

Risktec Solutions

risk management and assessment for business

**How to enable and justify the safe
development of complex sites**

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Who are Risktec

- Independent and specialist risk management consulting and training provider
- We focus on:
 - Safety & Risk Assessment [what are the risks?]
 - Management Systems [how are they managed?]
 - Culture & Behaviour [what really happens!]
 - Training & Education [knowledge transfer]
- 130+ personnel across 10 offices world-wide
- Primarily operating in Major Hazard Industries
- Becoming increasingly involved in Wind Industry [onshore and offshore]

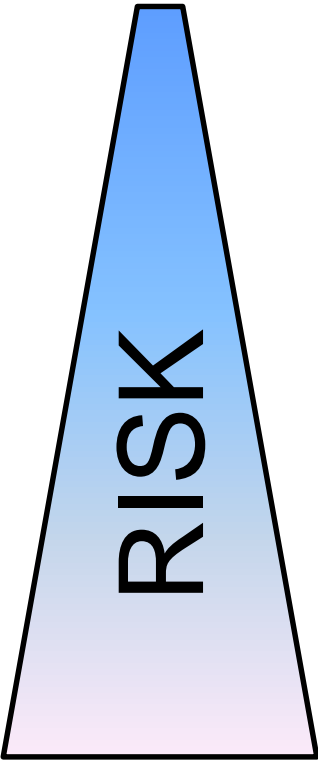


Purpose of Presentation

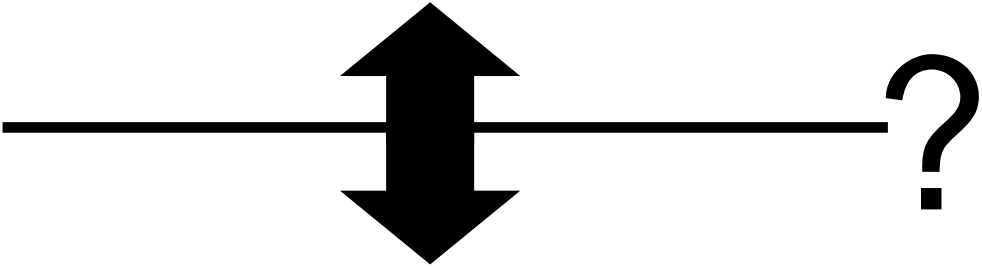
1. Introduce the concept of 'complex sites'.
2. Describe how to go about developing a complex site such that risk is reduced to acceptable levels.
3. Describe how this position should be demonstrated to satisfy all relevant 'stakeholders' and gain planning consent.

...using Wear Point Wind Farm as a Case Study

What is a complex site?



