

ProSafe 2011



Safety Management at Major Hazard Facilities - Experiences and Observations



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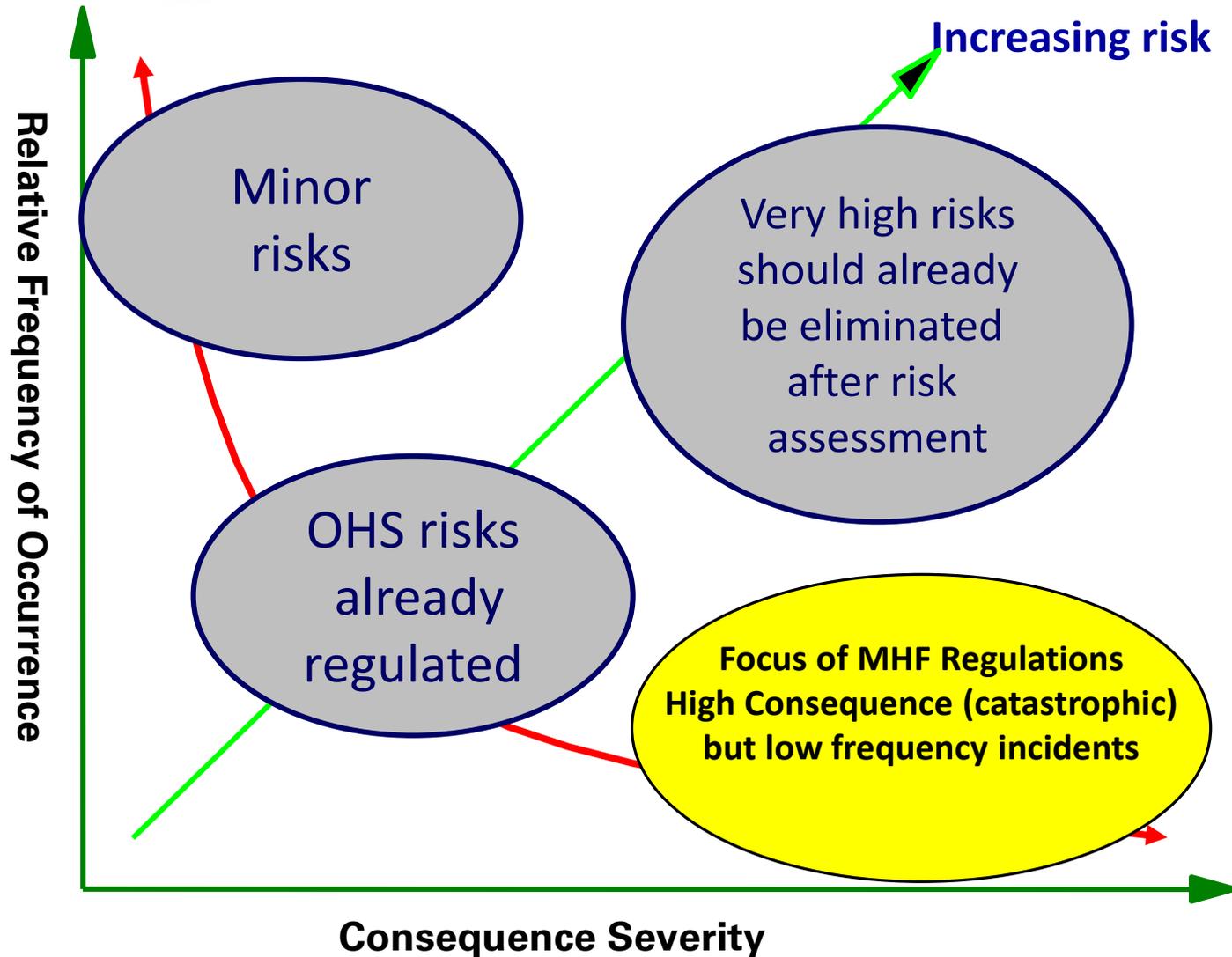
- Introduction
- Regulation of Process Safety
- Risk-based Assessment
- Risk Management Controls
- Ongoing Risk Management

- Most larger process facilities are categorised as “Major Hazard Facilities”
- Process safety at these facilities is regulated by the applicable MHF regulations.

