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# EUROCONTROL Guidelines

The Change & Transition Tools Compendium  
Annex D  
Reference and Guidance Material



# **Annex D**

## **Reference and Guidance Material**

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# Annex D

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Change management standard process design

Annex D No: D-1

<b>EXECUTIVE SUMMARY</b>	<b>Last update: 05/06/2010</b>															
<b>Name of method or tool etc:</b>	<b>Type:</b>															
Change management standard process design	Generic change model, reference material															
<b>Abstract:</b>																
<p>The Change Management standard process design establishes a management, a communication and information, participation and an evaluation process as key processes for the management of changes in a structured way. The commitment and leadership of Management in management process plays a key role in this model.</p> <p>The communication and information process ensures acceptance by and dialogue with staff. The participation process of the model strives to involve staff representatives being equally responsible, together with management, for the conduction of the change. The evaluation process of the model ensures continuous evaluation and includes a feedback mechanism for affected staff and project managers.</p>																
<b>ProACT Process Model</b>																
<b>Applicable to Phase and Main Activity:</b>																
<p>The diagram illustrates the ProACT Process Model, structured into four sequential phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase is represented by a colored block with specific activities listed within it. Decision gates, marked with an 'X', are positioned at the end of each phase. Two horizontal bars at the bottom represent cross-cutting activities: 'Communication, participation and involvement' and 'Continuous evaluation and adaptation', both also marked with an 'X' at the end.</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Main Activities</th> <th>Decision Gate (X)</th> </tr> </thead> <tbody> <tr> <td>Scoping Phase</td> <td>Change need analysis, Communication plan development, Stakeholder analysis, Risk &amp; opportunities identification</td> <td>X</td> </tr> <tr> <td>Planning Phase</td> <td>Feasibility evaluation, Risk &amp; opportunities, Project objectives definition, Project development, Establish structures and resources, Social impact assessment</td> <td>X</td> </tr> <tr> <td>Implementation Phase</td> <td>Risk &amp; opportunities analysis, Feasibility evaluation, Implementation plan development, Implement structures, Implement supporting</td> <td>X</td> </tr> <tr> <td>Evaluation</td> <td>Assess &amp; secure, Implement changes, Monitor &amp; reinforce, Process &amp; outcome assessment</td> <td>X</td> </tr> </tbody> </table>		Phase	Main Activities	Decision Gate (X)	Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X	Planning Phase	Feasibility evaluation, Risk & opportunities, Project objectives definition, Project development, Establish structures and resources, Social impact assessment	X	Implementation Phase	Risk & opportunities analysis, Feasibility evaluation, Implementation plan development, Implement structures, Implement supporting	X	Evaluation	Assess & secure, Implement changes, Monitor & reinforce, Process & outcome assessment	X
Phase	Main Activities	Decision Gate (X)														
Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X														
Planning Phase	Feasibility evaluation, Risk & opportunities, Project objectives definition, Project development, Establish structures and resources, Social impact assessment	X														
Implementation Phase	Risk & opportunities analysis, Feasibility evaluation, Implementation plan development, Implement structures, Implement supporting	X														
Evaluation	Assess & secure, Implement changes, Monitor & reinforce, Process & outcome assessment	X														
<b>References</b>																
<b>Developer and source</b>																
<p>DFS Deutsche Flugsicherung GmbH          Center Langen          Am DFS-Campus 1          63225 Langen          Phone: +49 6103 7070          Fax: +49 6103 7071 396          Web <a href="http://www.dfs.de/dfs/internet_2008/portal/english/start/index.html">http://www.dfs.de/dfs/internet_2008/portal/english/start/index.html</a></p> <p>Responsible:          Mr. Michael Platzek,          Personal development Expert of the business unit Centre          E-Mail: <a href="mailto:Michael.Platzek@dfs.de">Michael.Platzek@dfs.de</a>          Phone: +49 6103 7073 284</p>																
<b>Year of development / publication, updates etc.</b>																
2006																

<b>General description</b>	
<b>Purpose of measurement / study</b>	This model and the reference material provide information based on practical experience gained in change processes. Practice has shown that the four processes of this model present the core of a change process and should always be covered.
<b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b>	Generic change model
<b>Effort required (time, people, equipment, resources); usability and practicability</b>	<p>The required effort for the model depends on the number of stakeholders and the chosen way to ensure communication and Information (Interviews, workshops etc.). The overall effort is high, whereby the effort for planning of the processes is the highest at the start of a change project.</p> <p>Efficiency can be gained in using established information and consultation structures, e.g. team meetings, management meetings, information tools, Intranet etc. The effort overall is high but worth it.</p>
<b>Population – Demographic and or Professional Group for which the method is intended for</b>	The model and the reference material are not limited to a specific professional group.
<b>Object of measurement / study (individual, team, profession, department, company)</b>	Individual, team group, department, company/organisation.
<b>Language (other than English)</b>	English and German
<b>Cost information / Copyrights / Agreements needed</b>	<p>Information can be obtained from the responsible person at DFS: <a href="mailto:Michael.Platzek@dfs.de">Michael.Platzek@dfs.de</a></p> <p>No part of the publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the copyright owner DFS GmbH, Germany.</p>
<b>ATM specific mapping</b>	
<b>Guidance for use in the ATM Context</b>	<p>The most suitable change scenarios where the Change management standard process design model and the reference material can be used are:</p> <ul style="list-style-type: none"> <li>○ Consolidation, integration and outsourcing of services and units, e. g.: <ul style="list-style-type: none"> <li>● consolidation of control centres;</li> <li>● centralisation of services (e.g. maintenance, AIS);</li> <li>● outsourcing of services (e.g. development, maintenance).;</li> </ul> </li> <li>○ Implementation of future operational concepts and systems, e.g. encompassing: <ul style="list-style-type: none"> <li>● significant changes of roles and responsibilities in operational jobs;</li> <li>● significantly increasing automation of tasks or functions;</li> </ul> </li> <li>○ Harmonisation and mobility of staff, e.g.: <ul style="list-style-type: none"> <li>● transfer of operational staff to other states or in multinational working arrangements;</li> <li>● new organisational or social structures and/or processes.</li> </ul> </li> <li>○ Changes in working conditions, e. g.: <ul style="list-style-type: none"> <li>● new organisational or social structures and/or processes.</li> </ul> </li> <li>○ Changes in organisational structure of whole companies, authorities or units, e.g.: <ul style="list-style-type: none"> <li>● Corporate privatisation;</li> <li>● Civil/military integration of operations.</li> </ul> </li> </ul>
<b>Experiences of use in the ATM / safety industry / other industry context, including references / users</b>	The model is in use at DFS since 2006 and part of the management training program. It is also established as the basic model for all change management activities at DFS.

## ProACT Process Model

### Applicable to phase and activity of the ProACT Process Model

The model can be applied to the following phases and processes:

#### Continuous evaluation and adaptation process

The evaluation process of the model, if used continuously, can provide useful feedback already at early stages.

#### Communication, participation and involvement process

The communication and information process of the model ensures involvement by and participation of affected staff during a change project.

#### Scoping phase

Communication plan development:

The communication and information process of the model helps to establish a communication plan by using examples of available communication tools.

#### Planning phase

Project objectives definition – Project proposal development - Implementation plan development:

The management process of the model facilitates the conduction of the planning phase and provides tools and mechanisms for the development of the implementation plan.

#### Implementation phase

Implement supporting structures – Implement changes:

The management and the participation process of the model, if used simultaneously can provide useful support for the implementation phase ensuring that supporting structures are existent and work effectively.

#### Evaluation phase

Monitor & reinforce C & T process:

The evaluation process of the model provides the possibility of a feedback cycle improving change & transition processes.

## Technical description

### Description of the content / study

The four key processes used in the change management standard process design model are provided below.

#### The management process

Management assumes a central role in the process of accompanying the change. Transparency, efficient and timely communications are the key elements in this process. Management's role is also to record, evaluate and forward critical views towards the planned change, ensuring that further measures can be taken in order to increase acceptance. The responsibilities of Top Management are to communicate to staff, to create a positive attitude to change, to organise meetings at management level and to clarify staff roles and the tasks of managers at lower level.

#### The communication and information process

Communication and Information should aim to increase acceptance of the change. Communication in a change project should always be two-way (bottom-up and top-down), whereby information in a change project is one way (top-down). The contents of communication should include the established objectives of the change, details about change processes, planned time schedules and a list of responsible staff conducting the change. Regular meetings with staff should ensure the two-way communication. Information should include monthly Newsletter, an up-to-date Intranet site, Information of the outcome of management meetings, Interviews and their publication in in-house magazines or newspapers.

#### The Participation process

Participation of affected staff in a change project should result in the active integration of staff in the change. A joint communication process between the Board of Managing Directors, managerial staff and employees should be established. A common platform for dialogue should be created and managers should enter into a direct dialogue with their staff. Top managers should communicate to staff personally on objectives and strategies during Team meetings.

#### The evaluation process

Continuous evaluations within the Change project team using interviews, gap analysis and surveys should be done during the change project. Managers should provide feedback on their dialogues with teams and staff. Feedback possibilities should also be provided for staff councils, unions and individual staff. Events (meetings, conferences etc) should be analysed using evaluation forms.

<b>Context and Prerequisites for application</b>								
The model does not require specific software and can be used with standard Microsoft Office applications;								
<b>Equipment required for application</b>								
PC with Windows 95/98/NT2000/XP or Vista running system.								
<b>Required user qualifications</b>								
A Change expert having knowledge of project management processes would be preferable.								
<b>Requirements / constraint concerning conditions for use</b>								
No specific requirements or constraints for use are known.								
<b>Measure / Response Types</b>								
Not applicable								
<b>Collected parameters and data format</b>								
Not applicable								
<b>Results obtained and interpretation</b>								
The model, due to its step by step approach is able to provide users with early information for corrective actions in the change process contributing to avoid any risk or failure.								
<b>Description of use</b>								
<b>Figure / model</b>								
Project Management								
Management Process								
Participation Process								
Communication & Information Process								
Evaluation Process								
Milestones	<table border="1"> <tr> <td>Kick-off</td> <td>▲</td> <td>Planning</td> <td>▲</td> <td>Transition</td> <td>▲</td> <td>Assurance</td> </tr> </table>	Kick-off	▲	Planning	▲	Transition	▲	Assurance
Kick-off	▲	Planning	▲	Transition	▲	Assurance		
Project Phases	<table border="1"> <tr> <td>PHASE 1</td> <td>PHASE 2</td> <td>PHASE 3</td> <td>PHASE 4</td> </tr> </table>	PHASE 1	PHASE 2	PHASE 3	PHASE 4			
PHASE 1	PHASE 2	PHASE 3	PHASE 4					
Time Schedule	<table border="1"> <tr> <td>month/year</td> <td>month/year</td> <td>month/year</td> <td>month/year</td> </tr> </table>	month/year	month/year	month/year	month/year			
month/year	month/year	month/year	month/year					

Overview of the change management standard process design model

<b>Process description</b>	
<p>After identifying the needs for change in the “change need analysis” and the interests of the stakeholders, the main objectives and principles of the change process are described.</p> <p>In the next step all activities are organized and structured for each key process coordinated with the project activities coming from project management. All activities are visualised in a process sheet.</p>	
Project Management	<ul style="list-style-type: none"> <li>▪ <b>design project schedule</b></li> <li>▪ <b>qualify project manager in change management</b></li> <li>▪ <b>continuously enhance processes</b></li> </ul>
Management Process	<ul style="list-style-type: none"> <li>▪ <b>manager take the responsibility for the change-process</b></li> <li>▪ <b>manager generate high relevance for the change-process</b></li> </ul>
Participation Process	<ul style="list-style-type: none"> <li>▪ <b>Systematic involvement of stakeholders for high attention</b></li> <li>▪ <b>get input for successful implementation</b></li> <li>▪ <b>involve interest groups and persons for facilitation</b></li> </ul>
Communication & Information Process	<ul style="list-style-type: none"> <li>▪ <b>create transparency for the corporate relevance</b></li> <li>▪ <b>create agreement towards the change</b></li> <li>▪ <b>inform about prominence and proceedings of the change</b></li> </ul>
Evaluation Process	<ul style="list-style-type: none"> <li>▪ <b>evaluate the achievement of objectives from inner and outer perspective</b></li> <li>▪ <b>integrate own actions within HR-instruments for encouragement</b></li> </ul>
<b>Evaluation</b>	
<b>Strengths and Weaknesses of the tool</b>	
<p>The strength of the change management standard process design model is in its structured, participative approach. It is very comprehensive and easy to apply by management and staff. A sponsor and owner of the Change process are necessary. However, implementation in practice very much depends on an open minded, fully transparent organisational culture. To be successful in a change project, continuous evaluation and adaptation of the model during the change is necessary.</p>	
<b>Alternative methods / tools</b>	
<p>The hourglass model could be an alternative model, but could also be combined with this model.</p>	
<b>Possible combination with other methods / tools</b>	
<p>This model could be combined with any of the models in the Compendium.</p>	
<b>Psychometric / methodological integrity description</b>	
<b>Objectivity / (or at least) demonstration</b>	
<p>Not applicable</p>	
<b>Reliability / (or at least) demonstration</b>	
<p>Not applicable</p>	
<b>Validity / (or at least) demonstration</b>	
<p>Not applicable</p>	
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>	
<p>The model has been used over several years in different business branches of DFS through many change projects. It is also used in training for managers and change experts (about 13 training courses provided to managers, change experts, work councils and project managers). The acceptance of the model's practical approach can be rated rather high.</p>	

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**Business re-engineering and health and safety management – Literature survey**

**Annex D No: D-2**

<b>EXECUTIVE SUMMARY</b>		<b>Last update: 15/06/2010</b>
<b>Name of method or tool etc:</b>		<b>Type:</b>
Business re-engineering and health and safety management – Literature survey		Literature survey
<b>Abstract:</b>		
<p>The Business re-engineering and health and safety management literature survey summarises the findings of publicly available literature on the scale and form of business reengineering, e.g. company reorganisations in the UK and the effect it has on health and safety standards. Furthermore, the health and safety issues, pitfalls and opportunities associated with business reengineering are analysed.</p> <p>The literature survey provides an overview of current management structures to allow the Health and Safety Executive to review the extent to which health and safety management guidance is consistent with current industrial practice. It is complemented by publicly available research on the effects of reorganisation on health and safety so that the HSE can consider the need to review regulations covering the current and foreseeable needs of the nuclear industry. It further identifies where industry requires additional support in the form of guidance to meet the needs of a changing industrial environment.</p>		
<b>ProACT Process Model</b>		
<b>Applicable to Phase and Main Activity:</b>		
<p>The diagram illustrates the ProACT Process Model, a sequential process divided into four phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase contains specific activities:</p> <ul style="list-style-type: none"> <li><b>Scoping Phase:</b> Change need analysis, Communication development, Stakeholder analysis, Risk &amp; opportunities identification, Feasibility evaluation.</li> <li><b>Planning Phase:</b> Project objectives definition, Project proposal development, Establish structures and resources, Social impact assessment, Risk &amp; opportunities analysis, Feasibility evaluation.</li> <li><b>Implementation Phase:</b> Implementation plan development, Implement structures, Implement supporting structures, Implement training, Assess &amp; secure acceptance, Implement changes.</li> <li><b>Evaluation:</b> Monitor &amp; reinforce C&amp;T process, Process &amp; outcome assessment, Monitor &amp; reinforce.</li> </ul> <p>Decision gates are marked with 'X' at the end of the Scoping, Planning, and Implementation phases. Two horizontal bars at the bottom represent 'Communication, participation and involvement' and 'Continuous evaluation and adaptation'.</p>		
<b>References</b>		
<b>Developer and source</b>		
<p>Michael S Wright. Entec UK Ltd. 17, Angel Gate City Road London EC1V 2PT</p> <p>Health and Safety Executive UK (HSE) Web: <a href="http://www.hsebooks.co.uk">www.hsebooks.co.uk</a> E-mail: <a href="mailto:hseinformationsservices@natbrit.com">hseinformationsservices@natbrit.com</a> Phone: +44 1787 881165</p>		
<b>Year of development / publication, updates etc.</b>		
1996		

