Technical workshop proceedings:

Initial report – Framework for high-level
process safety management

TECHNICAL WORKSHOP PROCEEDINGS: INITIAL REPORT –
FRAMEWORK FOR HIGH-LEVEL PROCESS SAFETY MANAGEMENT

First edition

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FOREWORD

Technical workshop proceedings: Initial report – Framework for high-level process safety management provides a non-verbatim summary of the presentations and discussions from a technical workshop held on Wednesday 15 July 2009.

The workshop was commissioned by the Energy Institute Process Safety Committee. Some 25 process safety specialists from the various energy industry sectors participated: they had either implemented a process safety management (PSM) framework and had some experience to report, or were at a lower level of maturity such that they were considering implementing a PSM framework.

The aims of the workshop were to:

— Confirm the need for a UK (and EU) high-level PSM framework for energy industry sectors.
— Explore the scope of such a PSM framework.
— Start to develop the PSM framework at various levels of detail.

A draft 'straw man' PSM framework was used as a basis for the workshop sessions.

In conclusion, the need for a PSM framework for the energy industry sectors was confirmed by the workshop participants, and the scope was discussed.

It is proposed that the work started in this workshop is continued to complete the development of the PSM framework. This work should:

— Further develop and optimise the PSM framework based upon the workshop feedback.
— Complete the development of the PSM framework at the detailed level by convening further workshops.

The ultimate deliverable would be a high-level PSM framework which will provide guidance as to how companies can assure a high-level of PSM.

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ACKNOWLEDGEMENTS

1   BACKGROUND

The Process Safety Committee sees benefit in promoting a common high-level framework for process safety management (PSM) across the energy industry sectors. Center for Chemical Process Safety (CCPS) *Guidelines for risk based process safety* (*RBPS*) provides such a high-level framework and is being adopted in some companies, whereas other companies are adopting other models (e.g. PAS 55 and ISO 9001). In addition, PSM may be influenced by legislative requirements (e.g. OSCR, COMAH, etc).

The facilitated workshop was set up to explore what a high-level framework for PSM for energy industry sectors in the UK (and EU) should look like. The objective was to do so by presenting a 'straw-man' model mapped against models such as CCPS *RBPS*, and ask participants to explore whether it meets their needs or if adjustments are required (e.g. based on successes/weaknesses in applying the CCPS *RBPS* model (and other models)). It was also an objective to enable participants to further discuss the scope of the 'straw-man' model and their expectations of some of its building blocks.

The target participants were process safety specialists from the various energy industry sectors who have either implemented a process safety model (whether CCPS *RBPS* or other) and have some experience to report, or were at a lower level of maturity such that they were considering implementing a process safety model. There were some 25 workshop participants.

Participants were by invitation only and were drawn from:
—   EI Process Safety Committee members (or colleagues).
—   EI Technical Partner companies via other EI committees.
—   EI Technical Group member companies, EI member companies and EI individual members.
—   Various stakeholders (e.g. IChemE Safety and Loss Prevention Subject Group, European Process Safety Centre, British Chemical Engineering Contractors Association, Association of Electricity Producers, etc).

2   WORKSHOP INTRODUCTION

John Pond
Chairman, Energy Institute Process Safety Committee

The programme for the day was opened with the statement that PSM is a major issue for the industry, with increasing numbers of companies looking to adopt a more holistic and systematic approach to assuring the integrity of their operations.

Whereas many of the larger organisations have been working on these approaches for a number of years, with significant dedicated resources and varying degrees of success, others and many of the smaller organisations are looking for consistent guidance as they look to achieve efficient development and implementation approaches to achieve effective PSM. One of the first questions asked by many senior executive teams is: how are other people in similar industries addressing this issue?

The challenge for the workshop was set out: to confirm the need for an energy industry sectors PSM framework; to provide this guidance and explore what a high-level PSM framework for energy industry sectors in the UK (and EU) should look like.

A draft 'straw man' framework was produced ahead of the workshop by a sub-group of the Process Safety Committee (John Pond, Mark Scanlon and Martin Ball). This 'straw man' was used as a basis for the workshop sessions.

There were three workshop sessions:

Workshop session 1 – What do we need from a PSM framework?

The purpose of this session was for the breakout groups to review what their organisations needed from a PSM framework and discuss how it would support improved PSM in their organisations.

Workshop session 2 – Is the scope of the 'straw man' PSM framework right?

The purpose of this session was for the breakout groups to review scope of the PSM framework as presented in the 'straw man' identifying whether the scope is suitable, whether there is a need to add or remove elements and to develop a one line statement to describe the intent of each of the elements.

Workshop session 3 – Develop the expectations

The purpose of this session was to take a number of the elements of the PSM framework and start to identify the expectations which would define the things that an organisation would need to 'get right' in order to meet the intent of those elements, as defined in Workshop session 2.

**Framework
for
High-level
Process Safety Management**

**Energy Institute
Facilitated Workshop**

**John Pond
Mark Scanlon
Martin W. Ball
July 2009**

Introduction

- **Safety briefing**
- **Purpose of today**
  - EI Process Safety Committee sees benefit in promoting a common high-level framework for Process Safety Management across the energy industry sectors
  - Workshop will explore the need and what such a PSM framework should look like
- **Success criteria for today**
  - Challenge and validate need for a PSM framework
  - Identify what we need from a PSM framework
  - Start to define the scope and detail of PSM framework
- **Approach for the day**
  - Presentation of basic 'straw man'
  - Workshops:
    - Challenge and validate basic 'straw man'
    - Build on 'straw man' to build more detail in selected areas

3   PSM FRAMEWORK 'STRAW MAN'

Martin Ball
Member, Energy Institute Process Safety Committee (Bossiney Consulting Group)

The challenge for the process industry is often clearly set out in three statements by company chief executives as: ensure we don't hurt anyone; ensure we don't harm the environment; and achieve a certain level of return on capital employed (ROCE).

Typically we are very clear about what we need to do to deliver the ROCE (maximise income and optimise operating expenditure) and we are clear about the things we need to get right to ensure that these outcomes are as we require. However, with the safety and environmental targets, quite often things are not so clearly understood. We will typically see good lagging indicators, telling us how many incidents or injuries we have had; but very rarely do we see comprehensive leading indicators systematically measuring the factors which determine how likely things are to go wrong and consequently how likely we are to have an incident or injury tomorrow. All too often when we ask how will we achieve our safety and environmental targets and how will we know whether those things are being done, the answers are inconsistent.

A PSM framework should set out clearly what needs to be done to assure the integrity of the operation and what measures should be in place to know whether those things are being done.

The 'straw man' PSM framework consists of three levels:

Pillars: These set out the high level key components of the PSM framework.

