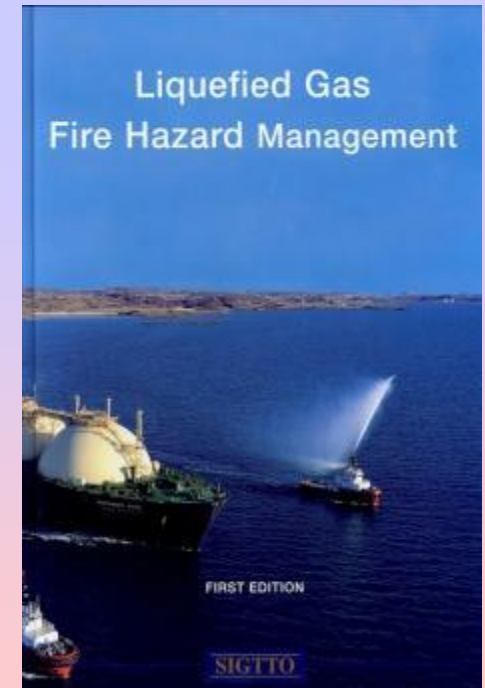




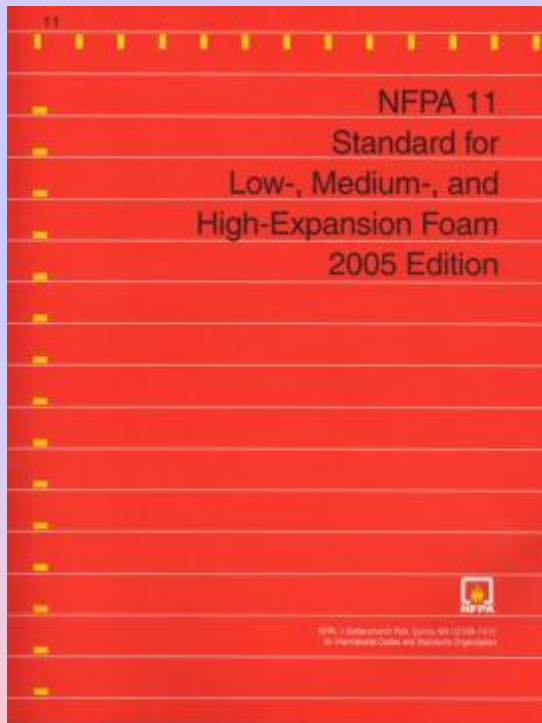
Buncefield Experience

Presented on the departure reception of
Kees Kappetijn,
August 30, 2012
By Niall Ramsden

Industry standards



Industry Standards





**BRANDVEILIGHEID
OPSLAGTANKS**

**BRANDVEILIGHEID
OPSLAGTANKS**

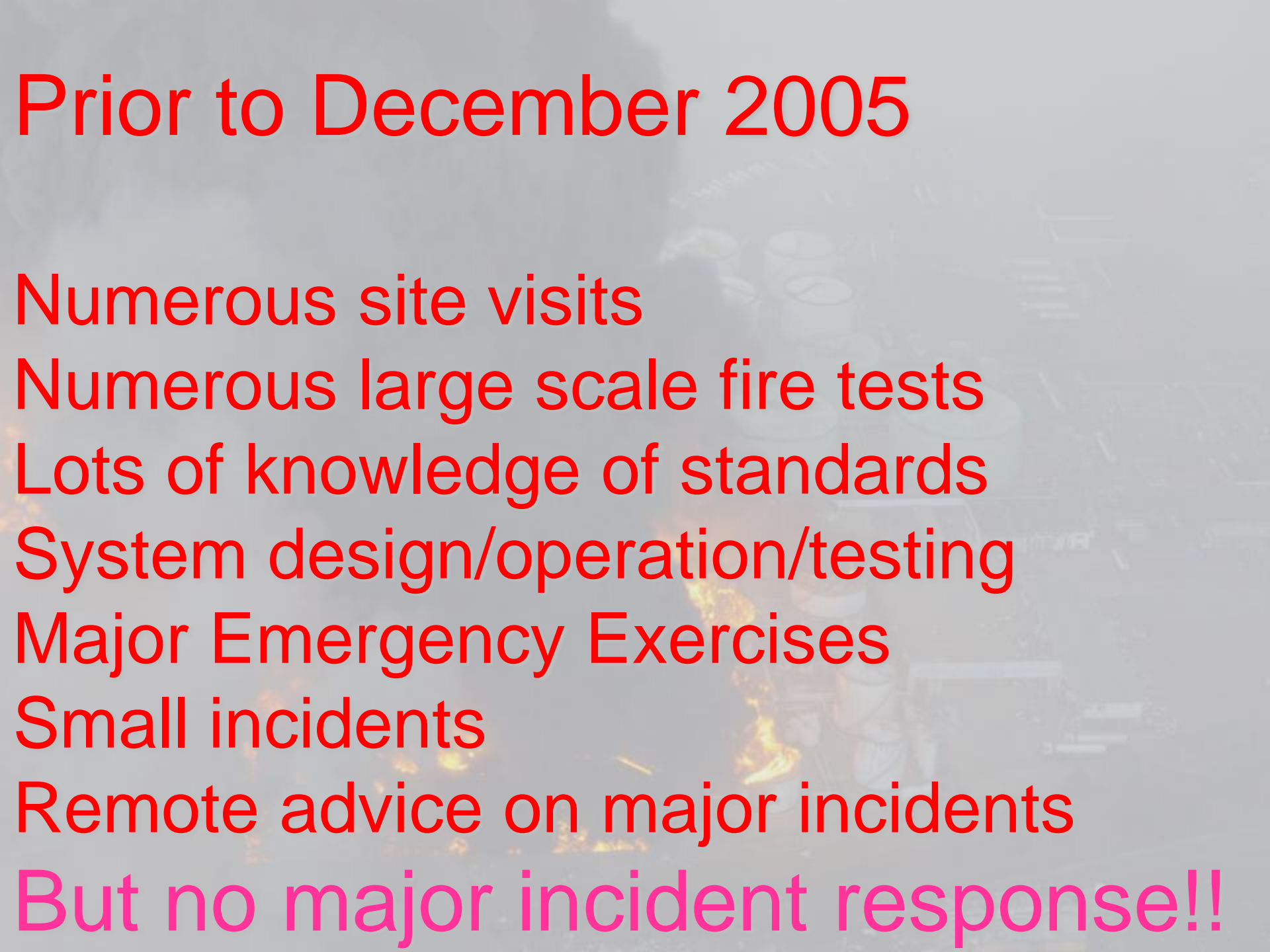
THE ATMOSPHERIC STORAGE TANK
TECHNICAL FRAME OF REFERENCE (CIV02)

