



**Ministry
of Defence**

**JSP 538
Regulation of the Nuclear Weapon Programme**

Part 2: Guidance

Preface

How to use this JSP

1. JSP 538 is intended as the primary source documentation describing independent Defence safety regulation of the Nuclear Weapon programme. It is designed to be used by staff responsible for both the regulation of activities delivered by Duty Holders and the staff of the Duty Holders within the Defence Nuclear Programme. This JSP contains the policy and direction on nuclear safety regulation and guidance on the processes involved and best practice to apply. This JSP will be reviewed at least annually.
2. The JSP is structured in two parts:
 - a. Part 1 - Directive, which provides the direction that must be followed in accordance with Statute, or Policy mandated by Defence or on Defence by Central Government.
 - b. Part 2 - Guidance, which provides the guidance and best practice that will assist the user to comply with the Directive(s) detailed in Part 1.

Related JSPs	Title
JSP 518	Regulation of the Naval Nuclear Propulsion Programme
JSP 471	Defence Nuclear Emergency Response
JSP 815	Defence Health, Safety and Environmental Protection

Coherence with other Defence Authority Policy and Guidance.

3. Where applicable, this document contains links to other relevant JSPs, some of which may be published by different Defence Authorities. Where particular dependencies exist, these other Defence Authorities have been consulted in the formulation of the policy and guidance detailed in this publication.

Training

4. Details of relevant training applicable to the DNP including safety regulation are identified in individual post specifications and/or terms of reference and the associated training plans developed against the Nuclear Competence Framework published by the Head of the nuclear profession.

Further Advice and Feedback- Contacts

5. The owner of this JSP is DSEA DNSR. For further information on any aspect of this guide, or questions not answered within the subsequent sections, or to provide feedback on the content, contact:

Job Title/E-mail	Project focus	Phone
DNSR Nuclear Weapon Regulator	Nuclear Weapon Regulation	03067932526

Contents

Preface.....	i
Contents.....	ii
Chapter 1 Authorisee and Duty Holder Guidance.....	1
Introduction.....	1
Annex A: Guidance on Specific Topics, Provided by DNSR for Authorisees and Duty Holders	2
Annex B: Guidance on the Application of the Authorisation Conditions.....	3
Annex C: Guidance on the Application of Further Authorisation Conditions.	65
Annex D: Guidance on the Application of Approving and Design Authorities Conditions	74
Chapter 2 Guidance for DNSR Staff.....	107
Introduction.....	107
Structure.....	107
Annex A: NWR Safety Assessment Principles.....	108
Annex B: DNSR Technical Assessment Guides.....	122
Glossary.....	123
Abbreviations.....	132

Chapter 1 Authorisee and Duty Holder Guidance

Introduction

1. This Chapter provides information and guidance on a selection of topics that are referred to in the JSP or are topics that have general applicability. The range of topics discussed and the information presented is not intended to be exhaustive and the reader should consult other authoritative advice and guidance, such as that issued by the Office for Nuclear Regulation (ONR) and the International Atomic Energy Authority (IAEA).

2. The guidance to Authorisees and Duty Holders offered in the attached Annexes is based largely on that which was available in the preceding issues of JSP 518 and JSP 538 and is generally being retained with minimal change. However, the guidance has been amended where necessary, e.g. to reflect changes made to AC/ADAC 17 and 36, and to reflect guidance that has been issued subsequently.

3. The Annexes to this Chapter provide guidance on the following topics:

Annex A – Guidance on Specific Topics, Provided by DNSR for Authorisees and Duty Holders

Annex B – Guidance on the Application of the Authorisation Conditions

Annex C – Guidance on the Application of Further Authorisation Conditions

Annex D – Guidance on the Application of the Approving and Design Authorities Conditions

Annex A to Chapter 1: Guidance on Specific Topics, Provided by DNSR, for Authorisees and Duty Holders

Below is a list of guidance on specific topics, provided by DNSR, for Authorisees and Duty Holders:

1. DNSR, Guide to an Application for UK Defence Nuclear Programme Competent Authority Approval of a Transport Package for Radioactive Material (IAEA 2009 & 2012 Regulations), Issue 19, dated April 2013.

Annex B to Chapter 1: Guidance on the Application of the Authorisation Conditions

AC1 Guidance Note	Interpretation
AC2 Guidance Note	Marking of the Site Boundary
AC3 Guidance Note	Restrictions on Dealing with the Site
AC4 Guidance Note	Restrictions on Nuclear Matter on the Site
AC5 Guidance Note	Consignment of Nuclear Matter
AC6 Guidance Note	Documents, Records, Authorities and Certificates
AC7 Guidance Note	Incidents on the Site
AC8 Guidance Note	Warning Notices
AC9 Guidance Note	Instructions to Persons on the Site
AC10 Guidance Note	Training
AC11 Guidance Note	Emergency Arrangements
AC12 Guidance Note	Duly Authorised and Other Suitably Qualified and Experienced Persons
AC13 Guidance Note	Nuclear Safety Committee
AC14 Guidance Note	Safety Documentation
AC15 Guidance Note	Periodic Review
AC16 Guidance Note	Site Plans, Designs and Specifications
AC17 Guidance Note	Management Systems
AC18 Guidance Note	Radiological Protection
AC19 Guidance Note	Construction or Installation of New Plant
AC20 Guidance Note	Modification to Design of Plant Under Construction
AC21 Guidance Note	Commissioning
AC22 Guidance Note	Modification or Experiment on Existing Plant
AC23 Guidance Note	Operating Rules
AC24 Guidance Note	Operating Instructions
AC25 Guidance Note	Operational Records
AC26 Guidance Note	Control and Supervision of Operations
AC27 Guidance Note	Safety Mechanisms, Devices and Circuits
AC28 Guidance Note	Examination, Inspection, Maintenance and Testing
AC29 Guidance Note	Duty to Carry Out Tests, Inspections and Examinations
AC30 Guidance Note	Periodic Shutdown
AC31 Guidance Note	Shutdown of Specified Operations
AC32 Guidance Note	Accumulation of Radioactive Waste
AC33 Guidance Note	Disposal of Radioactive Waste
AC34 Guidance Note	Leakage and Escape of Radioactive Material and Radioactive Waste
AC35 Guidance Note	Decommissioning
AC36 Guidance Note	Organisational Capability

AUTHORISATION CONDITION 1 - INTERPRETATION

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure there is no ambiguity in the use of certain specified terms which are found in the text of the Conditions. It also contains important powers for Defence Nuclear Safety Regulator (DNSR) to modify, revise or withdraw approvals, etc. and to approve modifications to any matter currently approved. Where appropriate, reference is made back to the relevant statutory Acts of Parliament.

Guidance To Authorisees

2. The following regulatory controls are used throughout the Conditions and have the following definitions and meanings:

Consent

Explanation: A consent is required before an Authorisee can carry out any activity for which DNSR has so specified the need.

Reason for use: A consent is used to ensure an Authorisee does not carry out an activity before DNSR has been satisfied that the proposed course of action is safe and all necessary procedures and controls are in place.

Approval

Explanation: An Authorisee is required to submit its arrangements for approval if so specified by DNSR.

Reason for use: An approval is used to freeze an Authorisee's arrangements. Once approved no alteration or amendment can be carried out without further approval by DNSR.

Direction

Explanation: A direction requires an Authorisee to take a particular action.

Reason for use: A direction is used for matters of major or immediate importance.

Agreement

Explanation: An agreement allows an Authorisee to proceed in accordance with its own arrangements.

Reason for use: Where the need to obtain DNSR's agreement is written into the Authorisee's arrangements, it prevents an Authorisee from proceeding unless the course of action has been agreed.

Notification

Explanation: When so notified, an Authorisee is required to submit information to DNSR.

Reason for use: A notification to an Authorisee is used to request the submission of information to DNSR.

Specification

Explanation: A specification issued by DNSR requires an Authorisee to implement the specified arrangements.

Reason for use: A specification is the means by which DNSR can implement discretionary control over an Authorisee's arrangements.

3. To differentiate between the use of these terms by DNSR and other organisations, the terms may be prefixed by 'DNSR' or 'regulatory'.

AUTHORISATION CONDITION 2 - MARKING OF THE SITE BOUNDARY

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee takes the necessary steps to make Authorised sites, facilities, Nuclear Powered Warships (NPW) and transportation secure in order to prevent unauthorised persons injuring themselves or damaging safety related plant or equipment.

Scope

2. This guidance relates to the identification, marking, inspection and maintenance of security by fences or other appropriate means around the sites, facilities, NPW or transportation, which are subject to Authorisation.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. Clear identification, using maps and plans as necessary, of the coverage of Authorisation. For sites, this should include a definition of any sea areas and the seaward boundary. This includes an indication of access controls, including both within and around any NPW and transportation.

b. Identification of the lines of responsibility for the control of access between individuals within each Life Cycle Phase and between Authorisees.

c. Any special precautions taken to prevent unauthorised entry, including patrols, manning and controls during movements. Fences, boundary markings, signs etc. should be provided as appropriate, not only warning of the restricted nature of an area but also giving hazard and emergency action information. See also Authorisation Condition 8 (AC8).

d. The arrangements for the inspection and maintenance of boundary markings, fences, signs, etc. including identification of those persons with the responsibility for carrying out such inspection and maintenance.

4. It is DNSR policy that all Defence Nuclear Programme activities will, as far as is practicable, be subject to Authorisation. However, the Office for Nuclear Regulation (ONR) Licensed Site boundaries are recognised by DNSR and are not required to be separately marked as Authorised site boundaries. As such, this Condition does not require those Authorisees who are also Licensed to apply measures in addition to those which satisfy Licence Condition 2 (LC2).

5. Where a Licensed Site has an attached area in which relevant support activities are undertaken by the same Licensee, but are not licensable activities under Nuclear Installations Act 65, AC2 will apply to that area. Hence the Authorisee's site will encompass all his relevant activities and compliance will be covered by compliance statements against LC2 for the licensed activities and AC2 for the remaining Authorised activities.

6. Suitable arrangements for security should be made by the sponsoring Authorisee or the Duty Holder at those sites that are not Authorised in their own right.
7. Whilst the assessment of the adequacy of security requirements implemented to prevent unauthorised access falls outside the scope of DNSR regulation, due credit will be given where such security arrangements effectively enhance the safety arrangements for restricted access. This Condition does not require the Authorisee to apply security measures in addition to those contained in JSP 440.

AUTHORISATION CONDITION 3 - RESTRICTIONS ON DEALING WITH THE SITE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee does not let, convey, assign, feu or transfer any part of the Authorised site to a third party without seeking the permission of the Defence Nuclear Safety Regulator (DNSR). This is to ensure that the Authorisee does not change the character of the activities that are Authorised and to prevent activities being carried out on the site which could put nuclear operations at risk. Also it is essential that nothing confuses the absolute responsibility of the Authorisee in respect of safety on the whole Authorised site or activity. The Authorisee should be able to demonstrate that there are organisational procedures to prevent individuals from conveying, assigning, transferring, feuing or granting any Authorisations in relation to the site or parts of the site without first obtaining the consent of DNSR.

Scope

2. See Introduction.

Guidance to Authorisees

3. The Authorisee should include a simple but enforceable statement in his documented arrangements to the effect that he will not let, convey, assign, transfer, feu or grant any Authorisation in relation to the site, Nuclear Powered Warship or transportation under his control without first obtaining DNSR's consent.

AUTHORISATION CONDITION 4 - RESTRICTIONS ON NUCLEAR MATTER ON THE SITE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee has adequate arrangements to control the introduction and storage of nuclear matter on the Authorised site or Nuclear Powered Warship (NPW) to ensure safety. It also provides Defence Nuclear Safety Regulator (DNSR) with powers to specify that certain types of nuclear matter cannot be brought onto the site or NPW without the consent of DNSR. This enables DNSR to intervene to ensure that, for specific activities, it can assess the adequacy of the Authorisee's arrangements before nuclear matter is brought onto the site. *(Nuclear matter being nuclear fuel, radioactive waste, etc. as defined by the NI Act).*

Scope

2. This guidance describes the arrangements for controlling nuclear matter being brought onto or stored on a site or NPW, or transported within a site and for the production and keeping of records pertaining to such matter.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel who are responsible for the processing, recording and storing of radioactive matter.
- b. The arrangements for ensuring that no nuclear matter is brought onto or stored on site or NPW or transportation within a site, unless:
 - (1) a safety case for the handling, storage or transport of that matter is in place;
 - (2) the Conditions and Limits of Safe Operation have been defined;
 - (3) operating instructions have been issued to ensure that the conditions and limits of safe operation are observed.
- c. The safety case needs to indicate the type and form of nuclear matter, the method of storage and how traceability of the matter will be achieved. These arrangements should include how any radioactive matter brought onto the site or NPW is managed.
- d. The safety case should include a justification for the use of all transport, storage flasks, packages and containers. The safety case should indicate the type and form of nuclear matter, the method of storage and how traceability of the material is achieved.
- e. The arrangements for ensuring that no nuclear matter is brought onto a site or NPW for the first time without the consent of DNSR.

- f. The arrangements for the production and keeping of all records which pertain to the introduction, storage, processing and transfer of nuclear matter.
4. Where matter is to be transferred between Authorisees then the arrangements must reflect the duty of co-operation between the Authorisees.
5. DNSR will not normally wish to be involved in the movement or use of sealed sources used for radiography except where there is a potential hazard which needs to be taken into account by the safety management arrangements. Further guidance on High Activity Sealed Sources is given in Authorisation Condition 25 guidance notes.

AUTHORISATION CONDITION 5 - CONSIGNMENT OF NUCLEAR MATTER

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the transfer of nuclear matter, other than excepted matter and radioactive waste, to sites in the UK other than relevant sites:
 - a. is carried out only with the consent of Defence Nuclear Safety Regulator (DNSR); and that
 - b. the Authorisee has adequate records of where such nuclear matter has been sent (Authorisation Condition 6). The Authorisee should also be able to demonstrate that there are organisational procedures to prevent individuals from consigning such matter to non-relevant sites without first obtaining a Consent from DNSR.
2. This Condition is aimed at ensuring not only that there is a record of where nuclear matter has been sent to, but also so that DNSR can be sure that there are adequate arrangements for safely handling such material at the destination.
3. For the Defence Nuclear Programmes, a relevant site (as defined in S26 of the Nuclear Installations Act 1965) is identified as:
 - a. Licensed site;
 - b. an Authorised site;
 - c. Nuclear Powered Warship.

Scope

4. This guidance relates to the consignment of nuclear matter to relevant sites and the requirement for making and preserving a record of all consignments of nuclear matter, including excepted matter and radioactive waste.

Guidance to Authorisees

5. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:
 - a. The management responsibilities of all personnel responsible for the consignment of nuclear matter.
 - b. The arrangements for ensuring that nuclear matter, other than excepted matter and radioactive waste, is consigned only to a relevant site.
 - c. The arrangements for recording details of all consignments of nuclear matter, including excepted matter and radioactive waste.
 - d. The arrangements for ensuring the preservation of records for the specified period.