- Current regulation of “Major Hazard Facilities”:

Jurisdiction	MHF Regulation
Victoria	State regulations
Queensland	State regulations
Western Australia	State regulations
NSW	State regulations
Tasmania	State regulations
Northern Territory	Regulations, with reference to National Standard
South Australia	MHF Regulations not implemented
Commonwealth	Commonwealth regulations

- Future: “Harmonised” Regulations due 1 January 2012



Similarities - Key Principles

- Focus on **major hazards** (catastrophic events i.e. typically high consequence and low frequency)
- Places the **responsibility on the Facility Operator**
- Requires a proactive **risk-based approach**
- Requires the active **demonstration** of safe operation
- **Consultation** with various parties is required

Differences

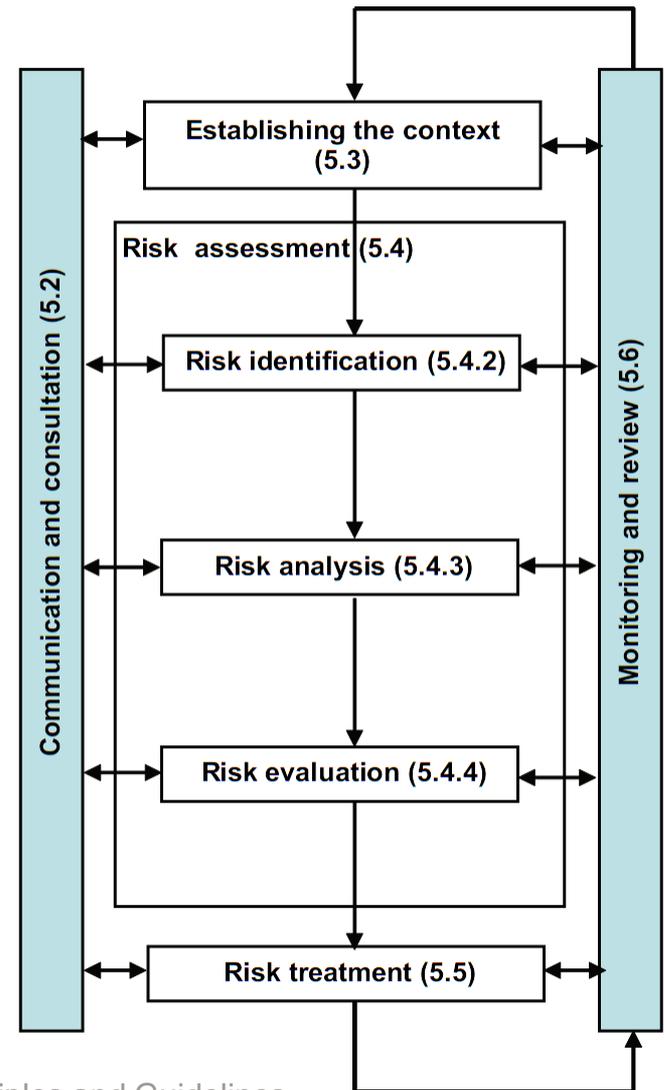
- **Classification** of an MHF
- **Definition** of a Major Incident / Major Accident
- **Cumulative** Assessment
- **Security Plan**
- **Application** by the Regulator

Draft Model MHF Regulations - key points:

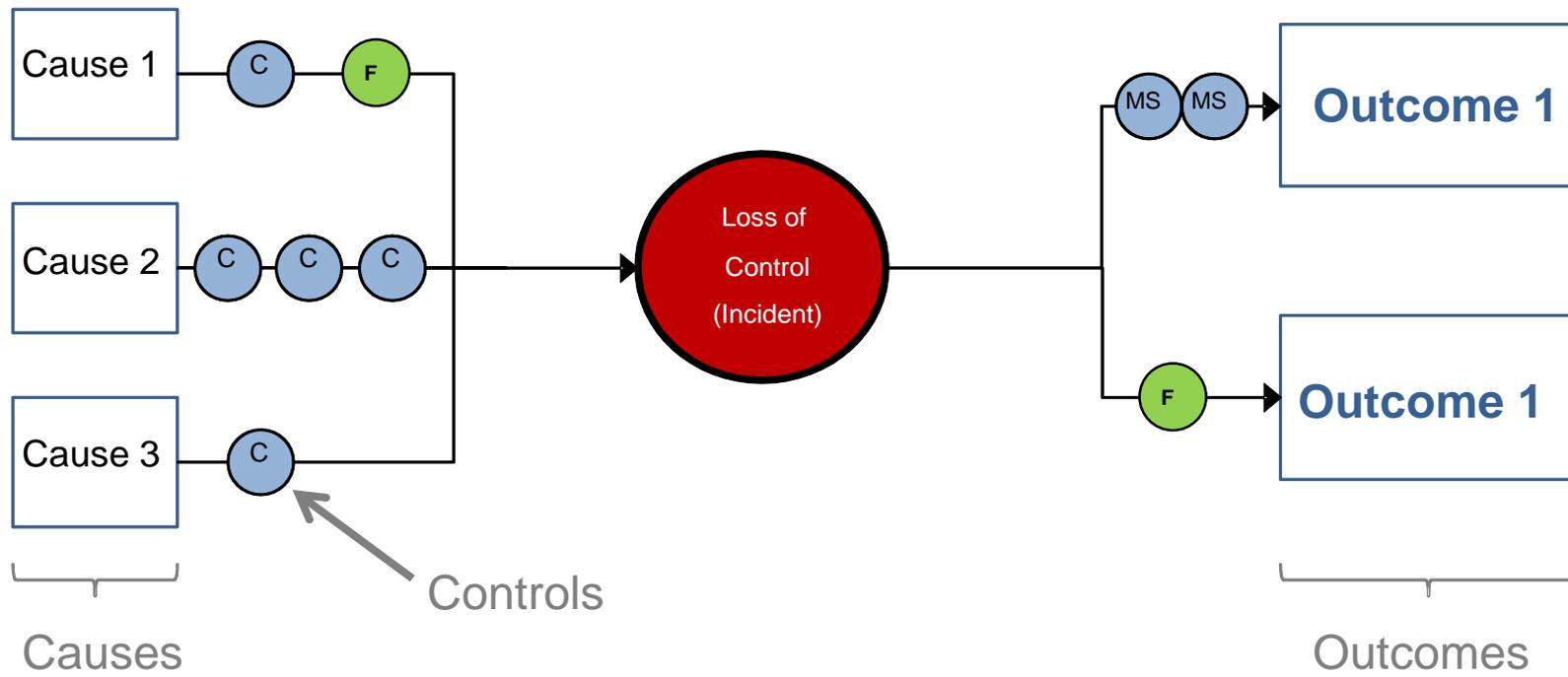
- Definite classification as an MHF, if the AQR >1
- “Goods in transit” would be included
- Major Incident definition not restricted to scheduled materials
- Requirement to consider risks cumulatively
- Security Plan required

Risk Management Process

- Establish Context
- Risk Assessment
 - Identification
 - Analysis
 - Evaluation
- Risk Treatment
- Monitoring & Review
- Communication & Consultation