<b>General description</b>
<p><b>Purpose of measurement / study</b></p> <p>This literature survey provides an indication of the scale and form of business reengineering in the UK and the effect that business reengineering has on health and safety standards. It allows the HSE to gauge the importance of business reengineering and the need to provide support to industry in this area.</p> <p>An understanding of the form of business reengineering may also help to identify any inconsistencies in the assumptions, implicit or otherwise, between the HSE's advice on health and safety management and the current style of industrial management.</p> <p>It also defines the health and safety issues associated with business reengineering so that appropriate advice can be generated and provides some initial inputs to a best practice model for the management of the health and safety aspects of business reengineering.</p>
<p><b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b></p> <p>Literature survey</p>
<p><b>Effort required (time, people, equipment, resources); usability and practicability</b></p> <p>The literature survey is 96 pages in length.</p>
<p><b>Population – Demographic and or Professional Group for which the method is intended for</b></p> <p>The literature survey is intended to directors, managers and health and safety professionals.</p>
<p><b>Object of measurement / study (individual, team, profession, department, company)</b></p> <p>The literature survey analysed the nature of influence which a company reorganisation can have on health and safety of affected staff.</p>
<p><b>Language (other than English)</b></p> <p>English only</p>
<p><b>Cost information / Copyrights / Agreements needed</b></p> <p>The document can be downloaded for from: <a href="http://www.hse.gov.uk/RESEARCH/crr_hm/100-124.htm">http://www.hse.gov.uk/RESEARCH/crr_hm/100-124.htm</a>.  <u>Applications for reproduction should be made in writing to:</u>            Copyright Unit, Her Majesty's Stationery Office, St Clements House, 2-16 Colegate, Norwich NR3 150.            No part of the publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the copyright owner.</p>
<b>ATM specific mapping</b>
<p><b>Guidance for use in the ATM Context</b></p> <p>The most suitable change scenarios where the literature survey can be used are:</p> <ul style="list-style-type: none"> <li>○ Consolidation, integration and outsourcing of services and units, e. g.:           <ul style="list-style-type: none"> <li>● consolidation of control centres;</li> <li>● centralisation of services (e.g. maintenance, AIS);</li> <li>● remote operations and maintenance settings;</li> <li>● outsourcing of services (e.g. development, maintenance).</li> </ul> </li> <li>○ Implementation of future operational concepts and systems, e.g. encompassing:           <ul style="list-style-type: none"> <li>● significant changes of roles and responsibilities in operational jobs;</li> <li>● significantly increasing automation of tasks or functions.</li> <li>● new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).</li> </ul> </li> <li>○ Changes in working conditions, e. g.:           <ul style="list-style-type: none"> <li>● new shift/rostering cycles and working hours (e.g. to flexibly adapt to variations in traffic amount);</li> <li>● new organisational or social structures and/or processes.</li> </ul> </li> </ul>

- Changes in organisational structure of whole companies, authorities or units, e.g.:
  - Corporate privatisation.
- Certification and regulatory implementation activities, e.g.:
  - certification as ATM service provider or training provider;
  - implementation of harmonised safety management standards;
  - implementation of harmonised competence regulations.
- Changes in organisational culture, e.g.:
  - Safety reporting culture.

#### **Experiences of use in the ATM / safety industry / other industry context, including references / users**

The literature survey focuses on reengineering in organisations operating in various sectors where health and safety hazards were considered being significant.

### **ProACT Process Model**

#### **Applicable to phase and activity of the ProACT Process Model**

The literature survey discovers deficiencies and opportunities on health and safety aspects during organisational change. It could be useful for the following processes:

##### Scoping phase

Risk & opportunities identification:

The literature survey provides information on health and safety management aspects.

##### Planning phase

Risk and opportunities analysis – Implementation plan development:

The literature survey provides information on the impact of health and safety aspects and the effects of changes on health and safety of staff.

### **Technical description**

#### **Description of the content / study**

The literature survey provides an overview of current publicly available literature and investigates on the scale and form of business reengineering in the UK; the effect that business reengineering has on health and safety standards and finally the health and safety issues pitfalls and opportunities associated with business.

It provides an indication of the scale and of the form of business reengineering in the UK and the effect that business reengineering has on health and safety standards and allows matching these standards to current industrial practice. An understanding of the form of business reengineering helps to identify any inconsistencies in the assumptions, implicit or otherwise, between health and safety management and the current style of industrial management.

The literature survey also defines the health and safety issues associated with business reengineering and generates advice as necessary, including an outline of health and safety 'pitfalls' and opportunities in business reengineering. Furthermore it identifies issues which need further in subsequent research.

#### **Context and Prerequisites for application**

The literature survey can be applied to civil aviation with no specific prerequisites.

#### **Equipment required for application**

No specific equipment is needed.

#### **Required user qualifications**

A health and safety expert should be part of the team guiding the change process.

#### **Requirements / constraint concerning conditions for use**

No specific requirements or constraints for use are known.

#### **Measure / Response Types**

The literature survey is based on literature research, available online and CD-Rom databases, audit findings and complemented by oil and gas contractor safety management procedures in the annex.

**Collected parameters and data format**

There is no description of collected parameters and the data format provided in the document.

**Results obtained and interpretation**

Main findings from the survey are:

- It is possible to identify examples of where reorganisation has contributed to major accidents involving multiple fatalities;
- On the other hand, health and safety statistics published by companies reveal an improvement in overall performance subsequent to reorganisation, even if standards fell during reorganisation in some examples;
- Industry level statistics in those sectors experiencing change, including the rail, power, water and petrochemical sectors, do not consistently reveal a decline in performance, with most sectors revealing improvements in reported accident and injury rates;
- Reorganisation can be a major source of stress and result in poorer mental health and job satisfaction, although the level of mental health has been reported to fall back to pre-reorganisation levels in some but not all of the studies;
- Some research suggests that latter day forms of management structures and systems are associated with permanently higher levels of stress, but there are only a few studies in this area and accordingly it is difficult to reach firm conclusions based on these studies alone.

It was difficult to reach firm conclusions based solely on current research other than to suggest that reorganisation can be a stressful process.

The form of a reorganisation can have both positive and negative impacts on health and safety. It may be that organisation which recognise that reorganisation may cause stress and proactively address health and safety issues are more likely to display neutral or positive effects on standards than those organisations in which reorganisation is driven primarily by business concerns with health and safety addresses incidentally or not at all.

The following issues were noted in the context of health and safety and general reorganisations:

- Empowerment can, on occasion, be implemented without providing support in the form of training in team building or other necessary skills,
- The lack of employee involvement in the process of change contradicts the goal of empowerment;
- There is concern about loss of technical support;
- Delaying without changing the way in which work is undertaken is a high risk for failure;
- Failing to keep employees informed and consulted is a factor in the creation of stress and the acceptance and consequent success of reorganisation,
- Changes were implemented without first analysing the requirements.

The Literature survey revealed that the negative effects of reorganisation are due by deficiencies in the approach taken to the planning and implementation of changes and excessive reduction in personnel with key competencies rather than constituting inherent and unavoidable side effects of "flatter" management.

The Literature survey suggests that many of the features of delayed organisations, e.g. having "flatter" management, correspond to those advocated by safety management and as Shillito (1995) suggests go through natural progression from the traditional Command Culture (Rule Book Culture) to a Behavioural Culture.

This progression corresponds in many ways to the progression from the traditional "Command and Control" approach to business management to the latter day "process based" approach to management involving empowered personnel in delayed organisations.

Problems in implementing changes in "flatter" management structures arise from poor planning and implementation.

Description of use	
<b>Figure / model</b>	
<b>The Rule Book Culture</b>	<b>The Engineered Culture</b>
<p>This approach believes that workers are lazy, careless, in need of constant motivation and management discipline. Rules should be learned by heart because workers cannot be expected to think or relied upon to read. The only means of achieving safety...is by punishing non-compliance....The culture is distinguished by the paperwork which usually remains in the office; ...These are frequently described as 'Regulations', 'Rules' and 'Orders'.</p>	<p>The theme for this culture is that workers in industry and users of industrialised products must be protected against all hazards, poor quality and environmental harm by the designs of engineers. It is the job of all engineers to eliminate all possible sources of harm, failure, poor health or loss of environmental quality. If they don't they are negligent</p>
<b>The Behavioural Culture</b>	<b>The Procedural Culture</b>
<p>This culture is based on the idea that workers are normal human beings who are motivated to work by many factors. They tend to be proud of achievements,...are concerned about the environment and want to work safely. Such reasonable people tend to create their own systems which fit their needs. Responsible behaviour tends to result when the workers are provided with the education and training to understand what is required and are empowered to accept responsibility for the work. The Behavioural Culture still contains policies and objectives and targets..procedures, manuals, records and audits. However, the attitude to these artefacts is different. They are treated as tools to aid performance.</p>	<p>The Procedural Culture treats the workers with more respect than the Rule Book Culture. It assumes that they are careless and forgetful, and in need of constant motivation. Motivation is made more palatable by rephrasing rules as Policies', 'Objectives' and 'Targets'. This introduces the need to produce compliance....</p> <p>The answer to the problems of carelessness and forgetfulness is again simple to provide instructions. This leads onwards to the development of procedures, as sets of instructions, to which the worker should constantly refer.....</p>
Model of cultures	
<b>Process description</b>	
<p>The literature survey suggests that if health and safety is taken as a benchmark during a change process, reorganisation should not pose an obstacle to maintaining preventive health and safety management. It also suggests that the lessons learnt regarding problems in the management of changes may be of value when considering the issue of management of change in the area of health and safety management, particularly regarding cultural, planning and management of change issues.</p>	
<b>Evaluation</b>	
<b>Strengths and Weaknesses of the tool</b>	
<p>The literature survey discovered that no studies exist which examined the effect of business reengineering on health and safety, other than the issues on stress.</p>	
<b>Alternative methods / tools</b>	
<p>No alternative methods or tools are known.</p>	
<b>Possible combination with other methods / tools</b>	
<p>The literature survey should be studied along with the documents: "Business re-engineering and health and safety management – Best practice model" and "Business re-engineering and health and safety management – Case studies" also provided in this Compendium.</p>	
<b>Psychometric / methodological integrity description</b>	
<b>Objectivity / (or at least) demonstration</b>	
<p>Not applicable</p>	
<b>Reliability / (or at least) demonstration</b>	
<p>Not applicable</p>	
<b>Validity / (or at least) demonstration</b>	
<p>Not applicable</p>	
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>	
<p>Not applicable</p>	

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Organisational change and major accident hazards

Annex D No: D-3

<b>EXECUTIVE SUMMARY</b>	<b>Last update: 15/08/2010</b>															
<b>Name of method or tool etc:</b>	<b>Type:</b>															
Organisational change and major accident hazards	Information Sheet															
<b>Abstract:</b>																
<p>The organisational change and major accident hazards information sheet provides guidance for employers responsible for major hazards on how to manage the impact of organisational change on their control of the hazards. Organisational change is a normal and inevitable part of business life in all sectors.</p> <p>But organisations associated with major accident hazards have a greater potential for disastrous consequences and higher costs in terms of lives and money. These consequences mean that organisations managing major hazards must aim for much higher reliability than is normally necessary in commercial decision making. The information sheet therefore describes common pitfalls to look for, suggests a three-part framework for managing organisational change, and explains the legal duties of an employer.</p> <p>This information sheet is intended for employers and senior managers dealing with organisational change, and anyone involved in planning or implementing such change. It will also be helpful to employees and trade union or staff representatives and safety representatives.</p>																
<b>ProACT Process Model</b>																
<b>Applicable to Phase and Main Activity:</b>																
<p>The diagram illustrates the ProACT Process Model, which is divided into four main phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase contains specific activities and decision gates. A bar for 'Communication, participation and involvement' spans the Planning and Implementation phases. A bar for 'Continuous evaluation and adaptation' spans the entire process.</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Activities</th> <th>Decision Gates</th> </tr> </thead> <tbody> <tr> <td>Scoping Phase</td> <td>Change need analysis, Communication plan development, Stakeholder analysis, Risk &amp; opportunities identification</td> <td>X</td> </tr> <tr> <td>Planning Phase</td> <td>Feasibility evaluation, Risk &amp; opportunities, Project objectives development, Project proposal and resources, Establish structures, Social impact assessment, Risk &amp; opportunities analysis, Feasibility evaluation</td> <td>X</td> </tr> <tr> <td>Implementation Phase</td> <td>Implementation plan development, Implement supporting structures, Implement training, Assess &amp; secure, Implement changes</td> <td>X</td> </tr> <tr> <td>Evaluation</td> <td>Monitor &amp; reinforce, Process &amp; outcome assessment</td> <td>X, X</td> </tr> </tbody> </table>		Phase	Activities	Decision Gates	Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X	Planning Phase	Feasibility evaluation, Risk & opportunities, Project objectives development, Project proposal and resources, Establish structures, Social impact assessment, Risk & opportunities analysis, Feasibility evaluation	X	Implementation Phase	Implementation plan development, Implement supporting structures, Implement training, Assess & secure, Implement changes	X	Evaluation	Monitor & reinforce, Process & outcome assessment	X, X
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Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X														
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Implementation Phase	Implementation plan development, Implement supporting structures, Implement training, Assess & secure, Implement changes	X														
Evaluation	Monitor & reinforce, Process & outcome assessment	X, X														
<b>References</b>																
<b>Developer and source</b>																
<p>Health and Safety Executive UK (HSE)          Caerphilly Business Park          Caerphilly CF83 3GG          UNITED KINGDOM          The guidance is part of a series of information and guidance material on the management of organisational change available on Web: <a href="http://www.hse.gov.uk/humanfactors/topics/orgchange.htm">http://www.hse.gov.uk/humanfactors/topics/orgchange.htm</a>          E-mail: <a href="mailto:hseinformationervices@natbrit.com">hseinformationervices@natbrit.com</a>          Phone: +44 1787 881165</p>																
<b>Year of development / publication, updates etc.</b>																
2003																

<b>General description</b>	
<b>Purpose of measurement / study</b>	The short information in this guidance material aims to help employers to manage changes impacting on health and safety and control hazards.
<b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b>	Guidance material
<b>Effort required (time, people, equipment, resources); usability and practicability</b>	The guidance material is 8 pages in length and covers the change process from planning to implementation in a concise (short) overview of common pitfalls in organisational change, describes a 3-step framework model of change and points to legal requirements of employers when introducing change. The practical application requires a change team including a Health and a Safety Expert to lookup any effect on health and safety risks and hazards.
<b>Population – Demographic and or Professional Group for which the method is intended for</b>	Employers and senior managers dealing with organisational change, and anyone involved in planning or implementing such change. It will also be helpful to employees and trade union or staff representatives and safety representatives.
<b>Object of measurement / study (individual, team, profession, department, company)</b>	Changes to roles and responsibilities, organisational structure, staffing levels, staff disposition or any other change that may directly or indirectly affect the control of the hazard.
<b>Language (other than English)</b>	English only
<b>Cost information / Copyrights / Agreements needed</b>	The publication may be freely reproduced, except for advertising, endorsement or commercial purposes. The guideline can be downloaded from: <a href="http://www.hse.gov.uk/pubns/chis7.pdf">http://www.hse.gov.uk/pubns/chis7.pdf</a> .
<b>ATM specific mapping</b>	
<b>Guidance for use in the ATM Context</b>	<p>The most suitable change scenarios where the guidance material can be used are:</p> <ul style="list-style-type: none"> <li>○ Consolidation, integration and outsourcing of services and units, e. g.: <ul style="list-style-type: none"> <li>● consolidation of control centres;</li> <li>● centralisation of services (e.g. maintenance, AIS);</li> <li>● remote operations and maintenance settings;</li> <li>● outsourcing of services (e.g. development, maintenance).</li> </ul> </li> <li>○ Implementation of international working structures, e.g.: <ul style="list-style-type: none"> <li>● Functional Airspace Blocks (FAB);</li> <li>● Trans-national companies or working arrangements (e.g. EAD Group, Entry Point North).</li> </ul> </li> <li>○ Implementation of future operational concepts and systems, e.g. encompassing: <ul style="list-style-type: none"> <li>● significant changes of roles and responsibilities in operational jobs;</li> <li>● significantly increasing automation of tasks or functions.</li> <li>● new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).</li> </ul> </li> <li>○ Changes in working conditions, e. g.: <ul style="list-style-type: none"> <li>● new shift/rostering cycles and working hours (e.g. to flexibly adapt to variations in traffic amount);</li> <li>● new organisational or social structures and/or processes.</li> </ul> </li> <li>○ Changes in organisational structure of whole companies, authorities or units, e.g.: <ul style="list-style-type: none"> <li>● Corporate privatisation;</li> <li>● Civil/military integration of operations.</li> </ul> </li> </ul>

**Experiences of use in the ATM / safety industry / other industry context, including references / users**

The guidance material has been developed for high risk industries, e.g. offshore installations and pipeline works, nuclear installations, chemical installations and railway infrastructure and train operators. However the guidance material can also be used in civil aviation being part of the high risk industries.

