

Hazards Forum Workshop  
9 October 2025, Manchester

# Resilience in a Complex World

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1

## Hazards that reduce resilience

Natural hazards

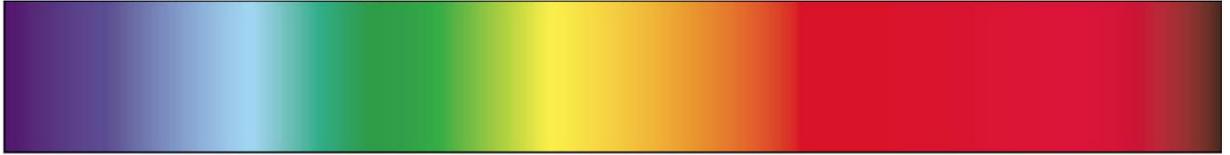
Engineered hazards

(Includes unfortunate policy decisions)

Malicious hazards

2

Everyone wants resilience?



Resilient

Efficient

3

### Natural Hazards: Carmont derailment 12 August 2020



06:38 train from Aberdeen to Glasgow. Ran into debris washed onto the track by very heavy rain and derailed; one coach went down an embankment. Three fatalities.

*Photos from RAIB Summary Report v2 January 2024.*

4

# Natural Hazards: Storm Desmond

December 2025



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# Engineered hazards: Iberian power loss 28 April 2025

## FINANCIAL TIMES

UK COMPANIES TECH MARKETS CLIMATE OPINION LEX WORK & CAREERS LIFE & ARTS HTSI

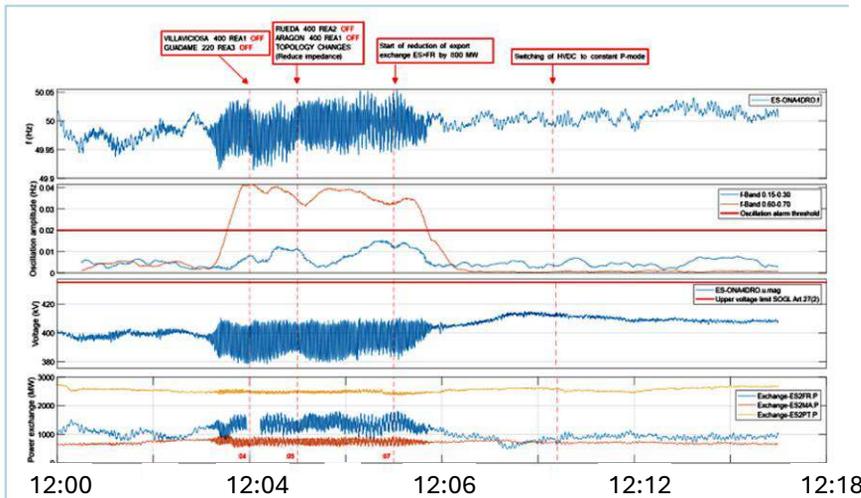
Spain [+ Add to myFT](#)

### Spain declares state of emergency in the wake of huge power outage

Many face night without electricity after train network, traffic lights and mobile connections shut down by mystery blackout

7

### 28 April measurements



#### Timeline

- 12:03 First oscillation
- 12:20 Second oscillation
- 12:33 Shutdown

Data from preliminary report



8

# Engineered Hazards: Heathrow power outage 21 April 2025

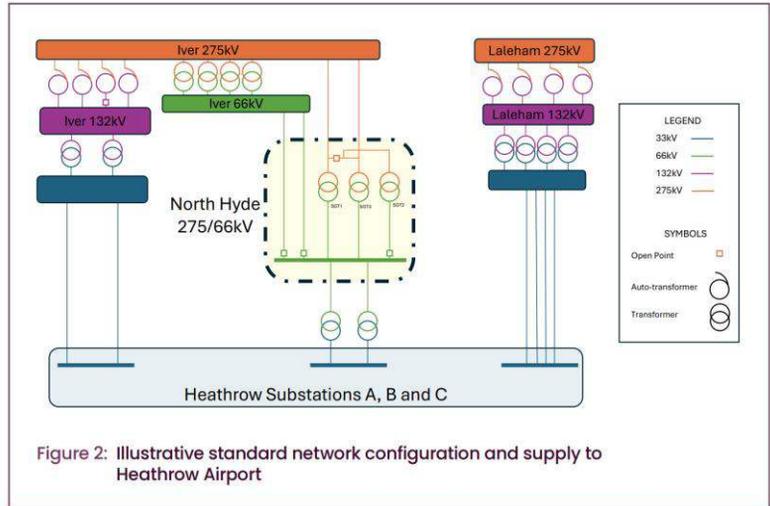


Figure 2: Illustrative standard network configuration and supply to Heathrow Airport

Diagram from North Hyde Interim Report, NESO 6 May 2025

9

# Politically engineered hazards Bexley derailment

4 February 1997



Railways Act 1993 privatised the railways

Three contributors to accident:

**Poor track maintenance**

**Train excess speed**

**Wagons overloaded**

Each was the responsibility of a different privatised entity.

A railway is a complex system but there was no single body with overall responsibility for safety.

Remember the spectrum!



See: <https://engineeringx.raeng.org.uk/media/m3kbpmdm/engx-bexley-train-crash-a-system-failure.pdf>

10

# Malicious hazards



## Hackers behind Ukraine power cuts, says US report

© 26 February 2016



Ukraine has been forced to turn to back-up power sources in recent months following a spate of power cuts.

Hackers were behind an attack that cut power to 225,000 people in Ukraine, a US report has concluded.

The December 2015 incident is thought to be the first known successful hack aimed at utilities.

The report, written by the Department of Homeland Security, is based on interviews with staff at Ukrainian organisations that dealt with the aftermath of the attack.

## FOREIGN AFFAIRS

# China Is Winning the Cyberwar

*America Needs a New Strategy of Deterrence*

ANNE NEUBERGER

September/October 2025

Published on August 13, 2025



EDUARDO HORCIANO

# Malicious Hazards: JLR cyber attack September 2025



### Implications:

- 33,000 employees
- 200,000 in supply chain
- Potential cost in billions

What were the priorities in designing the JIT manufacturing system?  
 And where was resilience in the list?



Resilient

Efficient

## Summary

### Natural hazards

More extreme events due to climate change  
Need to revisit decisions from many years ago

### Engineered hazards

are the most common type of hazard which their project is a part  
Resilience is not usually a priority

### Malicious hazards

Where there is a software-controlled system, there is a door for a cyber attack

END