

# Buncefield – lessons learned

## NWWHSG 2011

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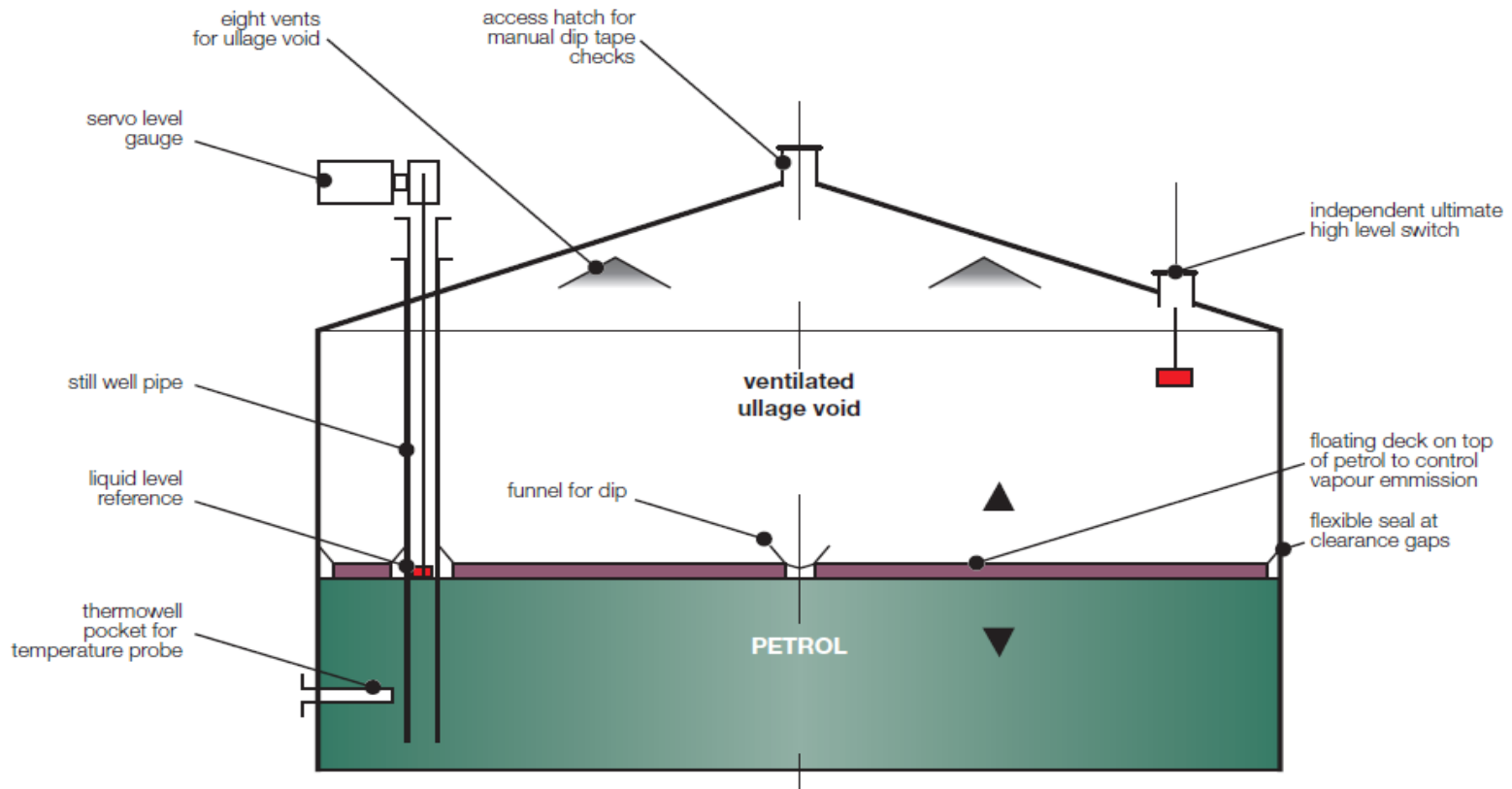
# Buncefield Major Incident Investigation Board - outputs



- Design and operation of fuel storage sites
- Emergency preparedness
- Explosion mechanism
- Land use planning
- Major incident policy and procedures

# The Fuel Tank

Figure depicts the basic layout of Tank 912. This was a floating deck tank whereby in addition to the fixed roof, there is a deck inside the tank which floats on the fuel, thus minimising the emission of vapour from the fuel surface.