**ProACT Process Model****Applicable to phase and activity of the ProACT Process Model**

The guidance material covers the change process from planning to implementation focusing on impact on health and safety and managing hazards during a change. It could be useful for the following processes:

Communication, participation and involvement process

The guidance material provides useful information on how to setup and maintain a communication and an active participation process and provides explanations how involvement should be conducted.

Scoping phase

Risk & opportunities identification:

The guidance material provides a risk assessment procedure to identify risks and opportunities resulting from the change.

Planning phase

Risk and opportunities analysis:

The guidance material provides a mapping of people and tasks, a scenario assessment including checklists on risk alert and competence and provides information on performance indicators to be used to monitor the impact of the change process on the management of major hazards.

Implementation phase

Implement supporting structures:

The guidance material provides information on the management of the transition and possible follow up actions to be taken into account.

Evaluation phase

Monitor & reinforce C & T process – Process & outcome assessment:

The guidance material provides information on organisational management aspects to consider for monitoring and assessing the outcome of a change.

**Technical description****Description of the content / study**

The main focus of this guidance is on change at operational and site level. It is also relevant to changes at corporate level which can have a significant impact on safety at operational level.

Examples of this include changes in reporting relationships, objectives, resources, management system, and available expertise for design, engineering support, and procurement and so on.

Although the guidance is specifically about major accident prevention, the processes outlined should have benefits for other aspects of health, safety and environmental management, and even commercial risk.

The guidance material sets out a three-step framework:

Step 1 - Getting organised for change

Step 2 – Risk Assessment

Step 3 - Implementing and Monitoring

Each step is explained and includes one or several short checklists covering common pitfalls in managing change. Various important topics are covered at each stage of the process. The steps can be used to plan and manage organisational changes from a health and safety perspective.

The guidance material further provides information on legal requirements for Offshore and Onshore, Nuclear and Railway operators in the United Kingdom.

<b>Context and Prerequisites for application</b>
The guidance material can be applied to civil aviation with no specific prerequisites.
<b>Equipment required for application</b>
No specific equipment is needed.
<b>Required user qualifications</b>
A health and safety expert should be part of the change team guiding the change process.
<b>Requirements / constraint concerning conditions for use</b>
No specific requirements or constraints for use are known.
<b>Measure / Response Types</b>
The guidance material does not include specific measurement methods, thus no response types are given.
<b>Collected parameters and data format</b>
There is no description of collected parameters and the data format provided in the document.
<b>Results obtained and interpretation</b>
HSE made the experience that in many instances organisational changes are not analysed and controlled as thoroughly as plant changes, resulting in reduced defences against major accidents, sometimes with fatal consequences. HSE also experienced that, unlike management of plant change, impacts of organisational change are less well understood, and there is a lack of robust, generally accepted approaches to ensuring safety.
Reference is made to an investigation report by the Health and Safety Executive into the fatal fire at Hickson & Welch Ltd in Castleford on 21 September 1992. Further references are made on safety assessments and safety cases published as HSE Books.
<b>Description of use</b>
<b>Figure / model</b>
<pre> graph TD     S1["<b>Step 1 Getting organised</b> Have a strong policy Make senior-level managers accountable Have a clear change-management procedure Communicate and include everyone Review and challenge"]     S2["<b>Step 2 Risk assessment</b> Identify the people involved Identify all changes Assess the risks Consider human factors, competence and workload Test scenarios"]     S3["<b>Step 3 Implementing and monitoring</b> Provide enough resources to make the change safely Monitor risks during change Keep your plan under review, track actions Monitor performance after change Review your change policy"]          S1 --&gt; S2     S2 --&gt; S3     S3 --&gt; S1     S3 --&gt; S2     </pre>
Figure 1: Managing organisational change

<b>Process description</b>
<p>The guidance material starts with an introduction, an explanation about the different types of changes and explains how to use the information provided.</p> <p>The three-step framework in the guidance material starts with step 1 - Getting organised for change. It covers the following topics:</p> <ul style="list-style-type: none"> <li>○ Policy – setting principles, commitments and accountabilities ;</li> <li>○ Commitment and resources – explaining management commitment, sponsoring and resources required;</li> <li>○ Clear systems – explaining a systematic and realistic way of managing change;</li> <li>○ Participation and communication – explaining how participation and involvement should be managed;</li> <li>○ Review and challenge – explaining the review and assessment of change plans.</li> </ul> <p>Step 2 – Risk assessment covers the following topics:</p> <ul style="list-style-type: none"> <li>○ Assessment procedures – helping to identify the main risks;</li> <li>○ Mapping – helping to understand and to track the main details of the change;</li> <li>○ Scenario assessments – explaining factors to consider, action tracking and human reliability and competence;</li> <li>○ Performance indicators – explaining that key performance indicators should be used to monitor the impact of the change;</li> </ul> <p>Step 3 - Implementing and Monitoring covers the following topics:</p> <ul style="list-style-type: none"> <li>○ Safety during the transition – explaining the elements to be taken into account during periods of uncertainty;</li> <li>○ Monitoring the change – explaining the regular review of the performance indicators and decisions made;</li> </ul> <p>The guidance material is completed with information on legal duties of UK businesses for the protection of employees and the management of Health and Safety at Work. It further entails detailed Regulations for Offshore and Onshore, Nuclear and Railway operators in the United Kingdom, to be respected.</p>
<b>Evaluation</b>
<b>Strengths and Weaknesses of the tool</b>
No strengths or weaknesses are known.
<b>Alternative methods / tools</b>
Hourglass model; Integrated Operations – Man – Technology – Organisation Method (IO-MTO), however these models do not have a strong focus on the risk and safety aspects during a change process.
<b>Possible combination with other methods / tools</b>
If combined with the Hourglass model or the Integrated Operations – Man – Technology – Organisation Method (IO-MTO) the risk and safety aspects could be covered. It can also be combined with interviewing tools.
<b>Psychometric / methodological integrity description</b>
<b>Objectivity / (or at least) demonstration</b>
Not applicable
<b>Reliability / (or at least) demonstration</b>
Not applicable
<b>Validity / (or at least) demonstration</b>
Not applicable
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>
The guideline is based on previous work and research conducted by the Health and Safety Executive UK. However, no specific information is provided making it possible to judge the guidance material on its objectivity, reliability or validity.

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<b>EXECUTIVE SUMMARY</b>	<b>Last update: 05/07/2010</b>															
<b>Name of method or tool etc:</b>	<b>Type:</b>															
Managing and regulating organisational change in the nuclear industry	Guidance Material															
<b>Abstract:</b>																
<p>The guidance material on managing and regulating organisational change in the nuclear industry sets out a structured high-level process for Regulators in the Nuclear Industry helping them to assess whether Nuclear Companies licensed by the Nuclear Safety Regulators have an effective process for managing organisational change (e.g. staffing issues, organisational restructuring etc.) in place.</p> <p>The regulator may wish to gain an early and accurate awareness of any proposed organisational change which has the potential to impact upon nuclear safety. This entails the gathering of information which enables a judgement to be made about the adequacy with which that change has been analysed and planned, and the provisions for implementing and monitoring the change.</p> <p>The requirements of a structured management of change process are outlined and a number of other factors influencing the regulator's confidence in the Nuclear Companies management of change are described. This guidance material is of interest to Regulators in civil aviation helping them to develop and document a verification procedure for aviation organisations that manage organisational change processes, especially when safety related changes are subject of such an organisational change.</p>																
<b>ProACT Process Model</b>																
<b>Applicable to Phase and Main Activity:</b>																
<p>The diagram illustrates the ProACT Process Model, divided into four phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase contains specific activities, and decision gates are marked at the end of the Scoping and Planning phases. Two horizontal bars at the bottom represent 'Communication, participation and involvement' and 'Continuous evaluation and adaptation'.</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Activities</th> <th>Decision Gate</th> </tr> </thead> <tbody> <tr> <td>Scoping Phase</td> <td>Change need analysis, Communication plan development, Stakeholder analysis, Risk &amp; opportunities identification, Feasibility evaluation</td> <td>X</td> </tr> <tr> <td>Planning Phase</td> <td>Project objectives definition, Project proposal development, Establish structures and resources, Social impact assessment, Risk &amp; opportunities analysis, Feasibility evaluation</td> <td>X</td> </tr> <tr> <td>Implementation Phase</td> <td>Implementation plan development, Implement supporting structures, Implement training</td> <td>X</td> </tr> <tr> <td>Evaluation</td> <td>Assess &amp; secure acceptance, Implement changes, Monitor &amp; reinforce C&amp;T process, Process &amp; outcome assessment</td> <td>X</td> </tr> </tbody> </table>		Phase	Activities	Decision Gate	Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification, Feasibility evaluation	X	Planning Phase	Project objectives definition, Project proposal development, Establish structures and resources, Social impact assessment, Risk & opportunities analysis, Feasibility evaluation	X	Implementation Phase	Implementation plan development, Implement supporting structures, Implement training	X	Evaluation	Assess & secure acceptance, Implement changes, Monitor & reinforce C&T process, Process & outcome assessment	X
Phase	Activities	Decision Gate														
Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification, Feasibility evaluation	X														
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Implementation Phase	Implementation plan development, Implement supporting structures, Implement training	X														
Evaluation	Assess & secure acceptance, Implement changes, Monitor & reinforce C&T process, Process & outcome assessment	X														
<b>References</b>																
<b>Developer and source</b>																
<p>OECD          Nuclear Safety Division          OECD Nuclear Energy Agency          Le Seine St-Germain          12 boulevard des Iles          92130 Issy-les-Moulineaux, France</p> <p>Web: <a href="http://www.oecd.org/LongAbstract/0,3425,en_2649_34667_32125049_1_1_1_37461,00.html">http://www.oecd.org/LongAbstract/0,3425,en_2649_34667_32125049_1_1_1_37461,00.html</a>          ISBN : 92-64-02069-1</p>																
<b>Year of development / publication, updates etc.</b>																
2004																

<b>General description</b>
<b>Purpose of measurement / study</b>
The purpose of this guidance material is to provide Regulators with detailed elements of a structured change process conducted at a licensed company to gain an early and accurate awareness of any proposed organisational change impacting nuclear safety and helping the Regulators to evaluate and assess the licensed company's practices for managing organisational change.
<b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b>
Guidance material
<b>Effort required (time, people, equipment, resources); usability and practicability</b>
The guidance material is 18 pages in length. The effort involved in conducting and documenting the review process is unspecified and depends on the scope and level of detail involved. Effort or Regulators might be considerable and might require insights into different parts of the organisation (management plans, current practices, risk assessment).
<b>Population – Demographic and or Professional Group for which the method is intended for</b>
The guidance material is aimed for Regulatory Authorities in the nuclear industry and for the whole organisation and structure of a licensed Nuclear Company. It might also be helpful to employees and trade union or staff representatives as well as safety experts.
<b>Object of measurement / study (individual, team, profession, department, company)</b>
The regulatory process described in the guidance material requires a licensed company to document the processes in place for the planning, managing and evaluating organisational change. Responsibility for this documentation lies within the management of a licensed company.
<b>Language (other than English)</b>
English only
<b>Cost information / Copyrights / Agreements needed</b>
The report is available online, free of charge, at Website: <a href="http://www.oecd.org/LongAbstract/0,3425,en_2649_34667_32125049_1_1_1_37461,00.html">http://www.oecd.org/LongAbstract/0,3425,en_2649_34667_32125049_1_1_1_37461,00.html</a> .
<b>ATM specific mapping</b>
<b>Guidance for use in the ATM Context</b>
The most suitable change scenarios where the guidance material can be used are:
<ul style="list-style-type: none"> <li>○ Consolidation, integration and outsourcing of services and units, e. g.: <ul style="list-style-type: none"> <li>• consolidation of control centres;</li> <li>• centralisation of services (e.g. maintenance, AIS);</li> <li>• remote operations and maintenance settings;</li> <li>• outsourcing of services (e.g. development, maintenance).</li> </ul> </li> <li>○ Implementation of international working structures, e.g.: <ul style="list-style-type: none"> <li>• Functional Airspace Blocks (FAB).</li> </ul> </li> <li>○ Implementation of future operational concepts and systems, e.g. encompassing: <ul style="list-style-type: none"> <li>• significant changes of roles and responsibilities in operational jobs;</li> <li>• more integrated ATM processes characterised by wide information sharing, enhanced CDM (Collaborative Decision Making);</li> <li>• new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).</li> </ul> </li> <li>○ Harmonisation and mobility of staff, e.g.: <ul style="list-style-type: none"> <li>• Application of regulations concerning operational competence (e.g. ESARR 5, common ATCO license).</li> </ul> </li> <li>○ Changes in working conditions, e. g.: <ul style="list-style-type: none"> <li>• new shift/rostering cycles and working hours (e.g. to flexibly adapt to variations in traffic amount);</li> <li>• new organisational or social structures and/or processes.</li> </ul> </li> <li>○ Changes in organisational structure of whole companies, authorities or units, e.g.: <ul style="list-style-type: none"> <li>• Civil/military integration of operations.</li> </ul> </li> </ul>

- Certification and regulatory implementation activities, e.g.:
  - certification as ATM service provider or training provider;
  - implementation of harmonised safety management standards;
  - implementation of harmonised competence regulations;
  - implementation of harmonised/interoperable technology and procedural standards.
- Changes in organisational culture, e.g.:
  - Safety reporting culture.

#### Experiences of use in the ATM / safety industry / other industry context, including references / users

The guidance material was produced by the Committee on the Safety of Nuclear Installations (CSNI) and the Special Experts Group on Human and Organisational Factors (SEGHOF) for the interest of government and industry bodies. No information is available on the use of the guidance material in practice.

