## High Reliability Organisation (HRO) Mindfulness: Ensuring Nuclear Safety

#### **Tom Anderson**





#### **Overview**

- Safety as retrospective and prospective
- High Reliability Organisations (HROs)
- HRO mindfulness
- Measuring mindfulness
  - Issues
  - Approaches

## **Understanding Organisational Safety**

- Man-made disasters failure of foresight
- Normal Accident Theory inevitable consequence of complex systems - fatalism
- High Reliability Organisations (HROs) safe, reliable operations as a result of design and management – possible foresight

## **High Reliability Organisations (HROs)**

- Original study group
  - Nuclear power and electrical distribution
  - Nuclear powered aircraft carriers
  - Air Traffic Controllers
- Now includes
  - Oil & Gas production
  - Healthcare
  - Fire Fighters

# What do High Reliability Organisations have in common?

- Complex socio-technical systems
  - Redundancy
  - Constant, long-term learning
  - Command and Control
    - Decentralised decision making
  - Heedful interrelating

## HROs as "mindful" organisations



### Five mindfulness factors

| Reluctance to Simplify    | Not being afraid to ask stupid questions Watching out for 'Groupthink' Watching for 'Normalisation' and 'Practical Drift' |
|---------------------------|---|
| Focus on Failure          | Having 'Chronic Unease' Actively looking out for weak signals Onus of proof   |
| Sensitivity to Operations | Collective puzzle solving Developing Situational Awareness Avoiding parallel worldviews                                   |
| Deference to Expertise    | Empowering workers at 'the sharp end' Knowledge of who holds knowledge Building 'requisite variety'                       |
| Commitment to Resilience  | Redundancy, to avoid 'single point failure' Fast learning from errors Not crippled when errors occur                      |

## Measuring mindfulness

#### What's been achieved:

Five mindfulness factors have been validated against each other

#### What needs to be done:

- Operationalising all five factors
  - Focus on Failure can be seen as weak signals and near misses
  - But, difficulty operationalising all factors e.g.
     Sensitivity to Operations

## How do we operationalise the five mindfulness factors?



## Psychometric assessment

- Literature review for attitudes and behaviours
- Initial pilot psychometric used direct questions for the five mindfulness factors
- Next-stage psychometric assesses an individual's:
  - Reasoning
  - Interaction
  - Coping styles
- Also measures nuclear behavioural competencies

## **Psychometric assessment**

| Reasoning (style of thinking) | Interaction (style of relating to others) | Coping (self-attitude and coping style) |
|-------------------------------|---|---|
| Critical Thinking             | Self Directed                             | Resilient                               |
| Conscientiousness             | Cooperative                               | Self directed                           |
| Investigative                 |   | Adaptive                                |
| Vigilance                     |   |   |



Coping

Sensitivity to operations

Focus on failure

Reluctance to simplify

Deference to Expertise **Commitment** to resilience

**Critical thinker** 

Conscientious

Investigative

Vigilant

Self-directed

Cooperative

Cooperative

Resilient

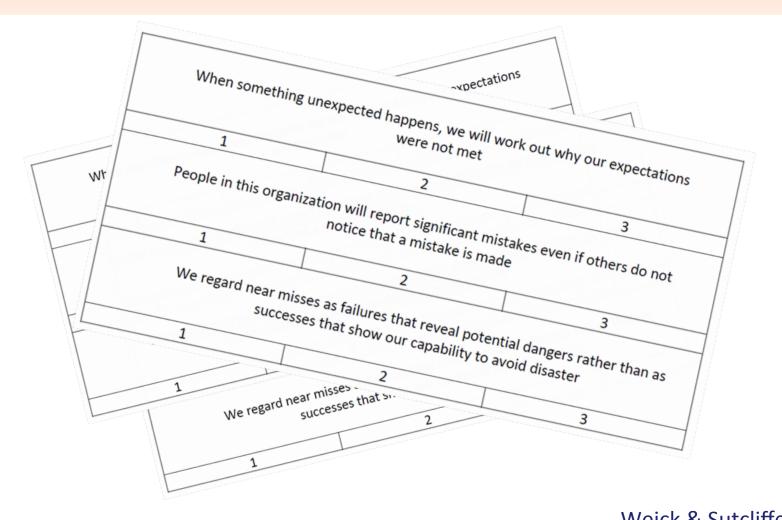
Decisive

**Adaptive** 

## **Ethnographic assessment**

- Using Ethnography
  - Empirical, data driven sociological approach
  - Looks at how work is done in real-time in the real-world
  - Provides descriptions of social practices of work
  - Study informs how people make sense of their working environment
    - HCI, Air Traffic Control, Police work

## Organisational audit



## Mindfulness to change an organisation's culture



# What are the benefits of this approach?

- Gives baseline measure of an organisation's current HRO/mindfulness potential
- Data comes from own organisation
  - Encourages engagement
- Data can be analysed
- Identifies areas for improvement
- Develop strategy for HRO/mindfulness performance

### **Next steps**

- Next-stage psychometric tool now ready for pilot
- We need to engage with participants/ organisations
- Comparison against other nuclear competency frameworks
- Ethnographic studies ongoing

## Thank you



www.bluestreamconsulting.co.uk enquiries@bluestreamconsulting.co.uk