Elements: Within each of the pillars are a number of elements which set out the key aspects of the operation that we need to get right in order to assure the integrity of the operation.

Expectations: Within each of the elements the expectations define what we need to get right in order to meet the intent of the element.

3.1   PILLARS OF PSM

There are four pillars defining the high level components of the framework:

Process safety leadership:
This pillar sets out how we define and communicate the level of performance we are prepared to accept from the business and how we will ensure that we put in place the necessary resources to achieve the required level of performance.

Risk identification:
This pillar sets out how we identify and assess the risks that we need to manage in order to assure the integrity of the operation, how we identify the necessary control

measures and how we record and maintain the process safety knowledge we develop from these risk identification activities.

Risk management:
  This pillar sets out how we implement and manage the control measures that have been identified during our risk assessments.

Review and improvement:
  This pillar sets out how we measure and review our compliance with the expectations of the PSM framework and how we ensure we learn from our measurements and from findings from investigations.

3.2   ELEMENTS OF PSM

Within each of the pillars are a number of elements which set out the key aspects of the operation that we need to get right in order to assure the integrity of the operation:

Process safety leadership
Within the process safety leadership pillar there are five elements:
1.   Leadership involvement and responsibility.
2.   Identification and compliance with legislation.
3.   Employee selection and placement.
4.   Workforce involvement.
5.   Communication with stakeholders.

Risk identification
Within the risk identification pillar there are two elements:
6.   Hazard identification and risk assessment.
7.   Documents and records (process safety knowledge).

Risk management
Within the risk management pillar there are 13 elements:
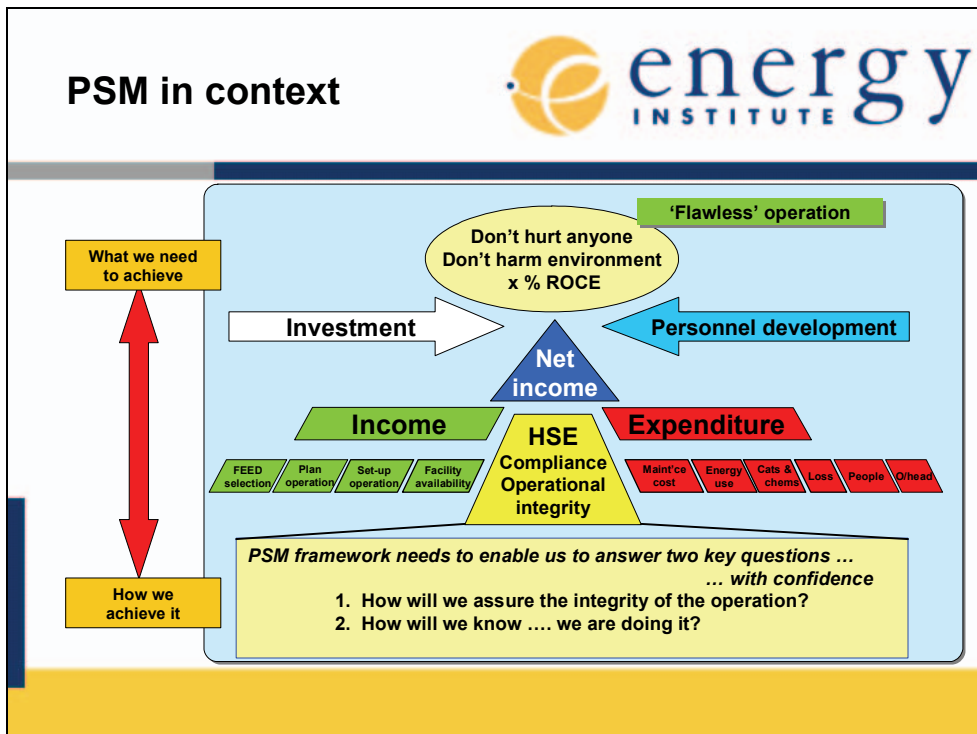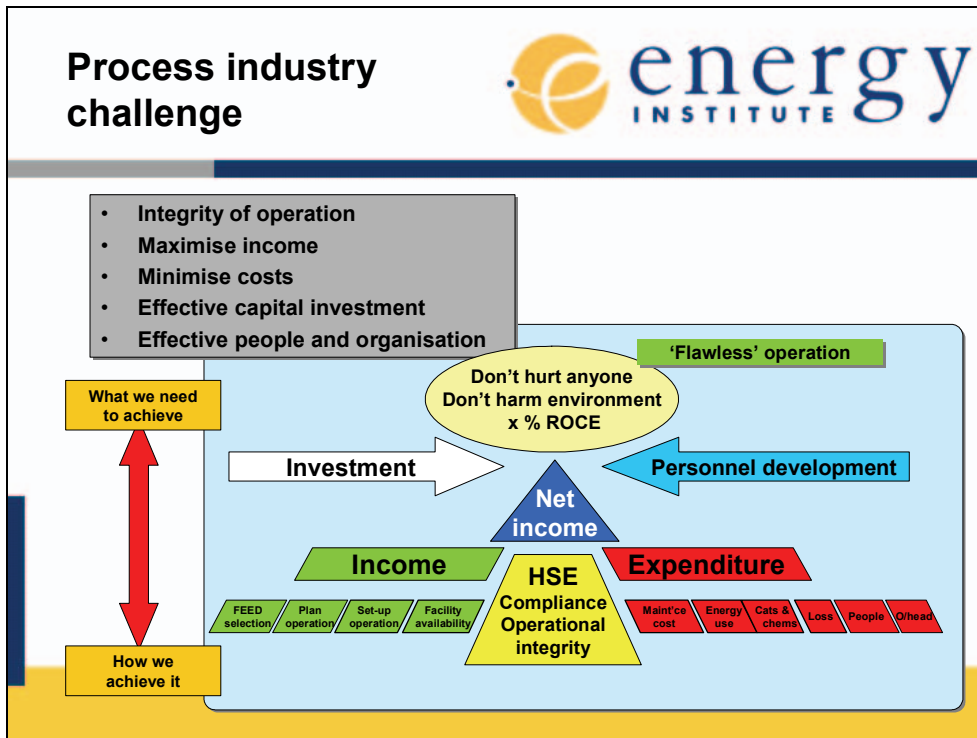8.   Operating manuals and procedures.
9.   Work log and handover.
10.   Management of operational interfaces.
11.   Employee competency assurance.
12.   Standards and practices.
13.   Management of change.
14.   Emergency preparedness.
15.   Inspection and maintenance.
16.   Management of safety critical devices.
17.   Task risk management.
18.   Work control and permit-to-work.
19.   Contractor selection and management.
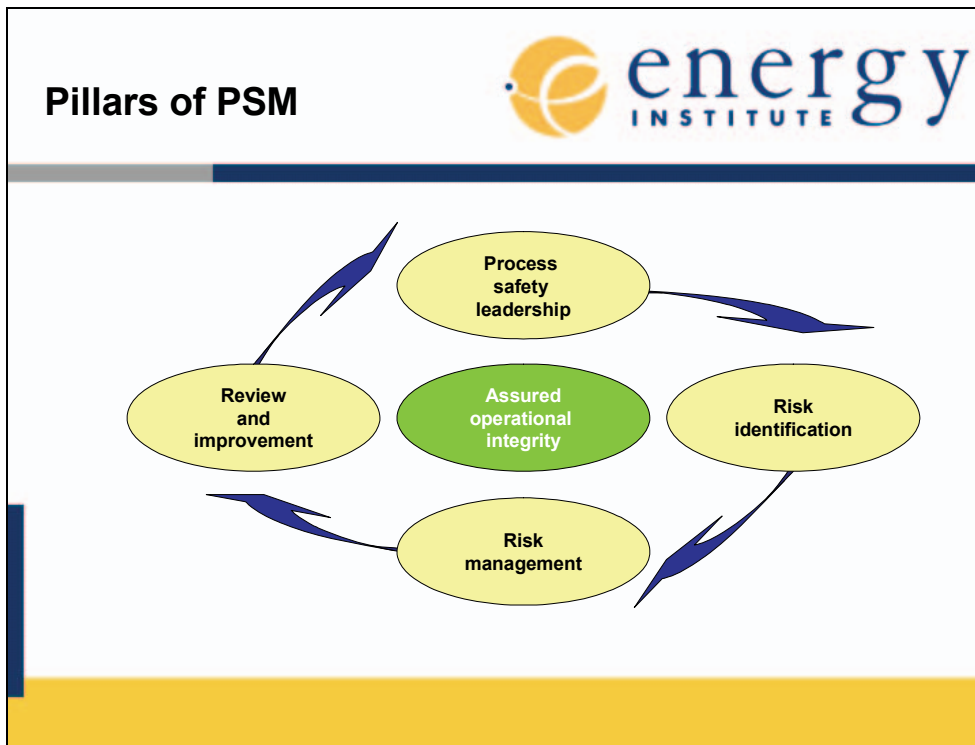20.   Project management.