AUDIT-METHODOLOGIE (CIV03)



Centre For Industrial Safety / Rotterdam Fire Brigade
Tanks Technical Reference and Audit Methodology

Prior to December 2005

The background of the slide is a grayscale photograph of a laboratory setting. It features various pieces of glassware, including beakers and test tubes, some of which are arranged on a rack. A prominent flame is visible in the lower-left quadrant, likely from a Bunsen burner. The overall scene is dimly lit, with the flame providing a source of light.

Numerous site visits
Numerous large scale fire tests
Lots of knowledge of standards
System design/operation/testing
Major Emergency Exercises
Small incidents
Remote advice on major incidents
But no major incident response!!



Buncefield Terminal fire 11 December 2005

24 tanks destroyed (~ 23 tanks & 7 bunds involved in initial event).

Picture credit: local Police website



On site

Gold Command 1000, 11 December
Incident Scene

~1200, 11/12 – ~1500 12/12

~1000 – ~1400 14/12





Extract from HFRS published report on Buncefield fire attack
“Incident Commander (White surcoat) consulting industry expert and
bronze commanders.”



Initially at Gold Command Escorted to Bronze

Foam – minimum requirements

Foam sources

Foam application

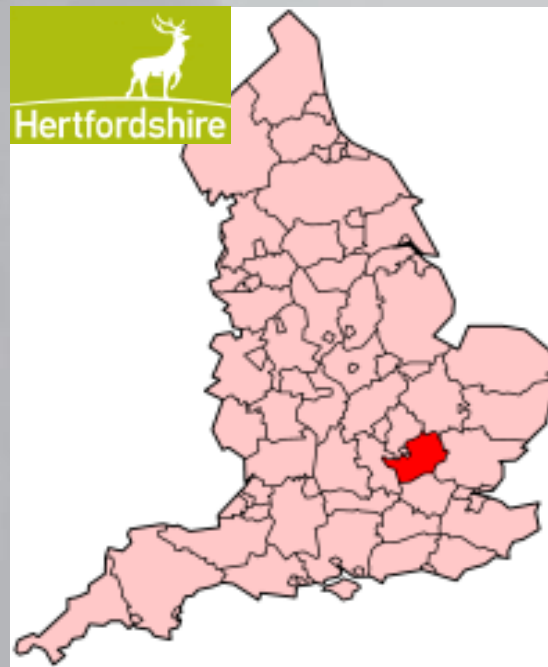
Explosion overpressure study

Incident investigation

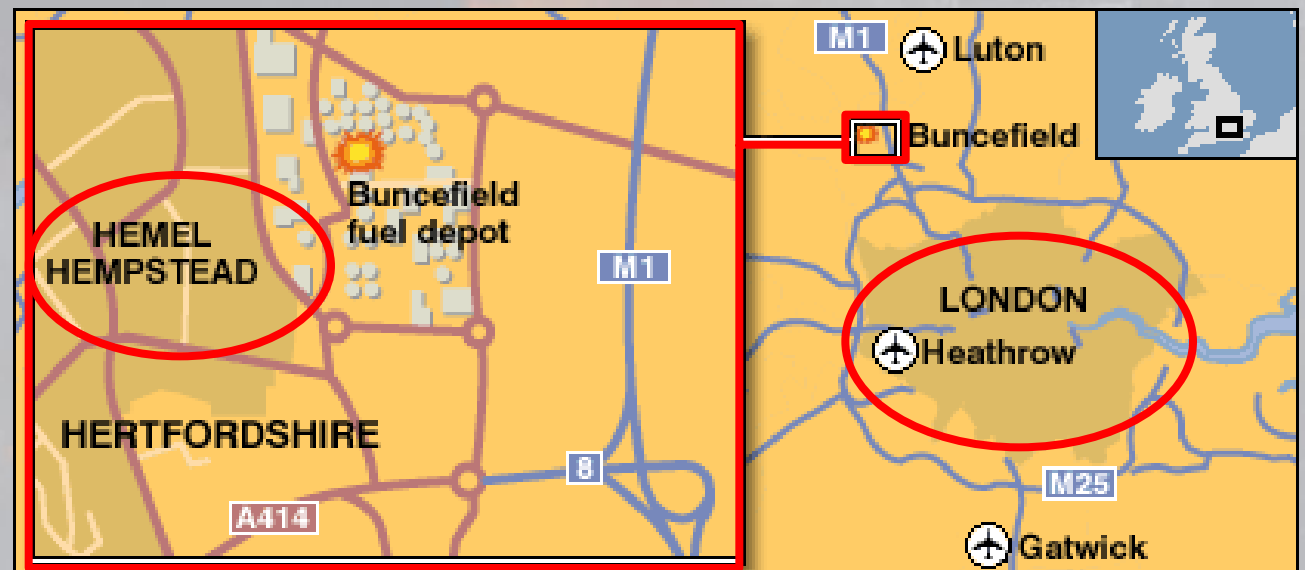
Other RPI personnel:

- Foam attack
- PSLG Follow up

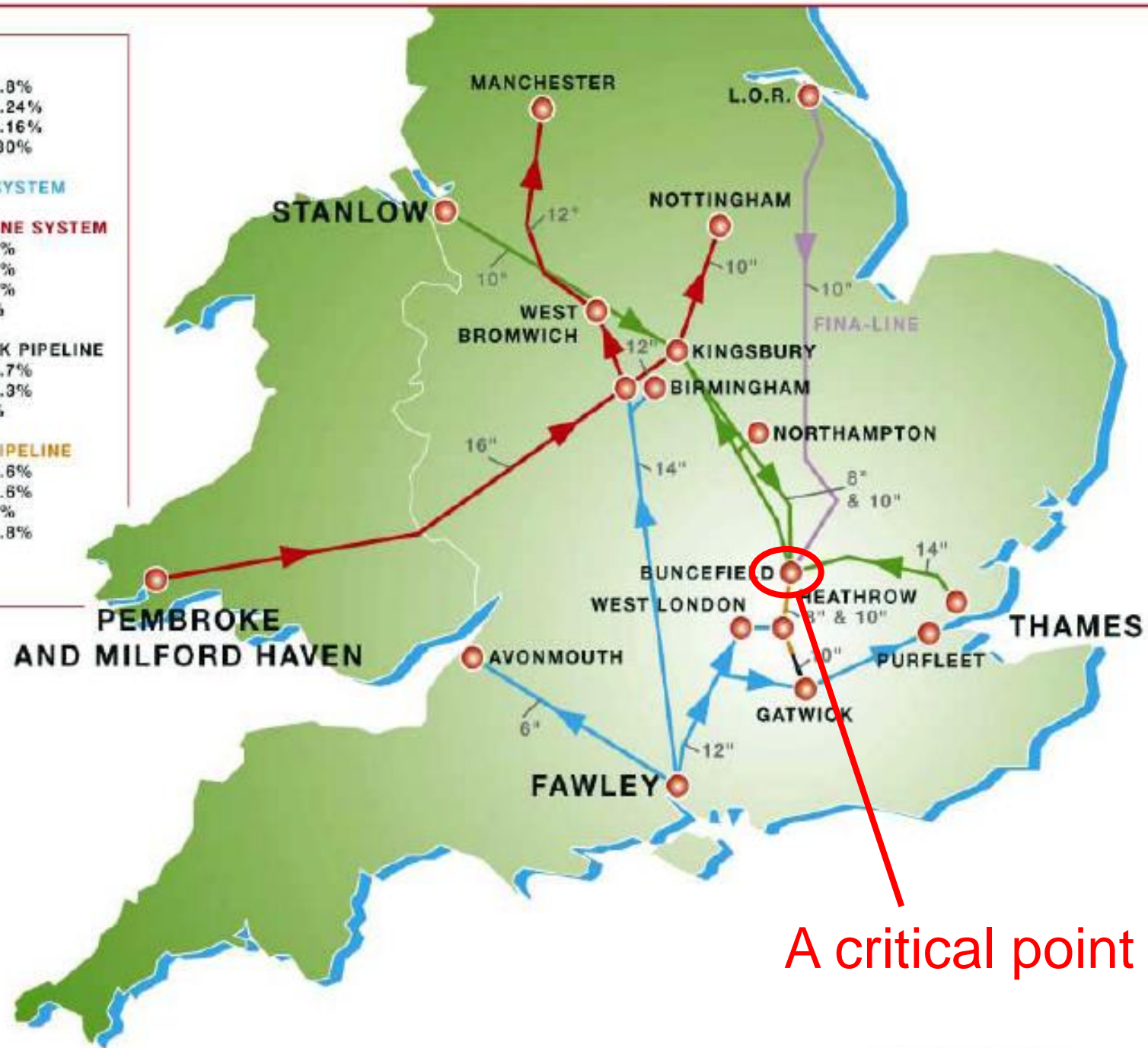




Location



U.K.O.P.	
Shell	47.8%
BP	33.24%
Texaco	15.16%
TotalFinaElf	3.80%
ESSO PIPELINE SYSTEM	
Esso	65%
Texaco	20%
TotalFinaElf	10%
Shell	5%
WALTON GATWICK PIPELINE	
BP	60.7%
Shell	33.3%
Texaco	6%
WEST LONDON PIPELINE	
BP	30.6%
Shell	37.6%
Texaco	21%
TotalFinaElf	10.8%
FINA-LINE	



A critical point

5th largest oil-products storage depot in the UK

Capacity ~275 million litres

~5% of UK oil storage capacity

Major hub on the UK's oil pipeline network (UKOP)