### ProACT Process Model

#### Applicable to phase and activity of the ProACT Process Model

The guidance material could be useful for the following processes:

##### Continuous evaluation and adaptation process

The guidance material provides information on which aspects the Regulator should analyse during the evaluation and adaptation process.

##### Scoping phase

Risk & opportunities identification – Feasibility evaluation:

The guidance material provides information on a baseline assessment by the regulator for the planned change.

##### Planning phase

Project objectives definition - Establish structures and resources - Risk and opportunities analysis – Feasibility evaluation:

The guidance material requires a regulated company to provide justifications to the Regulator on the proposed change. Information is provided on how and what the Regulator should then analyse to agree to the proposed change.

##### Implementation phase

Implement supporting structures – Implement changes:

The guidance material indicates that the licensed company provides information to the Regulator on indicators to be developed by the licensed company and on the review process by the Regulator on these indicators.

##### Evaluation phase

Monitor & reinforce C & T process – Process & outcome assessment:

The guidance material provides information for the Regulator on the review process by the licensed company and the arguments to be provided.

### Technical description

#### Description of the content / study

The guidance material concerns organisational change in nuclear power plant operations, such as reducing staffing levels, changing organisational structures, adopting new shift strategies, introducing new technologies or increasing the amount of work carried out by external contractors. The regulator's objective in this scenario is to ensure that change is planned and implemented without compromising safety. The report sets out a structured review process that might be employed by regulators to document that sufficient levels of safety are achieved.

Important points in this review process include:

- Baseline assessment – Analysis and documentation of current organisational structure
- Statement of proposed change – Outlining management responsibilities, the programme for introducing change, plans for peer review and self-assessment
- Categorisation of proposed change – The categorisation system needs to reflect the potential nuclear safety impact of changes that are inadequately conceived or executed
- Analysis and review of change proposal – Consideration of specific risks associated with the change
- Implementation programme – Identifying those elements of change which need to be completed in order to enable subsequent stages of the process to succeed
- Review of change – Drawing on and interpreting the findings of performance indicators discussed under the previous headings, and confirming that there are no unexpected or undesirable outcomes.

The report proceeds to discuss other issues that need to be considered for the regulatory oversight of organisational change to be successful. They include:

- Communication between regulator and licensee
- Impact of regulatory actions – The regulator must be aware of the impact of its own actions on licensee behaviour – and be careful not to constrain the licensee's choice of action or to impose inappropriate demands
- Succession management and corporate memory – The regulator may expect the licensee's change proposal to include a suitable treatment of corporate memory issues
- Licensee approaches to morale and safety culture – It is reasonable for the regulator to seek confirmation that the licensee is actively considering these factors and taking steps to sustain morale and a positive safety culture
- Licensee management of unplanned changes – Change can also be unplanned (e.g. staff leaving or labour being withdrawn). The licensee is expected to have arrangements for ensuring the delivery of safety functions without application of a formal change management process.

#### **Context and Prerequisites for application**

The guidance material can be applied to civil aviation with no specific prerequisites.

#### **Equipment required for application**

No specific equipment is needed.

#### **Required user qualifications**

Licensee staff responsible for conducting and documenting the review process will need insight into the organisational structure and management plans. Some expertise in risk analysis may be required.

#### **Requirements / constraint concerning conditions for use**

No specific requirements or constraints for use are known.

#### **Measure / Response Types**

The guidance material does not include specific measurement methods, thus no response types are given.

#### **Collected parameters and data format**

There is no description of collected parameters and the data format provided in the document.

#### **Results obtained and interpretation**

The guidance material concludes that regulators should acknowledge that organisational change has the potential to impact upon nuclear safety and that there is a need for both the licensed company and the regulator to adopt formal positions on this issue. The regulator may reasonably expect the licensed company to develop and implement a system for managing change which is comparable with the approach taken to managing plant and equipment change, and encourage self-assessment as part of that system. The regulator should be careful not to take action which could take, or be construed as taking, responsibility for managing the change away from the licensed company.

Change proposals would need to be subjected to suitable levels of regulatory scrutiny, although the regulator would need to be aware of the potential for its actions. Particular attention would need to be given to the steps which the licensed company has taken to ensure that it retains effective control of its operations, and that it maintains sufficient knowledge, competence and resources to understand its own plant and to act as an intelligent customer for functions that are contracted out.

The Regulator would also wish to examine the indicators and measures which the license company puts in place to monitor its continued delivery of nuclear safety functions. Regulators should seek to develop their own understanding and capabilities in the areas of safety management and wider organisational issues.

As the regulators' experience of dealing with organisational change grows, it is anticipated that criteria and tools to inform regulatory judgement will continue to be developed. Although national differences may influence the detailed regulatory approaches that are adopted, dialogue between regulators would be helpful to share practices, experiences and developments in this field.

### **Description of use**

#### **Figure / model**

No figure or model is available.

<b>Process description</b>
<p>The guidance material starts with a foreword, followed by an introduction and background information. A structure review process, being necessary, is then explained.</p> <p>The Licensee management of change process explains that a regulator may not wish to examine all the licensee's change proposals. The regulator may therefore require the licensee to develop a process for managing change which is akin to the process for managing plant modifications. That process could set out the way in which change proposals are derived, assessed and implemented.</p> <p>A rigorous change process would include a number of key elements:</p> <ul style="list-style-type: none"> <li>• reference to an organisational "baseline";</li> <li>• statement of proposed change;</li> <li>• categorisation of safety significance;</li> <li>• assessment and review of change proposal in accordance with categorisation;</li> <li>• implementation programme and use of performance indicators;</li> <li>• review of change post-implementation.</li> </ul> <p>These key elements comprise part of a safety management system or quality system for organisational change management, and as such they should each be subject to periodic review and audit by licensee and regulator. Each of these elements is discussed in the guidance material. Other issues, not directly linked to the organisational change process are also discussed in the document. The document concludes with a statement on the Regulators tasks and responsibilities.</p>
<b>Evaluation</b>
<b>Strengths and Weaknesses of the tool</b>
<p>The primary role of the process and categories described in the guidance material are to document the adequacy of a licensee's change management process. However the process may prove useful for internal use within the licensee's organisation, e.g. for planning, documenting and evaluating a change plan. Therefore the report may have applicability for a wider range of purposes and industries. On the other hand, the report lacks information about how the review process is documented in detail, what formats, tools and methods should be used.</p>
<b>Alternative methods / tools</b>
NEA/CSNI report "Regulatory aspects of management of change – summary and conclusions".
<b>Possible combination with other methods / tools</b>
Could be used in conjunction with the Organisational change and major accident hazards guidance material.
<b>Psychometric / methodological integrity description</b>
<b>Objectivity / (or at least) demonstration</b>
Not applicable
<b>Reliability / (or at least) demonstration</b>
Not applicable
<b>Validity / (or at least) demonstration</b>
Not applicable
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>
<p>The guidance material appears to reflect a solid basis of experience in nuclear regulation. However, no details on the source material are provided, and no validation or experience using this process is discussed.</p>

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**The UK regulator’s view of external influences on safety and license conditions for organisational change**

**Annex D No: D-5**

<b>EXECUTIVE SUMMARY</b>	<b>Last update: 10/07/2010</b>															
<b>Name of method or tool etc:</b>	<b>Type:</b>															
The UK regulator's view of external influences on safety and license conditions for organisational change	Information Sheet & UK Nuclear site license conditions															
<b>Abstract:</b>																
<p>The UK regulator’s view of external influences on safety information sheet provides a high-level overview of a range of change factors (industry, markets, technology, and government) that have affected nuclear regulation in the UK over the last 40 years, and gives examples of how the regulator has adapted to these changes.</p> <p>A particular emphasis of the report is on the need for anticipating change and for developing new approaches to regulating change for licensed organisations and their ways of working. An important aspect was to gain confidence that the licensed companies were approaching the change in a systematic and controlled manner. It became also clear that the company’s management of change was of such importance that it required regulatory oversight and that a consistent and proportionate approach was needed.</p> <p>Therefore a new License condition (LC 36) was introduced setting requirements on the control of changes to the organisational structure and resources which may affect safety and which have to be submitted for regulatory approval.</p> <p>The information sheet provides an insight into the tasks and responsibilities for oversight of the Nuclear Installations Inspectorate and the requirements for licensed companies. The change factors discussed range from operational, industrial and market factors to issues of governmental guidance, funding and policy. However, few concrete examples are provided on how is to be achieved.</p>																
<b>ProACT Process Model</b>																
<b>Applicable to Phase and Main Activity:</b>																
<p>The diagram illustrates the ProACT Process Model, which is divided into four sequential phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase contains a list of activities. Decision gates are marked with an 'X' at the end of the Scoping and Planning phases. Two horizontal bars at the bottom represent 'Communication, participation and involvement' (with an empty box) and 'Continuous evaluation and adaptation' (with an 'X' in a box).</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Activities</th> <th>Decision Gate</th> </tr> </thead> <tbody> <tr> <td>Scoping Phase</td> <td>Change need analysis, Communication plan development, Stakeholder analysis, Risk &amp; opportunities identification</td> <td>X</td> </tr> <tr> <td>Planning Phase</td> <td>Feasibility evaluation, Project objectives definition, Project proposal development, Establish structures and resources, Social impact assessment, Risk &amp; opportunities analysis</td> <td>X</td> </tr> <tr> <td>Implementation Phase</td> <td>Feasibility evaluation, Implementation plan development, Implement supporting structures, Implement training</td> <td>X</td> </tr> <tr> <td>Evaluation</td> <td>Assess &amp; secure acceptance, Implement changes, Monitor &amp; reinforce, Process &amp; outcome assessment</td> <td>X</td> </tr> </tbody> </table>		Phase	Activities	Decision Gate	Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X	Planning Phase	Feasibility evaluation, Project objectives definition, Project proposal development, Establish structures and resources, Social impact assessment, Risk & opportunities analysis	X	Implementation Phase	Feasibility evaluation, Implementation plan development, Implement supporting structures, Implement training	X	Evaluation	Assess & secure acceptance, Implement changes, Monitor & reinforce, Process & outcome assessment	X
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Evaluation	Assess & secure acceptance, Implement changes, Monitor & reinforce, Process & outcome assessment	X														
<b>References</b>																
<b>Developer and source</b>																
<p>Author: J. L. Summers (lyn.summers@hse.gsi.gov.uk)          UK Health and Safety Executive          St. Peter’s House, Stanley Precinct          Bootle Merseyside L20 3LZ, UK          Available online at <a href="http://www-pub.iaea.org/MTCD/publications/PDF/pub1120/CD/PDF/Issue2/CN-82-55.pdf">http://www-pub.iaea.org/MTCD/publications/PDF/pub1120/CD/PDF/Issue2/CN-82-55.pdf</a>          The nuclear site license conditions are available under: <a href="http://www.hse.gov.uk/nuclear/keythemes.htm#standards">http://www.hse.gov.uk/nuclear/keythemes.htm#standards</a>          Email: <a href="mailto:lyn.summers@hse.gsi.gov.uk">lyn.summers@hse.gsi.gov.uk</a></p>																
<b>Year of development / publication, updates etc.</b>																
2001																

<b>General description</b>	
<b>Purpose of measurement / study</b>	
The information sheet presents experiences and insights on change pressures in the nuclear industry that have affected the UK regulator over the last 40 years, and how the regulator has responded to these pressures. One of the measures is to ensure that change in the nuclear industry) is conducted safely. The License Condition 36 is discussed in more detail.	
<b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b>	
Guidance material	
<b>Effort required (time, people, equipment, resources); usability and practicability</b>	
The information sheet is 6 pages in length The nuclear site license conditions document is 12 pages in length.	
<b>Population – Demographic and or Professional Group for which the method is intended for</b>	
Employers and senior managers dealing with organisational change, and anyone involved in planning or implementing such change. It will also be helpful to employees and trade union or staff representatives and safety representatives.	
<b>Object of measurement / study (individual, team, profession, department, company)</b>	
Company, for the change and control of organisational change.	
<b>Language (other than English)</b>	
English only	
<b>Cost information / Copyrights / Agreements needed</b>	
The information sheet and the licence condition document are free of charge.	
<b>ATM specific mapping</b>	
<b>Guidance for use in the ATM Context</b>	
The most suitable change scenarios where the information sheet and the nuclear site license conditions document can be used are:	
<ul style="list-style-type: none"> <li>○ Consolidation, integration and outsourcing of services and units, e. g.: <ul style="list-style-type: none"> <li>● consolidation of control centres;</li> <li>● centralisation of services (e.g. maintenance, AIS);</li> <li>● remote operations and maintenance settings.</li> </ul> </li> <li>○ Implementation of future operational concepts and systems, e.g. encompassing: <ul style="list-style-type: none"> <li>● significant changes of roles and responsibilities in operational jobs;</li> <li>● significantly increasing automation of tasks or functions.</li> <li>● new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).</li> </ul> </li> <li>○ Harmonisation and mobility of staff, e.g.: <ul style="list-style-type: none"> <li>● Application of regulations concerning operational competence (e.g. ESARR 5, common ATCO license).</li> </ul> </li> <li>○ Changes in working conditions, e. g.: <ul style="list-style-type: none"> <li>● new shift/rostering cycles and working hours (e.g. to flexibly adapt to variations in traffic amount);</li> <li>● new organisational or social structures and/or processes.</li> </ul> </li> <li>○ Changes in organisational structure of whole companies, authorities or units, e.g.: <ul style="list-style-type: none"> <li>● Civil/military integration of operations.</li> </ul> </li> <li>○ Certification and regulatory implementation activities, e.g.: <ul style="list-style-type: none"> <li>● certification as ATM service provider or training provider;</li> <li>● implementation of harmonised safety management standards;</li> <li>● implementation of harmonised competence regulations;</li> <li>● implementation of harmonised/interoperable technology and procedural standards.</li> </ul> </li> <li>○ Changes in organisational culture, e.g.: <ul style="list-style-type: none"> <li>● Safety reporting culture;</li> <li>● Innovation and change readiness.</li> </ul> </li> </ul>	

**Experiences of use in the ATM / safety industry / other industry context, including references / users**

The information sheet and the nuclear site license conditions document have been developed for the UK Nuclear Industry; however the material can also be used in civil aviation with regard to safety related change requirements.

**ProACT Process Model****Applicable to phase and activity of the ProACT Process Model**

The information sheet and the nuclear site license conditions document cover the licensed company's responsibilities vis-à-vis the regulator for safety related changes. Both documents could be useful for the following processes:

Continuous evaluation and adaptation process

The documents provide a list of regulatory safety requirements for the periodic and systematic review to be respected during modification or adaptation of a nuclear power plant. The licensee is required to make and implement arrangements to control changes to its organisational structure and resources which may affect safety

Scoping phase

Feasibility evaluation:

The documents provide detailed regulatory safety requirements for the feasibility evaluation and stipulate that the feasibility evaluation report needs to be approved by the Safety regulator if the Safety of the plant is affected.

Planning phase

Feasibility evaluation – implementation plan development:

The documents set safety requirements on the licensee for the feasibility report and require that planned safety related changes are agreed by the regulator before they are implemented.

Implementation phase

Implement supporting structures- Assess & secure acceptance – Implement changes:

The documents indicate that the licensee shall apply a consistent and proportionate structure approach to change to allow regulatory oversight during the implementation of the change.

Evaluation phase

Process & outcome assessment:

The documents require that a change is adequately documented and that copies of the documents are provided to the regulator for further assessment.

