Oil and Gas Integrity Management Framework

Summary Presentation

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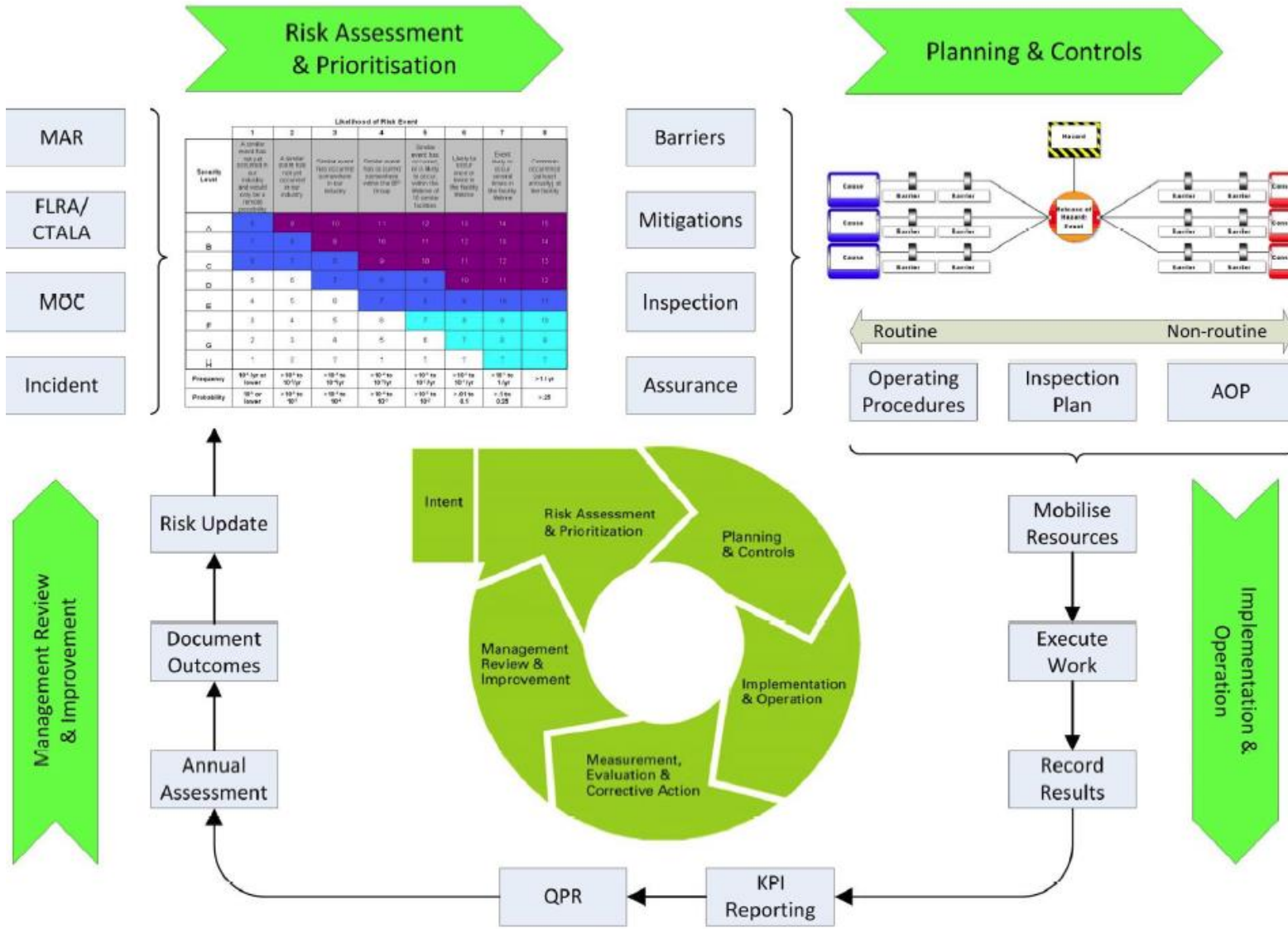
Background on Integrity Management Processes

- **Failure mechanisms** and information from design, construction, operations. From know-knows to unknown-unknowns.
- **Failure likelihood** availability of supporting data. More specific data helps. Worst credible vs Mitigated (Net) risk.
- **Consequences of failure** range of outcomes - worst case to fully mitigated. Different aspects – Safety, Environmental, Business ; Short vs Long term
- **Response capability** capacity, availability, reliability and deployability (especially subsea).
- **Cost and efficiency** how much are you prepared to pre-invest to mitigate a given risk? Planned vs reactive response costs.
- **KPI Monitoring** knowledge of system status and changes to risks. What are your leading indicators? What are the levels of reporting / visibility?