Important to British aviation industry

Gatwick

Heathrow

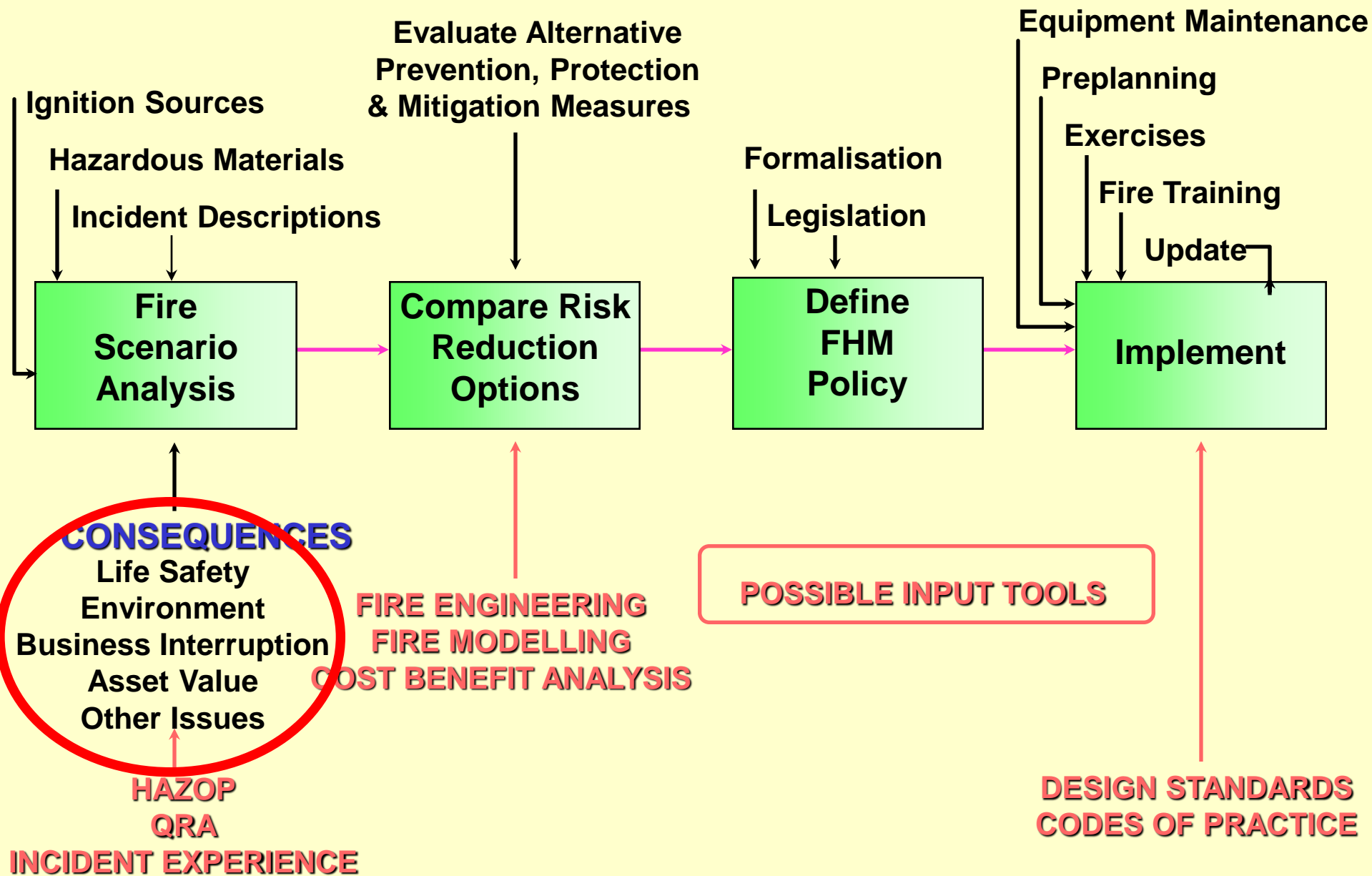
Luton





We live under a
Risk Based legislative
regime

FIRE AND EXPLOSION HAZARD MANAGEMENT



A major hub

Main risk actually business continuity!

Too often we only look at safety and environment issues

Equally

Sometimes regulators get involved when only minimal risk to safety or the environment!!

Risk Based assessments

Always difficult to assess
the low probability high
consequence incidents



Buncefield Terminal fire 11 December 2005

24 tanks destroyed (~ 23 tanks & 7 bunds involved in initial event).

Picture credit: local Police website







Search and rescue concerns





Some issues

Public concerns

Media interests

Firefighter safety concerns

Foam application

Regulatory issues

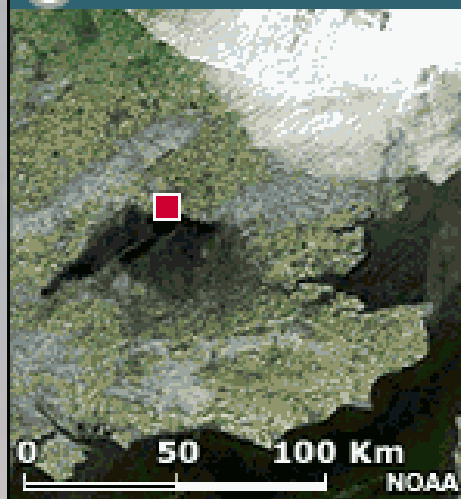
Consequences

Smoke issues





1 11 DEC, 0940 GMT

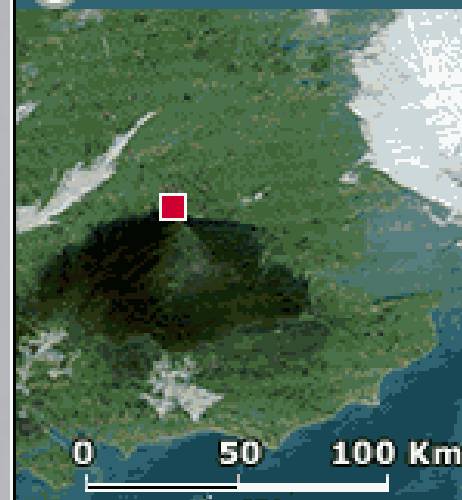


■ Buncefield fuel depot

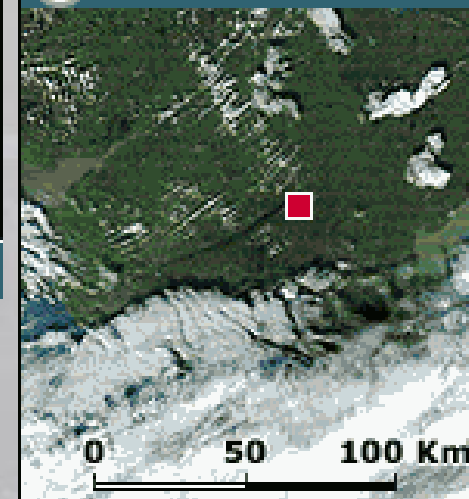
2 11 DEC, 1150 GMT



3 11 DEC, 1336 GMT



4 12 DEC, 1241 GMT



Transport disruption

Motorways closed

Queues at petrol stations

Panic buying

Department of Trade and Industry – “No shortages”

30% of Heathrow fuel

Rationing

Long-haul flights affected

Effect on local road network



Effect on local air travel



An aerial photograph of Heathrow Airport. In the foreground, the iconic white cylindrical control tower stands prominently. To its right, a BA aircraft is parked on the tarmac. In the background, another BA aircraft is visible on a runway, and a third is in flight in the upper right. The surrounding landscape is green and flat.

Fuel shortages
30% of Heathrow's fuel!