- e. The arrangements for ensuring that nuclear matter is not consigned to any place other than a relevant site without the consent of DNSR.
6. Any change in the Authorisee responsible for nuclear matter should be regarded as a consignment of nuclear matter from one Authorisee to another.
7. For consignments of nuclear matter (apart from excepted matter and waste) from a licensed Defence Nuclear Programme site to a non-Defence Nuclear Programme site, the Consent of ONR will be accepted by DNSR.

AUTHORISATION CONDITION 6 - DOCUMENTS, RECORDS, AUTHORITIES AND CERTIFICATES

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that adequate records are held by the Authorisee for a suitable period to ensure that the safety case for operation is available at all times, that design and construction information is available for decommissioning, that operational records are available to assist investigations in the event of an accident or incident and operational records are available for the statutory number of years after the cessation of operations for the purpose of assisting any claims of damage to health as a result of exposure to ionising radiation.

Scope

2. This guidance refers to the management of records associated with the Authorisation Conditions and statutory requirements.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. The management responsibilities of all personnel responsible for the production of documents, records, authorities and certificates and for the preservation of all documentation.

b. The arrangements and keeping of records of:

(1) the accumulated effective dose to all personnel who have been employed on Defence Nuclear Programme activities;

(2) personnel health records; and

(3) any reports investigating over-exposure;

for 50 years after completion of last entry. All other records relating to the control of exposure such as monitoring, dosimetry service, radioactive substance accounting etc should be kept for at least 2 years. Records are a means of demonstrating that statutory requirements have been met.

c. The management arrangements for controlling documentation and how its storage and preservation is carried out, including the generation of a record retention schedule, record schedules and the means of record retrieval. This should take account of the challenge of obsolescence of hardware and any associated software, and also loss of operator skills. Arrangements should demonstrate how the continued viability of the records is maintained and how often the recording method is subject to periodic review for its longevity.

d. The arrangements for assessing the minimum time scale for the maintenance of records unless agreement to the contrary has been reached with Defence Nuclear Safety Regulator.

e. The arrangement for safeguarding records against hazards which may render the records unusable. These hazards include such events as fire, flood and adverse environments. Safeguards may include duplication of records or high integrity storage.

f. The maintenance of adequate records for design, safety justification, production, testing, operation, support, modification and decommissioning is essential to the long-term safety of the Defence Nuclear Programmes and to satisfy legislative requirements.

AUTHORISATION CONDITION 7 - INCIDENTS ON THE SITE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee has adequate arrangements to deal with incidents that may occur within the scope of the Authorisation. It is essential that the Authorisee keeps a record of all such incidents, notifies Defence Nuclear Safety Regulator (DNSR) when appropriate, investigates the cause of each incident and produces a report of the investigation to ensure that lessons are learnt.

Scope

2. This guidance relates to incidents, as defined in the glossary.

Guidance to Authorisee

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for reporting incidents.
- b. The arrangement for reporting, investigating, reviewing and assessing all incidents that directly or indirectly affect nuclear or radiological safety, including notifying and reporting incidents to DNSR.
- c. The arrangements for the categorisation of incidents against the International Nuclear Events Scale.
- d. The above should include arrangements for:
 - (1) appointing personnel to implement and supervise the arrangements;
 - (2) categorising incidents, occurrences and deviations;
 - (3) ensuring staff awareness of the need for reporting incidents and events;
 - (4) ensuring an open approach to the reporting and assessment of incidents;
 - (5) specifying the appropriate level of investigation;
 - (6) referring the reports to the Nuclear Safety Committee and to DNSR;
 - (7) implementing recommendations;
 - (8) ensuring staff awareness of the lessons learned from incidents;
 - (9) reviewing and analysing all incidents for trends in location, type, cause etc. and promulgating the lessons learned;
 - (10) analysing incidents occurring elsewhere and applying any applicable lessons learned;

- (11) auditing the incident reporting and assessment system;
 - (12) providing an annual report to the respective safety committee on the effect of incidents on the validity of the respective safety justification;
 - (13) the control and storage of documentation recording incidents.
- e. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) for the provision of support where appropriate.

DNSR Expectation

4. All incidents with the potential to adversely affect safety are to be notified to DNSR and a verbal brief provided at the earliest practicable opportunity following the incident. This will enable DNSR to fulfil its duties under the defence ministerial reporting requirements. The timing of the notification will depend upon the safety significance or regulatory profile of the incident or event and will range between:
- (1) immediate notification by pager, telephone or fax;
 - (2) notification on the next working day;
 - (3) notification on the next Inspector's visit;
 - (4) notification during the Inspector's review of the Authorisee's event reporting process.
5. The Authorisee is to provide routine reports covering all safety related incidents not falling into the more serious category above.
6. DNSR to be informed of the assessment of incidents.
7. DNSR to be informed of any other incident/event/occurrence that might attract public and/or media attention.
8. The Authorisee is to submit proposals covering the period for retention of records relating to incidents for agreement by DNSR.

AUTHORISATION CONDITION 8 - WARNING NOTICES

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure the safety of all people on the site, Nuclear Powered Warship (NPW) or during transportation so that they can respond appropriately and without delay to an emergency situation. The Authorisee therefore needs to ensure that all warning notices are in appropriate places to advise people on what to do in that area in the event of a fire or any other emergency.

Scope

2. This guidance relates to the placing of notices on site, NPW or during transportation to ensure that personnel, visitors and contractors are made aware of:

- a. the meaning of any warning signal;
- b. the location of emergency exits or exit routes;
- c. the actions to be taken in the event of an emergency.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for the arrangements that ensure that there are appropriate, sufficient, up-to-date and suitably positioned notices and signs that denote potential hazards, explaining the meaning of all warning signals and identifying the measures to be taken in the event of an emergency.
- b. The arrangements that ensure all escape routes, emergency exits and equipment, and assembly points are clearly marked and are not obstructed.
- c. The review arrangements that ensure all notices and signs remain valid and are maintained in a legible condition, including the recording of such reviews. It should be recognised that notices and signage may vary depending on the activity being undertaken and periods when normal operation may be disrupted.
- d. The arrangements for ensuring that the dependence upon notices and signs is consistent with the training and briefings which should be given to personnel, including visitors and contractors who may not be familiar with local arrangements
- e. Warning notices and signs should be sufficiently clear to avoid confusion between the response to nuclear and non-nuclear emergencies.
- f. A 'warning notice' is defined as a notice which states one or more of the following:
 - (1) the meaning of a warning signal;
 - (2) the hazard associated with a warning signal;

(3) the action to be taken by individuals in response to a warning signal in order to avoid or minimise exposure to the hazard associated with the signal.

4. Notices and safety signs associated with the required response, e.g. signs for emergency exits, evacuation routes and muster points, and the location of emergency equipment, should be classed as warning notices.

5. A warning signal is an acoustic signal and/or illuminated sign used to indicate an accident or emergency condition requiring the person(s) hearing/seeing it to take specific action to protect themselves from harm, e.g. a fire alarm. Alarms that require action solely to maintain a process or operation within defined safety limits do not fall within this definition.

AUTHORISATION CONDITION 9 - INSTRUCTIONS TO PERSONS ON THE SITE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee provides adequate instructions to all persons allowed on the site, Nuclear Powered Warship (NPW) or involved in transportation so that they are aware of the risks and hazards associated with nuclear activities, the precautions that must be taken to minimise the risk to themselves and others and the actions to be taken in the event of an accident or emergency.

Scope

2. This guidance covers the provision of instruction to all persons who are authorised to enter a site, NPW or be involved in transportation for any purpose. The information provided to any person should be appropriate and adequate for the circumstances under which the person is authorised to be present.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for the provision of instructions.
- b. The arrangements for authorising persons, including contractors and visitors, to be on site or NPW or involved in transportation, including the arrangements for instruction of personnel on such topics as ionising radiations, nuclear emergencies, fire and bomb/terrorist alerts and making them formally aware of the hazards and the emergency arrangements, and how such arrangements relate to non-nuclear emergency arrangements.
- c. The arrangements for determining the content of the instruction provided, including an audit trail back to the hazards and emergency arrangements.
- d. The arrangements for co-operation between Authorisees where their activities overlap, typically when a NPW or transportation is within the site boundary.
- e. The arrangements for assessing that the outcome of instructions is acceptable.
- f. The arrangements for ensuring that records of staff training are kept.
- g. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) for the provision of information regarding the risks and hazards associated with a NRP, a nuclear weapon, component or relevant support equipment, the precautions to be observed in connection therewith and the action to be taken in the event of an accident or emergency.

AUTHORISATION CONDITION 10 - TRAINING

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that all people who carry out activities during design, construction, manufacture, commissioning, operation or decommissioning which may affect safety are adequately trained for that purpose. The Authorisee is expected to ensure that the necessary training requirements are identified for each activity, that individuals who carry out these activities can demonstrate that they have received such training and that records are kept to demonstrate that individuals have been trained. This Condition is in addition to the general duty under the Health and Safety at Work etc Act 1974 (HSWA) s.2(2) and the Ionising Radiation Regulations 1999, Reg. 14.

Scope

2. This guidance applies to the training requirements for all persons with specific safety responsibilities, including non-nuclear safety where this may have implications for nuclear or radiological safety. It is applicable to all organisations, whether they are regulated through the framework of Authorisation or not and includes, those with emergency response responsibilities.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. The management responsibilities of all personnel responsible for ensuring the provision of safety training to personnel who have responsibility for any operations that may affect nuclear or radiological safety.

b. The arrangements that ensure that a training plan is developed and maintained and equates to the training and qualifications required to undertake duties of safety specific posts.

c. The arrangements that ensure that records are kept in a training register to show that safety post holders have the required qualifications. Where personnel have more than one role, for instance their main post and also a role in responding to emergencies, then the training needs of both roles should be considered jointly.

d. The process of assessing posts' training requirements should consider the demands of any relevant safety case and the performance, skill, experience and knowledge of post holders which the safety case assumes.

e. The arrangements for ensuring a continuing programme of formal and practical training, including any new training needs and periodic refresher training.

f. The arrangements for gaining assurance that lodger units and contractors have adequate training arrangements. Where additional resources within an Authorisee's organisation are provided by contractors (for instance as secondees), then these staff should be treated as if they were employed by the Authorisee for the purposes of Authorisation Condition 10.

g. The arrangements for:

- (1) establishing the training need;
- (2) approving the training solution for each safety specific post;
- (3) approving the training delivery;
- (4) planning and providing the training;
- (5) verifying that the training is meeting the identified need.

h. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) for the provision of information to support the structuring and content of training.

AUTHORISATION CONDITION 11 - EMERGENCY ARRANGEMENTS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee has adequate arrangements in place to respond effectively to any emergency. The Authorisee is required to have arrangements in place to cover a wide range of events including those which can result in a significant release of radioactive material into the environment. The Condition gives Defence Nuclear Safety Regulator (DNSR) powers to ensure that the Authorisee's emergency arrangements are exercised. DNSR uses its powers to ensure the Authorisee's exercises demonstrate adequate performance to protect both workers and the public.

Scope

2. This guidance relates to the arrangements for dealing with any emergency which has nuclear safety implications. This includes situations where no actual hazard exists but where the potential for a hazard to arise is identified.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities for those personnel who are responsible for emergency response planning.
- b. The arrangements for defining and reviewing the risk and hazard assessments which derive from the emergency arrangements, and the key conclusions of the risk and hazard assessments.
- c. The arrangements for preparing the operating organisation's emergency plan on the basis of the risk and hazard assessment.
- d. The arrangements for ensuring that any person who has duties in relation to the emergency arrangements is a Suitably Qualified and Experienced Person, and is provided with training, instructions, equipment, etc.
- e. The arrangements for ensuring that all persons on site, Nuclear Powered Warship, or involved in transportation who may be affected by the emergency, are provided with the necessary instruction, training, equipment etc.
- f. The arrangements for ensuring that any external organisation with a role in the emergency arrangements (e.g. the emergency services) is appropriately consulted and provided with all necessary information.
- g. The arrangements for providing coherent information to the local authority to enable the preparation of an off-site plan, including identification of the key aspects of the information provided.
- h. The arrangements for providing advance information to the local community.

- i. The key aspects of the emergency arrangements, including the provision of support to the off-site plan and, in each case, the response capability or performance standard which the arrangements are intended to achieve.
- j. The arrangements for assessing the adequacy of the emergency arrangements and for ensuring that each aspect of the emergency arrangements, including the interfaces with external agencies, is exercised at appropriate intervals.
- k. How the emergency arrangements and any amendments thereto are approved.
- l. The arrangements for ensuring compliance with the provisions of the Radiation (Emergency Preparedness and Public Information) Regulations (REPPiR) (2001).
- m. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) for the provision of information and support to Authorisees in the event of an emergency.

DNSR Expectation

- 4. In accordance with REPPiR regulation 13(1)(1)(b), site Authorisees and Duty Holders as appropriate are to notify DNSR in addition to ONR without delay in the event of either a radiation emergency or an event which could reasonably be expected to lead to a radiation emergency.
- 5. DNSR will specifically approve arrangements for this Authorisation Condition (AC) and under sub clause (2) will expect to be provided with evidence, for DNSR agreement, that Authorisees have developed performance standards based on those detailed in JSP 471.
- 6. In accordance with AC11(2), site Authorisees and Duty Holders as appropriate are to submit to DNSR for approval such parts of their emergency arrangements as are sufficient to demonstrate compliance with the requirements of AC11.
- 7. In accordance with AC11(5), Authorisees and Duty Holders as appropriate are to rehearse their on-site emergency arrangements at intervals not exceeding 1 year, other than by agreement with DNSR, the scope of the rehearsal to be agreed with DNSR on a case-by-case basis.

DNSR Guidance to Authorisees Further to the Radiation (Emergency Preparedness and Public Information) Regulations (REPPiR) 2001

- 8. Further to REPPiR Regulation 7(6)(b), DNSR should in all cases be included in the consultations conducted by site Authorisees and Duty Holders as appropriate for the purpose of preparing an operator's plan, in accordance with Regulation 7(1), or of reviewing the plan (in accordance with Regulation 10(1)).

AUTHORISATION CONDITION 12 - DULY AUTHORISED AND OTHER SUITABLY QUALIFIED AND EXPERIENCED PERSONS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that only Suitably Qualified and Experienced Persons (SQEP) perform duties which may affect safety. The Authorisee is required to ensure that all activities that can affect safety are identified and the experience and qualification requirements for people to carry out these activities are defined. The Authorisee must ensure that the qualifications and experience of people match those required for the job. The Condition gives Defence Nuclear Safety Regulator (DNSR) the power to remove a person from safety related work if he or she is not suitably qualified or experienced for the job.