**Technical description****Description of the content / study**

The information sheet consists of two parts:

**Part 1** summarises the pressures and change processes that have occurred in the nuclear industry over the last 40 years, and that have challenged the regulator with regard to governing change processes without introducing overly restricting regulations on the industry. The change pressures include:

- Loss of experience of older staff;
- Reductions in numbers of contractor companies;
- Reductions in research;
- Building of new plants;
- Industrial changes (mergers, market changes).

**Part 2** outlines the regulator's response to these challenges. The main measure discussed is the introduction of Licensee Condition 36 in April 2000. This was motivated by the regulator's view that "licensees' management of change was of such importance that it required regulatory oversight and that a consistent and proportionate approach was needed.

The report concludes that the Nuclear Installations Inspectorate has been successful in adapting regulatory practices to changes in industry, markets and governmental objectives through the following measures:

- Being Proactive in its relations with government and market regulators;
- Adopting new competencies;
- Improving its efficiency and effectiveness;
- Developing new approaches to regulating changes in licensees' organisations and work practices;
- Anticipating change.

<b>Context and Prerequisites for application</b>
The information sheet can be applied to civil aviation with no specific prerequisites. The Nuclear site license conditions, especially condition 36 can be also applied for civil aviation as far as safety related changes are concerned.
<b>Equipment required for application</b>
No specific equipment is needed.
<b>Required user qualifications</b>
A health and safety expert should be part of the change team guiding the change process.
<b>Requirements / constraint concerning conditions for use</b>
No specific requirements or constraints for use are known.
<b>Measure / Response Types</b>
The documents do not include specific measurement methods, thus no response types are given.
<b>Collected parameters and data format</b>
There is no description of collected parameters and the data format provided in the documents.
<b>Results obtained and interpretation</b>
<p>The information sheet points to a number of general factors to be taken into account in regulating a safety critical industry which is subject to change. The Nuclear site license conditions set requirements on a nuclear site company for obtaining and maintaining its license. The following conditions are considered for a change process:</p> <ul style="list-style-type: none"> <li>• Documents, Records, Authorities and Certificates;</li> <li>• Incidents on the site;</li> <li>• Warning Notices;</li> <li>• Instructions to Persons on the site;</li> <li>• Training;</li> <li>• Emergency arrangements;</li> <li>• Duly authorised and other suitably qualified and experienced persons;</li> <li>• Safety documentation;</li> <li>• Periodic review;</li> <li>• Site Plans, Designs and Specifications;</li> <li>• Quality Assurance;</li> <li>• Construction and installation of new Plant;</li> <li>• Modification to design of Plant under Construction;</li> <li>• Commissioning;</li> <li>• Modification or experiment on existing Plant;</li> <li>• Operating Rules;</li> <li>• Operating instructions;</li> <li>• Operational records;</li> <li>• Control and supervision of Operations;</li> <li>• Safety Mechanisms, devices and circuits;</li> <li>• Examination, Inspection, Maintenance and Testing;</li> <li>• Duty to carry out Tests, Inspections and Examinations;</li> <li>• Periodic Shutdown;</li> <li>• Shutdown of Specified Operations;</li> <li>• Decommissioning;</li> <li>• Control of organisational change.</li> </ul>
<b>Description of use</b>
<b>Figure / model</b>
No figure or model is available.

<b>Process description</b>
<p>The Nuclear site license conditions 36 was introduced in April 2000 in addition to existing one's and sets the following conditions:</p> <ol style="list-style-type: none"> <li>(1) The licensee shall make and implement adequate arrangements to control any change to its organisational structure or resources which may affect safety.</li> <li>(2) The licensee shall submit to the Executive for approval such part or parts of the aforesaid arrangements as the Executive may specify.</li> <li>(3) The licensee shall ensure that once approved no alteration or amendment is made to the approved arrangements unless the Executive has approved such alteration or amendment.</li> <li>(4) The aforesaid arrangements shall provide for the classification of changes to the organisational structure or resources according to their safety significance. The arrangements shall include a requirement for the provision of adequate documentation to justify the safety of any proposed change and shall where appropriate provide for the submission of such documentation to the Executive.</li> <li>(5) The licensee shall if so directed by the Executive halt the change to its organisational structure or resources and the licensee shall not recommence such change without the consent of the Executive.</li> </ol> <p>The conditions are followed by an explanatory text, stating:</p> <p>In recent years there has been substantial change in the nuclear industry, both in terms of restructuring of licensees and the adoption of new ways of working such as increased contractorisation. Such changes can, if inadequately conceived or implemented, have a detrimental affect on safety. The purpose of this Condition is therefore to ensure that the licensee has adequate arrangements to control any change to its organisational structure or resources which could affect safety. These arrangements require the licensee to assess the safety implications of proposed changes before they are carried out.</p> <p>For changes that could have a significant effect on safety if they were inadequately conceived or executed the Condition gives HSE the power to require the licensee to submit its safety case to HSE, and to prevent the change from taking place until HSE is satisfied that the safety implications are understood and that there will be no lowering of safety standards. The Condition also gives HSE the power to halt any change that has commenced if it is concerned that the safety implications have not been adequately considered.</p>
<b>Evaluation</b>
<b>Strengths and Weaknesses of the tool</b>
<p>The information sheet makes some interesting points regarding successful regulation of an evolving industry. Change and transition processes do not only challenge the changing organisation itself, but also other organisations that interact with it. A particularly useful feature of the report is that it reflects a long-term perspective on change and transition, covering NII's experience with change over more than 40 years. License condition 36 on the control of organisational change has been developed based on the information sheet. The nuclear site license conditions are very complete and specify in detail the conditions related to a license and provide a good basis for safety related changes.</p>
<b>Alternative methods / tools</b>
<p>No alternative methods or tools are known.</p>
<b>Possible combination with other methods / tools</b>
<p>The documents can be used in conjunction with the documents on Organisational change and major accident hazards, Managing and regulating organisational change in the nuclear industry and on Managing change in nuclear utilities.</p>
<b>Psychometric / methodological integrity description</b>
<b>Objectivity / (or at least) demonstration</b>
<p>Not applicable.</p>
<b>Reliability / (or at least) demonstration</b>
<p>Not applicable.</p>
<b>Validity / (or at least) demonstration</b>
<p>Not applicable.</p>
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>
<p>The information sheet appears to reflect a solid basis of experience in nuclear regulation. The nuclear site license conditions, including the control of organisational change, are the basis to obtain and maintain a nuclear site license.</p>

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Managing change in Nuclear Utilities

Annex D No: D-6

<b>EXECUTIVE SUMMARY</b>	<b>Last update: 12/07/2010</b>															
<b>Name of method or tool etc:</b>	<b>Type:</b>															
Managing change in Nuclear Utilities	Technical Document															
<b>Abstract:</b>																
<p>The Managing change in nuclear utilities technical document is developed and published by the International Atomic Energy Agency (IAEA) and provides a series of basic principles for managing change in nuclear utilities. It is based on practices being used by senior management and regulators for the implementation of effective change whilst remaining focused on safe and reliable nuclear operation. Although developed for nuclear utilities the principles for managing change whilst maintaining a safe and reliable operation are of good use also for managers developing and implementing changes in ATM.</p> <p>The technical document explains in detail a complete change process from the <u>identification of a need for change</u>, the <u>evaluation of a proposed change</u>, the <u>development of change plans</u> and the <u>implementation of a change</u> up to the <u>review and monitoring of the change process</u> and is fully in line with the change process model below. The document further expands on and explains the role a regulator has in a change process. The annexes in the document provide practical examples for the management of change in some nuclear companies. The guidance contained in this document is relevant to all changes from both external (e.g., the take-over of the company or deregulation) and internal drivers, such as company reorganisation.</p> <p>The intended users of this publication are all levels of management, from senior executives to section managers, who are developing and implementing changes within their areas of responsibility. It also addresses regulators involved in assessing changes at the utility by ensuring that the changes are properly planned and executed so that safety and reliability are enhanced or at least maintained.</p>																
<b>ProACT Process Model</b>																
<b>Applicable to Phase and Main Activity:</b>																
<p>The diagram illustrates the ProACT Process Model, which is divided into four main phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase contains specific activities and decision gates. A bar for 'Communication, participation and involvement' spans all phases, and a bar for 'Continuous evaluation and adaptation' spans from the end of the Scoping Phase to the end of the Evaluation phase.</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Activities</th> <th>Decision Gates</th> </tr> </thead> <tbody> <tr> <td>Scoping Phase</td> <td>Change need analysis, Communication plan development, Stakeholder analysis, Risk &amp; opportunities identification</td> <td>X</td> </tr> <tr> <td>Planning Phase</td> <td>Feasibility evaluation, Project objectives definition, Project development, Project proposal and resources, Establish structures, Social impact assessment, Risk &amp; opportunities analysis</td> <td>X</td> </tr> <tr> <td>Implementation Phase</td> <td>Feasibility evaluation, Implementation plan development, Implement supporting structures, Implement training</td> <td>X</td> </tr> <tr> <td>Evaluation</td> <td>Assess &amp; secure acceptance, Implement changes, Monitor &amp; reinforce C&amp;T process, Process &amp; outcome assessment</td> <td>X</td> </tr> </tbody> </table>		Phase	Activities	Decision Gates	Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X	Planning Phase	Feasibility evaluation, Project objectives definition, Project development, Project proposal and resources, Establish structures, Social impact assessment, Risk & opportunities analysis	X	Implementation Phase	Feasibility evaluation, Implementation plan development, Implement supporting structures, Implement training	X	Evaluation	Assess & secure acceptance, Implement changes, Monitor & reinforce C&T process, Process & outcome assessment	X
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Evaluation	Assess & secure acceptance, Implement changes, Monitor & reinforce C&T process, Process & outcome assessment	X														
<b>References</b>																
<b>Developer and source</b>																
<p>Nuclear Power Engineering Section          Operational Safety Section          International Atomic Energy Agency          Wagramer Strasse 5          P.O. Box 100          A-1400 Vienna, Austria          Technical Document No. 1226 is available online at: <a href="http://www-pub.iaea.org/MTCD/publications/PDF/te_1226_prn.pdf">http://www-pub.iaea.org/MTCD/publications/PDF/te_1226_prn.pdf</a></p>																
<b>Year of development / publication, updates etc.</b>																
2001																

General description
<p><b>Purpose of measurement / study</b></p> <p>The nuclear industry, as many other high risk industries, faces an ever-changing environment providing opportunities for business improvements. Within the nuclear industry the need for change is being brought about by a number of external and internal drivers such as:</p> <ul style="list-style-type: none"> <li>○ Deregulation of the electricity supply industry;</li> <li>○ Aggressive global competition leading to privatization, acquisitions and mergers;</li> <li>○ Technological and analytical changes;</li> <li>○ Regulatory requirements;</li> <li>○ Changes in political and economic system;</li> <li>○ Early termination and decommissioning.</li> </ul> <p>When changes are planned, the utility (plant) should ensure that the goals and objectives to be achieved through the change are in line with corporate vision, mission goals and values. Properly managed, these changes can enhance safety, plant reliability and cost competitiveness.</p> <p>Managing changes requires communication, knowledge of the culture and recognition of the impact on the morale of the people involved to be effective.</p> <p>Utilities are responsible for the safety of plants, therefore it was considered essential that a <b>systematic approach to managing change</b> is adopted in order to maintain and preserve goals and objectives and to provide confidence to stakeholders including regulatory bodies.</p> <p>Consequently, the IAEA developed basic principles for an effective change process to identify, evaluate, plan, implement and monitor a change ensuring that changes have no detrimental effect on safety and performance, and to ensure that planned changes achieve the goals and objectives. These basic principles provide practical guidance for senior <u>management</u> and section managers to manage changes effectively and for <u>regulators</u> in their role as Supervisory Authorities concerning the safety oversight of changes. The document provides a suitable framework for the management of change whereby emphasis is given to the special considerations needed for maintaining a strong focus on the safety aspects of managing and operating nuclear power plants.</p> <p>The technical document is divided into a number of sections corresponding to the major process steps in the change process which are described. Sections 1 and 2 provide the introduction and overview of the change process. Sections 3–7 contain the detailed description of the activities in each of the steps ed. Management oversight is a critical activity that is necessary throughout the change process, it is contained in the last paragraph within each section.</p>
<p><b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b></p> <p>Guidance material/ Technical Document</p>
<p><b>Effort required (time, people, equipment, resources); usability and practicability</b></p> <p>This technical document is 56 pages in length.</p>
<p><b>Population – Demographic and or Professional Group for which the method is intended for</b></p> <p>All levels of management, from senior executives to section managers who are developing and implementing changes and regulatory authorities. It will also be helpful to employees and trade union or staff representatives and safety representatives.</p>
<p><b>Object of measurement / study (individual, team, profession, department, company)</b></p> <p>Company/Organisation</p>
<p><b>Language (other than English)</b></p> <p>English only</p>
<p><b>Cost information / Copyrights / Agreements needed</b></p> <p>The Technical Document is free of charge and can be downloaded from the following Website:  <a href="http://www-pub.iaea.org/MTCD/publications/PDF/te_1226_prn.pdf">www-pub.iaea.org/MTCD/publications/PDF/te_1226_prn.pdf</a></p>

### ATM specific mapping

#### Guidance for use in the ATM Context

The ATM change scenarios where the technical document is suitable and can be used are:

- Consolidation, integration and outsourcing of services and units, e. g.:
  - consolidation of control centres;
  - centralisation of services (e.g. maintenance, AIS);
  - remote operations and maintenance settings;
  - outsourcing of services (e.g. development, maintenance).
- Implementation of international working structures, e.g.:
  - Functional Airspace Blocks (FAB);
  - Trans-national companies or working arrangements (e.g. EAD Group, Entry Point North).
- Implementation of future operational concepts and systems, e.g. encompassing:
  - significant changes of roles and responsibilities in operational jobs;
  - significantly increasing automation of tasks or functions;
  - new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).
- Harmonisation and mobility of staff, e.g.:
  - transfer of operational staff to other states or in multinational working arrangements;
  - Application of regulations concerning operational competence (e.g. ESARR 5, common ATCO license).
- Changes in working conditions, e. g.:
  - new shift/rostering cycles and working hours (e.g. to flexibly adapt to variations in traffic amount);
  - new organisational or social structures and/or processes.
- Changes in organisational structure of whole companies, authorities or units, e.g.:
  - Civil/military integration of operations.
- Certification and regulatory implementation activities, e.g.:
  - certification as ATM service provider or training provider;
  - implementation of harmonised safety management standards;
  - implementation of harmonised competence regulations;
  - implementation of harmonised/interoperable technology and procedural standards.
- Changes in organisational culture, e.g.:
  - Safety reporting culture;
  - Innovation and change readiness.

#### Experiences of use in the ATM / safety industry / other industry context, including references / users

The document has been developed for the Nuclear Industry; however the material can also be used in civil aviation as the basic principles for managing change in a high risk environment are similar.

### ProACT Process Model

#### Applicable to phase and activity of the ProACT Process Model

The information sheet and the nuclear site license conditions document cover the licensed company's responsibilities vis-à-vis the regulator for safety related changes. Both documents could be useful for the following processes:

##### Communication, participation and involvement process

The document explains how communication to external and internal parties and stakeholders should be shaped and what it should contain. The development of a communication plan is proposed for communication to external and internal parties.

##### Scoping phase

Change need analysis – Stakeholder analysis – Risk & opportunities identification - Feasibility evaluation:

The documents contains *inter alia* an evaluation process to properly assess and manage risks and benefits associated with the envisaged change helping to ensure that acceptable levels of safety are continuously maintained.

Planning phase

Project objectives definition – Project proposal development – Establish structures and resources – Risk & opportunities analysis - Feasibility evaluation – implementation plan development:  
The document explains for example how to develop a plan for the implementation of a change including attributes required to effectively manage a change as a project.