Flight paths?

BAA 

Heathrow



Toxicity?

Pollution tracked after oil blast

Schools within a 10-mile radius of the blast remain closed

Environmental experts are monitoring pollution across southern England as a plume of smoke from the Hertfordshire fuel depot blasts drifts south.



Blaze pollution 'may end up in the water'

As a precaution drinking water abstraction boreholes have also been closed in conjunction with Three Valleys Water Company

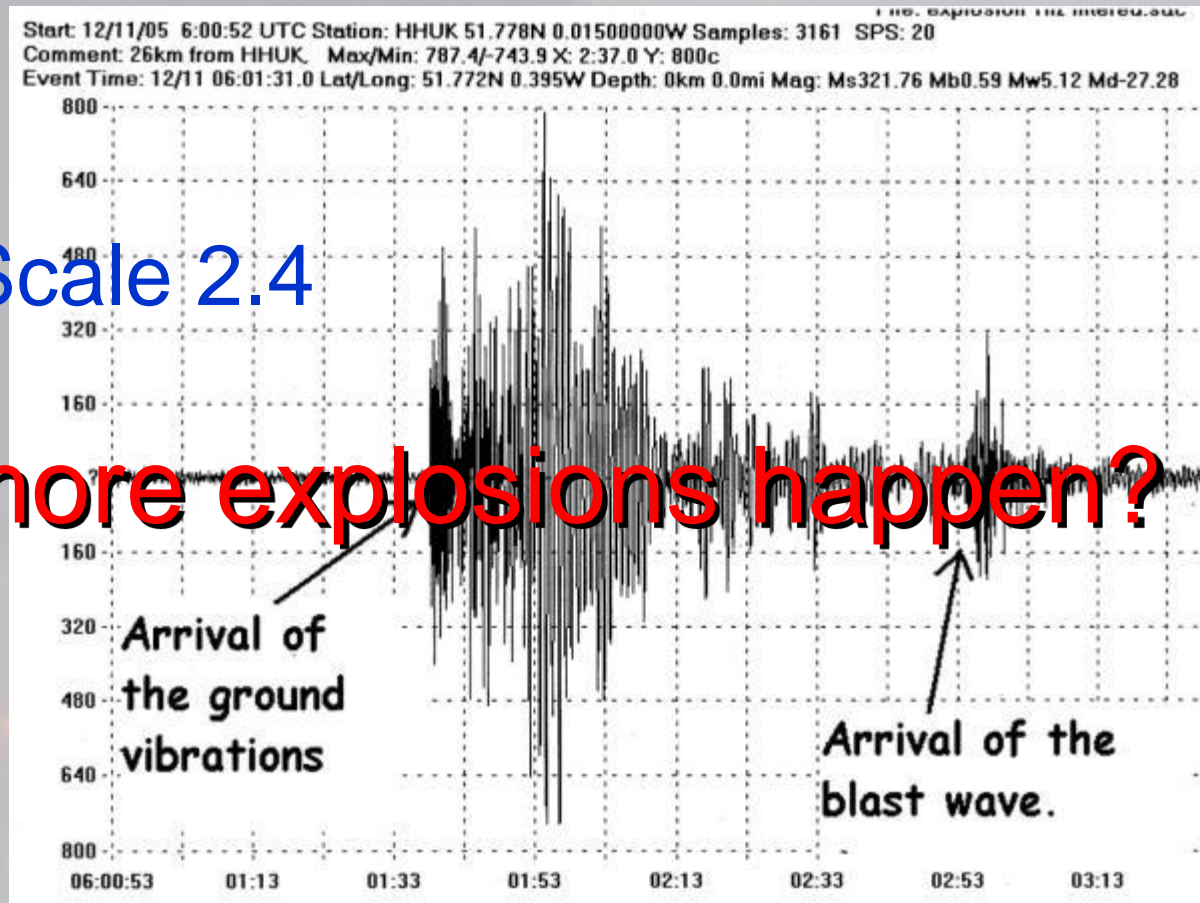
Further Explosions

Initial explosion

06:02

Richter Scale 2.4

Will more explosions happen?



Further explosion

06:27

Further explosion

06:28

Loss of property



Longer term –property value loss

Accommodation





January 26

'I DID LOOT BUNCEFIELD BLAST HOME'

A man has pleaded guilty to looting a house which had been evacuated following the massive Buncefield Oil Depot explosion last month

Warren Patten, 22, took property worth £5,500 from the detached house

Legal claims for people affected by Buncefield fuel explosions

Many hundreds, if not thousands, of people are likely to have legal claims for compensation resulting from the injuries sustained, the damage to their properties and the disruption to their lives.

Who is responsible?

Crucial issue - start gaining evidence surrounding the claims

Health problems

Potential for many more hundreds of people to go down with sickness and respiratory complaints such as asthma is high.

Immediate illnesses such as vomiting, but there is always the worry of more lasting injuries. Only time will tell here whether the fumes spewing out of the oil depot will lead to more chronic illnesses. The police are suggesting that the fumes are not toxic, but that maybe a knee jerk 'don't worry' sort of statement rather than a considered review. It may well simply too early to say how toxic is the plume.



“400 businesses and 25,000
staff affected

Overall financial impact may be
in the region of £ 5 billion”

Media Interest



Fire Fighting

First decision

Do you want to put it out?