# Independent High Level Switch

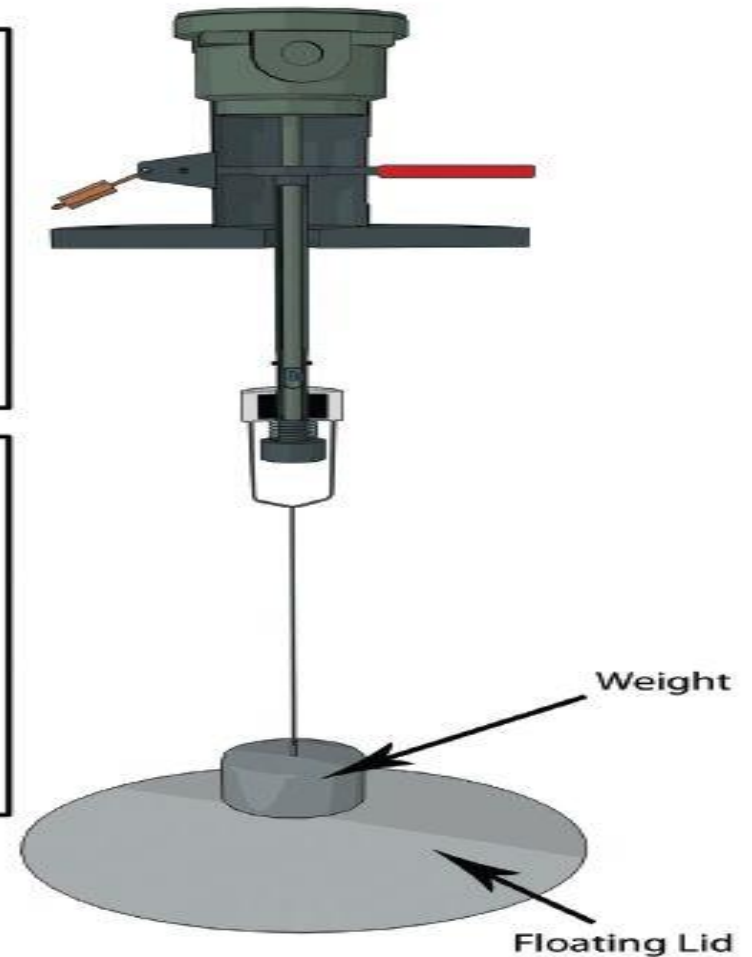