Implementation phase

Implement supporting structures- Assess & secure acceptance – Implement changes:  
The document explains for example on which items the change project teams should focus during the implementation of the change, like monitoring safety implications, transfer of responsibilities, resources and human, social and cultural issues.

Evaluation phase

Monitor and reinforce C & T processes - Process & outcome assessment:  
The document explains for example that effects of change are ongoing and need to be monitored and that reviews of the change should be conducted regularly to verify effectiveness and efficiency of the implemented change.

## Technical description

### Description of the content / study

IAEA realised in the year 2000 that although nuclear power industry had undergone change since inception, survival of the technology as a clean energy source for the future depended on the demonstration of long term safety to the public, protection of the environment, and economic superiority to competing energy sources. It also realised that proactive management of change including the enhancement of safety is paramount to be successful in creating confidence in nuclear energy sources.

**The overriding principles were strong management of the business with effective safety regulation.** However, many nuclear utilities had difficulties to create and sustain a safety conscious, continuous improvement and management culture, especially in times of change. Properly managed, changes could and should enhance nuclear safety, plant reliability and cost competitiveness, throughout the lifecycle from the design to the decommissioning stage.

The most important considerations to be taken into account by management dealing with change in a high risk environment (here nuclear power) are:

- Is there a policy on change management that gives priority to safety that is aligned to the vision, goals and objectives of the utility that is communicated to stakeholders?
- Is there a systematic, transparent and rigorous change management process applied to all types of change?
- Are appropriate resources provided to support the process of change?
- Has sufficient analysis been performed to ensure the changes are adequately justified and are in fact the correct option? - What risk analysis and independent reviews have been performed to ensure any potential encroachment on safety levels has been identified and compensatory measures developed? - Have these reviews been performed by individuals with commensurate nuclear knowledge and experience?
- Do senior managers have a mechanism to review progress regularly? - Is the information received sufficient to enable them to exercise their responsibilities as guardians of nuclear safety? - Have specific performance indicators been established to monitor the effects of the change?
- Does the communication plan keep all staff informed of progress and performance and provisions for feedback? - Does this communication also reach other stakeholders including the regulators, the public and trade unions?
- How has the utility assessed the cumulative impact of a number of changes in a business area?
- Following completion, did the change achieve the improvement targets originally established and if not do I understand the cause and do we have a plan to correct the situation? - Have we organised a post change peer review to ensure we are continuing to improve in both performance and safety with respect to the rest of the industry?

IAEA drafted the document with the contribution of the nuclear industry and nuclear regulators.

Utilities should develop a formal process, such as the framework described, for effective management of change to promote continuous learning and apply best practice to the evaluation of new changes.

<b>Context and Prerequisites for application</b>
The document can be applied to civil aviation with no specific prerequisites.
<b>Equipment required for application</b>
No specific equipment is needed.
<b>Required user qualifications</b>
A safety expert should be part of the change team guiding the change process.
<b>Requirements / constraint concerning conditions for use</b>
No specific requirements or constraints for use are known.
<b>Measure / Response Types</b>
The document does not include specific measurement methods, thus no response types are given.
<b>Collected parameters and data format</b>
There is no description of collected parameters and the data format provided in this document.
<b>Results obtained and interpretation</b>
<p>The document is divided into sections corresponding to the major process steps in the change process described. Sections 1 and 2 provide the introduction and overview of the change process; in Sections 3–7 the detailed description of the activities in each step are given. Since management oversight is a critical activity that is necessary throughout the change process it is summarised in the last paragraph of each section.</p> <p>The document also contains in Section 8 the Role of the Regulator in the verification, approval, oversight and inspection associated with the management of change. A strong safety authority is an important element in the nuclear business holding the nuclear utility accountable for its safety obligations, having the competence to judge the safety aspects of organisational change and acting decisively if safety aspects are challenged.</p>
<b>Description of use</b>
<b>Figure / model</b>
<pre> graph TD     A[1. Identify the need for change. (Drivers and required outcomes.)] --&gt; B[2. Evaluate the options to achieve the required outcomes.]     B --&gt; C[3. Develop plans to implement the change.]     C --&gt; D[4. Implement the plan.]     D --&gt; E[5. Monitor and learn from the change experience.]     B --&gt; A     C --&gt; A     D --&gt; A     E --&gt; A     </pre>
Figure 1: The management of change process

**Process description**

The management of change process described in this publication is shown in [Figure 1](#) is derived from a typical change process applicable to any industry. While no suggestion is made that this is the best process available, it provides a suitable framework for the management of change. The document emphasises on the special considerations needed for its use in the nuclear industry and reflects especially the need to maintain a strong focus on safety aspects when managing and operating nuclear power plants.

Therefore, nuclear utilities should develop a formal process, such as the framework described in the document, for effective management of change to promote continuous learning and apply best practice to the evaluation of new changes.

The management of change process describes its five steps as follows:

1. Identify the need for change, which includes the
  - setting of the goals and objectives of the utility and the integration of the needed changes into the corporate vision;
  - environmental scanning to review the business, societal and governmental influences on the organisation; scientific and technological advances;
  - measuring of the current state in terms of not only of the technical aspects of a change but also in regard to process, size and structure of the organisation and human and social factors including competence;
  - analysis of the gaps between current performance and the desired goals and objectives, including performance trending, benchmarking and assessment by independent bodies;
  - identification and selection of the options that should be evaluated for the needed improvement;
  - actions for management oversight and involvement.
2. Evaluate the options to achieve the required outcomes, which includes the
  - a concept of 'grading' (classification) of the proposed changes in terms of significance of impacts on, for example, safety, business, environment, social consequences etc in order that appropriate controls can be established / implemented in accordance with change significance (i.e. for the approval level of the changes);
  - risk identification and evaluation to assure that appropriate safety, environment and business considerations are comprehensively identified, evaluated and controlled, which can be verified by the regulator if requested;
  - systematic identification and evaluation of internal or external constraints to measure potential impacts or restrictions on the proposed change at individual, team, division, organisation and society level;
  - identification and evaluation of structural elements in the proposed change that impact on the safety culture and on safety management;
  - impact of the proposed change on people (i.e. potential loss of knowledge and skills, reduced staffing levels) and the infrastructure ensuring that acceptable safety levels are preserved;
  - realistic analysis of the costs and benefits from a long-term perspective and including the probability of risk occurring;
  - integration with other ongoing changes and evaluating cumulative effects to avoid overwhelming and achieve harmonisation (and synchronisation);
  - evaluation of the proposed change with regard to its long term perspective and sustainability of the utility;
  - assessment of the proposed change by an independent oversight body before the change takes place;
  - output from evaluating the proposed change to be taken forward to implementation;
  - actions for management oversight.
3. Develop plans to implement the changes, which includes the
  - establishment of terms of reference for the change project team to ensure all stakeholders (the sponsoring manager, the management team, the project leader) have a common understanding of the expectations;
  - development and approval of a project implementation plan (including: staff allocation to activities; resources; performance measures/activity; timescales and milestones; dependencies and enablers; targets; processes to be developed / changed; procedures and documents; transfer of responsibilities along timescale ect);
  - definition of the responsibilities and ownership of all parties involved in the change including strong ownership and leadership for people assigned responsibility for even a portion of the change;
  - the establishment of the authority to approve the changes that will be implemented and the controls applied to the approval process (in accordance with significance of the change);
  - development of a risk management plan for the preferred change on how the risks will be managed during the change;
  - planning of how cultural issues (organisational cultures; safety culture) that are impacted by the change will be handled (i.e. through a Safety Culture approach);
  - planning of communication based on a honest approach of openness with staff, between groups, with the regulator and the public; choice of appropriate media; dialogue (information and consultation) with staff;
  - output of each of the planning steps which should be compiled in a report;
  - actions for management oversight.
4. Implement the change, which includes the
  - approval of the implementation plan from the appropriate management levels and, if safety related changes are concerned, by the regulator to confirm that all identified prerequisites (i.e. requirements) have been completed;

- implementation of the change as a project following standard project management practices with regular meetings;
  - monitoring of the change ensuring that safety aspects are designed into the change and preserved throughout implementation; performance monitoring including effects outside the change area; implementation of a reporting system including the support from senior management through actions and communication;
  - identification of transfer of responsibilities, tasks and physical assets and controlling the impacts in terms of job description, training plans, authorities involved, audits to be performed, safety tasks etc;
  - establishment of a period of "shadow working" of the staff with transferred responsibilities to ensure a smooth handover of tasks and responsibilities (including training, OJT, competence assessments and performance control);
  - recognition of the importance of social and cultural aspects and their impact on safety during and after the change including social dialogue / consultation between social partners on issues that have social implications;
  - formal closure of the change project when it is becoming part of normal daily work, including scrutinising of records and reports by the regulator before the change management team is disbanded;
  - action for management oversight.
5. Monitor and learn from the change experience, which includes the
- review of the change against expectations in terms of identified results including the strengths and weaknesses, the successes and failures and the cost-benefit to the utility after the change has been implemented;
  - ongoing monitoring of the change as the effects will continue for some time after completion;
  - conduction of integrated reviews at a regular frequency to examine the effects of the completed change;
  - improvement of the change process through review for effectiveness and efficiency on a suggested cycle;
  - actions for management oversight.

The document outlines also the role of the regulator in the change process. The role is to oversee the safety of the licensee's (in nuclear power industry terms) activities including, where appropriate, those activities associated with change management.

## Evaluation

### Strengths and Weaknesses of the tool

Strength: The document describes in practical terms a generic model for changes and provides an overview of basic principles to be followed in managing change. It covers the change process from identifying the need to change to learning from the change experience. It provides a list of issues/aspects to be checked and considered. The Annex of the document contains examples for company procedures and lists (i.e. generic risks; templates and forms).

Weakness: The document does not go in all details of the specific methods suggested in the body text.

### Alternative methods / tools

No alternative methods or tools are known.

### Possible combination with other methods / tools

The documents can be used in conjunction with the documents on Organisational change and major accident hazards, Managing and regulating organisational change in the nuclear industry, the UK regulator's view of external influences on safety and license conditions for organisational change and with the approach to Safety Culture in the Compendium.

## Psychometric / methodological integrity description

### Objectivity / (or at least) demonstration

The document is based on best available knowledge and experience from both, the nuclear industry and nuclear regulators. It demonstrates a fairly balanced (unbiased) approach to change management in a high risk environment.

### Reliability / (or at least) demonstration

The approaches/procedures and principles proposed have a demonstrated track record in the nuclear industry.

### Validity / (or at least) demonstration

The approaches / procedures and principles proposed have a demonstrated track record in the industry (as best practice) and have content and face validity.

### Description of methodological integrity and additional Evidence or Value that the tool or study provides

The methods and processes described in the publication are based on practical experience by senior management at IAEA Member States. The development process as such is not described in detail. The formal concepts of validity and reliability do not apply.

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**Management of change in the Nuclear Industry – Evidence from Maintenance Reorganisations**

**Annex D No: D-7**

<b>EXECUTIVE SUMMARY</b>		<b>Last update: 04/08/2010</b>
<b>Name of method or tool etc:</b>		<b>Type:</b>
Management of change in the Nuclear Industry – Evidence from Maintenance Reorganisations		Research Report
<b>Abstract:</b>		
<p>The Management of change in the Nuclear Industry – Evidence from Maintenance Reorganisations research report provides an analysis on the management of change in the Nordic Nuclear Power Plants maintenance organisations. It focuses on the changes that are taking place or have recently taken place in maintenance and on the impact and effects these changes have on the culture of an organisation, the safety and the effectiveness of maintenance activities. Its aim is to study how to anticipate the consequences of organisational change to the safety and effectiveness of the organisation and to identify what change strategies and associated structures would best facilitate the psychological characteristics of work that enable effective working.</p> <p>Starting with a review of organisational changes and safety in the nuclear industry, the research report proceeds to discuss different approaches to manage change and presents the key elements of a rigorous change management process. It further proceeds with a study of the effects of organisational changes on safety and effectiveness of four Nordic Nuclear maintenance organisations and presents the findings on similarities and differences of their change management processes.</p> <p>The potential safety impacts after an organisational change on the organisational structure, organisational culture and the individual persons are further analysed and discussed. One of the main findings is that organisational changes are a potential safety risk especially since they have a effect on the organisational structure, the organisational culture and the individual persons which are strongly interrelated and hard to anticipate before a change is implemented. The intended users of this research report are all levels of management, from senior executives to section managers, regulators involved in assessing changes and safety experts at an organisation.</p>		
<b>ProACT Process Model</b>		
<b>Applicable to Phase and Main Activity:</b>		
<p>The diagram illustrates the ProACT Process Model, which is divided into four main phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase contains several key activities and decision gates. The Scoping Phase includes 'Change need analysis', 'Communication development', 'Stakeholder analysis', and 'Risk &amp; opportunity identification'. The Planning Phase includes 'Feasibility evaluation', 'Project objectives definition', 'Project proposal development', and 'Establish structures and resources'. The Implementation Phase includes 'Social impact assessment', 'Risk &amp; opportunity analysis', 'Feasibility evaluation', and 'Implementation plan development'. The Evaluation phase includes 'Implement supporting structures', 'Implement training acceptance', 'Assess &amp; secure', 'Implement changes', 'Monitor &amp; reinforce C&amp;T process', and 'Process &amp; outcome assessment'. Decision gates are marked with 'X' at the end of each phase. A bar for 'Communication, participation and involvement' spans across the Planning, Implementation, and Evaluation phases. A bar for 'Continuous evaluation and adaptation' spans across the entire process.</p>		
<b>References</b>		
<b>Developer and source</b>		
<p>Nordic Nuclear Safety Research          NKS Secretariat, NKS-775          P.O. Box 49, 4000 Roskilde, Denmark          ISBN 87-7893-180-0          Authors: Teemu Reiman, Pia Oedewald, Carl Rollenhagen and Ulf Kahlborn          Available online at <a href="http://www.risoe.dk/rispubl/NKS/nks-119.pdf">http://www.risoe.dk/rispubl/NKS/nks-119.pdf</a></p>		
<b>Year of development / publication, updates etc.</b>		
2006		

<b>General description</b>
<b>Purpose of measurement / study</b>
<p>The nuclear industry and especially the maintenance activities have been under various restructuring initiatives in addition to continuous incremental change due to e.g. new technologies, ageing plants, deregulation and the change of generation. These changes have been experienced as causing stress and uncertainty among the workers. Also, changes have led to e.g. lowered sense of control, goal non-clarity and lowered sense of personal responsibility over one's work.</p> <p>The research report is based on four case studies for reorganising Nordic Nuclear Power Plants maintenance units and on a literature review of change management at various other safety critical organisations and presents a framework for considering organisational changes and their safety consequences.. It focuses on evidence gathered from these case studies, but the results and models depicted in the report are of general relevance in the nuclear industry.</p> <p>When changes are planned, the utility should ensure that they are in line with their vision mission goals and values. Properly managed, these changes can enhance nuclear safety, plant reliability and cost competitiveness from design stage to decommissioning.</p> <p>Organisational changes clearly are issues that have potential effects on safety. Both positive and negative cases on safety effects of organizational changes exist, and various accidents have been pinpointed to organisational changes in the company. In this report the challenges of management of change at Nuclear Power Plants are considered mainly from the perspective of organisational culture. The cultural perspective taken in this research report strives to combine technical approaches to human resources approaches.</p> <p>Managing changes requires communication, knowledge of the culture and recognition of the impact on the morale of the people involved to be effective. The challenges of management of change at Nuclear Power Plants are considered mainly from organizational culture perspective. This cultural perspective taken in this paper strives to combine technical with human resources approaches.</p> <p>The various change management tools discussed in the report are likewise aimed at a combination of technical and human resources approaches in an organisation.</p>
<b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b>
Guidance material/ Research report.
<b>Effort required (time, people, equipment, resources); usability and practicability</b>
This research report is 62 pages in length.
<b>Population – Demographic and or Professional Group for which the method is intended for</b>
All levels of management, from senior executives to section managers and regulatory authorities, even outside the nuclear power plant maintenance utilities. It will also be helpful to employees and trade union or staff representatives and safety representatives. Based on case studies from the nuclear industry, the report is although accessible to readers with no background in nuclear operations.
<b>Object of measurement / study (individual, team, profession, department, company)</b>
Company/Organisation
<b>Language (other than English)</b>
English only
<b>Cost information / Copyrights / Agreements needed</b>
The report is free of charge and can be downloaded from the following Website: <a href="http://www.risoe.dk/rispubl/NKS/nks-119.pdf">http://www.risoe.dk/rispubl/NKS/nks-119.pdf</a>

### ATM specific mapping

#### Guidance for use in the ATM Context

The most suitable change scenarios where the research report can be used are:

- Consolidation, integration and outsourcing of services and units, e. g.:
  - consolidation of control centres;
  - centralisation of services (e.g. maintenance, AIS);
  - remote operations and maintenance settings;
  - outsourcing of services (e.g. development, maintenance).
- Implementation of international working structures, e.g.:
  - Trans-national companies or working arrangements (e.g. EAD Group, Entry Point North).
- Implementation of future operational concepts and systems, e.g. encompassing:
  - significant changes of roles and responsibilities in operational jobs;
  - significantly increasing automation of tasks or functions;
  - new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).
- Harmonisation and mobility of staff, e.g.:
  - transfer of operational staff to other states or in multinational working arrangements;
- Certification and regulatory implementation activities, e.g.:
  - implementation of harmonised safety management standards;
  - implementation of harmonised competence regulations;
  - implementation of harmonised/interoperable technology and procedural standards.
- Changes in organisational culture, e.g.:
  - Safety reporting culture;
  - Innovation and change readiness.