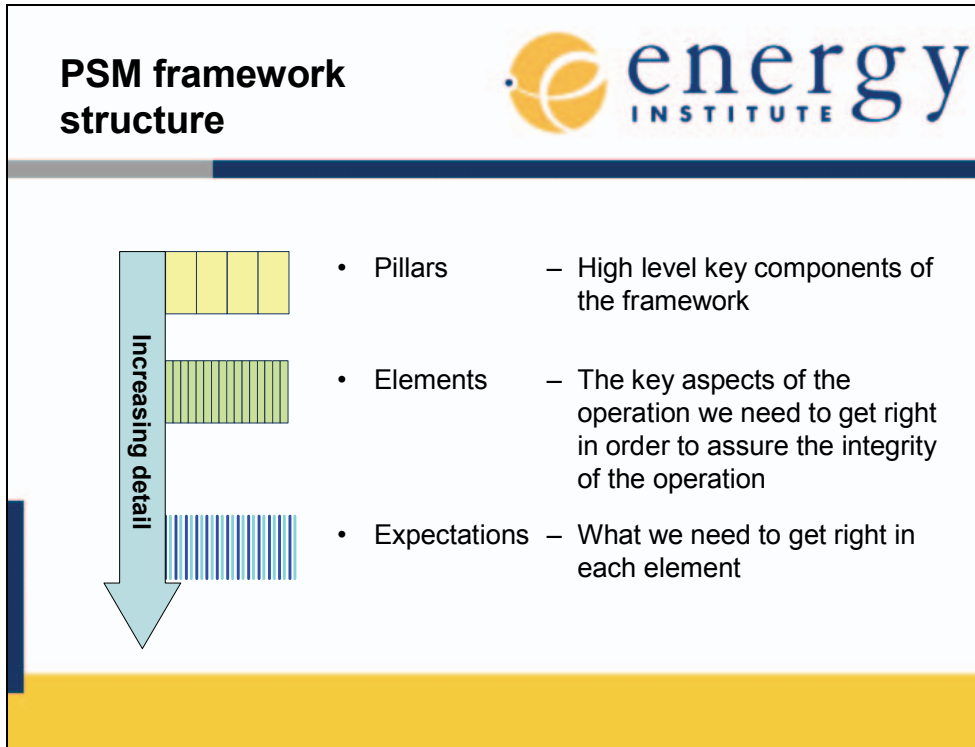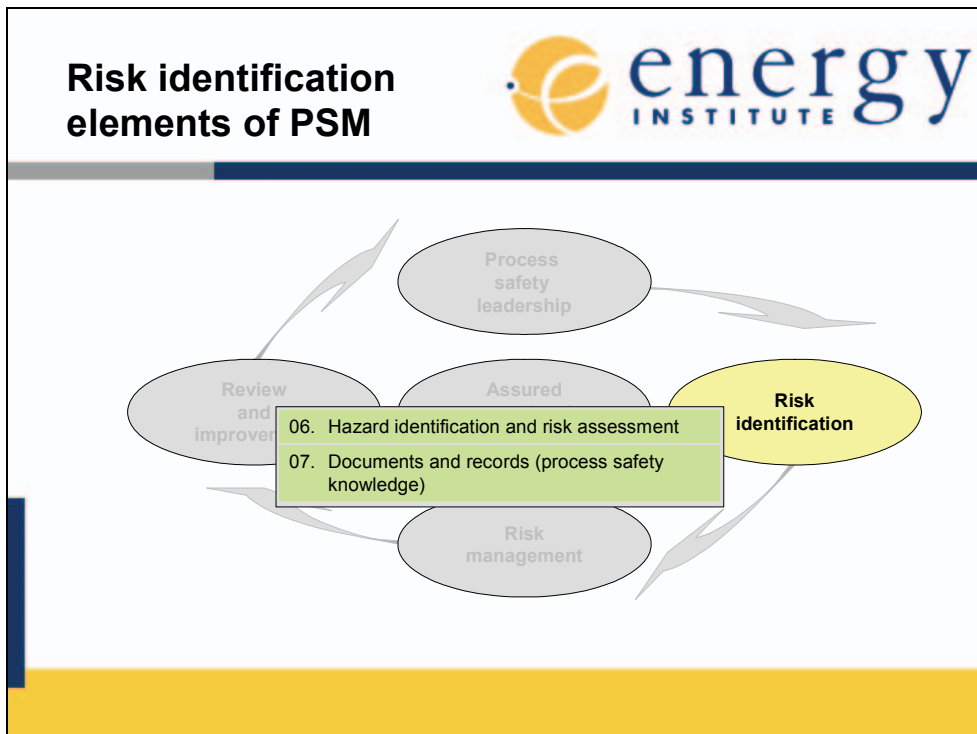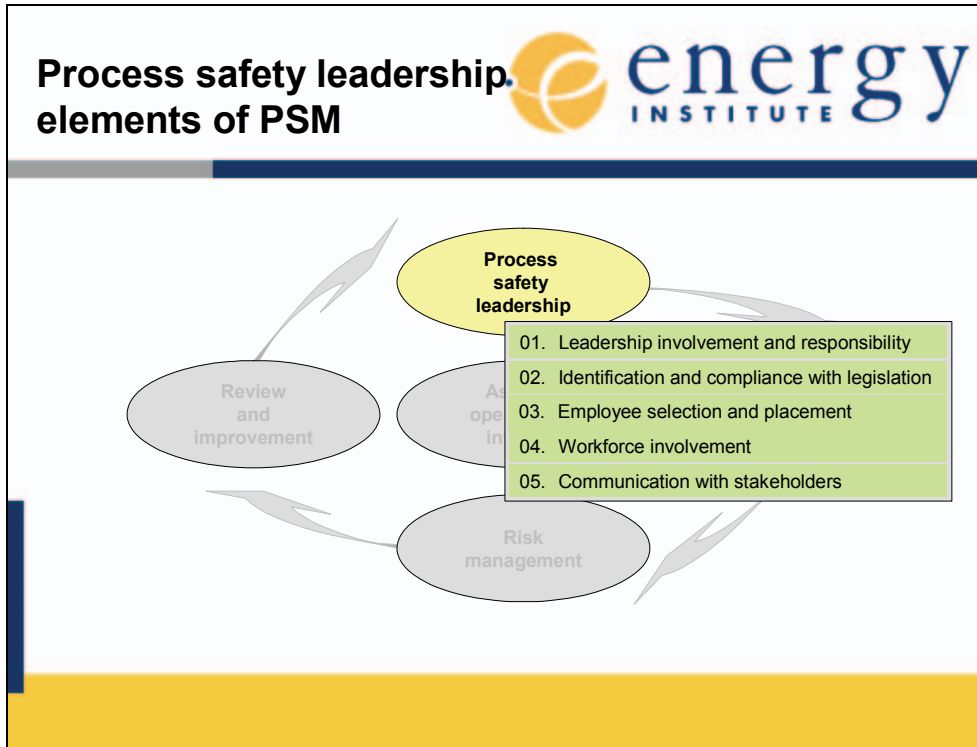**Review and improvement**