Scope

2. This guidance relates to nuclear safety and non-nuclear safety where this may have nuclear or radiological safety implications.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. The management responsibilities of all personnel responsible for post profiling and identification of required qualifications and experience of individuals who are to fill each nuclear safety related post.

b. A description of the system for post profiling, the required qualifications and experience of the individuals who are to fill each nuclear safety related post.

c. The methods of defining the categorisation of each post and the arrangements that apply for managing the categorisation.

d. The arrangements that ensure that:

(1) only SQEP carry out the duties that may affect nuclear or radiological safety;

(2) only Duly Authorised Persons (DAP) are appointed to posts which provide specific control and supervision functions significantly affecting nuclear and radiation safety.

e. A description of the arrangements for appointing DAP, including the circumstances under which they hold authority, what that authority is, how that authority is transferred/relinquished, and how the DAP's authority is made known to other Authorisees' personnel.

f. The arrangements that ensure that contractors have an appropriate level of expertise, are qualified to perform the tasks required, or alternatively are supervised by SQEP throughout their work. Contractors who are Authorisees in their own right, are subject to the requirements of this Authorisation Condition and other contractors should

adhere to these arrangements under the scrutiny of their parent Authorisee or Duty Holder.

g. Design and procurement activities are often carried out by external contractors who are not subject to the controls on qualifications and experience specified here. Authorisees should be able to provide assurance to DNSR that acceptable controls for appointing persons with the appropriate competence, qualifications and experience are in place in such organisations.

h. The 'waiver' arrangements for appointments should ensure that:

(1) the lack of qualification or experience is formally recorded along with the considerations which, permit the appointment;

(2) all waivers are controlled, managed, approved and regularly reviewed;

(3) an appropriate timescale is set defining the period of validity of the waiver.

i. The arrangements for identifying projected SQEP requirements to undertake future work programmes and the process for ensuring that future SQEP requirements are met.

j. The arrangements for appointing and training personnel to ensure that waivers are only necessary in exceptional circumstances and that they are not used as a palliative measure to overcome foreseeable and avoidable shortages of SQEP.

k. The Authorisees' arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) for the provision of information about the qualifications and experience of personnel conducting nuclear activities.

DNSR Expectation

4. The Authorisee to categorise posts in organisations according to their safety significance.

5. DNSR will expect to give agreement to those posts in the highest class, including the qualifications and experience relevant to those posts.

6. DNSR will expect to give agreement to a waiver if it is proposed to appoint someone in the highest class who does not meet the agreed qualifications and experience for the post.

AUTHORISATION CONDITION 13 - NUCLEAR SAFETY COMMITTEE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee sets up a senior level committee to consider and advise the Authorisee on matters which affect the safe design, construction, commissioning, manufacturing, operation and decommissioning on its Authorised site and any other matter relevant to safety. The committee must have members who are adequately qualified to perform this task including members who are independent of the Authorisee. The Condition gives Defence Nuclear Safety Regulator (DNSR) the power to veto the appointment of or continued presence of any member. The committee is intended to act as a check on the Authorisee's decision making process to ensure that safety considerations are given due weight. However, the committee is intended to be purely advisory and must not be considered to have an executive function. Where the Authorisee rejects the advice of the committee the Condition requires the Authorisee to notify DNSR; in this way DNSR can investigate the justification of the Authorisee's safety related actions.

Scope

2. This guidance relates to the Authorisee's or Duty Holder's Nuclear Safety Committee (NSC). The NSC's responsibilities should also cover all those aspects that are required by other Conditions and any other topic requested by the Authorisee or Duty Holder.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel involved with the NSC.
- b. The Terms of Reference (ToRs) for the NSC, including the arrangements for providing the ToRs to DNSR for approval.
- c. The constitution of the NSC, in particular the rules of attendance, what constitutes a quorum, the number of independent members, and members' experience and qualifications.
- d. The arrangements for managing the NSC.
- e. The arrangements for making appointments to the NSC, including informing DNSR of the name, experience, qualifications and details of current and past posts held by each member.
- f. The arrangements for emergency meetings or out of committee decisions of the NSC, when urgent advice is sought but a properly constituted meeting is not practicable.
- g. The arrangements that ensure a record of the committee's membership, the minutes of meetings, papers and reports considered are maintained.
- h. The status of the NSC advice and the action to be taken if the Authorisee or Duty Holder rejects such advice.

- i. The arrangements for notifying DNSR, as soon as practicable, if it is intended to reject, in whole or in part, any advice given by any such committee together with the reason for such rejection.

DNSR Expectation

4. DNSR will specifically approve the ToRs of the NSC.

AUTHORISATION CONDITION 14 - SAFETY DOCUMENTATION

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee sets up arrangements for the preparation and assessment of the safety related documentation used to justify safety during design, construction, manufacture, commissioning, operation and decommissioning. The arrangements for the assessment of safety related documentation are intended to ensure an independent review of the quality and accuracy of the Authorisee's safety related decisions and activities to ensure they have been adequately justified.

Scope

2. This guidance applies to the safety documentation produced to justify the safety during research, design, trials, development, construction, manufacture, commissioning, operation, modification and decommissioning.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for the production and approval of the safety documentation.
- b. The arrangements to:
 - (1) prepare, peer review and assess safety documentation;
 - (2) ensure that safety documentation is categorised in accordance with its safety significance;
 - (3) ensure that safety documentation is produced by Suitably Qualified and Experienced Person(s) (SQEP);
 - (4) ensure that safety documentation is reviewed by independent SQEP;
 - (5) determine whether documentation which has higher categories of safety significance should be subjected to an Independent Nuclear Safety Assessment by SQEP, independent of the groups responsible for the production of the safety case or for activities;
 - (6) submit documents, where appropriate, after peer review to the Authorisee's own Nuclear Safety Committee;
 - (7) ensure that documentation is submitted to Defence Nuclear Safety Regulator (DNSR) in accordance with the categorisation scheme or as specified by DNSR. This includes the provision of the Nuclear Safety Committee's comments as appropriate;

(8) ensure that safety documentation is approved and reviewed at appropriate intervals. The level at which safety documentation is reviewed should be in accordance with the Authorisee's categorisation scheme.

c. The requirement for safety documentation to cover procurement, commissioning, operation, maintenance, modification, decommissioning of equipment or systems, supporting infrastructure if appropriate, and the management of radioactive waste products including their storage and disposal.

d. State the approval level of the safety documentation.

DNSR Expectation

4. With regard to Authorisation Condition 14(1) DNSR expects:

a. The Authorisee to categorise safety documentation according to safety significance.

b. To give agreement to activities described in safety documentation in the highest class.

c. To be able to 'Call in' any safety documentation.

AUTHORISATION CONDITION 15 - PERIODIC REVIEW

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee periodically stands back and reviews the safety case against current standards to see if there are reasonably practicable improvements that could be made, to demonstrate that it is safe to continue to conduct nuclear activities for the next defined period and to identify any life limiting factors.

Scope

2. All safety cases, Statements of Compliance and Safety Justifications.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. The management responsibilities of all personnel responsible for the periodic review of safety cases.

b. The form of the review being undertaken. There are two types of review: the rolling programme of reviewing and updating safety cases and Statements of Compliance, and the less frequent stand-alone periodic review of the Safety Justification.

c. The arrangements for reviewing safety justifications when any change, significant external event or emergent information arises.

d. The procedure for managing the unplanned situation, especially as to whether the operation may continue.

e. The arrangements for reporting and ensuring that results of all reviews are subjected to scrutiny by a sufficiently independent and competent body before submission to the Nuclear Safety Committee.

f. The arrangements for agreeing, prioritising, planning and implementing recommendations from the review and obtaining agreement from Defence Nuclear Safety Regulator (DNSR) when significant safety or programme implications are identified.

g. The arrangement for reviewing the safety justification if operation beyond the original justified period or equipment/system design life is considered.

h. The arrangement for determining the scope and review periodicity, linking this to its life cycle and ensuring that the safety justification remains valid and is reviewed at intervals agreed by DNSR, e.g. whilst a typical timescale for periodic review is 10 years, for the Naval Reactor Plant this may be linked to the Long Overhaul Period programme.

i. The means by which the standards and processes for the review reflect current best practice, are systematic, address developments in technology and safety management, consider operating experience and emergent problems, address ageing,

incorporate lessons learned from other sites and industries and address the principle of continuous improvement.

j. The arrangements for ensuring that a holistic view is adopted during each review.

AUTHORISATION CONDITION 16 - SITE PLANS, DESIGNS AND SPECIFICATIONS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee indicates, using plans and schedules, any site, facility, Nuclear Powered Warship (NPW), transport activity or Naval Reactor Plant (NRP) which might affect safety and provides a schedule updated as necessary giving details of each and its associated operations. This is to ensure that the Authorisee and Defence Nuclear Safety Regulator (DNSR) are able to understand the content and function of the site, facility, NPW, transport activity or NRP.

Scope

2. This guidance relates to all site plans, plans, schedules and specifications for the site, facility, NPW, transport activity, NRP or utilities sufficient to define the activities and boundaries.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for ensuring that site plans, design specifications and schedules are maintained up to date and are forwarded to DNSR at appropriate intervals.
- b. The purpose of each facility, transport activity, service and utility. Their design life and the period of validity of the Safety Justification should be stated.
- c. The arrangements that verify, at suitable periodicity, that the plans and schedules reflect the actual state of the subject of the plan or schedule.
- d. The arrangement which ensures that independent surveys of facilities, transport activities, services and utilities are commissioned at appropriate intervals to show fitness for purpose.
- e. The arrangements for ensuring that the proximity of any building does not constitute an unacceptable hazard to nuclear services.
- f. The arrangements for locating facilities to ensure that hazards are minimised and separated by distance.
- g. The arrangements for maintaining detailed plans of approved berths, facilities and associated services including any nuclear or explosives limitations on occupancy required by the site safety case.
- h. The arrangements that state the period for which plans, designs and specifications will be retained.

AUTHORISATION CONDITION 17 – MANAGEMENT SYSTEMS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee establishes and implements management systems which give due priority to safety. This is to include the making and implementation of adequate quality management arrangements for all activities associated with the design, construction, manufacture, commissioning, operation and decommissioning on the site including the preparation and review of safety documentation. The Authorisee's arrangements are expected to include the provision of a quality management capability to oversee the specification, audit and review of quality management arrangements.

Scope

2. This guidance relates to the management systems implemented by Authorisees, Duty Holders and contractors, involved in activities covered by Defence Nuclear Safety Regulator (DNSR) Authorisation that may affect nuclear or radiological safety.

3. Duty Holders with responsibility for safety should have management systems, including quality management arrangements, appropriate to the scope and extent of their activities.

Guidance to Authorisees

4. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for establishing, co-ordinating and maintaining the management systems.
- b. The arrangements for ensuring that any of the management systems processes (e.g. financial, commercial, project, industrial safety or environmental) give due priority to safety.
- c. The arrangements for managing and supervising work with safety implications, demonstrating a clear split in responsibility for the prescription of nuclear and radiation safety and adherence to the rules.
- d. The quality management arrangements, making reference to any accredited system being operated.
- e. The arrangements for monitoring, reviewing and maintaining documents and procedures.
- f. The management arrangements for periodic internal and external audits, including audits by independent competent bodies.
- g. The arrangements for rectification of shortfalls and deficiencies identified during audits, including the use of Safety Justification Plans and other arrangements to ensure that issues are not overlooked and that lessons are learned and managed.

AUTHORISATION CONDITION 18 - RADIOLOGICAL PROTECTION

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee makes and implements adequate arrangements to assess the average effective dose for any class or classes of workers. It also requires the Authorisee to notify Defence Nuclear Safety Regulator (DNSR) if the dose exceeds a specified level. This is complementary to the Ionising Radiations Regulations 1999, Regulation 25 compliance of which fulfils this Authorisation Condition.

Scope

2. This guidance relates to the arrangements for assessing the average effective dose for classes of persons identified by the Authorisee.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for radiological protection including personal dosimetry and for the assessment of dosimetry returns.
- b. The classes of persons for whom the average effective dose will be assessed.
- c. The arrangements for assessing, recording and retaining the average effective dose of classes of persons.
- d. The arrangements for identifying and notifying DNSR if the average effective dose exceeds levels specified by DNSR.

AUTHORISATION CONDITION 19 - CONSTRUCTION OR INSTALLATION OF NEW PLANT

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee provides and implements adequate control over the construction and installation of any new facility, transport activity or Naval Reactor Plant (NRP) or system which may affect nuclear safety. The objective is for the Authorisee to plan the design, manufacture, construction and installation. This is to ensure that before the construction takes place a pre-construction safety report is produced to demonstrate the safety of the installation. The Condition gives the power to Defence Nuclear Safety Regulator (DNSR) to prevent the commencement of construction until it is satisfied with the safety case and/or put hold points during the construction process to ensure the installation is being constructed in accordance with the stated intent. DNSR's control can be either through using the direct powers in the Condition or through secondary powers built into the Authorisee's arrangements.

Scope

2. This guidance relates to the control of design, manufacture, construction or installation of any new facility, transport activity or NRP.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel who are responsible for ensuring correct manufacture/construction/assembly and installation activities.
- b. The personnel responsible for managing and supervising work and those responsible for categorising the proposed work.
- c. The arrangements for categorising all proposed work according to the hazard potential.
- d. The arrangements to:
 - (1) ensure that documentation is produced to justify the safety of the undertakings;
 - (2) ensure that such documentation is produced by Suitably Qualified and Experienced Persons (SQEP);
 - (3) ensure that the documents are reviewed by independent SQEP;
 - (4) ensure that the documents are approved through the appropriate due process;
 - (5) produce and keep records of the relevant safety documentation; and

(6) apply lessons learned from other similar projects.

e. The arrangements for managing the work during all phases of design, manufacture, construction or installation, including the assessment of hazards specific to the work and interactions between the broader site. This should demonstrate an integrated approach.

f. The arrangements for the production of a project programme and management plan that includes the arrangements for dividing the work into stages, where appropriate, each of which will have a safety justification and require approval before commencement. Approval hold points and the associated activities should be identified for internal approval activities (typically, internal audit, Independent Peer Review, Nuclear Safety Committee and the Design Authorities), as well as those associated with external approval activities undertaken by DNSR.

AUTHORISATION CONDITION 20 - MODIFICATION TO DESIGN OF PLANT UNDER CONSTRUCTION

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee cannot change the design of an installation once Defence Nuclear Safety Regulator (DNSR) has given its consent or agreement to design, manufacture or construction without going through a proper design change process which assesses the modification in relation to its safety significance and defines the degree of safety justification required. The Condition gives DNSR the power to intervene and stop a modification if it believes there is inadequate safety justification.

Scope

2. This guidance relates to all modifications during design, manufacture, construction and installation.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel who are responsible for ensuring that modifications are managed, controlled and supervised.
- b. The personnel responsible for the managing and supervising of work and those responsible for categorising the proposed work.
- c. The arrangements for categorising or re-categorising modifications according to their safety significance; the management arrangements governing the processing and approval of modifications at each categorisation level; and the safety documentation required for each categorisation level.
- d. The arrangements for implementing the modification in stages, where appropriate, with each stage needing DNSR consent, if specified, before commencement of the next stage.
- e. The safety documentation justifying the safety of the modification describing the level of approval required.
- f. A 'hold point' strategy and the arrangements for defining the appropriate level of approval for each stage.
- g. The arrangements for appointing a committee, whose specific purpose is to approve safety related design changes.
- h. The role of relevant groups or review bodies, the Approving Authority (incorporating the Design Authority) and the involvement of the Nuclear Safety Committee.

