ARPANSA’s Assessment Process for Holistic Safety

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Topics

- Outline of our current development
- Our approach to Assessment
- Changes to our inspection process
- Initial results
- Challenges
Current Development

• Since 2011 ARPANS has been developing an holistic (or Systemic) approach to safety and regulation
• The approach is designed to reduce safety vulnerabilities by addressing seven key characteristics of safety
• This is not a direct regulatory compliance tool
Holistic characteristics linked to common contributing causes:

- Leadership issues
- Operational attitudes and behaviours
- Organisational (business) environment
- Competence
- Risk assessment and management
- Oversight and scrutiny
- Organisational learning
- External regulation

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1 Prof. Richard Taylor, University of Bristol (UK), Safety Systems Research Centre
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Holistic Characteristics

- Human aspects
- Non-technical skills
- Defence in depth
- Management systems
- Resilience
- Safety culture
- Protective security and nuclear security culture

¹ Prof. Richard Taylor, University of Bristol (UK), Safety Systems Research Centre
Holistic Safety Characteristics

1 - Human Aspects
Safe organisations take account of weaknesses and strengths in human performance

• suitably qualified, experienced, competent people - SQEP
• Adequate training that is shown to be effective
• Accounting for Human Factors
  • In equipment and machine design
  • In process design
  • In the operating/business environment
Holistic Safety Characteristics

2 - Non Technical Skills
Safe organisations will possess and utilise effective non-technical skills

- Communication
- Leadership
- Team working
- Decision making
- Situational awareness
Holistic Safety Characteristics

3 - Defence in Depth
Safe organisations will apply defence in depth throughout

- Prevent Failures - conservative, proven, quality, design
- Maintain desired operational states and detect failures
- Protect from DB accidents - safety systems
- Limit progression of an accident by design
- Mitigate consequences of BDB accidents (emergency management)
Holistic Safety Characteristics

4 - Management System
Safe organisations integrate safety and environmental protection seamlessly.

- Safety and environmental protection processes are fully integrated in the business management system
- All business activities consider implications for safety and environmental protection.
Holistic Safety Characteristics

5 - Resilience

Learning (factual)  
Knowing what has happened

Responding (actual)  
Knowing what to do

Monitoring (critical)  
Knowing what to look for

Anticipating (potential)  
Knowing what to expect

Knowing what to expect

Resilience
Holistic Safety Characteristics

6 - Safety Culture
A safe organisations will at all levels possess shared values and beliefs for safety that produce behavioural norms that provide an appropriate and demonstrable attention to safety.

- Safety and security are clearly recognised values
- Leadership for safety and security is clear
- Accountabilities are clear
- Safety and security are integrated into all activities
- Safety and security is learning driven
- Integration across organisational boundaries
Holistic Safety Characteristics

7 - Protective Security and Nuclear Security Culture

Organisations with a good security culture will at all levels possess shared characteristics, attitudes and behaviours which serve as a means to support and enhance security

• Security Management is informed and integrated
Holistic Safety Guidelines

• We socialise our holistic expectations (meetings, conferences, forums, workshops, internet)
• ARPANSA expects licence holders to address the holistic characteristics and attributes (graded)
• Inspections examining performance against our holistic characteristics
• We will promote learning across our stakeholders based on our inspection findings (strengths and vulnerabilities)
• We are starting our own assessments of our licence holders

Our aim is to assist licence holders to identify and shore up any safety or security vulnerabilities
Our Approach to Assessment

- **Objective:** Map out strengths and vulnerabilities
- **Promote constructive engagement**
Assessment Process

• Step 1 - Planning and Implementation
  – identify target on risk informed basis
  – Determine and gather assessment team
  – Plan assessment
    • Breakdown into manageable modules if required
  – Gather data
    • Compliance History
    • Workplace observations
    • Meetings/interviews
    • Management system
Assessment Process

• Step 2 - Assessment Process
  – Information is considered against holistic safety guidelines
  – A score is given for each guideline
  – The rationale/justification for the score is described
  – Consideration is given to relative importance to safety (weighting factor)
  – Strengths and vulnerabilities map is gradually constructed

- **HIGH**
  - Good application of the principles

- **MED.**
  - Broadly acceptable but could be improved

- **LOW**
  - Vulnerabilities - should be rectified in the near term
## Assessment Process