Within the review and improvement pillar there are three elements:
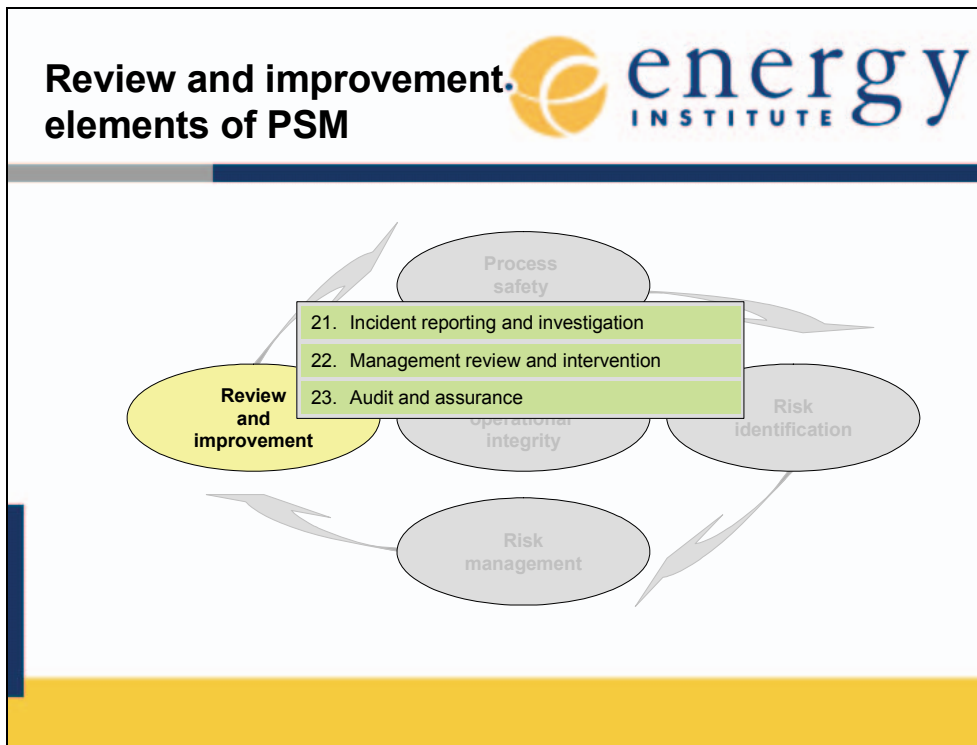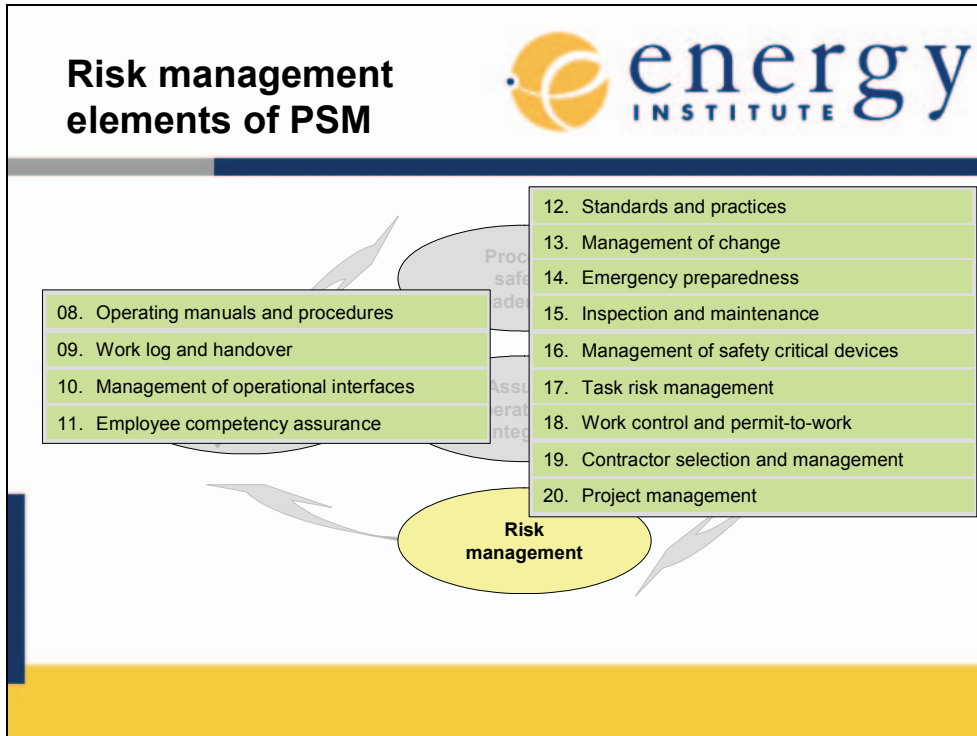
21.   Incident reporting and investigation.