- i. The arrangements for approval of modifications.
- j. The arrangements to ensure that where DNSR so specifies, the Authorisee is not to introduce a modification without the consent of DNSR.
- k. The arrangements, if so directed by DNSR, to halt a modification and not to recommence without DNSR consent.

AUTHORISATION CONDITION 21 - COMMISSIONING

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee has adequate arrangements for the commissioning of a new or modified facility, Nuclear Powered Warship (NPW) or transport activity, or Naval Reactor Plant (NRP) or process which may affect safety.

2. The Condition gives the Defence Nuclear Safety Regulator (DNSR) powers to control various stages of commissioning. This is to ensure that the Authorisee demonstrates that the facility, NPW, transport activity NRP or modification has been completed according to the design intent, and the necessary safety implications associated with commissioning have been considered, assessed and shown to be acceptable. Usually a hold point is put at the start of inactive commissioning, i.e. testing systems before the introduction of radioactive materials, and at the start of active commissioning. This latter hold point is to ensure that the Authorisee has demonstrated that the facility is functioning and is safe to allow the introduction of radioactive materials. Finally the Condition gives DNSR the power to control the commencement of routine operations by requiring the Authorisee to produce a pre-operational safety report and seek DNSR's consent to start operations.

Scope

3. This guidance relates to all commissioning of any facility, NPW, transport activity or NRP.

Guidance to Authorisees

4. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements. Including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel who are responsible for ensuring that commissioning trials are carried out safely.
- b. The personnel responsible for managing and supervising the commissioning of new or modified items.
- c. The system to define the commissioning required for each new or modified item. This should clearly differentiate between the testing required to demonstrate the project's design intent and the overall commissioning required to demonstrate correct functioning and fitness for purpose.
- d. The arrangements for commissioning in stages, including inactive and active commissioning, where appropriate, recognising that each stage may require DNSR consent, before starting the next stage.
- e. The arrangements that ensure only Suitably Qualified Experienced Persons control the commissioning process and assess the results of any tests or trials.
- f. The safety documentation justifying the safety of the proposed commissioning and the description of the level of approval required, including the approval of concessions.

g. The arrangements that ensure there are comprehensive and accurate records of test and trial results and that assessment of the results are kept and form part of the commissioning report.

h. The arrangements that ensure that new or modified items which may affect safety are not operated until the appropriate stage of commissioning has been completed. A report of such commissioning has been produced and a safety case(s) has been developed and considered. DNSR will expect all pre-commissioning safety reports to be approved before any inactive and active commissioning takes place. These arrangements also apply after major work to restore the design intent including after such events as a fire when major repair work may be required.

i. The Authorisee should make provision for the Approving Authority (AA) (incorporating the Design Authority) to be integrated into the arrangements for commissioning. The AA is charged with understanding the design intent with respect to the nuclear safety case and representing this design intent at all stages of design, build and commissioning. DNSR will seek assurance that the integrity of the design intent and appropriate configuration control is being maintained. The management of these aspects is normally vested in a committee, which controls safety related design changes. Inactive and active commissioning should be planned and executed to show that the design assumptions have been met.

j. All work with nuclear safety significance should be carried out in accordance with an appropriate procedure. The procedure should undergo a process of review and approval commensurate with its significance to safety.

AUTHORISATION CONDITION 22 - MODIFICATION OR EXPERIMENT ON EXISTING PLANT

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee has adequate arrangements to control all modifications to any facility, Nuclear Powered Warship (NPW), transport activity or Naval Reactor Plant (NRP) on an Authorised site that may affect safety. The Condition also gives Defence Nuclear Safety Regulator (DNSR) the power to control such modifications to ensure that they cannot commence until the Authorisee has adequately demonstrated the safety of the proposal. These powers can be direct or indirect via the Authorisee's own voluntary hold points. The Condition also gives DNSR the power to halt a modification or intervene at any stage in the interest of safety.

Scope

2. This guidance relates to all modifications, trials or experiments carried out on any part of existing facilities, NPW, transport activity, NRP and equipment.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel who are responsible for ensuring that modifications, trials or experiments are managed, controlled and supervised.
- b. The personnel responsible for managing and supervising work and those responsible for categorising the proposed work.
- c. The arrangements for categorising modifications, trials and experiments according to their safety significance; the management arrangements governing the processing and approval of modifications, trials and experiments at each categorisation level; and the safety documentation required for each categorisation level.
- d. The arrangements for considering the affect of modifications on the category of the facility.
- e. The arrangements for ensuring that the procedures for modifications, trials or experiments are implemented, properly controlled, authorised and conducted.
- f. The arrangements for implementing the modification, trial or experiment in stages, where appropriate, with each stage requiring DNSR consent, if specified, before commencement of the next stage.
- g. Producing a 'hold point' strategy and the arrangements for defining the appropriate level of approval for each stage.

- h. The safety documentation justifying the safety of the modification, trial or experiment and the level of approval required.
- i. The role of relevant groups or review bodies, including the involvement of the Nuclear Safety Committee and the Approving Authority (AA) (incorporating the Design Authority).
- j. The arrangements for approval of modifications, trials or experiments.
- k. The Authorisees' arrangements should make provision for the AA to be integrated into the control of modifications and alterations ensuring that operating instructions and procedures are consistent with the Safety Justification and the design intent.
- l. The arrangements to ensure that where DNSR so specifies, the Authorisee is not to introduce a modification without the consent of DNSR.
- m. The arrangements, if so directed by DNSR, to halt a modification and not to recommence without the consent of DNSR.

AUTHORISATION CONDITION 23 - OPERATING RULES

GUIDANCE NOTE

Introduction

1. The safe operation of a nuclear installation results from many factors including the design of the facility, Nuclear Powered Warship (NPW), transport activity or Naval Reactor Plant (NRP), its behaviour under fault or accident conditions and the actions of the operators. It is therefore essential that the totality of these often complex interactions are fully understood. The method of doing this is to require the operator to produce a safety case to justify the operation of the installation.

2. The purpose of this Condition is to ensure that the operational safety case identifies all the necessary conditions and limits of safe operation (CLOSO). Operating rules must then be set to ensure that the safety related facility, NPW, transport activity, NRP, or system is kept within parameters which ensure the safety during normal operation and fault and accident conditions, and allowing an appropriate margin for error where operator action is invoked.

Scope

3. This guidance relates to the operating conditions and limits necessary in the interest of safety, which may also be referred to as operating rules which are generated to prevent a breach of the safe operating envelope.

Guidance to Authorisees

4. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The identification of the safe operating envelope of the facility, NPW, transport activity or NRP from the design limits of individual safety critical components thereof.
- b. The identification in the safety case of appropriate CLOSO, hereafter referred to as operating rules, to be applied by the operator which will keep within its safe design limits allowing a margin for error or oversight.
- c. The arrangements that ensure that any operating rules identified in safety cases have been effectively translated into operational documentation
- d. The management responsibilities of all personnel who are responsible for defining, approving, producing, reviewing and maintaining the operating rules, ensuring a consistent and rigorous link to the design substantiation and design safety case.
- e. The arrangements for dealing with breaches of operating rules including their recording and monitoring to feed into a review process by competent persons with a knowledge of the design limits.
- f. The links with related Authorisation Conditions (AC), e.g. see AC24, along with any other links necessary to ensure that the Authorisee's safety management arrangements are effective and consistently implemented.

- g. The arrangements for ensuring that the appropriate operating rules are derived, reviewed, maintained and approved, including the Defence Nuclear Safety Regulator approval, if specified, via the appropriate clearance route.
- h. The arrangements for ensuring that amendments to operating rules are approved before implementation.
- i. The arrangements for dealing with a breach of an operating rule.
- j. The arrangements for the production and keeping of relevant operational records.
- k. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) supporting the Authorisees in the identification of the operating rules.

AUTHORISATION CONDITION 24 - OPERATING INSTRUCTIONS

GUIDANCE NOTE

Introduction

1. Safety is influenced by the actions of people who control, maintain or service the facility, Nuclear Powered Warship, transport activity or Naval Reactor Plant. It is important given the often complex nature of the safety case for all actions carried out by people to be done in accordance with procedures derived from the design intent and the safety case. It is also important that actions are not carried out on an ad hoc basis without evidence. Therefore the purpose of this Condition is to ensure that all operations which may affect safety, including any instructions to implement conditions and limits of safe operation (CLOSO), are undertaken in accordance with written operating instructions.

Scope

2. This guidance relates to operations that may affect nuclear or radiological safety. However, these can often not be separated in operating instructions from other operations which ensure the satisfactory output from the facility; such operations include the routine day-to-day operations and related activities such as research, trials, maintenance, commissioning and decommissioning.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for implementing (writing and acting upon) written operating instructions.
- b. The arrangements for translating the CLOSO (operating rules) into operating instructions. Such operating instructions should include:
 - (1) step-by-step instructions on how to carry out an operation to ensure that it is undertaken in the way identified in a manner consistent with the design intent and the safety case;
 - (2) instructions to ensure that the CLOSO are complied with (operating rules may be cited explicitly);
 - (3) other instructions necessary in the interests of safety.
- c. The arrangements for ensuring that the operating instructions and CLOSO are made available to personnel as appropriate.
- d. The arrangements for introducing operating instructions, their review, amendment, control and approval, including Defence Nuclear Safety Regulator (DNSR) approval, if specified.
- e. The arrangements for initiating a review of Operating Instructions in the light of operational experience indicating, for example, difficulties in following or understanding them. See also guidance to Authorisation Condition 23 on breach of operating rules.

f. The arrangements for ensuring that when significant changes are made to operating instructions they are submitted to an appropriate internal safety authority for approval, and DNSR if specified.

g. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority), for the provision of information to enable Authorisees to provide operating instructions including any instructions necessary in the interests of safety and any instructions necessary to ensure that any CLOSO are implemented.

AUTHORISATION CONDITION 25 - OPERATIONAL RECORDS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that adequate records are kept regarding the operation, inspection and maintenance of any safety-related facility, Nuclear Powered Warship (NPW), transport activity or Naval Reactor Plant (NRP).

Scope

2. Operational records are those relating to examination, inspection, maintenance, testing and operation of any facility, NPW, transport activity or NRP which may affect safety and records of the amount and location of all radioactive material, including nuclear fuel and radioactive waste, used, processed, stored or accumulated upon the site at any time.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces, are adequate. Consideration should be given to the following:

a. Management responsibilities of all personnel responsible for records associated with the operation, inspection and maintenance of the facility, NPW, transport activity, NRP, process or system.

b. The arrangements for identifying the records to be kept and the retention period. The arrangements for ensuring that records of operations are produced, controlled and retained. Operational records should, where appropriate, include the results of the operation, inspection and maintenance, and the environmental exposure levels experienced.

c. The arrangements for ensuring that baseline records are established and re-established following modifications or changes in operations.

d. The arrangements for the recording and keeping of records of the amount and location of all radioactive material, including waste stored or accumulated on sites and Nuclear Powered Warships.

e. The arrangements for security of records, including duplication and diversity of storage to minimise the risk of accidental destruction.

f. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) to establish what records are to be made of the operations conducted with facilities, NPW, transport activity or NRP and systems as necessary to support approval for service use.

g. The arrangements for operational records permit the Authorisee to review previous operations so as to:

(1) establish an operational baseline for a plant, facility or Nuclear Weapon System;

- (2) confirm that the facility, NPW, transport activity and NRP performance is maintained through life;
 - (3) confirm the continuing validity of the safety case;
 - (4) establish that assumptions regarding operations made in the safety case are realistic;
 - (5) support justification of continued operation in the case of abnormal/ anomalous events, defects etc;
 - (6) allow analysis to support improvements in design or operation Authorisation Condition 14 (AC14);
 - (7) support the berth assessment process, Further Authorisation Condition 2;
- h. A systematic approach should be taken to identify what records should be kept and the reasons for retaining each type of record. This should include such items as operating logs, records of maintenance activities, records of specific trials (which may be covered by Test Forms or Nuclear Procedures), etc.
- i. The arrangements should ensure that the records are maintained so as to meet the requirements of AC6 for security, access and means of retrieval. The coherence of the arrangements with those of other Authorisees is an important factor, where appropriate.

DNSR Expectation

4. The Defence Nuclear Safety Regulator (DNSR) will specify that Authorisees should provide DNSR with records of high activity sealed sources as defined in the Environmental Permitting (England and Wales) Regulations 2010 (SI 2010/675) or the High-Activity Sealed Radioactive Sources and Orphan Sources Regulations 2005 (SI 2005/2686) as appropriate which are held on the Authorised site, and which are not already held under a notification granted by Environment Agency/Scottish Environment Protection Agency, for example as mobile radioactive apparatus in accordance with RSA 93-equivalent or EPR10-equivalent arrangements.

5. MOD has determined that the following radioactive material does not constitute High-Activity Sealed Sources and should not be included in notifications:

- any component of a nuclear weapon;
- any nuclear fuel element;
- any radioactive substance inside a nuclear reactor;
- containers of radioactive material where the radioactive material would not constitute a sealed source in the absence of the container, and the container is for the purpose of storage or transport rather than to ensure the integrity of the source as in ISO 2919:1999.

AUTHORISATION CONDITION 26 - CONTROL AND SUPERVISION OF OPERATIONS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that safety-related operations are carried out only under the control and supervision of Suitably Qualified and Experienced Personnel (SQEP).

Scope

2. This guidance relates to all operations that may affect nuclear or radiological safety.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. The management responsibilities of all the personnel responsible for ensuring that no operations are carried out that may affect nuclear or radiological safety except under the control and supervision of SQEP who have been appointed for that purpose.

b. The arrangements through which the Authorisee gains assurance that personnel, including contractors, working on safety significant tasks are SQEP and appointed for that purpose by the Authorisee.

c. The arrangements for ensuring that personnel working on safety significant tasks on the Authorised site, who are not part of the site Authorisee's organisation, are SQEP and properly appointed for the purpose.

d. The arrangements for ensuring that copies of the operating instructions and conditions and limits of safe operation/operating rules are made available to operating personnel.

e. The arrangements to ensure that there are adequate staffing levels to meet the requirements of the safety case.

AUTHORISATION CONDITION 27 - SAFETY MECHANISMS, DEVICES AND CIRCUITS

GUIDANCE NOTE

Introduction

1. A facility, Nuclear Powered Warship (NPW), transport activity or Naval Reactor Plant (NRP) is designed to have multiple safety systems to provide defence in depth against maloperation, faults or accidents. It is important that at all times there are sufficient safety systems in good working order because by definition they must be able to function on demand and such instances are unpredictable. The purpose of this Condition is therefore to ensure that there are always sufficient and operable safety mechanisms, devices and circuits to provide the necessary defence in depth.

