONR and EA’s Principles for Flood and Coastal Erosion Risk Management, sets out a way for dealing with the significant uncertainty surrounding climate change in the future. Its aim is to build flexibility into options and decisions today so that they can be adjusted depending on what happens in future.
- 2.7 The managed adaptive approach is deemed to be appropriate due to the long timescales for the development of climate change effects on sea level and meteorological events. The time taken for sea level changes is significantly longer than the time required to implement the managed adaptive options.
- 2.8 UKCP18 sets out a range of sea level change at UK capital cities in 2100 relative to the 1981-2000 average. As an illustrative example, for London, for the high (RCP 8.5) emissions scenario, UKCP18 predicts a sea level rise of 0.53-1.15m at the 5th-95th percentile, UKCP18 Factsheet: Sea level rise and storm surge.

Q3 - In the document, Use of UK Climate Projections 2018 (UKCP18) by GB Nuclear Industry - Position Statement, the ONR states that the position is ‘informed’ but not ‘determined’ by the advice of expert panel members. Could you explain how the decision is made to be ‘informed’ but not ‘determined’ by the advice of the expert panel members. Also when this decision is made are the expert panel members advised of the decision and given the opportunity to respond.

- 2.9 The Expert Panel on Natural Hazards currently provides high quality technical advice to ONR’s external hazards team on seismicity, climate change and coastal flooding. It was set up in 2010, became fully functional in 2011, and was tasked to assist the external hazards team on new reactor licensing and construction projects primarily, where licensees would be submitting technically sophisticated external hazards safety cases.
- 2.10 The Expert Panel is made up of academics and specialist consultants covering a range of skill areas relevant to seismic and coastal flooding hazards and climate change. These skills are mainly needed to meet the

assessment needs of ONR in respect of new nuclear build and revisions to technical assessment guides. Expert Panel members provide support to the external hazards specialist inspectors and provide a resource that ONR can call on whenever it needs expert guidance. The Expert Panel provides ONR with a valuable source of authoritative technical expertise independent from the nuclear industry. The expert panel members highlight emerging research in their areas of expertise. ONR inspectors contextualise this and identify whether any changes are required to our guidance or if specific dutyholder interventions are required. ONR inspectors consult with the Expert Panel on drafts of regulatory guidance to ensure there is a technical consensus, so far as is possible.

- 2.11 Ultimately, regulatory decisions and technical guidance remain the responsibility of ONR inspectors. The working relationship between the Panel and ONR facilitates expert dialogue, using the Panel's insights and experience and ONR's regulatory knowledge and responsibilities to fulfil and enhance ONR's role as an effective regulator of the nuclear industry and ensuring public safety in doing so.