22.   Management review and intervention.

23.   Audit and assurance.

At this 'straw man' stage for the purposes of the introduction to the workshop the elements are only defined in terms of a title: these were reviewed and fleshed out in the workshop sessions.

4   WORKSHOP SESSION 1 – WHAT DO WE NEED FROM A PSM FRAMEWORK?

The purpose of this session was for the breakout groups to review what their organisations needed from a PSM framework and discuss how it would support improved PSM in their organisation.

Feedback summary

The breakout groups supported the need for a high-level framework for PSM. The key requirements were identified as:

—   Provide a vision for PSM:
   –   should help process safety professionals to educate the company board and executives and explain what needs to be done to achieve appropriate standards of PSM;
—   Define a model for and raise the profile of PSM within a company:
   –   identification of key activities for PSM;
   –   very clear definition of process safety requirements;
   –   framework for measurement – leading indicators for PSM;

— should be easy to implement and understand bridging the gap between board level vision statement and operations defining PSM as an integral of management control;
— should define what needs to be in place to maintain 'licence to operate';
— should help companies to define roles and responsibilities and accountability for PSM.

5 WORKSHOP SESSION 2 – IS THE SCOPE OF THE 'STRAW MAN' PSM FRAMEWORK RIGHT?

The purpose of this session was for the breakout groups to review the scope of the PSM framework as presented in the 'straw man' identifying whether the scope is suitable, whether there is a need to add or remove elements and to develop a one line statement to describe the intent of each of the elements.

Feedback summary

The breakout groups made the following suggested modifications to the scope of the PSM framework:

— Consider reducing the number of elements:
  – combining some of the elements into bigger blocks;
  – scope for some as 'golden rules' rather than elements?
— Consider how behaviour, culture and workforce 'empowerment' are addressed:
  – stand-alone elements;
  – incorporated into the other elements?
— Consider how resource management is addressed.

The breakout groups developed the following descriptions of the intent of each of the elements:

Element 1 – Leadership involvement and responsibility
— Applicable to senior management and leaders throughout the organisation.
— Sets out:
  – aims, goals, aspirations, guidance and culture;
  – what's expected;
  – what's unacceptable;
  – roles, responsibilities and accountabilities;
  – required competency/understanding to do this.

Element 2 – Identification and compliance with legislation
— Integration of legislation into the PSM framework.
— Demonstration of compliance with current legislation.
— Understanding of and preparation for upcoming legislation.
— Influencing potential new legislation.

Element 3 – Employee selection and placement
— Defining the required competencies for each role.
— Competency assurance against the required competencies.

Element 4 – Workforce involvement
— Involving and empowering people to get the 'right behaviour'.

Element 5 – Communication with stakeholders
— Sending and receiving the right messages to the wider community (stakeholders).

Element 6 – Hazard identification and risk assessment
— Identifying the level of risk that we have.

Element 7 – Documents and records (process safety knowledge)
— Defining and maintaining the required corporate knowledge and memory.

Element 8 – Operating manuals and procedures
— Ensure we have the right procedures to:
  – remain within operating envelope (non-routine/emergencies);
  – eliminate inconsistency of operations – human factors.

Element 9 – Work log and handover
— Ensure we have ongoing understanding of process condition – human factors.

Element 10 – Management of operational interfaces
— Define the dependency of our operations on 3rd parties.

Element 11 – Employee competency assurance
— Competency assurance against the required competencies.

Element 12 – Standards and practices
— Achieve acceptable minimum governing structures.

Element 13 – Management of change
— Ensure appropriate management of risks associated with:
  – incremental change;
  – engineering change;
  – management change;
  – all changes.

Element 14 – Emergency preparedness
— Ensuring capability to deal with identified on/offsite emergency events (failure of final barriers).

Element 15 – Inspection and maintenance
— Ensuring equipment remains 'fit for purpose' in terms of mechanical integrity and operational capability (for defined life).

Element 16 – Management of safety critical devices
— Correct identification, management, throughout lifecycle.

Element 17 – Task risk management
— Avoidance of human error.

Element 18 – Work control and permit-to-work
— Provision of a safe place of work (HASAWA etc).

Element 19 – Contractor selection and management
— To ensure plant integrity is not compromised by activities of contractors and suppliers.

Element 20 – Project management
— Management of plant modifications.

Element 21 – Incident reporting and investigation
— Identification of root causes, learning lessons and avoiding recurrence.

Element 22 – Management review and intervention
— Demonstrate management commitment to continuous improvement.

Element 23 – Audit and assurance
— Provide input to management review to ensure plant/procedural integrity and compliance.

6   WORKSHOP SESSION 3 – DEVELOP THE EXPECTATIONS

The purpose of this session was to take a number of the elements of the PSM framework and start to identify the expectations which would define the things that an organisation would need to 'get right' in order to meet the intent of the element, as defined in Workshop session 2.

Feedback summary

The breakout groups made the following suggestions for expectations for selected elements:

Element 1 – Leadership involvement and responsibility
— 	Based on broad understanding of risks (feedback from management review).
— 	'Felt' leadership (frontline).
— 	Open and honest communication.
— 	Getting involved in detail.
— 	Process safety as an integral part of decision making.
— 	Policy to objectives and targets.
— 	Process safety integrated with overall business targets but …as an 'AND gate' (commercial penalties).
— 	Process safety as inherent part of culture, as core value.

— Visibility of risk exposure (risk register).
— Consistency of messages.
— 'Walking the talk'.
— Ensuring appropriate resources available (budget/schedule).
— Ensuring responsibilities and accountabilities are clearly defined.
— Being prepared to hear bad news and act on it.
— Actively encourage communication of bad news (links to Elements 21/22).
— Continuous improvement as an objective.
— Process safety champion on the board.

Element 2 – Identification and compliance with legislation (not discussed.)