Scope

2. This guidance relates to safety mechanisms, devices and circuits (SMDC) identified in the safety case.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for SMDC, safe operation and for providing instructions that ensure safe operation and maintenance.
- b. The arrangements for ensuring SMDC identified in the safety case are incorporated into operating documentation and approved via the appropriate clearance route (see also Authorisation Condition 24 (AC24)).
- c. The arrangements for ensuring that any element of the facility, NPW, transport activity, NRP or system that may affect nuclear or radiological safety is protected by a SMDC, if identified in the safety case.
- d. The actions to be taken following the operation of those SMDC essential for ensuring safety.
- e. The arrangements for ensuring safe systems of work, including a system of permits to work, is implemented, that the safety system is maintained, tested according to specified procedures, and that safety-related trip or alarm levels are not changed without authorisation.
- f. The arrangements for reporting failures of SMDC on occasions when operation of the SMDC is invoked, and any operation with SMDC not in accordance with the safety case or other instruction.
- g. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) to establish which operating conditions and limits should be governed by the provision of suitable and sufficient SMDC and who will provide information in respect of such safety mechanisms, devices and circuits.

h. The arrangements for ensuring that at all times there are sufficient safety systems operational to ensure operation within the 'safety envelope' defined in the safety case. Any failure to comply with this or any failure of a SMDC discovered for instance during testing should invoke incident reporting arrangements made under AC7. Similarly, should a demand be placed on any SMDC for any reason, the circumstances should also be reported as an incident.

AUTHORISATION CONDITION 28 - EXAMINATION, INSPECTION, MAINTENANCE AND TESTING

GUIDANCE NOTE

Introduction

1. A nuclear installation, like any other complex machine, requires maintenance and if such maintenance is not carried out properly it has the potential to undermine the safety case and put safety at risk. The purpose of this Condition therefore, is to ensure that regular and systematic examination, inspection, maintenance and testing is scheduled, by and under the control of suitably qualified personnel and that records of maintenance activities are kept.

Scope

2. This guidance relates to the correct conduct of Examination, Inspection, Maintenance and Test (EIMT) and the provision of an EIMT schedule.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for:
 - (1) producing and controlling the EIMT schedules for all nuclear safety related equipment;
 - (2) ensuring that all nuclear safety related equipment is examined, inspected, maintained and tested such that it is in a safe condition to enable approved operations to be undertaken;
 - (3) ensuring that only Suitably Qualified and Experienced Persons carry out the EIMT activities, including supervision of the task;
 - (4) ensuring that when any EIMT reveals that safe operation or safe condition may be affected the appropriate action is taken to ensure that the matter is investigated and reported in accordance with the arrangements made under Authorisation Condition 7 (AC7).
- b. The arrangements for producing EIMT Schedules, including how they are derived from the safety cases, describing the operations and the periodicity of EIMT.
- c. The arrangements for ensuring that EIMT schedules are carried out on time (unless Defence Nuclear Safety Regulator has agreed to an extension of the interval specified in the EIMT schedule). It is therefore in the interests of the Authorisee to:
 - (1) identify the limiting safe periodicity for EIMT items;
 - (2) identify a periodicity for EIMT, within the limit defined above, which will give flexibility to suit operational needs.

- d. The arrangements for operating and reviewing the schedule, including recording of results and ensuring that those personnel carrying out the work have the appropriate qualifications and experience.
- e. AC30, Periodic Shutdown, requires EIMT schedules to be adhered to, even if the shut down is necessary to carry out EIMT.
- f. The arrangements for:
 - (1) allowing the suspension or delay in carrying out particular EIMT, specifying the levels at which such suspensions or delays are authorised;
 - (2) ensuring that appropriate action is taken in the event of a failure during EIMT and the requirements for reporting in such circumstances.
 - (3) managing Interfaces between EIMT schedules of different Authorisees.
- g. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) to establish the EIMT requirements.

AUTHORISATION CONDITION 29 - DUTY TO CARRY OUT TESTS, INSPECTIONS AND EXAMINATIONS

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to enable the Defence Nuclear Safety Regulator (DNSR), following consultation, to require the Authorisee to perform any tests, inspections and examinations which it may specify and to be provided with the results.

Scope

2. This guidance relates to the carrying out of tests, inspections and examinations as specified by DNSR in addition to any carried out under Authorisation Condition 28 (AC28).

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for the arrangements to carry out inspections, tests and examinations.
- b. The arrangements for carrying out such inspections, tests and examinations.
- c. The appropriate approval routes for carrying out such inspections, tests and examinations.
- d. The arrangements for assessing such inspections, tests and examinations and providing the results to DNSR.
- e. The arrangements for ensuring the provision of evidence to agreed dates, taking account of the operational requirements.
- f. The arrangements in place for producing and keeping records. Records are considered under AC6.

AUTHORISATION CONDITION 30 - PERIODIC SHUTDOWN

GUIDANCE NOTE

Introduction

1. It may be necessary for operations to be shut down at regular intervals for inspection and testing of essential components. The Examination, Inspection, Maintenance and Testing (EIMT) schedule will define the required intervals. The purpose of this Condition is, therefore, to ensure that shut down is in accordance with the EIMT schedule and these important examination and maintenance activities are carried out. The Condition also gives Defence Nuclear Safety Regulator (DNSR) the power to intervene and require the Authorisee to seek DNSR's consent to restart operations following the completion of the necessary maintenance.

Scope

2. See Introduction.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for the arrangements that ensure that periodic shutdowns are undertaken to meet EIMT requirements.
- b. The arrangements to ensure shutdown to enable scheduled EIMT to be undertaken.
- c. The arrangements for considering, justifying and obtaining the required approval to extend the period before scheduled shutdown and reporting the satisfactory completion of the EIMT.
- d. The arrangements to ensure start up is not commenced unless approved by DNSR where such consent has been required by DNSR.
- e. The arrangement for recording the extension and amending future shutdown plans where applicable.
- f. The arrangements in place for producing and keeping of relevant records of scheduled shutdowns and the work carried out. Records are considered under Authorisation Condition 6 (AC6) and AC25.
- g. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) to enable such EIMT to take place.

AUTHORISATION CONDITION 31 - SHUTDOWN OF SPECIFIED OPERATIONS

GUIDANCE NOTE

Introduction

1. If Defence Nuclear Safety Regulator (DNSR) has concerns about the safety of any activity, and the Authorisee is unable or unwilling to provide the necessary safety justification for continued operation, then DNSR must have the power to order the cessation of the activity. The purpose of this Condition is to give DNSR the power to instruct Authorisees to cease the activity within a given period. Following a direction to cease the Authorisee will require a consent from DNSR to restart the activity.

Scope

2. This guidance relates to the directed cessation of any defence nuclear activities.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for ensuring that there are arrangements to respond to a requirement to shutdown, if directed by DNSR.
- b. The process by which the Authorisee will respond to DNSR's direction to shutdown.
- c. The arrangements through which the restarting of activities will be justified and a consent obtained from DNSR following a shutdown under a DNSR direction.
- d. The arrangements for managing the interface with the Approving Authority (incorporating the Design Authority) to enable shut down within a given period.

AUTHORISATION CONDITION 32 - ACCUMULATION OF RADIOACTIVE WASTE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee has adequate arrangements to ensure that the production and accumulation of radioactive waste is minimised. The Condition also gives Defence Nuclear Safety Regulator (DNSR) the power to ensure that radioactive waste is stored under suitable conditions, and that adequate records are kept to enable DNSR to monitor the management of radioactive waste.

Scope

2. This guidance relates to the arrangements for the storage and minimising the rate of production and the total quantity of radioactive waste accumulated. It also includes the generation and the maintenance of records of the radioactive waste accumulated.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for the accumulation and recording of radioactive waste.
- b. The relevant Environment Agency/Scottish Environment Protection Agency Authorisations (EA/SEPA), permits, Noting Letters and Agreements or their equivalents under EPR10. Where the disposal of any radioactive waste has been authorised or permitted by EA/SEPA, the arrangements in respect of its prior accumulation should be in accordance with any requirements which may have been specified as part of that authorisation or permit, and the existence of such requirements should be explicitly stated. For activities under Crown control the EA and SEPA issue, respectively, approvals or letters of agreement of formal authorisations, or their equivalents under EPR10
- c. The arrangements for minimising the rate of production and total quantity of radioactive waste accumulated.
- d. The arrangements for managing the accumulation and storage of radioactive waste.
- e. The arrangements for the generation of records and the recording of radioactive waste accumulated. These requirements are in addition to the general record keeping requirements in respect of nuclear matter (which includes radioactive waste) considered under Authorisation Condition 4.
- f. The arrangements for ensuring that any conditions, with respect to accumulation of waste, required by the disposal authorisation are clearly identified and met.
- g. Any radioactive waste as a result of an accident involving radioactive material.

AUTHORISATION CONDITION 33 - DISPOSAL OF RADIOACTIVE WASTE

GUIDANCE NOTE

Introduction

1. An Authorisee may wish to store radioactive waste rather than dispose of it even when a suitable disposal route is available. The purpose of this Condition is to give Defence Nuclear Safety Regulator (DNSR) the power to direct the Authorisee to dispose of radioactive waste in these circumstances. DNSR will only give such direction where the disposal is to be carried out in accordance with (as applicable):

a. An Authorisation or permit granted by the appropriate Agency under the Radioactive Substances Act (RSA) 1993 or Environmental Permitting Regulations (EPR) 2010 as appropriate;

b. A corresponding approval or letter of agreement, or equivalent under EPR10, granted by the appropriate Agency under their Memorandum of Understanding with MOD in the case of premises occupied by or on behalf of the Crown for naval, military or air force purposes, to which RSA93 and EPR10 Schedule 23 do not apply;

c. A consent granted by DNSR under Further Authorisation Condition 3 in the case of a radioactive discharge from a Nuclear Powered Warship directly to the environment.

2. In this context the appropriate Agency means, in relation to England, the Environment Agency, in relation to Wales, Natural Resources Wales and, in relation to Scotland, the Scottish Environment Protection Agency.

Scope

3. This guidance relates to the disposal of accumulated or stored radioactive waste.

Guidance to Authorisees

4. Any DNSR direction under this Condition will require disposal to be made in accordance with an existing Authorisation, approval, letter of agreement or consent, as the case may be. The Authorisation Condition Compliance Statement should therefore reference the management arrangements already established for compliance with such Authorisation, approval, letter of agreement or consent and provide assurance that such arrangements would be implemented.

AUTHORISATION CONDITION 34 - LEAKAGE AND ESCAPE OF RADIOACTIVE MATERIAL AND RADIOACTIVE WASTE

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to place a duty on the Authorisee to ensure so far as reasonably practicable that radioactive material and radioactive waste is adequately controlled or contained so as to prevent leaks or escapes, and that in the event of any fault or accident which results in a leak or escape, the radioactive material or radioactive waste can be detected, recorded and reported to Defence Nuclear Safety Regulator (DNSR).

Scope

2. This guidance relates to any potential leakage or escape of solid, liquid or gaseous radioactive material or radioactive waste even when there is no immediate effect on nuclear or radiological safety. The guidance does not apply to discharges or releases of radioactive waste in accordance with an authorisation granted under the Radioactive Substances Act (RSA) 1993, permit granted under Environmental Permitting (England and Wales) Regulations 2010 (EPR10) or equivalent arrangements approved by DNSR.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

- a. The management responsibilities of all personnel responsible for controlling and containing radioactive material and radioactive waste in order to prevent its leakage or escape.
- b. The arrangements for controlling and containing radioactive material and radioactive waste in order to prevent its leakage or escape.
- c. The arrangements for detecting any leakage or escape of radioactive material or radioactive waste.
- d. The arrangements for notifying, recording, investigating and reporting any leakage or escape of radioactive material or radioactive waste. These should be in accordance with the arrangements made under Authorisation Condition 7 (AC7). This should cover not only equipment which provides continuous indication (level alarms, radiation alarms etc.) but also the monitoring activities associated with the storage, such as health physics surveys and regular visual checks.
- e. The Authorisee should define the levels at which reporting of leakage as an incident under AC7, is to be carried out.
- f. Any equipment used for compliance with this Condition should also be subject to the maintenance and testing requirements of AC28.
- g. Maintenance and testing of integrity of waste storage facilities and associated systems and functionality of alarms etc should form part of the arrangements and should meet the requirements of AC28.

AUTHORISATION CONDITION 35 - DECOMMISSIONING

GUIDANCE NOTE

Introduction

1. It is important that when a facility, Nuclear Powered Warship (NPW), transport activity or Naval Reactor Plant (NRP) reaches the end of its operational life it is decommissioned in a safe and controlled manner and not left to pose a hazard for current and future generations. The purpose of this Condition is therefore to require the Authorisee to have adequate arrangements for safe decommissioning. It also gives Defence Nuclear Safety Regulator (DNSR) the power to direct the Authorisee to commence decommissioning or to ensure decommissioning takes place in accordance with any national strategy. The Condition also gives DNSR the power to halt any decommissioning activity if DNSR has concerns about its safety.

Scope

2. This guidance relates to the decommissioning where there are nuclear or radiological hazards.

3. Compliance with applicable Authorisation Conditions is required until it is demonstrated to DNSR's satisfaction that there has ceased to be any danger from ionising radiations.

Guidance to Authorisees

4. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

a. The management responsibilities of all personnel responsible for decommissioning.

b. The overall policy, production of detailed or outline decommissioning and disposal plans with clearly defined 'hold points', the proposed disposal routes and any anticipated problems or areas of future difficulty for decommissioning.

c. The processes governing the maintenance of the capability (including, funding, personnel, equipment and facilities etc.) necessary to ensure that decommissioning can be achieved within a safe timescale.

d. The arrangements to:

(1) categorise equipment and facilities according to their hazard potential;

(2) ensure that the documentation is produced by Suitably Qualified and Experienced Persons (SQEP);

(3) ensure that the documents are reviewed by independent suitably SQEP.

(4) ensure that the documents are approved at the appropriate level;

(5) produce and keep records of the relevant safety documentation;

(6) apply lessons learned from other decommissioning projects.

- e. DNSR may consent to de-Authorisation where there is a clear programme for the removal of all residual activity to a level agreed, where applicable, with ONR and Environment Agency/Scottish Environment Protection Agency, and there is a demonstrable commitment that this programme will be met.
- f. The management interface arrangements with the Approving Authority (incorporating the Design Authority) to enable decommissioning within a given period.

AUTHORISATION CONDITION 36 - ORGANISATIONAL CAPABILITY

GUIDANCE NOTE

Introduction

1. The purpose of this Condition is to ensure that the Authorisee maintains adequate financial and human resources to ensure the safety of Authorised activities, and has adequate arrangements to control any change to its organisational structure or resources which could affect safety. These arrangements require the Authorisee to assess the safety implications of any proposed changes before they are carried out. For changes that could have a significant effect on safety if they are inadequately conceived or executed the Condition gives the Defence Nuclear Safety Regulator (DNSR) the power to require the Authorisee to submit a safety case to DNSR, and to prevent the change from taking place until DNSR is satisfied that the safety implications are understood and that there will be no lowering of safety standards. The Condition also gives DNSR the power to halt any change that has commenced if there is a concern that the safety implications have not been adequately considered.