#### Experiences of use in the ATM / safety industry / other industry context, including references / users

The research report has been developed for the Nuclear Industry; however the material can also be used in civil aviation as guideline material.

### ProACT Process Model

#### Applicable to phase and activity of the ProACT Process Model

The research report covers the following processes:

##### Communication, participation and involvement process

The research report provides examples on how communication, participation and involvement should be conducted in an organisational change process

##### Scoping phase

Change need analysis – Communication plan development - Stakeholder analysis – Risk & opportunities identification: The research report provides information on a baseline assessment to which the proposed change can be assessed.

##### Planning phase

Project objectives definition – Project proposal development – Risk & opportunities analysis - implementation plan development:

The research report provides information on the analysis and categorisation of a proposed change before this change is implemented, including an assessment of specific risks associated with the change.

##### Implementation phase

Implement supporting structures- Assess & secure acceptance – Implement changes:

The research report provides information on the identification of those elements which need to be completed, such as training, revised procedures and relocation of staff.

##### Evaluation phase

Monitor and reinforce C & T processes - Process & outcome assessment:

The research report provides information on a formal review process which interprets the findings of the performance indicators and confirms that there was no undesirable outcome.

<b>Technical description</b>
<p><b>Description of the content / study</b></p> <p>The Nordic Nuclear Safety Research report focuses on the challenges of management of change at nuclear power plants (NPPs) and considers a change mainly from organizational culture -perspective. The cultural perspective taken in this report strives to combine technical approaches to human resources approaches.</p> <p>By taking this approach the writers raised questions that are not usually explicitly taken into account in Nordic Power Plant change management, such as:</p> <ul style="list-style-type: none"> <li>○ what are the organizational dynamics that affect the organizational change?</li> <li>○ how do the structural changes affect the organizational culture and the individual employees in the organization?</li> <li>○ what safety consequences can changes in the employees perceptions of their work have?</li> <li>○ what safety consequences can changes in the cultural conceptions have?</li> <li>○ how to better take into account all the aspects of an organization (structural issues, human issues and cultural issues) in change initiatives?</li> </ul> <p>The research report then gathers information on how four Nordic Nuclear Power Plants have conducted the change processes for their maintenance reorganisations at:</p> <ul style="list-style-type: none"> <li>○ Organisational change at Loviisa nuclear power plant (Finland);</li> <li>○ Organisational change of maintenance at Oskarshamn nuclear power plant (Sweden);</li> <li>○ Organisational change of maintenance at Forsmark nuclear power plant (Sweden);</li> <li>○ Organisation of maintenance at Olkiluoto nuclear power plant (Finland).</li> </ul> <p>The most dominant motives, being present in 3 or 4 of the case studies, were:</p> <ul style="list-style-type: none"> <li>○ Reduce costs</li> <li>○ Maintain and develop competence</li> <li>○ Enhance the efficiency of maintenance</li> <li>○ Maintain nuclear safety in the long tern</li> <li>○ Enhance the availability of maintenance staff to different units or tasks</li> </ul> <p>A generic model for managing organisational change is presented which tries to combine the experience made at the four Nuclear Power Plants.</p> <p>The research report then summarises the insights from these case studies by providing an overview of the high-level goals that governed and motivated change at these organisations.</p> <p>The report concludes by discussing change in the context of organisational culture, and presents a model of the influence of organisational change on organisational structure, organisational culture, the individual, and performance.</p> <p>The appendix of the report contains an analysis of existing literature on change management at Nuclear Power Plants with a focus on safety related changes and the effect a change may have on the employees.</p>
<p><b>Context and Prerequisites for application</b></p> <p>The research report can be applied to civil aviation with no specific prerequisites.</p>
<p><b>Equipment required for application</b></p> <p>No specific equipment is needed.</p>
<p><b>Required user qualifications</b></p> <p>The application of the specific tools and methods mentioned in the report might require background in organisational analysis, management studies, psychology, sociology, as well as risk analysis.</p>
<p><b>Requirements / constraint concerning conditions for use</b></p> <p>No specific requirements or constraints for use are known.</p>
<p><b>Measure / Response Types</b></p> <p>The document does not include specific measurement methods, thus no response types are given.</p>
<p><b>Collected parameters and data format</b></p> <p>There is no description of collected parameters and the data format provided in this document.</p>

**Results obtained and interpretation**

The research report focuses on evidence gathered from four case studies made at Nuclear Power Plant maintenance units in the Nordic countries. The approach taken in the nuclear industry to manage organisational change (e.g. IAEA 2001, NEA 2004) has been derived from the process of managing plant modifications. It noticed that Nuclear Power Plants have realised that organisation changes require planning, implementation and reviewing. They used several models which focussed mostly on the structural aspects of the organisation and are quite straightforward in nature.

However, the guidelines of NEA, for example, seem to assume that if the new organisational solution and the implementation programme have been well planned, the risks of the change are known and can be controlled. The risks of organisational changes are attributed to the adequacy of the new structure. However, it is not the structure per se that should be evaluated and managed during the change.

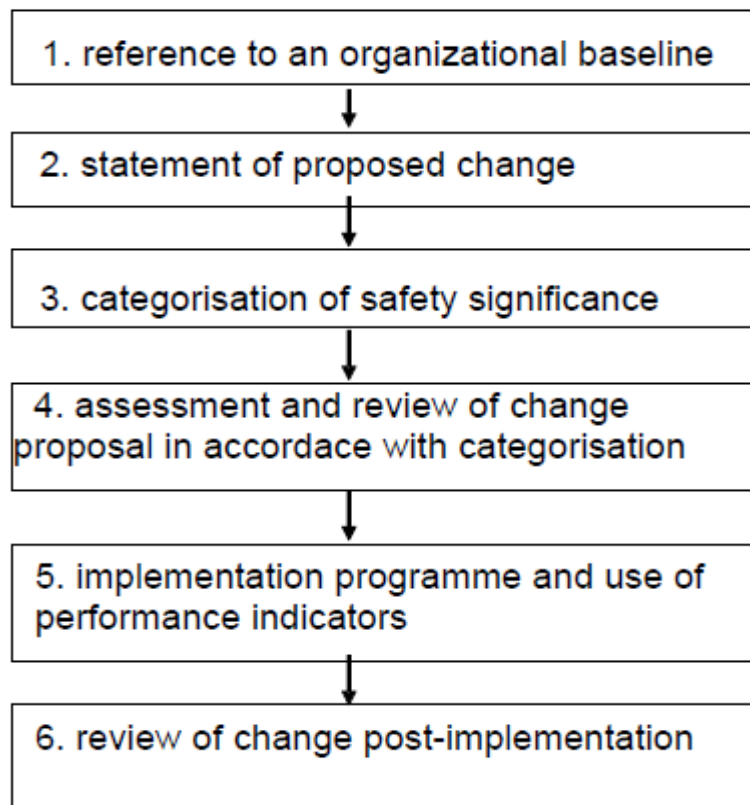
**Description of use****Figure / model**

Figure 1: Model of a process for managing organisational change

**Process description**

The research report presents a generic model for the process for managing organisational as shown in figure 1, comprising the following steps:

1. Reference to an organisational baseline  
The baseline assessment provides the starting point against which the proposed change to the planned organisational structure or processes can be assessed.
2. Statement of proposed change  
The change process starts with a statement of what the change entails, why it is introduced and what the goals of the change are. Management should prepare for the reorganisation by teaching the members of the organisation a rich language for these matters. If they learn to analyse and talk about organisational changes in a nuanced matter, it is presumably easier to see both good and bad aspects of various suggestions.

<b>Process description</b>
<p>3. Categorisation of safety significance A categorisation and analysis of the proposed change on safety aspects should be conducted. Expect personnel to express worry about the safety consequences of changes and communicate these issues with the personnel. Do not hide the inherent uncertainty that every organisational change has about its effects. Take the safety worry of the personnel seriously. If they worry about safety too much due to the organisational changes, the ensuing stress might affect safety negatively.</p> <p>4. Assessment and review of change proposals in accordance with categorisation Most changes seek to demonstrate that competent personnel remain after the change has been introduced to deliver safety functions, the responsibility of management is clearly defined and training needs and procedural modifications have been recognised. Pay attention on how the sense of control over competent personnel work is changing, their feeling about doing meaningful work in the new structure, the expectations put on them and to their sense of personal responsibility over their work even in change situation when things are not always under their control.</p> <p>5. Implementation programme and use of performance indicators The implementation programme should identify shoes elements which need to be completed to enable the change process to proceed, like training, revised procedures and relocation of staff. The significance of performance indicators for monitoring the effects of a change should not be underestimated. These performance indicators can comprise increased working hours, reduction of first time maintenance and amount of peer review comments. Delayed feedback of the effects on the organisational change should be taken into account. Change initiatives usually show on the determined indicators only after a while.</p> <p>6. Review of change after implementation A typical change process should also include a formal review stage. The review should be based on the findings of the performance indicators and should confirm that there have been no unexpected or undesirable outcomes. However, corrective measures should not be forgotten. The best thing known about organisational changes is that they usually do not end up precisely where they are aimed at and that the process is iterative in nature requiring many corrective measures along the way.</p>
<b>Evaluation</b>
<b>Strengths and Weaknesses of the tool</b>
The research report provides some practical guidance by presenting a generic model for managing change processes and lists a range of specific tools and methods that could be used to implement a change process. However, the generic model is only roughly explained and leaves the reader to draw its own conclusions for the preparation of a planned change process in the organisation.
<b>Alternative methods / tools</b>
No alternative methods or tools are known.
<b>Possible combination with other methods / tools</b>
The documents can be used in conjunction with the documents on Organisational change and major accident hazards, Managing and regulating organisational change in the nuclear industry and on the UK regulator's view of external influences on safety and license conditions for organisational change.
<b>Psychometric / methodological integrity description</b>
<b>Objectivity / (or at least) demonstration</b>
Not applicable
<b>Reliability / (or at least) demonstration</b>
Not applicable
<b>Validity / (or at least) demonstration</b>
Not applicable
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>
The report appears well researched and includes a literature review. Conclusions are derived from and validated by the 4 case studies presented. It provides a high-level overview of topics to be considered before embarking on a change process.

**Regulatory Aspects of Management of Change**

**Annex D No: D-8**

<b>EXECUTIVE SUMMARY</b>	<b>Last update: 10/08/2010</b>															
<b>Name of method or tool etc:</b>	<b>Type:</b>															
Regulatory Aspects of Management of Change	Workshop Report															
<b>Abstract:</b>																
<p>The is Regulatory Aspects of Management of Change report presents the outputs from a Workshop convened by the Committee for the Safety of Nuclear Installations (CSNI) of the OECD Nuclear Energy Agency (NEA) for Nuclear Safety Regulators to share experiences and approaches dealing with organisational change at licensed organisations.</p> <p>It is clearly a nuclear licensee’s responsibility to manage its own affairs and to ensure that the means by which this is achieved do not compromise nuclear safety, it can be argued that if changes to staffing levels or organisational structure are inadequately conceived or executed they have the potential to affect the way in which safety is achieved and managed. Therefore, it is appropriate for nuclear regulators to consider and to adopt a formal stance on the way in which nuclear licensees manage change. Regulators want to have confidence that change is being managed and controlled in such a way that it does not compromise nuclear safety.</p> <p>Within the nuclear industry, all regulators share the challenge of determining effective methods for regulating a changing industry. Although the philosophy of minimising the potential for organisational change to adversely affect nuclear safety is shared, the detailed approaches and methods which are used are likely to depend upon the overall regulatory regime which is in place.</p> <p>In order to facilitate this exchange, the Special Experts’ Group in Human and Organisational Factors (SEGHOFF) of the CSNI convened a workshop in September 2001. This report presents the discussions which took place at that workshop and its findings. It also presents a high-level model and recommendations for regulatory oversight of the management of change.</p>																
<b>ProACT Process Model</b>																
<b>Applicable to Phase and Main Activity:</b>																
<p>The diagram illustrates the ProACT Process Model, which is divided into four sequential phases: Scoping Phase, Planning Phase, Implementation Phase, and Evaluation. Each phase is represented by a colored arrow pointing to the right, with specific activities listed within it. Decision gates are marked with 'X' at the end of each phase. A horizontal bar labeled 'Communication, participation and involvement' spans across all four phases. Another horizontal bar labeled 'Continuous evaluation and adaptation' spans from the end of the Planning Phase to the end of the Evaluation Phase.</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Activities</th> <th>Decision Gate</th> </tr> </thead> <tbody> <tr> <td>Scoping Phase</td> <td>Change need analysis, Communication plan development, Stakeholder analysis, Risk &amp; opportunities identification</td> <td>X</td> </tr> <tr> <td>Planning Phase</td> <td>Feasibility evaluation, Project objectives definition, Project development, Establish resources, Social impact assessment, Risk &amp; opportunities analysis, Feasibility evaluation</td> <td>X</td> </tr> <tr> <td>Implementation Phase</td> <td>Implementation plan development, Implement supporting structures, Implement training, Assess &amp; secure acceptance</td> <td>X</td> </tr> <tr> <td>Evaluation</td> <td>Implement changes, Monitor &amp; reinforce process, Process &amp; outcome assessment</td> <td>X</td> </tr> </tbody> </table>		Phase	Activities	Decision Gate	Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X	Planning Phase	Feasibility evaluation, Project objectives definition, Project development, Establish resources, Social impact assessment, Risk & opportunities analysis, Feasibility evaluation	X	Implementation Phase	Implementation plan development, Implement supporting structures, Implement training, Assess & secure acceptance	X	Evaluation	Implement changes, Monitor & reinforce process, Process & outcome assessment	X
Phase	Activities	Decision Gate														
Scoping Phase	Change need analysis, Communication plan development, Stakeholder analysis, Risk & opportunities identification	X														
Planning Phase	Feasibility evaluation, Project objectives definition, Project development, Establish resources, Social impact assessment, Risk & opportunities analysis, Feasibility evaluation	X														
Implementation Phase	Implementation plan development, Implement supporting structures, Implement training, Assess & secure acceptance	X														
Evaluation	Implement changes, Monitor & reinforce process, Process & outcome assessment	X														
<b>References</b>																
<b>Developer and source</b>																
<p>OECD - Nuclear Energy Agency (NEA)          Nuclear Safety Division          Le Seine St-Germain          12 boulevard des Iles          92130 Issy-les-Moulineaux, France          Available online at: <a href="http://www.nea.fr/html/nsd/docs/2002/csni-r2002-20.pdf">http://www.nea.fr/html/nsd/docs/2002/csni-r2002-20.pdf</a></p>																
<b>Year of development / publication, updates etc.</b>																
2002																