Element 6 – Hazard identification and risk assessment
Looking for answers to:
— What are your hazards (defined process)?
— What's the severity?
— What's the probability?
— What risk control measures are in place?
— What are the residual risks?
— Are you prepared to accept these?
— Who has signed this off as acceptable?
— Are they widely communicated throughout the workforce?
— Are they reviewed?

Element 7 – Documents and records (process safety knowledge)
— Are they in a useable form?
— Are they up to date – control?
— Are they retrievable within a reasonable time (rapid access)?
— Process safety knowledge.
— Learning from internal/external incidents.
— Compensate for 'brain drain'.

Element 8 – Operating manuals and procedures
— Safe operating envelope.
— Return to safe operating envelope, if departure.
— Identification of key (safety critical) hazards and procedures.
— Shutdown of plant in emergency.
— Return to normal conditions.
— Safe start-up and shutdown.
— Temporary operating procedures.
— One action/step – presentation simplicity using a defined template.
— High risk tasks – hands-on procedures.
— Complex high risk task identification.
— Temporary procedure – abnormal temporary operations.
— Operation with degraded barriers.
— Need to make sure operators complete.
— Overall balance of experience – target users.
— Task assignment and acceptance of responsibility.

— Assurance of following procedures.
— Prior approval of authority to carry out task.
— Accessibility of procedures and control.
— Hold point identification – human factors:
  – Warning levels:
    - warn;
    - stop;
    - advise.
— Authors to procedures/manual:
  – user;
  – technical;
  – safety.
— Deviation – departure from procedure process:
  – Examination of proposed way.
  – Look at what can go wrong:
    - human factors;
    - equipment failure.
  – Review of procedures.
— Training for application of procedures.
— Refresher training.
— Notification of errors and review of documents:
  – learning process;
  – continuous improvement.
— Level of use and criticality, i.e. do you:
  – learn and are approved?
  – take instruction with you?
  – sign and document compliance?
— Buy-in from stakeholders:
  – operations;
  – maintenance;
  – management;
  – etc.
— Violation – identification of non-conformance.
— Emergency procedures:
  – what you do;
  – why you are doing it.
— Automation of procedures – allocation of function.

Element 13 – Management of change
— Engineering change.
— Organisational change.
— Personnel change.
— Temporary change.
— Procedural change.
— Software change.
— Incremental change – degradation.
— Accumulative change.
— Traceability – first start.

— Loss of layers of protection:
  – initiates change process.
— Change of specifications (procurement).
— Alarm management change.
— Recognise change:
  – what is change?
  – does the individual/team have the capability to assess and classify change?
  – sign-off acceptance;
  – assessment of the risk;
  – records;
  – change implementation – procedure interactions.
— How to handle prototype equipment (novel equipment).
— Does the change meet the issue?
— How to know change is managed:
  – audit;
  – review.
— How effective is the change?
— Manage training associated with change.
— Update of procedures and operating manuals.
— Manage the management of change process:
  – changes;
  – review;
  – audit;
  – update;
  – management of safety.
— Management of information from employees, i.e. corporate memory.

Element 15 – Maintenance and inspection and Element 16 – Management of safety critical devices
A process which will deliver:
— Clearly defined performance standards.
— Performance assurance – accurate picture.
— Impact of failures (by risk assessment process):
  – continue;
  – mitigate;
  – shutdown.
— Risk-based inspection programme.
— Define required resources to achieve programme.
— Programme should be adequately resourced.
— Technical authorities to be assigned.
— Predictive input for future planning.
— Maintenance (business critical):
  – avoid breakdown.
— Inspection:
  – predictive;
  – assurance.
— Assurance tasks (safety critical).
— Review and adjust programme as required.

— Deferment procedures:
– technical authority;
– management authority.
— Competence, training and experience requirements defined.
— Build up history – corporate memory and knowledge for new projects.

7   PROPOSALS TO EI PROCESS SAFETY COMMITTEE

This Section sets out proposals for continuing this project to develop a PSM framework for the energy industry sectors: these proposals were made at the September 2009 EI Process Safety Committee meeting: the proposals were endorsed.

The need for a PSM framework for the energy industry sectors was supported by the workshop participants. It is proposed that the work started in this workshop is continued to complete the development of the PSM framework. This work should:

—   Further develop the elements based upon the workshop feedback, looking to optimise the overall number of elements and provide a framework with the minimum level of complexity.
—   Complete the development of the expectations for each of the elements.

It is proposed that the approach for this developmental work should build upon the approach employed for this initial workshop, with the work being led by a sub-group of the Process Safety Committee and holding a number of additional workshops to review the work of the sub-group and assist with the development of the expectations.

The ultimate deliverable would be a high-level PSM framework which will provide guidance as to how companies can assure a high-level of PSM.

The structure of the framework would be a series of detailed expectations which would be grouped into elements which address the key aspects of operations that need to be right to achieve a high level of PSM.

ANNEX A
GLOSSARY

A.1   INTRODUCTION

For the purpose of these Technical Workshop Proceedings the following interpretations in A.2 apply irrespective of the meaning they may have in other connections.

A.2   GLOSSARY OF ABBREVIATIONS

CCPS	Center for Chemical Process Safety
COMAH	The Control of Major Accident Hazards [Regulations]
CSR	corporate social responsibility
EU	European Union
FEED	front end engineering design
HASAWA	Health and Safety at Work etc Act
ISRS	International Safety Rating System
JV	joint venture
OHSAS	Occupational Health and Safety Management System
OSCR	The Offshore Installations (Safety Case) Regulations
PSM	process safety management
RBPS	[Guidelines for] Risk based process safety
ROCE	return on capital employed
UK	United Kingdom

ANNEX B
REFERENCES

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www.aiche.org/ccps
Guidelines for risk based process safety (*RBPS*), ISBN 978-0-470-16569-0 (April 2007).

British Standards Institution (BSI)
www.bsi-global.com
PAS 55 Asset management (2008).
OHSAS 18001 Occupational health and safety management systems. Requirements (July 2007).

International Organization for Standardization (ISO)
www.iso.ch
ISO 9001 Quality management systems - Requirements (2008).