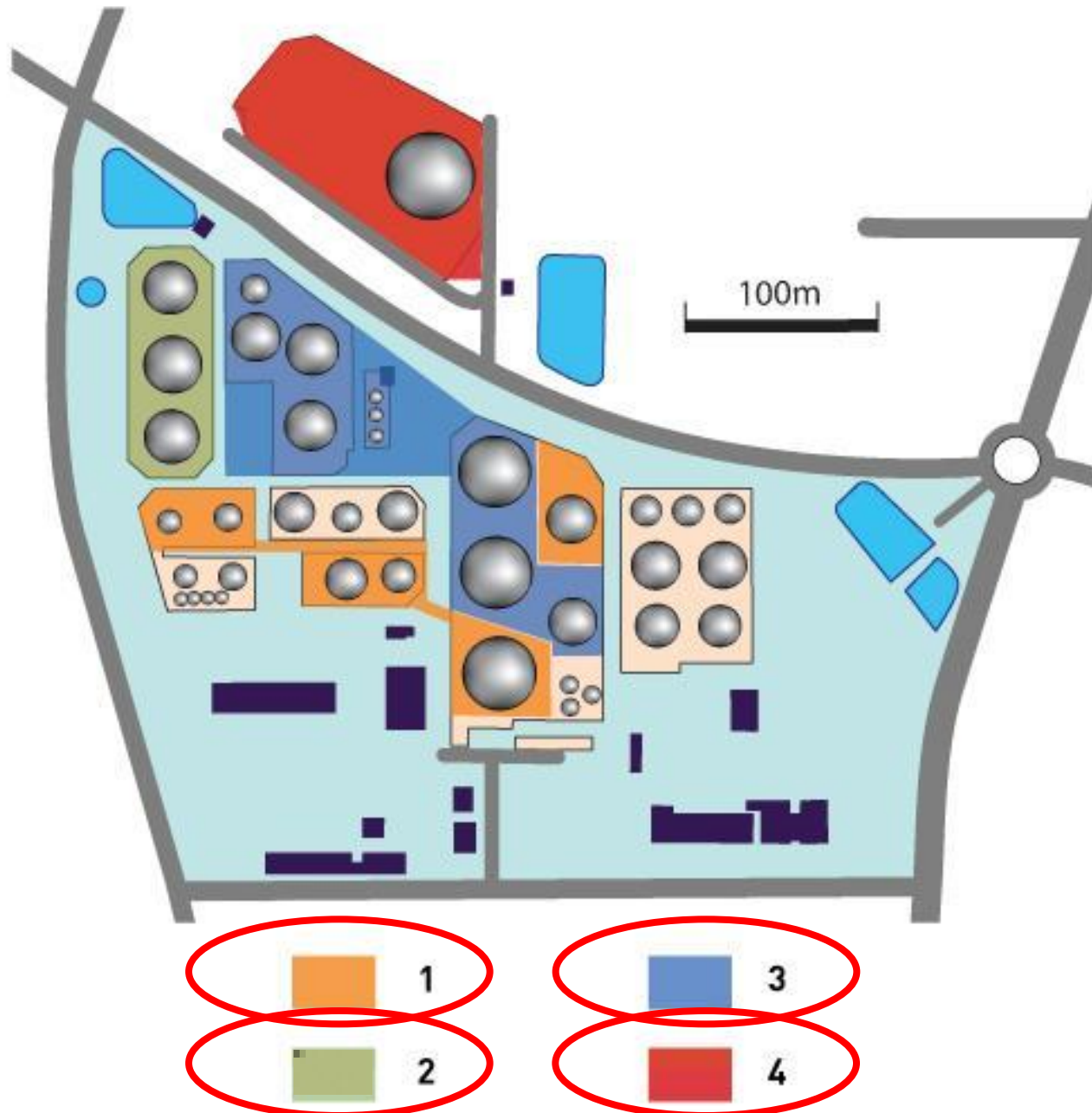


An aerial photograph of a large-scale industrial fire. Thick, billowing black smoke rises from the center of the inferno, partially obscuring the sky. Bright orange and yellow flames are visible at the base of the smoke plume and along the edges of the burning area. The fire appears to be consuming a large structure or a significant amount of industrial materials. The overall scene is one of a major disaster or accident.

The main incident attack

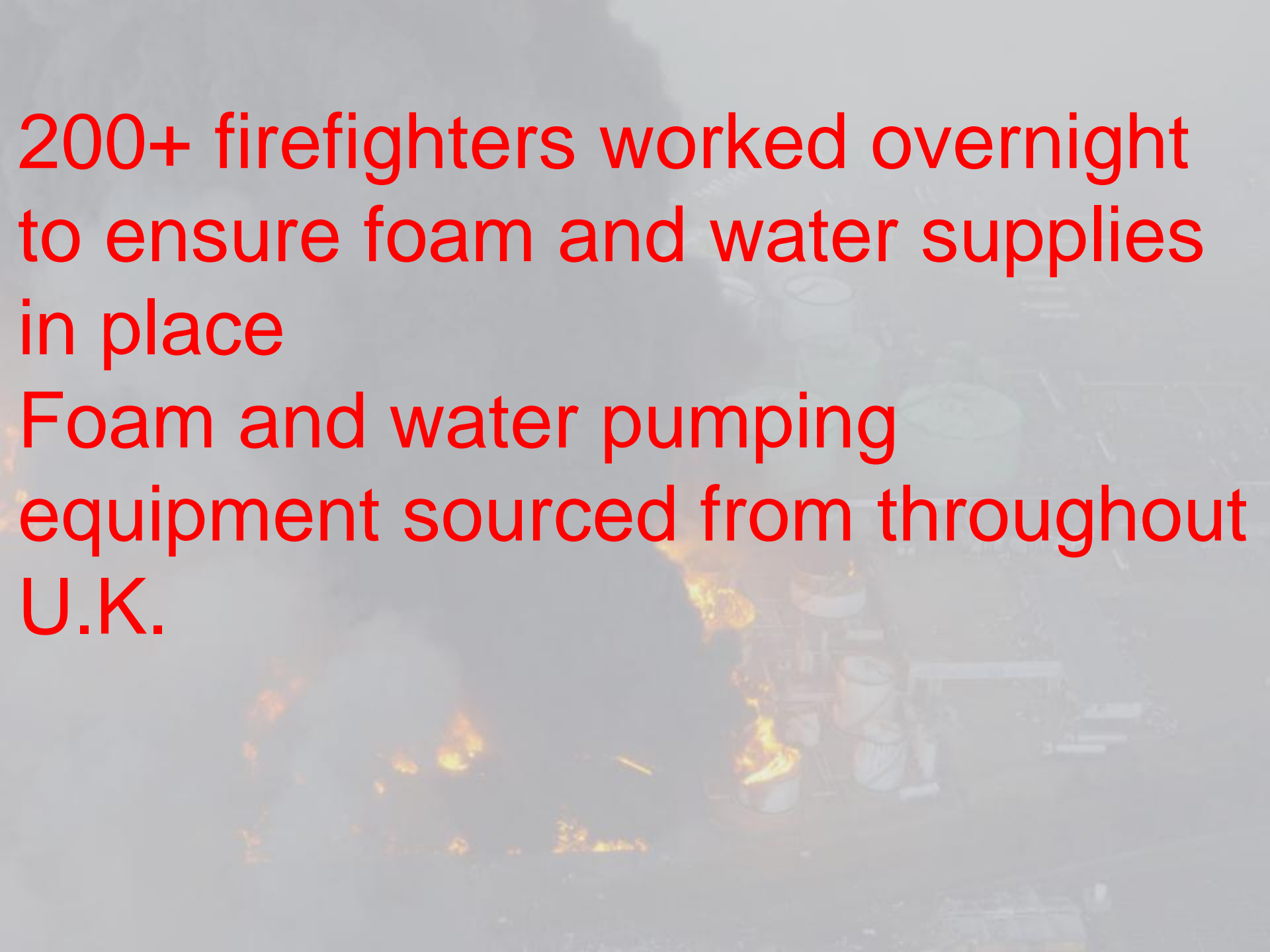
The plan!