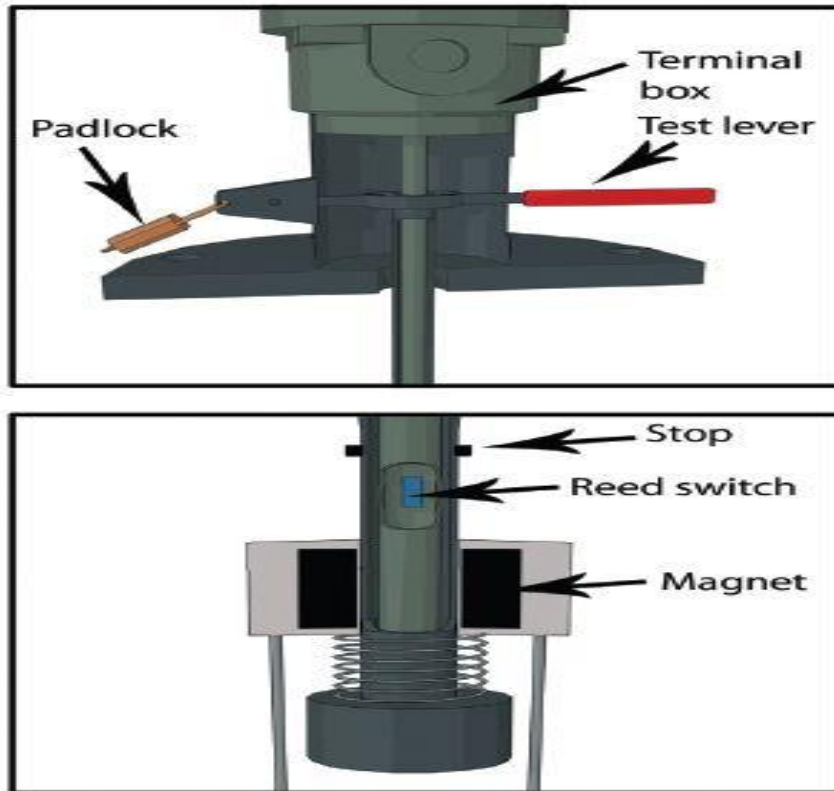
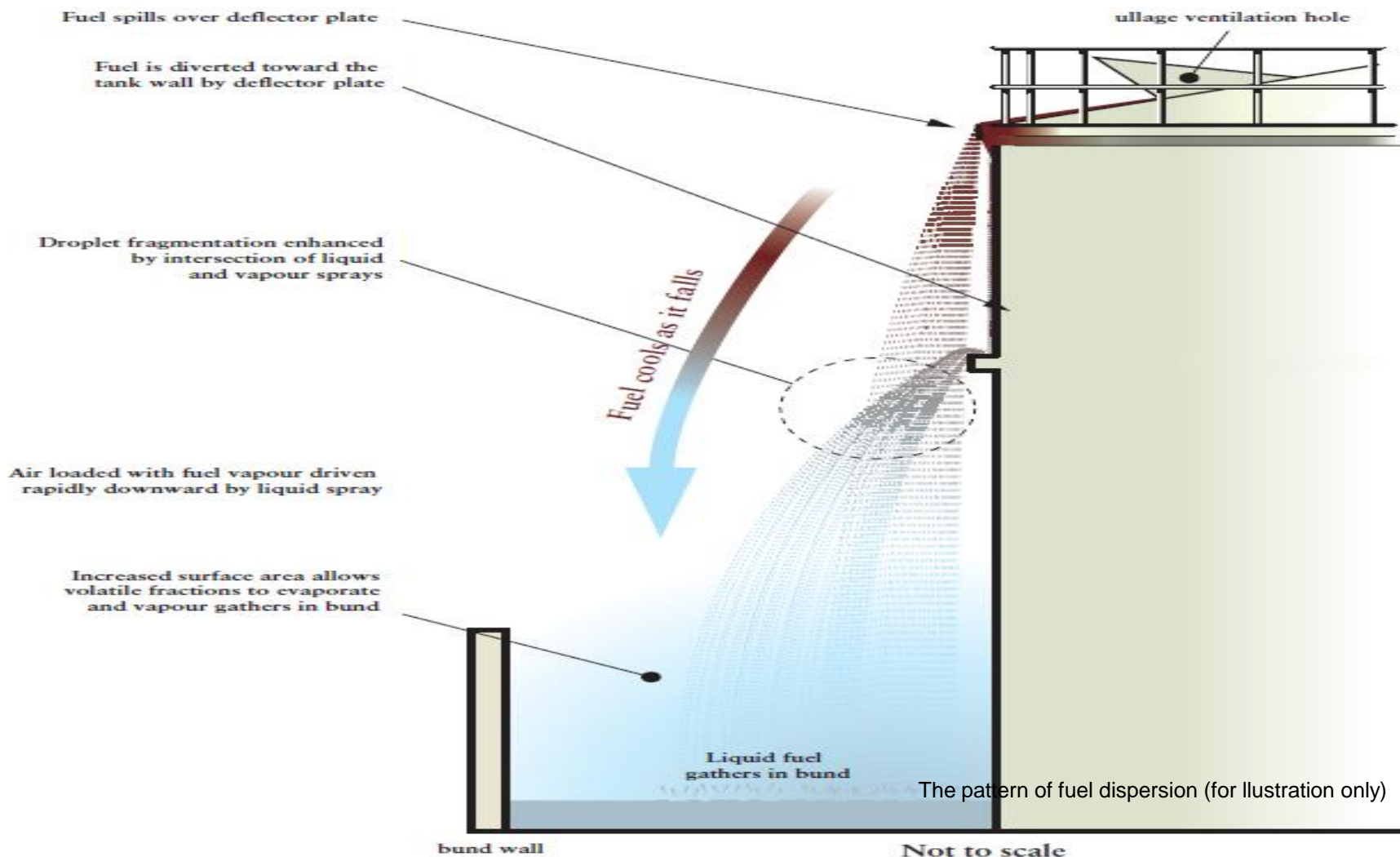