Office of Public Sector Information (OPSI)
www.opsi.gov.uk
Health and Safety at Work etc Act 1974 (HASAWA).
The Control of Major Accident Hazard Regulations 1999 (SI 1999/743) (as amended) (COMAH).
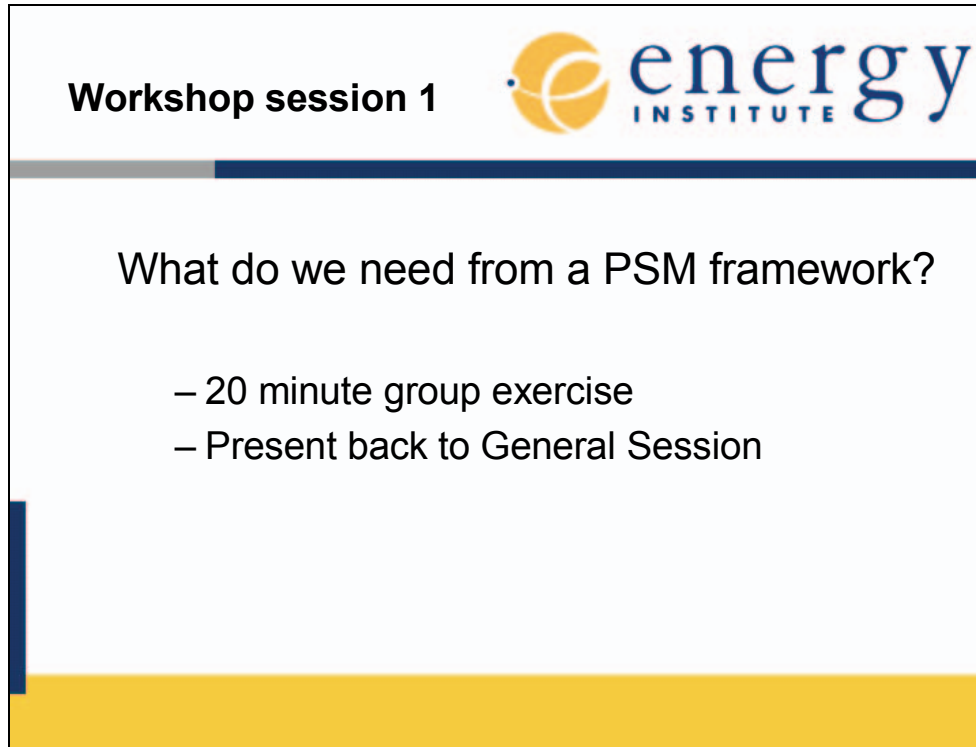The Offshore Installations (Safety Case) Regulations 2005 (SI 2005/3117) (OSCR).

Det Norske Veritas (DNV)
www.dnv.com
International Safety Rating System (ISRS).

ANNEX C
CHARTS FROM WORKSHOP SESSION 1

Group 1
—   Set a standard within company.
—   Educate board.
—   Easy to implement and understand.
—   Needs to integrate with existing management systems (ISRS/OSHAS 18001).
—   Need to be able to 'pick and mix'.
—   Need to be able to demonstrate added value against CCPS *RBPS*.
—   Raise profile of process safety.
—   Promote good risk management.
—   Link to process safety performance indicators.
—   Identifying and addressing needs of EI 'clientele'.
—   Involving service providers/contractors/joint venture (JV) partners.
—   Address 'project lifecycle' aspects.
—   Terminology: 'loss prevention'.

Group 2
— A vision:
    – PSM as an integral of management;
    – identification of key activities for PSM;
    – framework for measurement – leading indicators;
    – gap between board level vision statement and operations;
    – move to proactive system for PSM.
— Engagement:
    – Involvement of PSM in many aspects of management:
      - staff solution;
      - project planning;
      - etc.
    – Allocation of resources based on understanding of process safety risks:
      - frequency;
      - consequence.
— Simple as possible.
— Designed to deliver process safety – for application by companies.
— Licence to operate.

Group 3
— General definition:
    – major accident hazards rather than process safety;
    – scope – corporate social responsibility (CSR) and security;
    – very clear definition of process safety requirements.
— Process safety:
    – activities to control hazards to give long term assurance;
    – focus on safety barriers;
    – understanding and managing hazards and risks;
    – graded approach.

Group 4
— Provide clear indication of status of integrity.
— Define leadership competency.
— Positive for all employees.
— Response to failure/deficiencies in plant, people and process.
— 'Time to fix'.
— Provision of leading process safety metrics.
— Ability to quantify increased risk from change/fail.
— Plant integrity monitoring.
— Input to planning for inspection/maintenance programme.
— Clear roles and responsibilities, and accountability
— Business sustainability.

ANNEX D
CHARTS FROM WORKSHOP SESSION 2

Task 1 – Is the coverage suitable – Do we need to add/delete or modify any elements?

Group 1
— Incorporation of PSM in policy.
— Definition and scope of PSM.
— Behaviour/culture.
— Workforce 'empowerment'.
— Work log/handover: does it need to be a separate element?
— Inspection and maintenance – call 'integrity management'?
— Why 23 elements?
    – impact on communicating upwards;
    – combine some?
    – 21 and close out?
    – scope for some as 'golden rules', rather than elements;
    – add 'performance monitoring' (part of '22 Management review'?);
    – '20 Project execution' (all lifecycle phases) instead of '20 Project management'.

Group 2
Not covered.

Group 3
'15 Inspection and maintenance':
- – Assessment of results?
- – Integrity management?

'19 Contractor selection':
- – Add (suppliers and equipment).

'20 Project management':
- – Where is design/commissioning?

'21 Incident investigation and reporting'
- – Where is learning from experience (company and worldwide)?

'22 Management review'
- – Where is measurement?

— Does human factors map across these elements?
— Consolidate elements into 'big blocks'?
— Resource management?

Group 4
— Human factors indicator.
— Don't like 'involvement' should be 'committed'.
- – Elements 1 and 4.

Task 2 – One line description of the intent of each element

Group 1

Element 1 – Leadership involvement and responsibility
— Senior management, leaders throughout the organisation.
— Aims, goals, aspirations, guidance.
— Culture:
- – what's expected;
- – what's unacceptable.
— Responsibilities defined.
— Competency/understanding to do this.

Element 2 – Identification and compliance with legislation
— Demonstrate compliance with current legislation.
- – upcoming?
- – influencing?
— Integration legislation / PSM framework.

Element 3 – Employee selection and placement
— Competency assurance (overlap with Elements 3 and 11)
— What competency is required?

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— Are they being achieved?

Element 4 – Workforce involvement
— Are people empowered to ……?
— Will we get the ……'right behaviour'?

Element 5 – Communication with stakeholders
— Sending and receiving the right messages to the wider community (stakeholders)

Group 2

Element 6 – Hazard identification and risk assessment
— What level of risk do we have.

Element 7 – Documents and records (process safety knowledge)
— Corporate knowledge and memory (part of Element 6 – Hazard identification and risk assessment)
— Management of change.
— Evidence for setting your operating envelope.

Element 8 – Operating manuals and procedures
— Inconsistency of operations – human factors.
— Trying to remain within operating envelope (non-routine/emergencies).

Element 9 – Work log and handover
— Ongoing understanding of process condition – human factors.