Scope

2. This guidance provides advice on the arrangements for maintenance of adequate financial and human resources and the management of change to the organisation which delivers and manages safety. The scope of organisational changes ranges from high level changes, e.g. management board reorganisations or agency mergers, to low level changes; this includes the reduction of manpower in response to cost saving measures and the increased use of contractors. The arrangements should reflect the roles needed to carry out the full range of Authorised activities including normal operations, decommissioning projects, maintenance, examination and testing, emergency response, etc. The governance of nuclear safety and Intelligent Customer functions are an integral part of the nuclear baseline.

Guidance to Authorisees

3. The Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements, including interfaces are adequate. Consideration should be given to the following:

Adequate Arrangements

4. The Authorisee should demonstrate that adequate arrangements have been made and implemented to provide and maintain adequate financial and human resources, and to control any changes to the organisational structure or resources. Such arrangements should include a description of the Authorisee's:

- a. nuclear baseline;
- b. procedures for organisational change;
- c. arrangements for assessing and obtaining the financial resources necessary to continue to ensure the safety of Authorised activities.

Nuclear Baseline

5. The nuclear baseline should be documented, and that documentation should identify and justify all safety significant aspects of the organisation, including:

- a. The purpose of the organisation.
- b. Senior management and their responsibilities.
- c. Lines of accountability from the workforce to senior management.
- d. Description of the staff comprising the organisation, including:
 - (1) numbers of staff required;
 - (2) identification of posts with safety responsibilities, including those with safety responsibilities to the Authorisee but not part of his organisation, requiring the post holders to be Suitably Qualified and Experienced Persons (SQEP); there needs to be an emphasis on sufficient in-house technical resource and Intelligent Customer aspects;
 - (3) identification of posts with specific safety responsibilities requiring the post holders to be Duly Authorised Persons;
 - (4) terms of reference and job descriptions; and
 - (5) training, qualification and experience requirements plan.
- e. Arrangements for the employment of contractors.

Procedures for Organisation Change

- 6.
- a. **Role of Senior Management.** A statement of senior management commitment should be produced, including: acceptance of their responsibility; recognition that the management of safety is a key business objective; and a description of control of their organisation.
 - b. **Project Management.** The arrangements for proactive management of the change should be described, including the means by which proposed changes are to be planned, developed, assessed and subsequently implemented.
 - c. **Review and Assessment.** The arrangements for independent review and assessment, depending upon categorisation, should be described, including any arrangements for independent peer review.
 - d. **Audit and Feedback.** The arrangements for audit of an organisation post implementation of change should be described, to provide assurance that the change has been correctly implemented, and that the arrangements are robust on completion.

Categorisation

7. As with equipment modifications, changes to the organisational structure or resources are to be categorised according to their safety significance. This is to enable the application of a degree of scrutiny and review commensurate to the impact of the proposed change. This in turn should be based upon an assessment of the consequences of a management failure due to the organisational changes and the subsequent loss of control of a safety significant activity.

Documentation

8. The arrangements should provide for adequate documentation to justify any proposed change. This should include:

- a. Recognition of the safety implicated aspects of the nuclear baseline arrangements.
- b. Consideration of options.
- c. Principles for change.
- d. Demonstration of how the revised organisation is to function, highlighting the effect of change from the datum.

Submission

9. The Authorisee's arrangements should cover the submission of any documentation called for review by DNSR.

Approval of Specified Arrangements

10. The Authorisee should recognise the need for DNSR to review any proposed change and be prepared to stop the change or operational programme if DNSR is not satisfied with the safety implications.

11. Organisations may use their Compliance arrangements for Authorisation Condition 22 as a framework.

Annex C to Chapter 1: Guidance on the Application of Further Authorisation Conditions

- FAC1 Duty of Co-operation
- FAC2 Operational Berths
- FAC3 Radioactive Discharges
- FAC4 Transport Packages

FURTHER AUTHORISATION CONDITION 1 - DUTY OF COOPERATION

GUIDANCE NOTE

Introduction

1. This condition results from the mobility of reactors and weapons in the Defence Nuclear Programmes, and the separate responsibilities of Approving Authorities. The first purpose of the condition is to maintain coherent arrangements between Authorisees to ensure the safe transfer of reactors or weapons from one to the other. The second purpose of the condition is to maintain arrangements for co-operation between Authorisees and Approving Authorities to ensure that appropriate design control is exercised throughout reactor or weapon life and across life-cycle phases (in the nuclear weapons programme this complements the requirements of Approving and Design Authorities Conditions (ADAC)). Finally, the condition ensures that arrangements are made for co-operation with independent organisations (e.g. contractors) and internally within the Authorisee's organisation where this is necessary to maintain safety.

Scope

2. This guidance relates to the factors which Authorisees should consider to ensure that they co-operate with other Authorisees, with the Approving Authorities and with other organisations (both external and internally).

Guidance to Authorisees

3. The responsibility for nuclear and radiological safety within the Defence Nuclear Programmes remains ultimately with the Authorisee and cannot be delegated to another body/person.

4. The Further Authorisation Condition Compliance Statement should be sufficiently comprehensive to provide the basis for evidence that the safety management organisation and arrangements are adequate. Consideration should be given to the following:

- a. The management responsibilities for all personnel who interface with other Authorisees which transfer reactors or weapons across the boundary;
- b. The documented arrangements which provide for the coherent management of such transfers including reference to the other Authorisees' arrangements;
- c. The management responsibilities for all personnel who interface with Approving Authorities which provide information on reactors or weapons;
- d. The documented arrangements which provide for intelligent management of such information including reference to the Approving Authorities' arrangements;
- e. The arrangements by which the Authorisee provides assurance about nuclear and radiological safety;
- f. The contractual or other enforceable arrangements to cover the nuclear and radiological safety responsibilities of external organisations;
- g. The documented arrangements for internal co-operation including links with related Authorisation Condition (AC), notably AC17 and AC36, necessary to ensure that the Authorisee's safety management arrangements are effective and consistently implemented.

FURTHER AUTHORISATION CONDITION 2 - OPERATIONAL BERTHS

GUIDANCE NOTE

Introduction

1. This Condition results from the need for Nuclear Powered Warships (NPW) to berth at operational locations outside Authorised sites including those in foreign countries. The purpose of the Condition is to ensure that regulatory consent is obtained for the use, and the scope of such use, of an operational berth by a NPW. Operational Berths (OB) form de facto temporary nuclear sites. The management arrangements need to take account of the hazards and risks in a targeted and proportionate manner while remaining cognisant of national and international political aspects. In the case of foreign berths, arrangements consistent with those in the UK need to be demonstrated, so far as is reasonably practicable. As with other aspects of NPW operations, the basic requirement is that the risks associated with the use of the berth should be As Low As Reasonably Practicable (ALARP).

Scope

2. There is no specific limitation on the activities that may be conducted at an OB. However, the activities need to be fully scoped and described, with the appropriate arrangements put in place to ensure adequate margins of safety and demonstration of ALARP. A clear articulation of the scope of activity is therefore an essential precursor to justifying the use of a berth. The submission should be linked to the scope of activity, with a targeted and proportionate response to high risk activities. Wherever possible, source information (e.g. Naval Reactor Plant (NRP) and Nuclear Weapon safety analyses) should be referenced. It should also be clearly demonstrated that any conditions or limits identified in source documents have been implemented. Siting principles (e.g. ONR SAP ST.1 *et seq*) should be addressed, and the “Devonport Comparator” should be considered to be a maximum acceptable population density without an appropriate ALARP case being made. Regulatory consent will be limited to those activities included within the scope; additional activities that have nuclear safety implications will require further specific formal regulatory consent.

Visiting Nuclear Powered Warships

3. Visiting NPW will be considered on the same basis as Royal Navy NPW. Arrangements should be in place at all UK (including berths in Authorised sites) and Overseas Territory berths for visiting NPW that mirror those for UK NPW up to the edge of the quay, berth or other structure. Arrangements aboard the vessel are exempt from UK legislation as described in Part 1 Annex A to Chapter 2. The Standard Statements of the United Kingdom, United States and France (see JSP 518 Part 2 Annex E to Chapter 1) should be taken as assurance of the standards of safety for their NPW.

REPPIR

4. Although legally only applicable to UK and Gibraltar, the principles of REPPIR should be applied to all OB. A Report of Assessment should be prepared for all OB, but for those outside UK or Gibraltar it will only need to be submitted to the Defence Nuclear Safety Regulator (DNSR). In determining “reasonable foreseeability”, the use of time at risk arguments to reduce probability should not be employed. However, any emergency arrangements required (e.g. co-located support) need only be in place when the berth is occupied. Where there is likely to be an urgent need for berthing before co-located assets can be deployed, contingency arrangements should be identified, which may be generic for all berths if this is deemed appropriate. Consent to use an OB will be conditional upon reassessment of the berth by the operator at intervals not exceeding three years, based upon the REPPIR review frequency.

FURTHER AUTHORISATION CONDITION 3 - RADIOACTIVE DISCHARGES

GUIDANCE NOTE

Introduction

1. This condition results from the need for environmental controls equivalent to those in legislation to apply to all parts of the Defence Nuclear Programmes. The purpose of this Condition is to ensure that discharges of radioactive material are minimised and controlled and subject to regulatory consent.

Scope

2. The discharge of radioactive material to the environment from defence licensed sites is regulated by the statutory regulators (Environment Agency/Scottish Environment Protection Agency (EA/SEPA)) under the Environmental Permitting (England and Wales) Regulations 2010 (EPR10) and the Radioactive Substances Act 1993 (RSA93). EPR10 Schedule 23 and RSA93 do not apply to premises occupied on behalf of the Crown for naval, military or air force purposes (Section 42 and Schedule 4 refer respectively). However, radioactive discharges from non-licensed, Authorised sites are subject to regulation by EA/SEPA in accordance with agreements between MOD and EA/SEPA. This EA/SEPA regulation specifically does not cover discharges directly to the environment from Nuclear Powered Warships (NPW) either within licensed or Authorised sites or outwith such sites.

3. By the nature of reactor and weapon design, gaseous radioactive discharges arise from both the weapon and propulsion programmes. Discharges of low-level liquid radioactive waste arise from the propulsion programme, and liquid radioactive waste may also arise from the weapon programme as a result of oxidation and condensation of original gaseous material.

4. The scope of the Defence Nuclear Safety Regulator (DNSR) regulation under Further Authorisation Condition 3 (FAC3), and in particular the direction referred to at Clause (2) thereof, is specifically limited to those parts of the programme which are not subject to regulation by EA/SEPA either under EPR10, RSA93 or by agreement with MOD: i.e. to discharges directly to the environment from NPW. Thus DNSR will only issue consents under FAC3 in relation to the following activities:

- a. low-level gaseous radioactive discharges from NPW directly to the environment;
- b. the discharge of low-level liquid radioactive waste from NPW directly to the environment where it is not practicable for this to be transferred ashore for processing and discharge under EA/SEPA regulation; for practical purposes it is anticipated that this will be restricted to the discharge of low-level liquid radioactive waste from submarines at sea.

5. All other radioactive waste from NPW should be transferred ashore for processing and discharge under EA/SEPA regulation.

6. Further, DNSR consents under FAC3 will cover only discharges arising from routine NPW operations and specifically not discharges which may arise as a result of an accident or emergency.

Submissions for Consent

7. In all cases discharges are anticipated to be low but, as a minimum, one-off assessments should be carried out on a pessimistic basis to estimate the maximum quantities of radioactive material which may be discharged. Comparison with applicable quantities set out in Exemption Orders made under EPR10 or RSA93 or equivalent may confirm that no regulatory consent to discharge is required. Alternatively such consent may be required either on a regular or precautionary basis.
8. Duty Holders as identified below are responsible for carrying out the necessary assessments and seeking DNSR consent as required:
 - a. Site Authorisees (with support from Approving Authorities) are responsible for carrying out the assessments and seeking DNSR consent as required to discharge gaseous radioactive waste from NPW within their Authorised site;
 - b. Authorisees for the “at sea” phase (with support from Approving Authorities) are responsible for carrying out the assessments and seeking DNSR consent as required to discharge gaseous radioactive waste from NPW at operational berths and at sea;
 - c. Authorisees for the “at sea” phase (with support from Approving Authorities) are responsible for carrying out the assessments and seeking DNSR consent as required to discharge liquid radioactive waste from NPW at sea.
9. The submission should address the following key objectives:
 - a. to show that all discharges of radioactive waste are minimised and controlled;
 - b. to identify the arrangements for maintaining records of discharges and the particular details which will be recorded;
 - c. to demonstrate that the resulting radiation doses received by members of the public are As Low As Reasonably Practicable (ALARP);
 - d. to estimate by calculation/modelling etc. the radiological consequences arising (or upper bound thereof), in particular the resulting radiation doses to members of the public, and to show that these are below dose constraints for radioactive waste discharges as set out in extant Government or similar publications;
 - e. To identify any requirement for environmental monitoring in order to validate the estimated radiological consequences or conversely to demonstrate that in view of the very low levels of the discharges no such monitoring is required.
10. Submissions for consent to discharge should address each applicable paragraph of the FAC, and should identify a date for review.
11. While not prescriptive, it is anticipated that submissions will cover all routine discharges over a defined period (a period of one year will normally be suitable), with limits proposed on a bounding basis in respect of each identified site (i.e. Authorised site or Operational Berth) and, on an aggregated basis, for all discharges outwith designated sites (i.e. at sea). In principle, the form of the submission should be consistent with EA requirements under EPR10 or RSA93 but moderated as appropriate on a proportionate basis reflecting the very low levels of discharge in this case. For example simple bounding estimates may be used to estimate radiological consequences where it can be shown that these are well below regulatory concern. It is anticipated that this will normally be the case.

DNSR Expectations

12. DNSR will conduct assessments in accordance with the principles and methodologies adopted for this purpose by EA under EPR10 or RSA93, moderated as appropriate on a proportionate basis reflecting the very low levels of discharge in this case. Detailed guidance is set out in a DNSR Technical Assessment Guide¹.

13. Regulatory consent to discharge will be conditional upon continued compliance with the arrangements set out in the submission, including periodic review. DNSR may specify the duration of a consent, and may review consents in light of any significant change in circumstances. Any breach of a consent should be notified to DNSR immediately.

¹ DNSR/TAG/008, DNSR Guidance on the Regulation of Radioactive Discharges.