Phased approach



An aerial photograph of an industrial site, likely a refinery or chemical plant. The facility features numerous large, cylindrical storage tanks and complex piping. A massive, billowing plume of white smoke or steam rises from the left side of the image, partially obscuring the background. In the lower-left and lower-center areas, there are visible fires and bright orange flames, suggesting a major incident or controlled burn. The overall scene conveys a sense of industrial scale and potential hazard.

The reality!



200+ firefighters worked overnight
to ensure foam and water supplies
in place
Foam and water pumping
equipment sourced from throughout
U.K.





>1600m

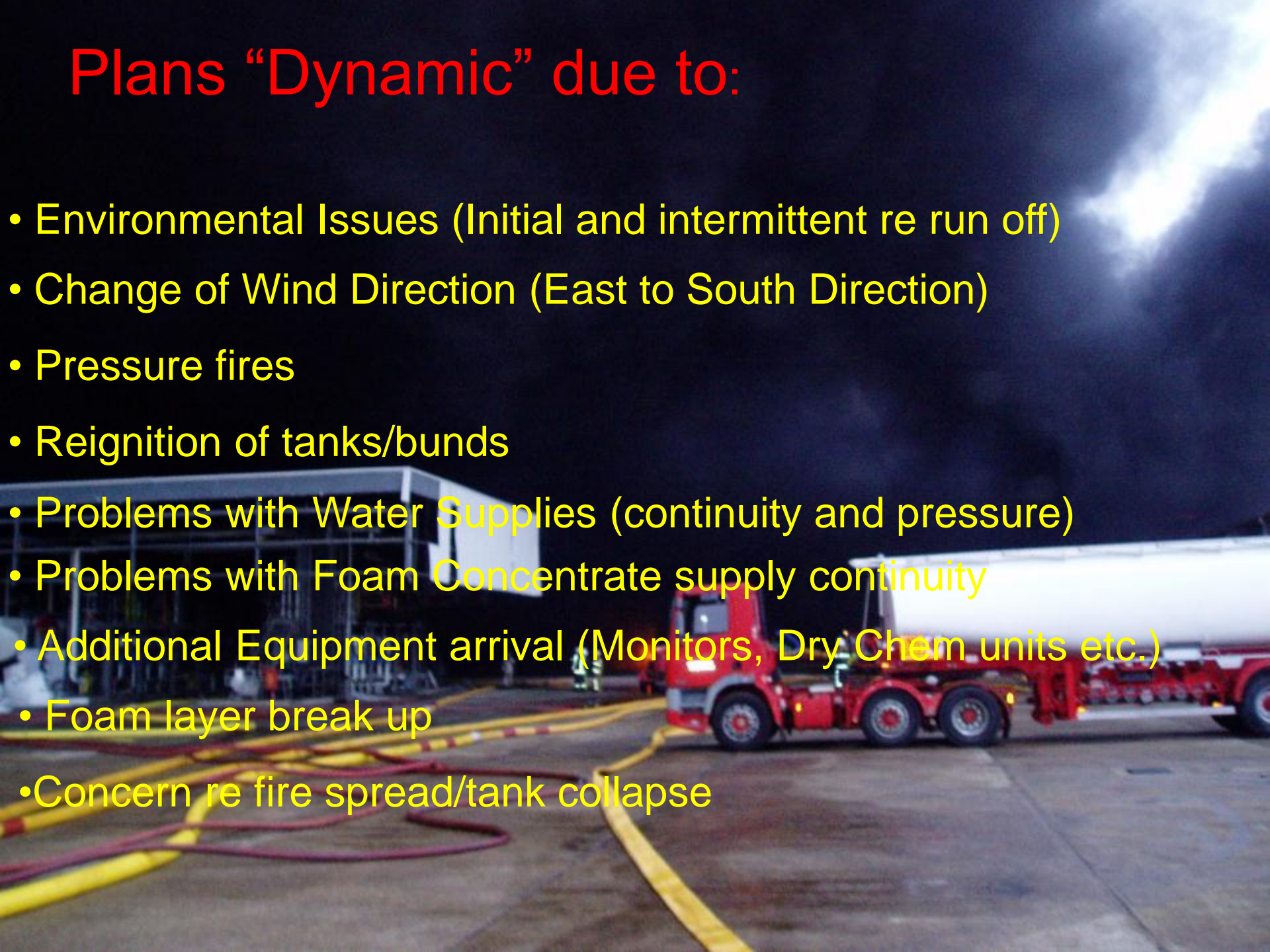
Physical effort Fatigue





Plans “Dynamic” due to:

- Environmental Issues (Initial and intermittent re run off)
- Change of Wind Direction (East to South Direction)
- Pressure fires
- Reignition of tanks/bunds
- Problems with Water Supplies (continuity and pressure)
- Problems with Foam Concentrate supply continuity
- Additional Equipment arrival (Monitors, Dry Chem units etc.)
- Foam layer break up
- Concern re fire spread/tank collapse





The firefighting?