Definitely not a remote Scottish Moorland

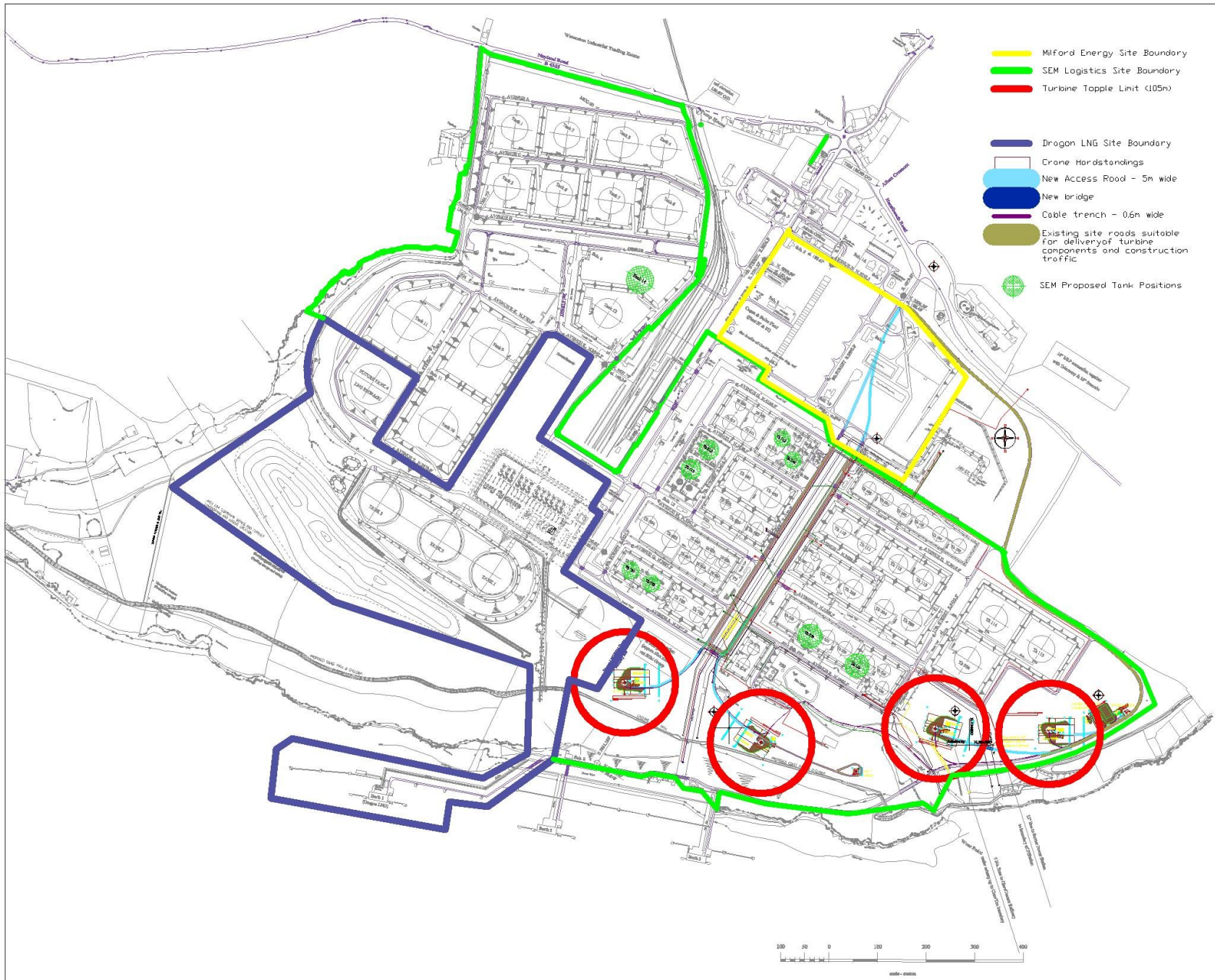


Definitely is where Turbines are located in close proximity to a Major Hazard Facility

Wear Point Wind Farm

- Wear Point near Waterston, Milford Haven, South West Wales
- Proposal for 4 large Turbines [max tip height: 105m]
- Located within SemLogistics Oil & Gas Storage Facility ['Top-Tier' COMAH Site]
- Located adjacent to a large LNG Storage Facility [Dragon LNG 'Top-Tier' COMAH Site]
- Being developed by **INFINERGY**





- Milford Energy Site Boundary
- SEM Logistics Site Boundary
- Turbine Topple Limit (105m)

- Drogon LNG Site Boundary
- Crane Hardstandings
- New Access Road - 5m wide
- New bridge
- Cable trench - 0.6m wide
- Existing site roads suitable for delivery of turbine components and construction traffic
- SEM Proposed Tank Positions



Why assess risk?

If inadequately conceived or executed, the Wind Farm could:

- Compromise the safe operation of the neighbouring COMAH Sites.
- Present an unacceptable risk to personnel working within these Facilities.
- Increase the risk, and/or escalate the effects, of a major accident within these Facilities beyond acceptable levels.

To ensure the Wind Farm is developed safely, a **Safety Assurance Process** should be followed to ensure, and robustly demonstrate, that the Wind Farm poses no unacceptable additional risk to these neighbouring COMAH Sites and hence the general public.

Hazard Identification [1]

- Identify all reasonably foreseeable hazards
- Must consider complete life-cycle of Wind Farm [Construction, Operation, Maintenance & Decommissioning]
- Must consider planned and potential future changes to neighbouring Facilities
- Must consider direct and indirect hazards
- Ideally performed via a structured, team-based approach
- Workshop Team to have knowledge and experience in:
 - Layout/design of Wind Farm
 - Construction of Wind Farm
 - Design, Operation of proposed Wind Turbines
 - Design/Operation of neighbouring Facilities
 - Safety Management within neighbouring Facilities
- Must be conducted at earliest appropriate opportunity to ensure SAP influences Wind Farm layout/design

Hazard Identification [2]

Wear Point Wind Farm:

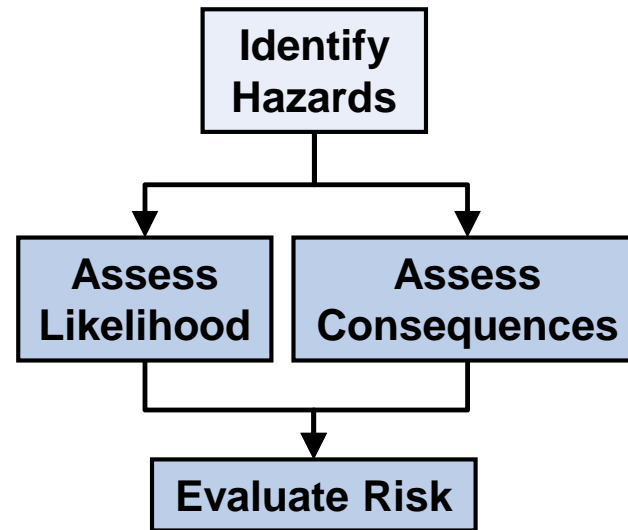
Direct Hazards:

- Turbine blade 'throw'
- Turbine ice 'throw'
- Construction crane topple
- Turbine Tower collapse/topple
- Fire
- Causes instability in essential electrical supplies
- Disrupts essential communications
- Distraction to shipping navigation
- Threat to security

Indirect Hazards:

- Fire
- Explosion
- Missile/Collision
- Vapour Cloud

Safety Assurance Process



Risk Assessment

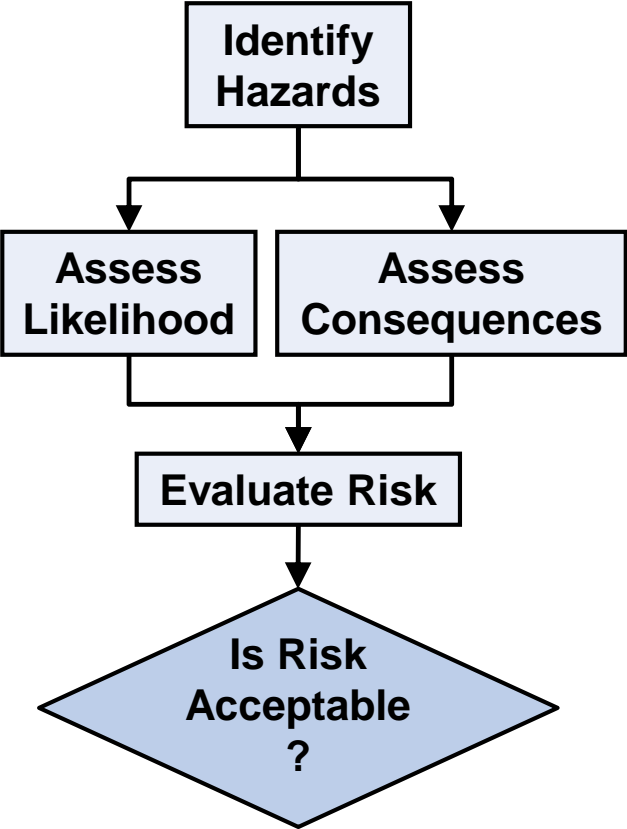
Example Wear Point Wind Farm RA activities:

- Turbine/Crane 'topple' survey [can a Turbine or Crane strike safety significant infrastructure?]
- Probabilistic blade throw assessment [what is the probability of a Turbine blade failing, being thrown towards either COMAH Site and striking safety significant infrastructure per year?]
- Dispersion modelling of vapour cloud [can it reach Turbine at flammable concentrations?]