FURTHER AUTHORISATION CONDITION 4 - TRANSPORT PACKAGES

GUIDANCE NOTE

Introduction

1. This Condition results from the Defence Nuclear Safety Regulator's (DNSR's) role as Defence Competent Authority for transport packages which is consequent on exemptions in legislation. The purpose of this Condition is to ensure that transport of radioactive material is adequately safe from a radiological and nuclear safety viewpoint. The associated requirements for containment, control of radiation, and control of contamination are more stringent than those often adopted on a site because carriers cannot in general control potential hazards in the manner which is customary on a nuclear site, and because any radiation shine or release of radioactive (RA) material from a package in transport is likely to be directly onto a public road or other area frequented by members of the public.

Scope

2. Any transport of RA material outside a fixed site. For the precise scope see the International Atomic Energy Agency (IAEA) 'Regulations for the Safe Transport of Radioactive Material, 2012 Edition' (SSR-6) (hereafter referred to as the Regulations) paragraphs 106 and 107.

3. In Further Authorisation Condition (FAC) 4 and this Guidance Note the meaning of 'transport' is as defined in paragraph 106 of the Regulations, i.e. 'transport' comprises 'all operations and conditions associated with and involved in the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of RA material and packages'.

Guidance to Authorisees and Duty Holders

Competent Authority Approval

4. Competent Authority approval is required for certain packages, in particular Type B and Type C packages and those containing fissile material (see the Regulations paragraph 802 etc.). Submissions for such packages should be made 12 months before the intended first use or before the expiry of an extant certificate.

5. In general package approval certificates issued by DNSR will be valid for 5 years, after which a 'Periodic Review' and re-approval by DNSR is required prior to continued use.

Presentation of Safety Cases for Packages

6. Safety cases for packages requiring Competent Authority approval should be presented in a form which is reasonably easy for assessors to gain an overview of the design and design substantiation prior to delving into the detail. DNSR has issued further guidance on this subject in the DNSR Applicants Guide (see Annex A to Chapter 1 of this JSP). Package Design Safety Reports should follow the format defined by the DNSR Applicants Guide, which is specifically designed to ensure that all relevant clauses within the Regulations are duly considered.

7. In respect of format and presentation safety cases of US origin compliant with the US NRC/Department of Energy requirements for the format of 'Safety Analysis Reports for Packagings' are acceptable to DNSR if they adequately address all appropriate issues and contain a 'cross reference' table setting out where in the report each requirement of the regulations is addressed (see the DNSR Applicant's Guide).

Interpretation of the Regulations

8. In interpreting the Regulations and the adequacy of management arrangements for safety Duty Holders should take note of:

International Atomic Energy Authority Standards, including:

GS-R-3
TS-G-1.1
TS-G-1.2
TS-G-1.3
TS-G-1.4
TS-G-1.5
TS-G-1.6

Guidance issued by ONR (formerly the DfT) including:

‘An Applicant’s Guide to the Suitability of Elastomeric Seal Materials for Use In Radioactive Material Transport Packages’

‘A DfT Guide to the Approval of Freight Containers as Type IP-2 and Type IP-3 Packages’

US Guidance

On occasion it may be appropriate to take note of the approaches required and/or recommended by the NRC (in CFR 71 and the NUREGs) when addressing aspects of the design and substantiation of package designs, in particular where the point is not clearly covered by IAEA or UK/EU standards.

Periodic Review

9. Safety cases for ‘Periodic Reviews’ of packages should generally be presented to the standard required for new packages. This does not preclude justification of ‘grandfather rights’ for older designs.

Marking, Labelling, and Placarding: Security Considerations

10. Packages and associated conveyances should normally be marked, labelled, and placarded in accordance with the Regulations. However if the package has a dedicated escort/guard, and the escort/guard is in possession of both the information that would normally be visible on the package and/or conveyance and appropriate emergency response orders, then if necessary to improve security visible placards and labels may be omitted.

Transport of Radioactive Material within Fixed Sites

11. Compliance with the requirements for the transport of RA material between sites will almost always be sufficient to meet the requirements for the safety of transport of RA material within a large site. Alternative approaches are however permissible.

Emergency Response

12. Given appropriate interface arrangements it is acceptable for MOD rather than the consignor to be responsible for transport emergency response plans

DNSR Expectations

13. DNSR uses internationally accepted standards as expressed in the extant issue of the 'Regulations for the Safe Transport of Radioactive Material' (SSR-6) issued by the UN International Atomic Energy Agency (see Part 1 Ch 2). For consistency with other Authorisation Conditions, FAC4 has been drafted in a matter that is similar to the wording of the ONR Licence Conditions. However Duty Holders should be aware that DNSR is most unlikely to accept any management arrangements for the transport of radioactive material which do not provide that:

- a. all 'transport' activities are to be carried out in accordance with the extant issue of the Regulations, except where specifically agreed with DNSR;
- b. packages for RA material are to have safety cases which demonstrate compliance with the Regulations as interpreted by DNSR;
- c. safety cases for packages containing both Class 7 and Class 1 material (as defined in the United Nations regulations) are to address the possibility of an explosion within the package and to demonstrate compliance with any requirements of the Chief Inspector Explosives (MOD);
- d. safety cases for packages containing both fissile material and a substantial quantity of Class 1 material may be assessed by reference to SAP (Part 2 Chapter 2).

14. It follows that in practice all packages are to be designed, manufactured, inspected, tested, loaded, and used in accordance with the Regulations, and that submissions are to be made to DNSR for those packages for which the Regulations require Competent Authority approval.

15. Duty Holders, including consignors and carriers, are to rehearse their accident and emergency arrangements at such intervals and at such times and to such extent as DNSR may specify.

Annex D to Chapter 1: Guidance on the Application of the Approving and Design Authorities Conditions

Introductory Note

- 1 Interpretation
- 3 Management of Interface Arrangements
- 6 Documents, Records, Authorities and Certificates
- 7 Incidents
- 9 Information on Hazards
- 10 Information on Training
- 11 Emergency Arrangements
- 12 Suitably Qualified and Experienced Persons
- 13 Nuclear Safety Committee
- 14 Safety Documentation
- 15 Periodic Review
- 16 Diagrams, Designs and Specifications
- 17 Management Systems
- 19 Design of a Nuclear Weapon, Component or Relevant Support Equipment
- 21 Approval for Use
- 22 Modification to Nuclear Weapons, Components or Relevant Support Equipment
- 23 Conditions and Limits of Safe Operation
- 24 Operating Instructions
- 25 Operational Records
- 27 Safety Mechanisms, Devices and Circuits
- 28 Examination, Inspection, Maintenance and Testing
- 30 Periodic Withdrawal
- 31 Withdrawal of Approval
- 35 Decommissioning
- 36 Organisational Capability

Introductory Note

1. The following Approving and Design Authorities Condition (ADAC) Guidance Notes have been developed to aid the Accreditee with the interpretation of each ADAC and to provide guidance on the content of the ADAC Compliance Statement. Compliance with the Approving and Design Authorities (ADA) Conditions is mandatory.
2. For the purposes of these Guidance Notes 'Accreditee' includes the Approving Authority and the Atomic Weapons Establishment Design Authority.
3. When compiling Compliance Statements, authors are encouraged to consider the guidance offered in this Annex and also the broader HSG65 framework.

APPROVING & DESIGN AUTHORITIES CONDITION 1 - INTERPRETATION

GUIDANCE NOTE

Purpose and Scope

1. The purpose of this Approving and Design Authorities Condition (ADAC) is to ensure that there is no ambiguity in the use of certain terms that are found in the text of the ADAC.

APPROVING & DESIGN AUTHORITIES CONDITION 3 - MANAGEMENT OF INTERFACE ARRANGEMENTS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee:
 - a. Provides adequate information on nuclear weapons, components and relevant support equipment safety to each Authorisee and within the Accreditee, to enable Authorisees and the Accreditee to discharge their nuclear weapon and radiological safety responsibilities.
 - b. Has adequate arrangements in place to gain assurance that the activities undertaken by the Authorisees will not compromise the intrinsic safety of the nuclear weapons, components or relevant support equipment.

Scope

2. This advice relates to the provision of management information to and from Authorisees, suppliers and within the Accreditee.

Guidance on ADAC Compliance Statements

3. Consideration should be given to the following:
 - a. The responsibilities of Accreditee personnel for the interface arrangements with the Authorisees and within the Accreditee, including the management structure, responsibilities and interactions between the associated organisations, committees and individuals.
 - b. The arrangements to ensure the provision of adequate information on nuclear weapons, components and relevant support equipment safety to each Authorisee and within the Accreditee to enable them to discharge their nuclear and radiological safety responsibilities.
 - c. The arrangements the Accreditee has in place to gain assurance that the activities undertaken by Authorisees or the Accreditee will not compromise the intrinsic safety of a nuclear weapon, component or relevant support equipment.
 - d. The contracts and customers supplier agreements etc. with customers, suppliers, Authorisees and within the Accreditee.

DNSR Expectation

4. With regard to ADAC3(1) the Defence Nuclear Safety Regulator-Nuclear Weapon Regulator expects an Authorisee, Design Authority (DA) or Approving Authority (AA) which has an interface affecting nuclear safety with another Authorisee, DA or AA to agree a 'Documented Arrangement' with the other party which is to define, with respect to nuclear safety, the responsibilities of the parties as they affect the other.

APPROVING & DESIGN AUTHORITIES CONDITION 6 - DOCUMENTS, RECORDS, AUTHORITIES AND CERTIFICATES

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee generates and maintains adequate records to demonstrate compliance with all the regulatory requirements throughout all project phases, including decommissioning.

Scope

2. The records referred to are those necessary to demonstrate compliance with each ADAC. The Compliance Statement should also identify the arrangements for the preservation and storage of records.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The arrangements for controlling documentation, its storage and preservation, including the maintenance and means of retrieval against the challenge of obsolescence.
 - c. The arrangements for establishing the minimum timescale for the maintenance of records².
 - d. The arrangement for safeguarding records against hazards.
 - e. The maintenance of adequate records of the design, safety justification, production, testing, operation, support, modification and decommissioning of nuclear weapons, components and relevant support equipment.

² Unless agreement to the contrary has been reached with DNSR or there are longer statutory periods (i.e. 50 years for over exposure reports, IRR99 Regs. 23 and 28) the period for retention of records is 30 years.

APPROVING & DESIGN AUTHORITIES CONDITION 7 - INCIDENTS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accredee has adequate arrangements in place:

a. To assist Authorisees in the investigation and reporting of accidents, incidents or anomalous events that may occur whilst a nuclear weapon, component or relevant support equipment is in their custody.

b. For the notification, recording, investigation and reporting of any condition or anomalous condition that may affect nuclear or radiological safety of a nuclear weapon, component or relevant support equipment revealed through Accredee sponsored activities.

Scope

2. This Condition relates to the provision of support to an Authorisee during the investigation and reporting activity resulting from an accident or major incident to the more routine investigations associated with minor defects to equipment or procedural anomalies. The arrangements should address, amongst other things, the notification, recording, investigation and reporting of any anomalous conditions that may be identified by the Accredee, e.g. during stockpile surveillance activities. It includes the communication of lessons learned to avoid repetition and minimise the consequences of similar events.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.

b. The arrangements governing the notification, recording, investigation and reporting of anomalous conditions revealed through Accredee activities. The arrangements should include:

(1) the processes and procedures employed to compile, approve, maintain the arrangements up to date;

(2) the processes and procedures necessary to integrate the Accredee management arrangements with those of each Authorisee; and

(3) the arrangements for alerting and advising the Authorisees and Defence Nuclear Safety Regulator.

c. The arrangements to co-operate with Authorisees in the categorisation of accidents, incidents and anomalous events.

d. The arrangements for:

(1) appointing personnel to implement and supervise the arrangements;

- (2) ensuring staff awareness of the need for reporting;
- (3) ensuring an open approach to the reporting and assessment of incidents;
- (4) specifying the appropriate level of investigation;
- (5) implementing recommendations;
- (6) ensuring staff awareness of the lessons learned from incidents and anomalous events;
- (7) reviewing and reporting; and
- (8) the control and storage of records.

APPROVING & DESIGN AUTHORITIES CONDITION 9 - INFORMATION ON HAZARDS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accredittee implements adequate arrangements to provide each Authorisee with information so that they are aware of the hazards and consequences associated with nuclear weapon, component and relevant support equipment, the associated precautions to be observed and the action to be taken in the event of an accident or emergency.

Scope

2. This Condition covers the provision of information to Authorisees to enable them to assess the risk from the presence of nuclear weapons, nuclear components or relevant support equipment, the precautions to be observed and the action to be taken in the event of an accident or emergency.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The arrangements for determining, approving and maintaining up to date the information provided to Authorisees, including an audit trail back to the source document.
 - c. The arrangements for transmitting information to the Authorisees.
 - d. Where appropriate the arrangements for assessing that the Authorisees have correctly interpreted the information.

APPROVING & DESIGN AUTHORITIES CONDITION 10 - INFORMATION ON TRAINING

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has arrangements to provide information to Authorisees on suitable training for those who conduct operations with a nuclear weapon, component or relevant support equipment to enable them to establish their training needs.

Scope

2. This Condition covers the generation and transfer of information to Authorisees to enable them to establish their training needs.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
- b. The processes and procedures employed in order to generate the information on training requirements.
- c. The arrangements for ensuring that information provided to Authorisees is kept up to date.

APPROVING & DESIGN AUTHORITIES CONDITION 11 - EMERGENCY ARRANGEMENTS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has arrangements to provide information and support to Authorisees in the event of an accident or emergency.

Scope

2. This Condition relates to the arrangements the Accreditee has in place to provide information and support to Authorisees during the render safe and recovery activities immediately following an accident or emergency.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The arrangements for providing suitable information and support to Authorisees in the event of an accident or emergency.

APPROVING & DESIGN AUTHORITIES CONDITIONS 12 - SUITABLY QUALIFIED AND EXPERIENCED PERSONS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure:
 - a. That only Accreditee's staff that are Suitably Qualified and Experienced Persons (SQEP) perform duties which may affect the safety of a nuclear weapon, component or relevant support equipment; and
 - b. That adequate arrangements exist to provide information to Authorisees about the qualifications and experience required by their personnel responsible for conducting operations with a nuclear weapon, component or relevant support equipment.

Scope

2. This Condition relates to SQEP within the Accreditee and also the provision of information to Authorisees to assist them in determining their SQEP requirements.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
 - a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The arrangements for compiling, maintaining and approving post requirements.
 - c. The methods of defining the classification of each post and the arrangements for managing the classification.
 - d. The arrangements to ensure that only SQEP carry out duties that may affect nuclear or radiological safety.
 - e. The arrangements for the management of 'waivers'.
 - f. The arrangements for identifying and planning for the provision of future SQEP requirements.
 - g. The arrangements for providing information to Authorisees to assist them in determining the qualifications and experience required by their staff.

DNSR Expectation

4. With regard to ADAC12 (1) Defence Nuclear Safety Regulator (DNSR) expects:
 - a. The Accreditee to classify posts, typically in three classifications, in the organisation according to the safety significance of the post and to agree the classification scheme with DNSR.