Figure 12 The working principles of the IHLS

# The Fuel Leak



# Technical Causes

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## Defective

- level gauge
- independent high level switch
- bunds and run offs



# Technical Causes 2

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## Independent High Level Switch poorly

- designed
- Installed
- maintained

# Organisation and Management Systems

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**3 parties (designer, installer, user) with no shared understanding of:**

- the safety critical nature of the equipment**
- how the SCE should operate**
- SCE reliability**

# Organisational and Management Systems

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- Increasing operational pressures
- Lack of control of tank filling on site
- Loose procedures
- Loose procedures not followed
- Auditing of loose procedure
- No process safety indicators
- Inadequate board level focus

# Underlying Causes - Summary

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- **Inadequate understanding of process safety risk**
- **Lack of rigour in SCE procurement, maintenance and use**
- **Poor communications**
- **Insufficient response to warning signals**
- **Culture driven by work pressures and priorities**
- **Poor auditing**

# As the Judge said:

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- **Slackness**
- **Inefficiency**
- **Complacency**

# Manchester Hole cave, Nidderdale





# Forage harvester



# Quarry overturn





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- **What is your tolerance of error**
  - **What is your threshold for action**

# Leading indicator

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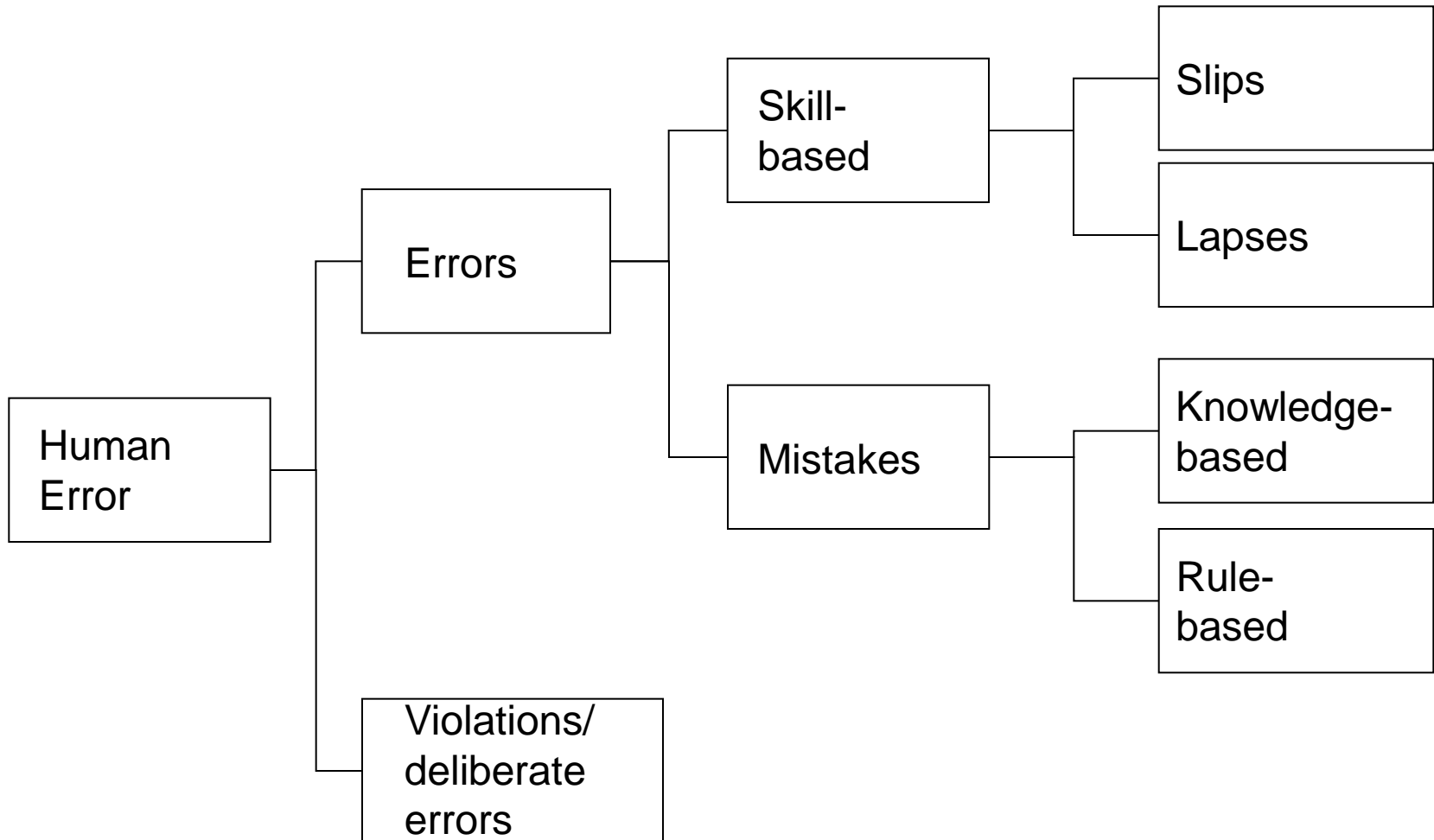
- **Active monitoring focusing on a few critical risk controls to ensure they are effective**

# Possibilities

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- I've seen this before, so I'll...
  - This is new but it looks like, so I'll
  - Not sure about this, but I'll...
  - I got caught out by this last time, so I'll...
  - I don't care about that, let's do this...
  - Etc etc
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- But the action always makes sense to the person at the time – we are 'furious pattern-matchers'

# Error Taxonomy



# Top Gear



# Deepwater Horizon



## And what about the regulator?

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- **Go to the right places**
- **Do the right things**
- **Finish what you start**