Analysis must cover all possible Turbine types

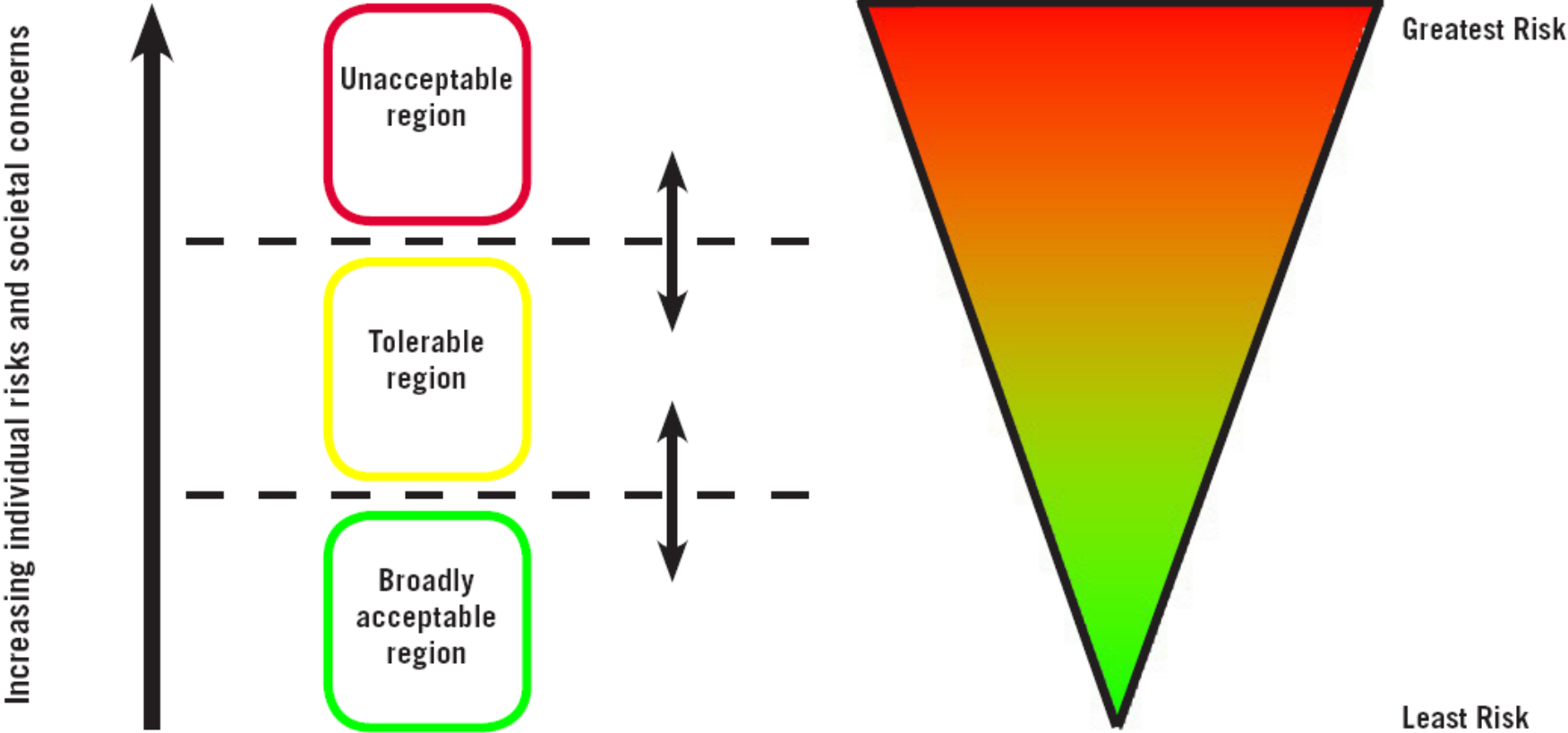
Perform bounding analysis wherever possible