Issues

A magnificent joint effort

Logistical strength of the Government

Fire Brigade

Specialist equipment and expertise
from Industry

Control of building activity nearby
Acceptability of Controlled Burndown
Tank contents monitoring

Comparison with fill rates

Quiescent state

Independent HiHi and ESD

Operation and Maintenance controls

Remote tank valve operation

Vapour detection in bunds

Bund integrity under fire conditions

Bund capacity for firewater

Firewater run off control, containment and treatment

FSIA – including system vulnerability

Preplanning and Exercising Preplan

Performance standards for foam procurement

Training on foam application and foam system testing

Consequence modelling

Major Incident Response Unit development

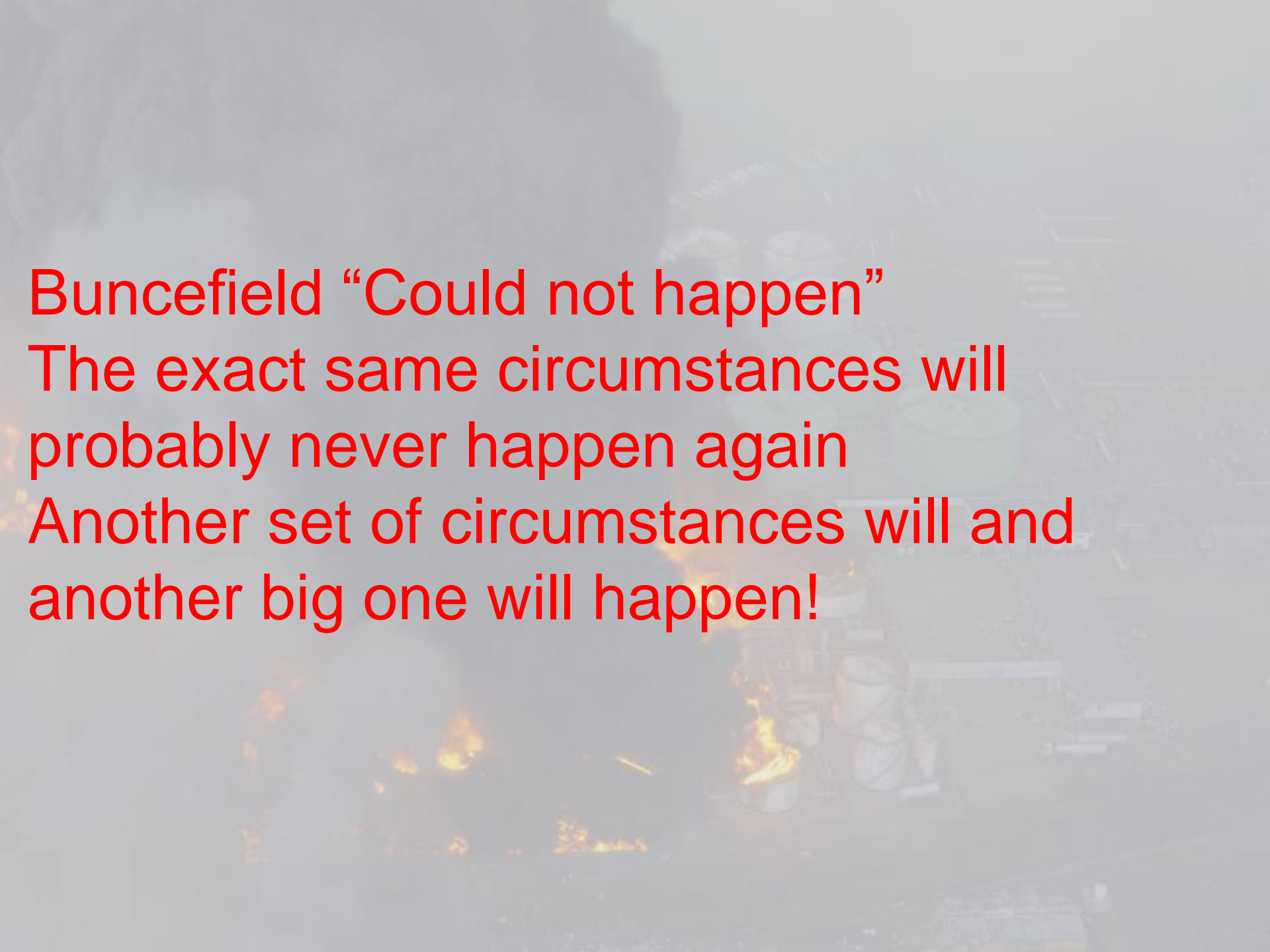
Issues

A true

Fire Hazard

Management

approach!!

An aerial photograph of a large industrial fire at Buncefield. Thick black smoke billows from the site, partially obscuring the background. In the foreground, several large white storage tanks are visible, some of which are surrounded by intense orange and yellow flames. The ground is covered in a layer of dark, charred material and debris. The overall scene depicts a major industrial disaster.

Buncefield “Could not happen”
The exact same circumstances will
probably never happen again
Another set of circumstances will and
another big one will happen!









Buncefield “Could not happen”

The exact same circumstances will probably never happen again

Another set of circumstances will and another big one will happen!

Maintain versatility, expertise and skill set

Every one can have a part to play

Different circumstances Different solutions





Storage Tank Firefighting

A background image showing a large industrial fire at a storage tank facility. Thick black smoke billows from a large fire in the distance. In the foreground, several firefighters wearing helmets and dark uniforms are visible, some looking towards the fire. The scene is hazy and smoky.

Not an exact science
Provide the tools and
the knowledge to
keep options open!

A team effort

Complementary skills