### 1. HUMAN ASPECTS

#### 1.1 Selection of SQEP

<table>
<thead>
<tr>
<th>question</th>
<th>level of compliance</th>
<th>adjustment</th>
<th>adjusted level</th>
<th>justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) What is the quality of the system that determines the positions that have important safety and security functions?</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>As a standard format, each task procedure and instruction provides a list of participant responsibilities and accountabilities. Key operational roles require persons to be accredited and authorised and there are specific education, training and competency requirements associated with these that are very well documented. These requirements are embedded in job descriptions and annual performance reviews. However, the link between responsibilities and training is not always apparent and there is no formalised process that addresses the tasks associated with particular job descriptions.</td>
</tr>
<tr>
<td>b) How well are the skills and competencies defined/determined?</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>Skills and competencies are well defined in a training manual for each authorised and accredited person plus engineering and maintenance staff. There is less direct control of competences on internal service providers who provide services such as safety analysis and engineering support (these persons are well qualified but their knowledge of specific systems is less controlled). Control of contractor competence is at an organisational level. An assessment of contractor personnel knowledge and safety culture has not been undertaken but generally this work is undertaken with the supervision of operations staff.</td>
</tr>
<tr>
<td>c) What is the quality of the systems for the personnel selection to perform in a SQEP position? How well is it documented?</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>Requirements are well documented. The regulator observes accreditation and re-accreditation interviews and verifies that accreditation requirements have been met. One non-compliance has been addressed in this regard but was some years ago. Some candidates for accreditation have been rejected or subject to further training. Maintenance of knowledge remains under regulatory scrutiny but operational performance appears to be satisfactory. Provisions for other positions including engineering and maintenance are less formal.</td>
</tr>
<tr>
<td>d) How well does the system ensure that the selected person is sufficiently qualified, experienced and suitable to make safe decisions?</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>The training manual addresses authorisation/reauthorisation and accreditation/reaccreditation processes very well. Any changes to these invoke change control and will be categorised according to safety significance. These involve internal peer review and may require regulatory approval is significant to safety.</td>
</tr>
<tr>
<td>e) How well does the system ensure that suitability of the personnel in SQEP positions is maintained?</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>Cuts, accreditation and authorisations are time limited.</td>
</tr>
<tr>
<td>f) How well does the system ensure that the above assessment is sufficiently thorough and up to date?</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>Training requirements are generally considered effective. Toolbox meetings are held regularly but feedback from these is a little murky. Inspections have identified that in some areas there is little verification to ensure that trained practices are implemented in the front end workpractices. Audit processes could also be improved in some areas to avoid organisational drift over time. In regard to controls in the physical plant and equipment, there is good technological defence in depth that tends to prevent significant deviation from standard procedures.</td>
</tr>
</tbody>
</table>

Average: 3.8
Assessment Process

• Step 3 - Feedback and Consultation
  – Discuss initial findings
    – Are reflections accurate
    – Has anything important been missed
    – Are there good practices to share
    – Is there agreement on vulnerabilities and ways to address them.
  – Update assessment accordingly
Assessment Process

• Step 4 - Reporting
  – Detailed findings against holistic guidelines
  – Focus on any special areas
  – Key vulnerabilities
  – Analysis of Findings
    – Discussion about common contributing causes of accidents
    – Suggestions and recommendations
  – Action plan and follow-up
Challenges Encountered

- How well do we really know a licence holder (easier for an operator to do itself)
- What level of transparency is achieved
  - Use same inspection team as normal compliance inspections (may inhibit open dialogue)
Holistic Assessment - Benefits Found

• Better understanding of licence holder safety and practices
• Can provide evidence for what people already know to justify action
• Can assist to risk inform inspection programme
• Provides baseline for future assessment
• May promote transparency between the licence holder and regulator
Thematic Inspection Process

- ARPANSA’s Licensing structure is arranged around facility and source licences (No site licences)
- Individual inspectors are responsible for specific licences
- As a consequence it is not always easy to get a good overview of organisational culture and practices
- To get a better view of organisational culture and safety a new strategy was needed.
Thematic Inspections - Licence Framework

- ANSTO OPAL Reactor Licence
  - Operations
  - Safety Assessment
  - Radiation Protection
  - Security

- ANSTO Bragg Institute Licence
  - Operations
  - Safety Assessment
  - Radiation Protection
  - Security

- ANSTO Health Licence
  - Operations
  - Safety Assessment
  - Radiation Protection
  - Security

- ANSTO Waste Operations Licence
  - Operations
  - Safety Assessment
  - Radiation Protection
  - Security

- Other ANSTO Licences
Inspections - Vertical Approach
Thematic Inspections - Horizontal Approach

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Other ANSTO Licences
- Operations
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Process

• Open and transparent with licence holder. Strive for engagement rather than simply observation
• Inspections concentrate on investigating holistic safety characteristics
• Inspections pair up licence inspectors with holistic safety specialists
• Detailed planning is essential
• Aim to have inspectors looking for similar things and asking similar questions
• Communication important between inspector groups (cross checking)
Example of Outcome
Radiation Protection Services

• Highlighted differences in RP requirements, practices and vulnerabilities within the single organisation
• Highlighted importance of individual behaviours for cross organisational learning - not all good practices were consistently applied
• Observations and recommendations made regarding rotational deployment system
• Highlighted importance of deployment specific training. Some good practices observed.
• Some cultural differences identified between business areas. Programmes for regular reviews should be undertaken in order to roll out best practices to all areas.
• What is already in place
  – Human Aspects
  – Non Technical Skills
  – Defence in Depth
  – Management Systems
  – Safety Culture
  – Security Culture
ANSTO Health

Consultation

No Blame Zero Tolerance

Strong Leadership

Improved Systems

Continuous Improvement

Reporting ↑555% 5yrs

Incorporate Learnings
Summary

• ARPANSA continues to apply it’s traditional regulatory practices whilst increasing it’s focus on holistic safety
• The holistic approach can identify strengths and vulnerabilities not previously seen by the regulator
• There is general co-operation with the holistic approach which focuses less on regulatory compliance and more on organisational safety performance (an objective shared with operators)
• ARPANSA will continue to adapt and improve its approach to holistic safety to its licence holders
THANK YOU

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ARPANSA’s Holistic Safety Webpage