Safety Assurance Process

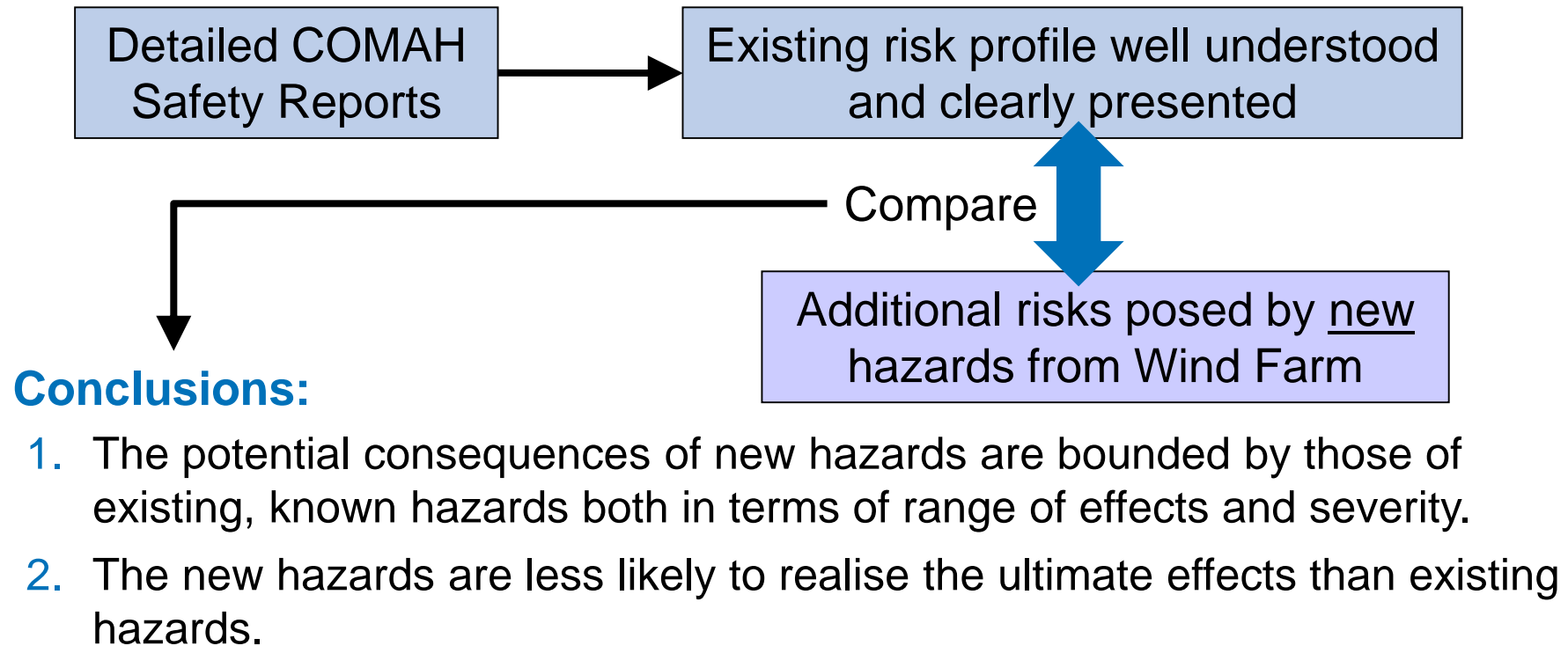


Is Risk Acceptable?

HSE 'Tolerability Of Risk' Guidance



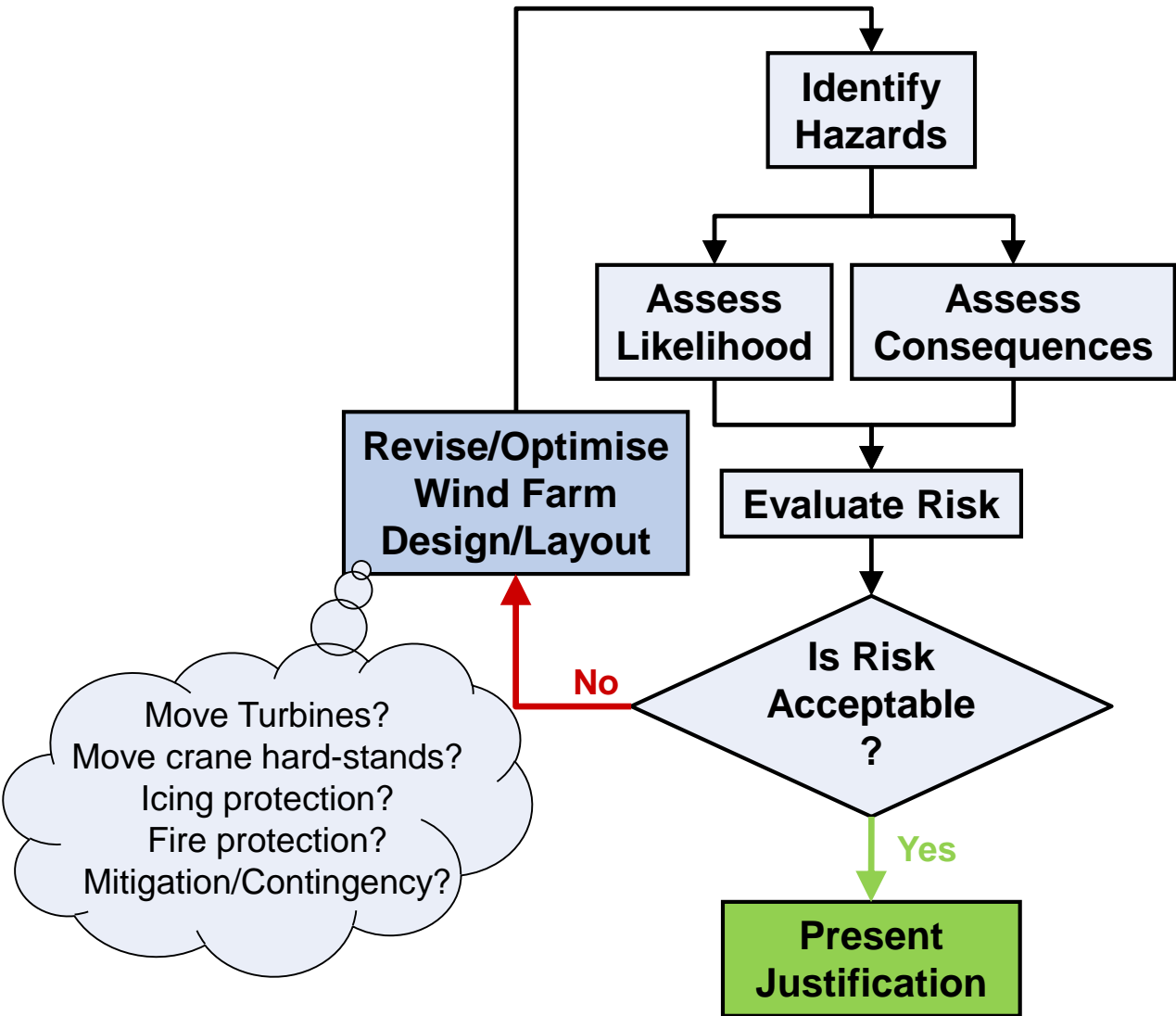
Is Risk acceptable?