Element 10 – Management of operational interfaces
— Dependency on 3rd parties:
    – not much use – covered by Elements 6 and 8, e.g. alarm management;
    – human / machine interface or human factors would be more useful;
    – (workforce?) – link to Element 19?

Element 11 – Employee competency assurance
— Competency assurance against the required competencies.

Group 3

Element 12 – Standards and practices
— Achieve acceptable minimum governing structures.

Element 13 – Management of change
— Incremental change / engineering change / management change / all changes.

Element 14 – Emergency preparedness
— Ensuring capability to deal with identified on/offsite emergency events (failure of final barriers).

Element 15 – Inspection and maintenance
—   Ensuring equipment remains 'fit for purpose' in terms of mechanical integrity and operational capability (for defined life).

Element 16 – Management of safety critical devices
—   Correct identification, management, throughout lifecycle.

Element 17 – Task risk management
—   Avoidance of human error.

Group 4

Element 18 – Work control and permit-to-work
—   Provision of a safe place of work (HASAWA etc)

Element 19 – Contractor selection and management
—   To ensure plant integrity is not compromised.
—   Suggest combining with 'Element 11 Employee competency assurance'.

Element 20 – Project management
—   Suggest change to 'Management of plant modifications'.
—   Eliminate and include in 'Element 13 Management of change'.

Element 21 – Incident reporting and investigation
—   Clarify that this refers to breaching of barriers and loss of containment (not occupational safety)?
—   Learn lessons and avoid recurrence.
—   Include root cause analysis.

Element 22 – Management review and intervention
—   Demonstrate management commitment to continuous improvement

Element 23 – Audit and assurance
—   Provide input to management review to ensure plant/procedural integrity and compliance.

ANNEX E
CHARTS FROM WORKSHOP SESSION 3

Workshop session 3

Develop the expectations
 – What are the things we must get right to meet the intent of the element?
  • Group 1 Elements 1 and 2
  • Group 2 Elements 6 and 7
  • Group 3 Elements 8 and 13
  • Group 4 Elements 15 and 16

 – 60 minute group exercise
 – Each group to work on one element
 – Present back to General Session

Group 1

Element 1 – Leadership involvement and responsibility
— Based on broad understanding of risks (feedback from management review).
— 'Felt' leadership (frontline).
— Open and honest communication.
— Getting involved in detail.
— Process safety as an integral part of decision making.
— Policy to objectives and targets.
— Process safety integrated with overall business targets but …as an 'AND gate' (commercial penalties).
— Process safety as inherent part of culture, as core value.
— Visibility of risk exposure (risk register).
— Consistency of messages.
— 'Walking the talk'.
— Ensuring appropriate resources available (budget/schedule).
— Ensuring responsibilities and accountabilities are clearly defined.
— Being prepared to hear bad news and act on it.
— Actively encourage communication of bad news (links to Elements 21/22).

— Continuous improvement as an objective.
— Process safety champion on the board.

Element 2 – Identification and compliance with legislation not discussed.

Group 2

Element 6 – Hazard identification and risk management
Looking for answers to:
— What are your hazards (defined process)?
— What's the severity?
— What's the probability?
— What risk control measures are in place?
— What are the residual risks?
— Are you prepared to accept these?
— Who has signed this off as acceptable?
— Are they widely communicated throughout the workforce?
— Are they reviewed?

Element 7 – Documents and records (process safety knowledge)
— Are they in a useable form?
— Are they up to date – control?
— Are they retrievable within a reasonable time (rapid access)?
— Process safety knowledge.
— Learning from internal/external incidents.
— Compensate for 'brain drain'.

Group 3

Element 8 – Operating manuals and procedures
— Safe operating envelope.
— Return to safe operating envelope, if departure.
— Identification of key (safety critical) hazards and procedures.
— Shutdown of plant in emergency.
— Return to normal conditions.
— Safe start-up and shutdown.
— Temporary operating procedures.
— One action/step – presentation simplicity using a defined template.
— High risk tasks – hands-on procedures.
— Complex high risk task identification.
— Temporary procedure – abnormal temporary operations.
— Operation with degraded barriers.
— Need to make sure operators complete.
— Overall balance of experience – target users.
— Task assignment and acceptance of responsibility.
— Assurance of following procedures.
— Prior approval of authority to carry out task.
— Accessibility of procedures and control.

— Hold point identification – human factors:
  – Warning levels:
    - warn;
    - stop;
    - advise.
— Authors to procedures/manual:
  – user;
  – technical;
  – safety.
— Deviation – departure from procedure process:
  – Examination of proposed way.
  – Look at what can go wrong:
    - human factors;
    - equipment failure.
  – Review of procedures.
— Training for application of procedures.
— Refresher training.
— Notification of errors and review of documents:
  – learning process;
  – continuous improvement.
— Level of use and criticality, i.e. do you:
  – learn and are approved?
  – take instruction with you?
  – sign and document compliance?
— Buy-in from stakeholders:
  – operations;
  – maintenance;
  – management;
  – etc.
— Violation – identification of non-conformance.
— Emergency procedures:
  – what you do;
  – why you are doing it.
— Automation of procedures – allocation of function.

Element 13 – Management of change
— Engineering change.
— Organisational change.
— Personnel change.
— Temporary change.
— Procedural change.
— Software change.
— Incremental change – degradation.
— Accumulative change.
— Traceability – first start.
— Loss of layers of protection:
  – initiates change process.
— Change of specifications (procurement).

— Alarm management change.
— Recognise change:
  – what is change?
  – does the individual/team have the capability to assess and classify change?
  – sign-off acceptance;
  – assessment of the risk;
  – records;
  – change implementation – procedure interactions.
— How to handle prototype equipment (novel equipment).
— Does the change meet the issue?
— How to know change is managed:
  – audit;
  – review.
— How effective is the change?
— Manage training associated with change.
— Update of procedures and operating manuals.
— Manage the management of change process:
  – changes;
  – review;
  – audit;
  – update;
  – management of safety.
— Management of information from employees, i.e. corporate memory.

Group 4

Element 15 – Maintenance and inspection and Element 16 – Management of safety critical devices
A process which will deliver:
— Clearly defined performance standards.
— Performance assurance – accurate picture.
— Impact of failures (by risk assessment process):
  – continue;
  – mitigate;
  – shutdown.
— Risk-based inspection programme.
— Define required resources to achieve programme.
— Programme should be adequately resourced.
— Technical authorities to be assigned.
— Predictive input for future planning.
— Maintenance (business critical):
  – avoid breakdown.
— Inspection:
  – predictive;
  – assurance.
— Assurance tasks (safety critical).
— Review and adjust programme as required.

—   Deferment procedures:
  –   technical authority;
  –   management authority.
—   Competence, training and experience requirements defined.
—   Build up history – corporate memory and knowledge for new projects.