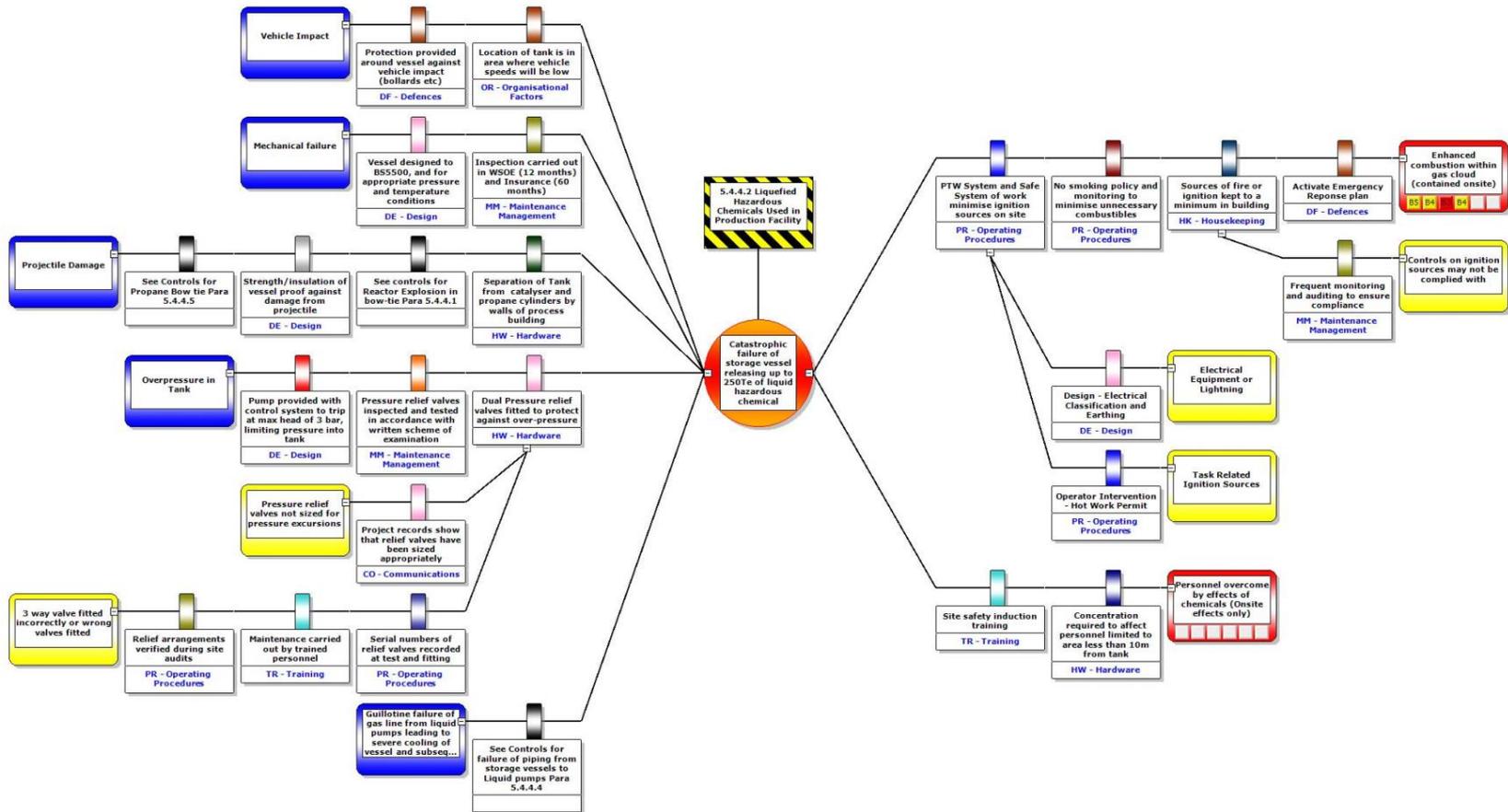
- Bow-tie Diagram (1)



- Commonly use Bow-tie Diagram
- Shows events that can lead to major accidents with causes and control measures
- Convenient means of summarising accident causes and controls
- Useful for communicating the key information needed for operators

