A Safety Case Framework for Offshore Wind

Outline

1. Introduction
   • Siemens
   • Risktec

2. Why the need?

3. The Solution – a Safety Case approach

4. What is it?

5. What it isn’t?

6. What are the benefits?

7. Where next?
Why the need?

Siemens Internally
Customer
Regulator
Is Siemens managing risk effectively?

Do we know what could go wrong?

Can we assure ourselves that they are working effectively?

Do we have systems in place to prevent this from happening?
Independent and specialist risk management consulting and training provider.

Part of the TÜV Rheinland Group.

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*
- Resource Solutions - *specialist, flexible support*

- 260+ personnel across 16 offices world-wide.
- Primarily operating in Major Hazard Industries [Oil & Gas, Nuclear, Defence etc.].
- Becoming increasingly involved in **Wind Industry** [onshore and offshore].
What is a Safety Case?

The demonstration that something is safe!

That adequate controls are in place to ensure that the major HSE risks are both tolerable and reduced As Low As Reasonably Practicable [ALARP].

What does it look like?

A document issued to a regulator to show risks are ALARP to obtain a license to operate.

Traditional Major Hazard Industries [Nuclear, Oil & Gas, Defence]

Offshore Wind

Not constrained by regulation.

Whatever Industry wants it to be.

Document

Live Safety Management System

.....but regardless of the presentation, it’s about the practical implementation of a Risk Management approach; a Safety Case Approach!
Dispelling the Myths.....

- Complex and theoretical.
- A thick, weighty document that no one reads.
- Something to tick a box and get a stakeholder off your back and then sits on a shelf gathering dust.
- Symptomatic of a legislative regime.
- Very expensive.

- Proportionate to risk.
- Fit for purpose, simple, clear and effective. No baggage or precedents! Useful.
- Provides a central focal point to maintain and improve safety throughout the life-cycle of an asset. A live document.
- Independent from legislation. Good practice. Shows stakeholders you are managing risk effectively.
- Effective management of risk proven to reduce overall project costs.

Industry Opportunity
A Hypothetical Wind Farm – the foundation of the Safety Case Framework

All activity associated with an offshore wind farm from air or sea port and from construction through operation and maintenance to decommissioning.

The Framework covers all areas. Although Siemens may not be responsible for all hazards, there is still a requirement to understand how the risk has been controlled.
What does Safety Case Framework cover?

Wind Farm Life-Cycle

- Concept/Development
- Design
- Site Construction & Commissioning
- Operation & Maintenance
- Decommissioning/Re-Powering

Product Life-Cycle

- Concept/Development
- Design
- Production/Manufacture
- Works Testing

Logistics

- Recycling/Disposal
Risk Management Process

- We know what could go wrong?
  - We have systems in place to prevent this from happening?
    - We can assure ourselves that they are working effectively?
      - Are risks ALARP?
        - Yes
          - Identify Safety Critical Equipment
            - Inspect, Maintain, Test etc.
          - Define Roles & Responsibilities
            - Monitor, Review, Audit etc.
        - No
          - Implement further risk reduction measures

- Identify Hazards
  - Generate Hazard Register
  - Develop Risk Scenarios
  - Screen Significant Hazards
  - Perform detailed Risk Assessment on Significant Hazards
What does it look like and how is it used?

**Product**  
(e.g. Wind Turbine, Offshore Platform)  
Generates:  
Generic Product Safety Case  
Demonstrates: all (or selected) Product design, construction, operation etc. risks are reduced ALARP on a generic basis (not location specific)

**Project**  
(e.g. Specific Wind Farm)  
Generates: Wind Farm Safety Case  
Demonstrates that a specific Wind Farm is designed and can be constructed, operated, maintained and decommissioned safely and that all risks are reduced ALARP

**Safety Case Framework**  

**Safety Case Procedure**  

**Safety Case Toolkit**  

**Logistics**  
(e.g. Marine Operations, Aviation)  
Generates:  
Generic Logistics Safety Case  
Demonstrates: all (or selected) Offshore Wind Logistics risks are reduced ALARP on a generic basis (not location specific)
Significant Hazard Working Groups – ALARP decision makers?

Control of Hazardous Energy
- Fire, Smoke and Gas
- Electrical/EMF Systems
- Mechanical Systems
- Pneumatics and Hydraulics Systems

Structural Integrity
- Fallen Loads
- Marine Vessel Collisions
- Helicopter Collisions
- Structural Failure

Occupational Risk
- Personnel Marine & Helicopter Transport
- Occupational Health & Welfare
- Working at Height
- Lifting Activities

Emergency Preparation and Response
- First Aid
- Evacuation, Escape and Rescue
- Crisis and Emergency Response

Design, Construction, Commissioning, Operation, Maintenance, Service

Significant Hazard Working Groups
- Accountable
- ALARP decision makers
- Bowtie owners and approvers
Significant Hazard Working Groups – ALARP decision makers?

Control of Hazardous Energy

- Fire, Smoke and Gas

Emergency Preparation and Response

- Evacuation, Escape and Rescue
- Crisis and Emergency Response
Conclusions – Safety Case Framework

Systematic process of identifying all serious Product and Project risks – independent of owner. Ensures risks Managed not Analysed

Living process that allows lessons from other products or projects to be shared – continued improvement. Blueprint for the future.

Focus on risk to people – breaks down silo mentality. Cultural change producing results.