So, whilst the Wind Farm poses additional risks to the COMAH Sites, these risks are readily bounded by, and very small in comparison to, existing risks.

Hence the Wind Farm will **not significantly increase the existing risk profile** of the neighbouring Sites and can be justified on this basis.

Safety Assurance Process



Present Safety Justification

- Written demonstration that Wind Farm can co-exist with the neighbouring Facilities safely throughout its life-cycle.
- Formal presentation of the SAP [approach and findings/conclusions] and demonstration it is safe.
- Will play a central role within Planning Application.
- Ensure protection of confidential information.
- Seek endorsement of neighbouring Facility Operators.
- Peer Review?

Scope of Safety Justification

Must justify all ‘primary’ safety issues;

“Issues which are fundamental to the demonstration that the proposed Wind Farm can co-exist with the neighbouring COMAH Sites safely, at a conceptual level”

Present Action Plan for resolution of ‘secondary’ safety issues post consent;

“Issues which are critical to the ultimate safe operation of the Wind Farm but are not fundamental in demonstrating that the proposed Wind Farm can co-exist with the neighbouring COMAH Sites safely”

Post Consent Activities

- Close-out all 'secondary' safety issues based on Action Plan.
- Demonstrate that any 'as-built' changes do not undermine Safety Justification.
- Present evidence to neighbouring Facilities.

Summary

To successfully develop complex sites, developers should:

- Adopt a robust Safety Assurance Process [SAP].
- Fully integrate SAP within overall Project activities.
- Commence SAP activities at earliest appropriate opportunity.
- Involve 'stakeholders' in SAP particularly during Hazard Identification.
- Use SAP to help shape evolving Wind Farm design/layout to ensure risks are reduced to acceptable levels.
- Align justification with existing Facility Safety Justification wherever possible [essentially a new 'external hazards' assessment].
- Present written evidence of Safety Justification ideally in a 'stand-alone' report forming a key part of the Planning Application.
- Justify 'primary' safety issues.
- Allow neighbouring Facilities to easily extract justification relevant to them.
- Seek endorsement from neighbouring Facility Operators.
- Accept the need to close-out 'secondary' safety issues post consent.

More information



**Reducing risks,
protecting people**

HSE's decision making process

www.hse.gov.uk

Risktec.tuv.com



www.windenergynetwork.co.uk

Series of features on Risk Management:

The secrets of effective Risk Management

The Hazards and Risks from Wind Energy

How should risk be managed?

5 simple steps of an effective Risk Management Process

Effective Hazard Identification

When is a risk worth taking?

An introduction to the concept of 'Tolerability of Risk'

Thank you for your attention

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