R4 RISK Risk-Based Assessment

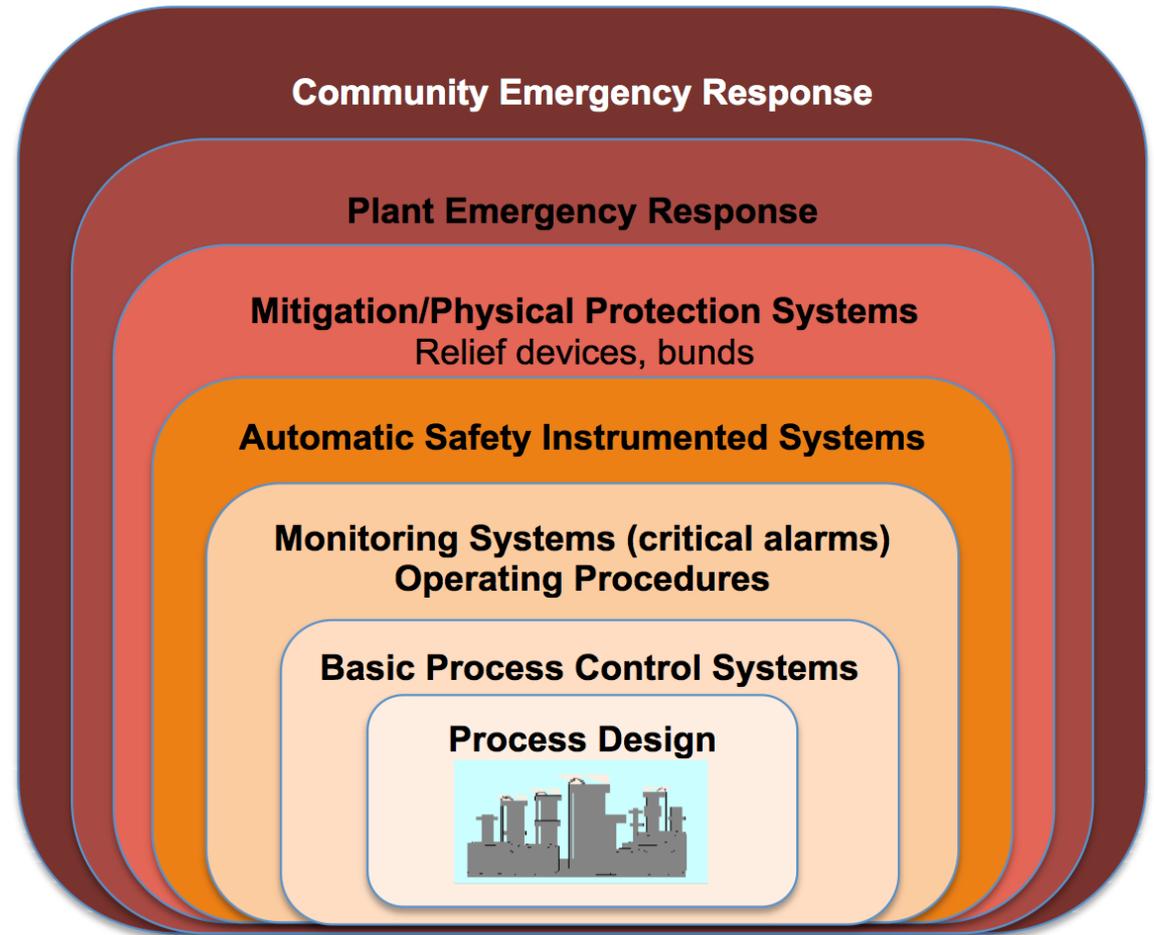
- Bow-tie Diagram (2)



- Some things that are not truly “controls”
 - Training
 - Certification
 - Communications
 - Signage
- The absence of some of these things could affect the reliability of identified controls

R4 RISK Risk Management Controls

Layer of Protection Analysis “onion”



- 5 Characteristics of Good Controls
 - Implemented
 - Effective
 - Independence
 - Reliable
 - Monitored & Audited

- Implemented
 - Is it actually in place?
 - Has it been disabled?
 - Do any persons who are required to act know their roles and functions?

- Effective
 - Will the action of the control directly prevent or mitigate the incident?
 - Will the control be able to detect the trigger for it to act?
 - Will the control be able to act sufficiently in a short enough period of time to be effective (i.e. prevent escalation of the hazard)?

