

Sharing Experiences December 2013 – February 2014: A dialogue among participants

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Between December 2013 and February 2014 the UK experienced a succession of deep low pressure systems hitting the UK. Taken individually, for the most part the storms were notable but not exceptional for the time of the year with the exception of the storm on 12-13 February which one of the most significant storms to affect Wales and north-west England in recent decades.

The impacts have included flooding of thousands of properties, power outages and transport difficulties including the cutting off of Cornwall and parts of Devon from the national rail network, and tragically, some deaths. The evolution of the events included severe gales, flooding – starting with surface water then river then groundwater as is the pattern of inland flooding – and on the coast, erosion and flooding from surge tides. The Met Office has provided a summary (see <http://www.metoffice.gov.uk/climate/uk/interesting/2014-janwind>) for the period January and February.

News reports and images on the media have shown the importance of how different elements of infrastructure are interconnected and interdependent. Whether the reports were factual or not is one thing, but some reports were:

- Flights at Gatwick were cancelled because of flooded power equipment – a substation within the Gatwick complex was inoperative owing to floodwaters. Even the high-tech toilets were unable to be flushed;
- difficulties were experienced by the energy providers in repairing wind-damaged power lines as the road network was flooded or blocked with trees;
- Continuing gales made it difficult to use 'cherry pickers' to repair power lines;
- Problems were faced by road and rail networks and their operators with debris and floods making transport corridors impassable - road transport being used by rail engineers for inspections;
- the well-publicised breach of some 100m of sea wall and communications links at Dawlish and the recovery operation which included a £35M programme of works lasting some two months and involved reinstatement of communications cabling, controlled landslips and rebuilding the station structures at Dawlish station. Note also there were the properties protected!

All these and other reports I am sure reinforces the need for improved appreciation of how 'Systems Thinking' and understanding interdependencies can help the UK become more resilient in a world of environmental change. While Government has asked for evidence in a formal inquiry into transport resilience

(<https://www.gov.uk/government/consultations/transport-resilience-review-call-for-evidence>) the overall question of how interdependencies between infrastructure sub-sectors fared – or will fare in our changing climate - has not been highlighted in the 'mainstream'.

The IOA Forum/ARCC Network Dialogue kick-off meeting provided a starting point for a dialogue on interdependency issues that we now know about 'this time around', recognising that some had been known already (e.g., Dawlish was a known vulnerable site – all four miles of sea wall were studied by RSSB/ NR in 2007 and plans had been made to design and build a new wall that would address climate change concerns in CP5 and CP6).

The participants were asked for further examples and were provided with a few ideas to guide their interventions:

- Resistance versus Resilience?
- Optimisation versus Redundancy?
- Standards?
- Political assistance...or hindrance? ...or seeking the sound bites??
- Does 'value engineering' help or hinder?

Points raised during Dialogue kick-off meeting:

Immingham (a significant port) – was closed for five days due to tidal surges, lost power/ICT, total operational dependency was at risk. Issues also around

- Strategic road salt depot was port-side (vulnerable), so difficult to access
- Biomass – rendered useless

As was done for the heavy snowfalls a couple of years ago, it would be interesting to see an impact timeline to illustrate how effects cascaded in days/weeks after the event across the UK

- It was noted that similar work for this set of extreme events is being taken forward by IUK (taken from press cuttings etc.)
- Also noted that there was a Scientific Advisory Group for Emergencies (SAGE) initiative

During Dec 2013, EA flood defences upstream were needed to prevent salt water intake to water treatment facilities

EA were under pressure during this time as staff were drafted in to help work extra shifts to man emergency help-lines for what became a long-term, national event.

Repairs were being undertaken during the series of storms, but the combination of high winds and heavy rain led to falling trees and power lines down. It was noted that it is difficult to get clearance to fell large trees. Also climate change projections suggest a greater number of storms in the future – leading to a concentration of fallen trees/supply disruption across specific swathes of the countryside.

There are mutual aid agreements between water companies, sharing equipment across regions, but countrywide events as in 2013/14 made this much more difficult to implement.

There is little information available on the implications of interdependencies, especially on local highways. Often focus is on physical infrastructure, but there are also dependencies associated with care (health and social) and education services that are part of the broader infrastructure systems. There is a need to understand the wider implications of interdependencies, including in the context of providing services that enable a community to work – impact on users.

Challenges noted

Interdependencies issues were recognised this time round but how can we capture and embed this knowledge in systems thinking? It is important that we adopt a systems thinking approach as opposed to the more common silo/sector-based approach.

In the case of Dawlish, storm surge and sea-level rise has been known to be threatening the rail system. How can we encourage investment to minimise future risks?

There has been considerable investment by DNOs over past 6 years in protecting major substations, but this does not necessarily cover independent facilities such as those at Gatwick.

Synergies and risk elements

Need more cost effective means of mitigating overall risks

Including within resilience plans a reasonable time for recovery that would allow potential negative consequences to be addressed as part of the planned response

Recognising the resilience of assets and the resilience of service – minimise overall impact.