Integrity Management
Performance Improvement Cycle



Critical factors for Oil and Gas operators

Consequences are High impact if it goes wrong

- Safety (Piper Alpha) and Environmental (Macondo)

Large scale of IMR operations spreads the risk/cost

- Aggregate work on a combined vessel campaign saves cost.
- Hold “fill in” work which is less critical and less weather sensitive.
- Resources available on demand to respond to critical emergent work.

Planning

- Cost of failure is high. Test onshore before execution.
- Contingency plans “What if?....”

Example – Riser caisson corrosion

Some systems designed to be a sealed

How is a seal failure identified?

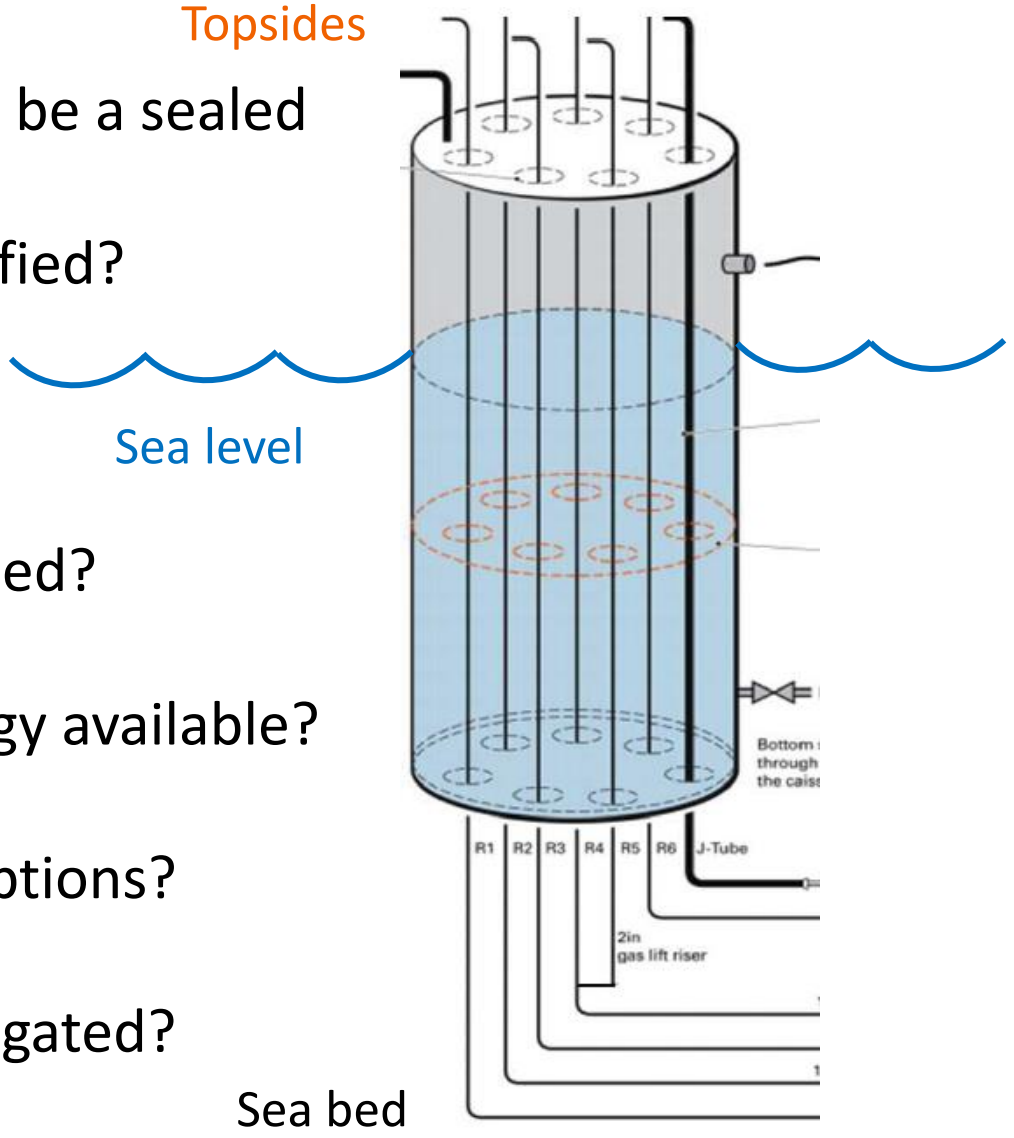
What is the risk?

How is Inspection preformed?

Is the Inspection technology available?

What are the mitigation options?

Is the risk successfully mitigated?



What would we do differently/again?

Early input to front end design

- Ensure long term integrity management is built in – and works.

Execution

- Set up either dedicated resource (if scale permits) or resource sharing agreement for execution of work. This can give economy of scale and more predictable costs for all if set up correctly.

Standardise data management

- Information was stored/managed on numerous systems…
- Utilise new technology to speed access to critical information and avoid software dependency.