<b>General description</b>	
<b>Purpose of measurement / study</b>	<p>This report summarises the outputs from a Workshop convened by the Special Experts' Group in Human and Organisational Factors (SEGHOF) of the Committee for the Safety of Nuclear Installations (CSNI) and organised by the UK Nuclear Installations Inspectorate (NII). The purpose of the workshop was to allow nuclear regulators from different countries to exchange regulatory views and aims to provide guidance to regulators on how to overview the licensee's organisational change processes so as to comply with regulatory expectations and to manage change in a safe manner.</p> <p>The report proceeds to discuss potential solutions and challenges, including elements of the licensee's change management process, regulatory interest in Human Resources aspects of change management and dialogue between regulator and licensee.</p>
<b>Type (e.g. observation, questionnaire, interview, checklist, measurement instrument, etc.)</b>	Workshop Report
<b>Effort required (time, people, equipment, resources); usability and practicability</b>	The workshop report is 40 pages in length.
<b>Population – Demographic and or Professional Group for which the method is intended for</b>	The report is aimed at regulators in the nuclear industry, but the insights gained and the regulatory processes described could be also used by regulators in the aviation industry.
<b>Object of measurement / study (individual, team, profession, department, company)</b>	Company, for the regulatory oversight and control of a change process.
<b>Language (other than English)</b>	English only
<b>Cost information / Copyrights / Agreements needed</b>	The workshop report is available online, free of charge at: <a href="http://www.nea.fr/html/nsd/docs/2002/csni-r2002-20.pdf">http://www.nea.fr/html/nsd/docs/2002/csni-r2002-20.pdf</a>
<b>ATM specific mapping</b>	
<b>Guidance for use in the ATM Context</b>	<p>The most suitable change scenarios where the report can be used are:</p> <ul style="list-style-type: none"> <li>○ Consolidation, integration and outsourcing of services and units, e. g.: <ul style="list-style-type: none"> <li>● consolidation of control centres;</li> </ul> </li> <li>○ Implementation of future operational concepts and systems, e.g. encompassing: <ul style="list-style-type: none"> <li>● significant changes of roles and responsibilities in operational jobs;</li> <li>● new technologies (e.g. Data link, 4D trajectory based planning and control, support tools for separation delegated to flight crew, conflict resolution and collision avoidance automation support).</li> </ul> </li> <li>○ Harmonisation and mobility of staff, e.g.: <ul style="list-style-type: none"> <li>● Application of regulations concerning operational competence (e.g. ESARR 5, common ATCO license).</li> </ul> </li> <li>○ Changes in working conditions, e. g.: <ul style="list-style-type: none"> <li>● new shift/rostering cycles and working hours (e.g. to flexibly adapt to variations in traffic amount);</li> <li>● new organisational or social structures and/or processes.</li> </ul> </li> <li>○ Changes in organisational structure of whole companies, authorities or units, e.g.: <ul style="list-style-type: none"> <li>● Civil/military integration of operations.</li> </ul> </li> <li>○ Certification and regulatory implementation activities, e.g.: <ul style="list-style-type: none"> <li>● certification as ATM service provider or training provider;</li> <li>● implementation of harmonised safety management standards;</li> <li>● implementation of harmonised competence regulations;</li> <li>● implementation of harmonised/interoperable technology and procedural standards.</li> </ul> </li> <li>○ Changes in organisational culture, e.g.: <ul style="list-style-type: none"> <li>● Safety reporting culture.</li> </ul> </li> </ul>

**Experiences of use in the ATM / safety industry / other industry context, including references / users**

The workshop report is aimed for Nuclear Regulatory Authorities; however it can also be used by regulators in civil aviation with regard to the oversight and control of safety related changes at licensed organisations.

**ProACT Process Model****Applicable to phase and activity of the ProACT Process Model**

The information contained in the workshop report can be applied to the following processes:

Continuous evaluation and adaptation process

The workshop report recommends that the regulator maintains dialogue with the licensee to ensure timely and effective scrutiny during a change process.

Scoping phase

Risk & opportunities identification - Feasibility evaluation:

The workshop report recommends that the regulator clarifies its expectations and objectives for the management of change to the licensee.

Planning phase

Project proposal development - Feasibility evaluation – Implementation plan development:

The workshop report recommends to the regulator to ensure that the licensee develops and establishes an effective baseline which can be approved by the regulator before the change is implemented.

Implementation phase

Assess & secure acceptance:

The workshop report recommends that the regulator scrutinises soft issues such as morale, working practices and culture to ensure that the licensee respects its commitments and obligations and safety is not hampered.

Evaluation phase

Process & outcome assessment:

The workshop report recommends the regulator should encourage the licensee to establish a self assessment process after a change has been implemented, including effective reporting to the regulator.

**Technical description****Description of the content / study**

The workshop report consists of explanations about:

- The Aims of the workshop
- The structure of the workshop for day 1 and day 2
- Summaries and Conclusions for the detailed sessions on:
  - Session 1 - Overview of Organisational Change, including
    - The definition of drivers for Organisational Change
    - The forms of Organisational Change having impact on safety
    - The formal regulatory position on Organisational Change
  - Session 2 - Defining Regulatory Issues & Concerns, including
    - A list of potential areas of concern for regulators
    - An overview of risks in a change process
    - An overview of potential solutions to issues
  - Session 3 - Generic Regulatory Challenges, including
    - Elements of the licensee's change management process
    - Competencies to apply change management
    - Regulatory interest in the HR aspects of change management
    - Dialogue between Regulator and licensee
  - Session 4 - Specific Issues, including
    - Regulator awareness and assessment of licensee approach to contractorisation
    - Resources, succession management and corporate memory
    - Organisational structure
- Conclusions derived from the workshop including challenges and regulatory approaches
- Recommendations distilled from the workshop

The workshop report is further completed by an Annex describing the detailed outcomes of each of the sessions and a list of workshop participants.

<b>Context and Prerequisites for application</b>
The information contained in the workshop report can be applied to civil aviation with no specific prerequisites.
<b>Equipment required for application</b>
No specific equipment is needed.
<b>Required user qualifications</b>
Regulators responsible for safety oversight will need insight into the licensee's organisational structure and management plans. Some expertise in risk analysis may be required. The report makes some reference to topics specific to the nuclear industry, but is accessible to all regulators of high risk business areas.
<b>Requirements / constraint concerning conditions for use</b>
No specific requirements or constraints for use are known.
<b>Measure / Response Types</b>
The workshop report does not include specific measurement methods, thus no response types are given.
<b>Collected parameters and data format</b>
There is no description of collected parameters and the data format provided in the workshop report.
<b>Results obtained and interpretation</b>
<p>The workshop report distilled the following recommendations for regulators as a result of the workshop discussions:</p> <p>Regulators should:</p> <ol style="list-style-type: none"> <li>1) Make explicit the regulatory interest in management of change.</li> <li>2) Clarify regulatory expectations and objectives concerning management of change.</li> <li>3) Adopt a pragmatic approach &amp; not impede legitimate business practices.</li> <li>4) Adopt a flexible approach to change, recognising the diverse drivers for change and the alternative business strategies that can be adopted by licensees.</li> <li>5) Seek and combine information from a variety of sources.</li> <li>6) Ensure the licensee develops and uses an effective baseline.</li> <li>7) Consider how to obtain early indicators of the adequacy of the change process (e.g. by examination of the steps in the process).</li> <li>8) Ensure that proper oversight is maintained of the outcome of the change process, and of the monitoring and review processes applied by the licensee.</li> <li>9) Encourage licensee self assessment.</li> <li>10) Scrutinise 'soft' issues such as morale, working practices, culture, etc.</li> <li>11) Focus on the steps taken to retain effective control, and to maintain knowledge, competence and the ability to act as an intelligent customer.</li> <li>12) Consider how to develop and resource its own expertise in management of change processes</li> <li>13) Develop criteria and tools for regulatory judgement.</li> <li>14) Maintain dialogue with other regulators to share experience (recognising appropriate national differences).</li> <li>15) Maintain dialogue with licensees to ensure timely and effective scrutiny without imposing an unnecessary burden.</li> <li>16) Maintain the licensee's focus on safety during change and seek evidence that this focus is in place.</li> <li>17) Maintain the licensee's focus on long-term safety issues.</li> </ol>

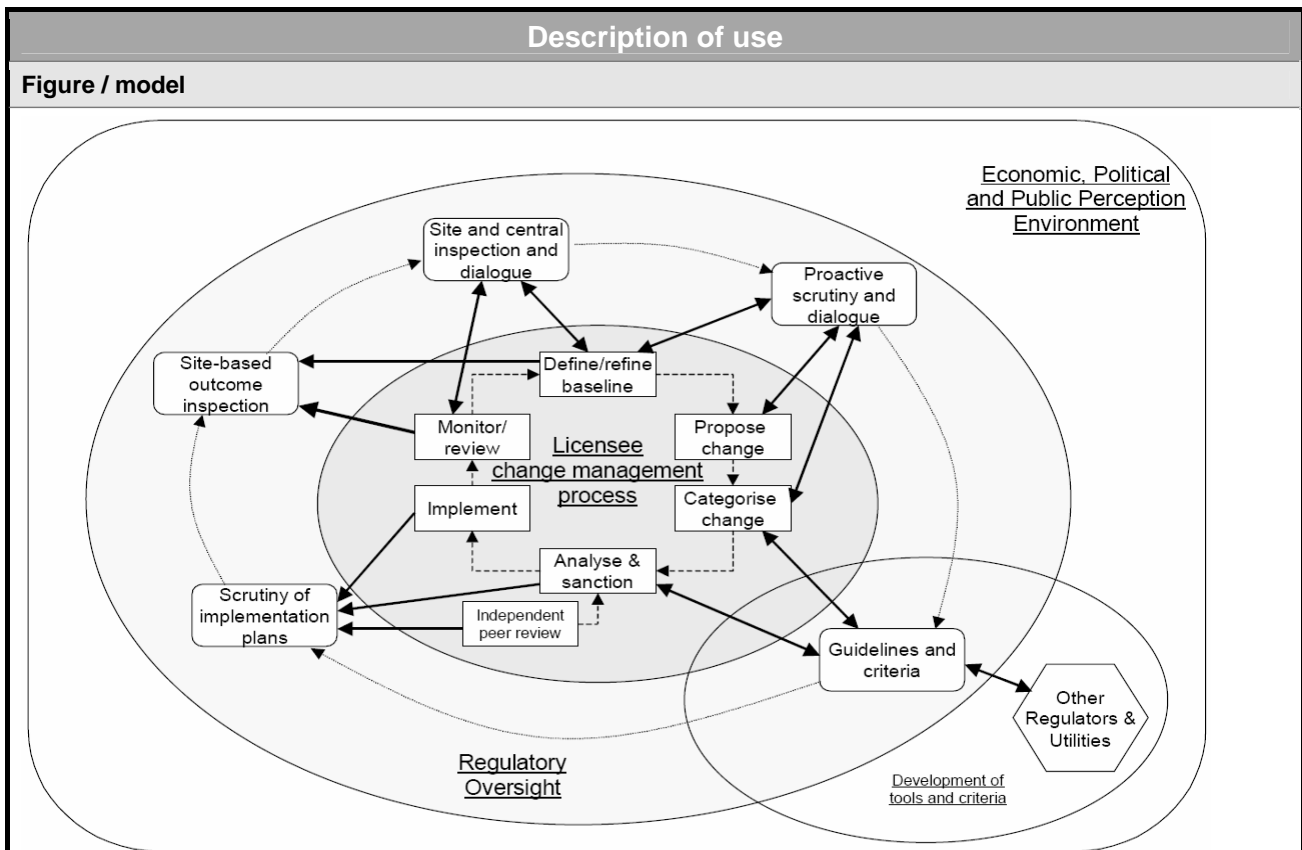


Figure 1: Model of regulatory oversight of change management processes

### Process description

The workshop report provides a model of regulatory oversight of change management, as shown in figure 1 and describes the following activities for Regulatory oversight/

#### Site and central inspection and dialogue

The site and central inspection and dialogue should start with the establishment of a baseline and clear statement of the proposed change, followed by categorisation of safety significance, justification/evaluation, planning, implementation and review (including independent review where appropriate). It would allow the regulator to review the proposed change and to proceed with an agreed inspection programme.

#### Proactive scrutiny and dialogue

The change management programme must be clear and visible, and should acknowledge the regulator's role, and the timing of its interactions with the licensee. The regulator must express its own views clearly, and there must be an agreed end-point to the change process. Dialogue would help ensure a common perception of the importance of specific issues, and hence avoid perceived unnecessary regulatory burden. In order for the regulator to understand and make judgements about the adequacy of organisational structure, the regulator/licensee dialogue must be timely, relevant and involve the right people.

#### Guidelines and criteria

The licensee is encouraged to adopt particular methods and guidelines. The regulator should develop criteria and tools for regulatory judgement. The regulator should also take responsibility for ensuring that its own assessment processes are robust and adequate and can influence the licensee to develop solutions.

#### Other Regulators and utilities

The regulator should maintain dialogue with other regulators to share experience and effective scrutiny without imposing an unnecessary burden to the licensee.

#### Scrutiny of implementation plans

The regulator should scrutinise the implementation plans and maintain dialogue with the licensee to ensure timely and effective corrective actions, if necessary and allow routine inspections.

#### Site based outcome inspection

The regulator should review the outcome of the implemented change, including respective inspections on site and provide feedback to the licensee on its findings and results.

<b>Evaluation</b>
<b>Strengths and Weaknesses of the tool</b>
<p>The workshop report provides an overview of topics relevant for planning, documentation and evaluation of a change process. In addition it provides useful information on the aspects of safety oversight by regulators. It is therefore a valuable resource for regulators and licensees in ATM.</p> <p>However, no details on the source material are provided and no validation or experience using these regulatory practices is discussed in the workshop report.</p>
<b>Alternative methods / tools</b>
No alternative methods or tools are known.
<b>Possible combination with other methods / tools</b>
This workshop report can be used in conjunction with the UK regulator's view of external influences on safety and license conditions for organisational change and the Managing change in nuclear utilities document.
<b>Psychometric / methodological integrity description</b>
<b>Objectivity / (or at least) demonstration</b>
Not applicable.
<b>Reliability / (or at least) demonstration</b>
Not applicable.
<b>Validity / (or at least) demonstration</b>
Not applicable.
<b>Description of methodological integrity and additional Evidence or Value that the tool or study provides</b>
The report reflects the positions and challenges of nuclear safety regulators on the management of change and as such could be a useful source of information for Regulatory Authorities in Civil Aviation.



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