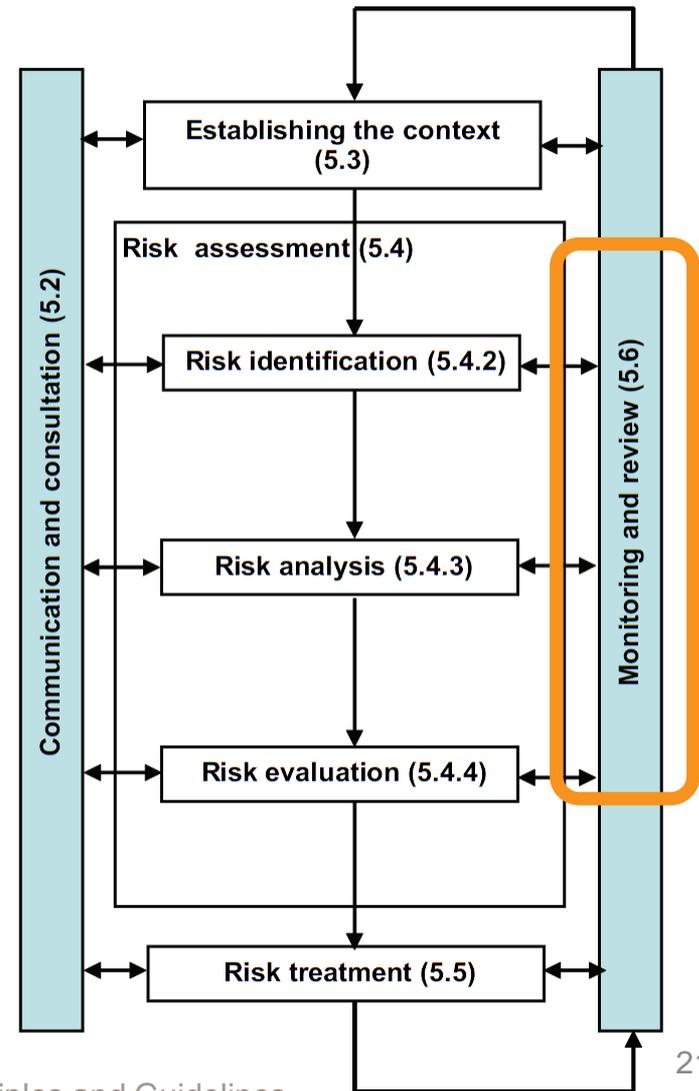
- Reliable
 - Will it function as required on demand?
 - How reliable is it?
 - Is it sufficiently reliable for its intended purpose?

- Independence
 - Will the control function separately from other controls?
 - Consider potential common-mode failures.

- Monitored & Audited
 - Is the control of a type that enables its performance / function to be verified?
 - Is the performance of the control measure actually being monitored / audited?
 - Are the results of the monitoring / auditing being reviewed?
 - Do the results show that the control is meeting its required reliability?

Risk Management Process

- Monitoring & Review



- 5 Characteristics of Good Controls

- Implemented
- Effective
- Independence
- Reliable

Assess during
risk assessment

- Monitored & Audited

Ongoing
Risk
Management

Controls Management

- Performance Indicator
 - *Any quantitative or qualitative information used to measure the performance of any functional aspect of a control measure.*
- Performance Standard
 - *A benchmark, target or reference level of performance set for a control measure as measured by the performance indicator, or for an aspect of the Safety Management System (SMS), against which performance may be tracked.*

- Engineering Controls
 - e.g. Trip systems, relief systems, etc.
 - Manage by Periodic Testing, review of results etc.
 - May implement SIL (AS61511) to demonstrate reliability
- Administrative Controls
 - e.g. Operating procedures, maintenance procedures
 - Audits of compliance
 - Checklists

- Variations exist between current state-based MHF regulations and their application
- Harmonisation will (hopefully) reduce these variations
- Risk based-approaches should be applied
- Bow-tie diagrams are an effective tool
- Careful selection of controls is required
- Ongoing management of controls is required

Thank you