- b. To give agreement to those posts in the highest classification and to agree the qualifications and experience relevant to each of the posts.
- c. To give agreement to waivers where it is proposed to appoint a person to a post in the highest classification where the person proposed does not possess all the qualifications and experience agreed for the post.

APPROVING & DESIGN AUTHORITIES CONDITION 13 - NUCLEAR SAFETY COMMITTEE

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure the Accreditee has arrangements for ensuring that a Nuclear Safety Committee (NSC) (or committees) is established to consider and give independent advice on matters that may affect the nuclear or radiological safety of nuclear weapons, components or relevant support equipment.

Scope

2. This advice relates to the NSC and any subordinate committee(s) or working group(s)³ that report to NSC. The scope also covers all those aspects that are required by other Conditions and any topic requested by the Accreditee.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The responsibilities of all personnel associated with the NSC.
 - b. The Terms of Reference (ToR) for the NSC and any subordinate committee(s) or working group(s) that reports to the NSC. The arrangements for forwarding the ToR to the Defence Nuclear Safety Regulator (DNSR) for approval.
 - c. The overarching committee and working group structure within the Accreditee, defining the interactions between the NSC, committees and working groups.
 - d. The constitution of each committee, in particular the rules of attendance, what constitutes a quorum, the number of independent members, and members' experience and qualifications.
 - e. The arrangements for managing the committee(s) and working group(s) reporting to the NSC.
 - f. The arrangements for making appointments to the NSC, subsidiary committee(s) and working group(s), including the provision of information to DNSR covering the name, experience, qualifications and details of current and past posts held by each member.
 - g. The status of the NSC advice and the action to be taken in the event that the advice of the NSC or subsidiary committee(s) is rejected. This should include the reporting of such matters to the DNSR.
 - h. The arrangements for managing the committee(s) and working group(s) reporting to the NSC.

³ It is anticipated that the Compliance Statement will include and integrate the roles of the Trident Safety Committee and AWE Warhead Safety Committee etc.

- i. The arrangements for emergency meetings or out of committee decisions, when urgent advice is sought, but a properly constituted meeting is not practicable.
- j. The arrangements that ensure a record of the committee(s) membership, the minutes of meetings, papers and reports considered are maintained.

DNSR Expectation

- 4. DNSR is to specifically approve the Compliance Statement for this ADAC.

APPROVING & DESIGN AUTHORITIES CONDITION 14 - SAFETY DOCUMENTATION

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has arrangements for the preparation and assessment of safety cases and safety related documentation to ensure the intrinsic safety of the nuclear weapons, components and relevant support equipment. It also includes the preparation and assessment of safety information provided to the Authorisees to enable them to justify the safety of their operations.

Scope

2. This Condition requires the Accreditee to have management arrangements to encompass:

- a. All safety documentation that has implications for nuclear weapons, components and relevant support equipment; and
- b. The design, activities including research, trials, development, manufacture, operation, setting to work and decommissioning of the equipment.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
- b. The management arrangements governing the preparations, review and approval of safety documentation, including:
 - (1) the arrangements within the Accreditee and between the Accreditee and Authorisee; and
 - (2) the submission of documentation to Defence Nuclear Safety Regulator (DNSR).
- c. The arrangements for transmitting safety information to the Authorisees.

DNSR Expectation

4. With regard to ADAC14 (1) DNSR expects:

- a. The Accreditee to categorise safety documentation according to safety significance.
- b. To give agreement to safety documentation in the highest class.
- c. To be able to 'call in' any documentation.

APPROVING & DESIGN AUTHORITIES CONDITION 15 - PERIODIC REVIEW

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has arrangements for the periodic and systematic review and reassessment of safety cases and safety information.

Scope

2. This review should seek to ensure the continued safety of the nuclear weapon, components and relevant support equipment for the period up to completion of the next review and should include:

- a. The review of any information provided to Authorisees to justify the continued safety of their operations; and
- b. The examination of all safety information and modifications, irrespective of their safety category.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The arrangements for determining the scope and frequency of each review.
 - c. Identification of the processes and procedures governing the planning and conduct of periodic reviews.
 - d. Identification of the processes and procedures governing the conduct of the periodic reviews of safety justifications in those situations where a change, significant external event or emergent information (typically surveillance findings) alters the status of the safety case.
 - e. The arrangements for reporting the review and ensuring that the results are subjected to review by an independent competent body before submission to the Nuclear Safety Committee.
 - f. The arrangements for agreeing, prioritising, planning, implementing and reviewing findings from the review.
 - g. The arrangement for reviewing the safety justification in the event that operation beyond the original justified period is considered.

APPROVING & DESIGN AUTHORITIES CONDITION 16 - DIAGRAMS, DESIGNS AND SPECIFICATIONS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that, when requested, Defence Nuclear Safety Regulator (DNSR) is provided with up to date diagrams, design information and specifications relating to the nuclear weapon, component or relevant support equipment as DNSR may specify.

Scope

2. The Condition covers all phases from research to decommissioning.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The organisation to ensure that there is an effective management system to respond to requests from DNSR.

b. The processes and procedures governing the provision of information to DNSR, including the provision of amendments to the information already provided.

APPROVING & DESIGN AUTHORITIES CONDITION 17 - MANAGEMENT SYSTEMS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee establishes and implements management systems which give due priority to safety. This is to include the making and implementation of adequate quality management arrangements in respect of all matters which may affect safety of the design and approval activity for nuclear weapons, components or relevant support equipment. The Accreditee is to make and implement adequate arrangements to provide assurance about the quality of operations conducted by Authorisees in order to support continued approval for service use.

Scope

2. The scope covers the management systems used to control and monitor those actions necessary in the interest of safety and to demonstrate compliance with the ADAC and in particular the arrangements made under them. This Condition relates to the managements systems, including quality management arrangements, of the Accreditee and their monitoring of the quality of operations conducted by Authorisees.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals responsible for maintaining the management systems.
 - b. The arrangements for ensuring that any of the management system processes (e.g. financial, commercial, project, industrial safety or environmental) give due priority to safety.
 - c. The quality management arrangements, making reference to any accredited system being operated.
 - d. The arrangements for monitoring and reviewing management system documents and procedures.
 - e. The arrangements for periodic internal and external audits and the arrangements for the rectification of shortfalls and deficiencies identified during such audits.
 - f. The arrangements for monitoring the quality of operations conducted by Authorisees in order to support continued approval for service use.

APPROVING & DESIGN AUTHORITIES CONDITION 19 - DESIGN OF A NUCLEAR WEAPON, COMPONENT OR RELEVANT SUPPORT EQUIPMENT

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee exercises control over the design of nuclear weapons, components and relevant support equipment.

Scope

2. The Condition covers all phases of the development process leading to design approval.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.

b. The design and procurement processes, which should integrate:

(1) the arrangements for identifying, agreeing and recording the safety requirements to be satisfied by the nuclear weapon, components and relevant support equipment;

(2) the system to develop, agree and, where necessary, modify the programme of safety related work;

(3) the arrangements for ensuring the adequacy of the evidence generated, including aspects such as the management of trials, modelling and assessments, documentation and build standard reconciliation;

(4) the arrangements for developing and proving nuclear weapon, component and relevant support equipment processes and procedures (e.g. HR/4 Specifications, Procedural Guides and Special Weapon Operating Publications) used post manufacture;

(5) the arrangements associated with establishing and proving the manufacturing capability, and for ensuring that the quality and build standards are maintained in accordance with the design intent;

(6) the arrangements governing the assessment of the safety of the evidence generated; and

(7) the arrangements for the design to be kept under control to meet the required safety characteristics in the defined environments, including the arrangements governing the specification and recording of the design.

c. The arrangements controlling interactions with the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 21 - APPROVAL FOR USE

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that there are arrangements for the approval of nuclear weapons, components and relevant support equipment.

Scope

2. This Condition embraces the Approval of nuclear weapons, components and relevant support equipment.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.

b. The processes and procedures governing the management of Approval activities, including:

(1) the identification and recording of the objectives of the Approval programme;

(2) the system to develop, record, agree and, where necessary, modify the Approval programme;

(3) the arrangements for dividing Approval into stages, and the safety documentation required;

(4) the arrangements for ensuring that full and accurate records are kept of every test and examination carried out implementing the Approval programme;

(5) the arrangements for demonstrating the adequacy of the 'in-service' processes and procedures (e.g. Procedural Guides and Special Weapon Operating Publications);

(6) the arrangements governing the assessment of the Approval evidence;

(7) the procedures used to identify and retain records of the Approval process; and

(8) the arrangements for maintaining the validity of the Approval evidence generated.

c. The arrangements controlling interactions with the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 22 - MODIFICATION TO NUCLEAR WEAPONS, COMPONENTS OR RELEVANT SUPPORT EQUIPMENT

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure arrangements exist to control modifications to nuclear weapons, components or relevant support equipment.

Scope

2. This Condition covers the control and assessment of modifications throughout all phases of the Concept, Assessment, Design, Manufacture, Implementation, Disposal (CADMID) cycle.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.

b. The processes and procedures undertaken to categorise, assess, approve and implement changes to the design of a nuclear weapon, component or relevant support equipment. This should include the:

(1) processes and procedures employed to initiate modification action when arising from within the Accreditee or externally, typically manufacturing concessions and changes to logistics;

(2) processes and procedures undertaken to assess and seek approval for a proposed modification;

(3) arrangements for the review and approval of a modification;

(4) arrangements for governing the dissemination of information following a modification;

(5) safety categorisation system employed; and

(6) processes and procedures used to update the design and as built records, manufacturing records and documentation defining the interfaces.

c. The principal interactions with the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 23 - CONDITIONS AND LIMITS OF SAFE OPERATION

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee produce safety cases to demonstrate the intrinsic safety of a nuclear weapon, component and relevant support equipment and to identify for Authorisees the conditions and limits (e.g. environmental exposure levels and storage configurations) necessary in the interests of safety.

Scope

2. This Condition requires the production of safety cases to demonstrate the level of compliance with the design safety requirements and thereby nuclear and radiological safety within the defined operating conditions and limits in the interest of safety.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The arrangements controlling interactions with Authorisees, including the arrangements for transmitting information between the Accreditee and Authorisees.
 - c. The arrangements controlling interactions with the Defence Nuclear Safety Regulator.
 - d. The arrangements employed by the Accreditee for reviewing, approving and maintaining up-to-date the conditions and limits for safe operation.

APPROVING & DESIGN AUTHORITIES CONDITION 24 - OPERATING INSTRUCTIONS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has arrangements to provide Authorisees with information necessary to enable the provision of written operating instructions for nuclear weapons, components or relevant support equipment including any instructions to implement conditions and limits of safe operation.

Scope

2. This ADAC covers the provision of information for the 'in-service' written operating instructions that govern the handling, processing, storage, transport and operation of nuclear weapons, components and relevant support equipment.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between associated organisations, committees and individuals.
 - b. The processes and procedures undertaken to ensure that adequate safety instructions are generated, including the arrangements for reviewing, amending, controlling, approving and maintaining up-to-date such instructions.
 - c. The arrangements for controlling interactions with Authorisees, including the arrangements for providing Authorisees with 'instructions necessary in the interest of safety' and the conditions and limits of safe operation.
 - d. The arrangements controlling interactions with the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 25 - OPERATIONAL RECORDS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure the Accreditee has arrangements for specifying to Authorisees the records to be made of the operations conducted with nuclear weapons, components and relevant support equipment necessary to support continued Approval for use.

Scope

2. This Condition relates to all operations that may affect nuclear or radiological safety.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The management structure, responsibilities and interactions between the associated organisations, committees and individuals.

b. The processes and procedures undertaken in order to define and agree the nuclear weapon, component and relevant support equipment operational records required.

c. The arrangements for specifying to Authorisees the operational records to be compiled.

d. The arrangements controlling interactions with the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 27 - SAFETY MECHANISMS, DEVICES AND CIRCUITS

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has arrangements to specify for Authorisees which conditions and limits for a nuclear weapon, component or relevant support equipment require the provision of safety mechanisms, devices and circuits (SMDC).

Scope

2. This ADAC covers the arrangements necessary to identify to Authorisees where SMDC need to be embodied into their equipment. Such circumstances may arise where, under fault or accident conditions, the Authorisee's equipment may give rise to an adverse environment sufficient to overwhelm the protection built in to the nuclear weapon, component or relevant support equipment.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between the associated organisations, committees and individuals responsible for defining the requirements for SMDC.
 - b. The processes and procedures governing the:
 - (1) identification of those Operating Rules, conditions and limits that require the introduction of safety mechanisms, devices and circuits by an Authorisee; and
 - (2) reassessment of the requirements following a change, typically in the operating conditions and limits.
 - c. The arrangements controlling interactions with Authorisees.

APPROVING & DESIGN AUTHORITIES CONDITION 28 - EXAMINATION, INSPECTION, MAINTENANCE AND TESTING

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee has adequate arrangements to specify to Authorisees the requirements for the regular and systematic examination, inspection, maintenance and testing (EIMT) of all nuclear weapons, components and relevant support equipment. The arrangements must also provide for the specification of an EIMT schedule for nuclear weapons, components or relevant support equipment.

Scope

2. The scope of the ADAC covers:
- a. The specification of in-services EIMT requirements to be implemented by Authorisees.
 - b. The maintenance of an EIMT schedule covering:
 - (1) the activities undertaken by the Authorisees; and
 - (2) withdrawals necessary to enable the Accreditee to ensure the continued safety of the stockpile, e.g. service life assessment conducted in accordance with the ADAC30 arrangements.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
- a. The management structure, responsibilities and interactions between the associated organisations, committees and individuals.
 - b. The arrangements for deriving and approving the EIMT policy.
 - c. The processes and procedures governing the determination of the EIMT schedule covering EIMT by Authorisees and withdrawal for Service Life Assessment and refurbishment candidates by the Accreditee (ADAC30).
 - d. The processes and procedures governing the specification of EIMT requirements to Authorisees.
 - e. The management arrangements to control the withdrawal of nuclear weapons and components or relevant support equipment.

APPROVING & DESIGN AUTHORITIES CONDITION 30 - PERIODIC WITHDRAWAL

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure adequate arrangements exist to:
 - a. Enable nuclear weapons, components and relevant support equipment to be withdrawn from service for examination, inspection, maintenance and testing (EIMT) by the Accreditee.
 - b. The planning, conduct and reporting of such EIMT by the Accreditee in support of activities such as service life assessment.

Scope

2. This Condition covers:
 - a. The arrangements for the withdrawal of nuclear weapons, components and relevant support equipment from service.
 - b. Planning of activities such as the service life assessment and refurbishment programmes (programme requirements are to be integrated into the schedule of ADAC28).
 - c. Conduct of EIMT activities by, or on behalf of, the Accreditee necessary to ensure the continued safety of the stockpile.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:
 - a. The management structure, responsibilities and interactions between the associated organisations, committees and individuals.
 - b. The processes and procedures governing the planning of the examination, maintenance, inspection and testing to be undertaken by the Accreditee, including the safety justification.
 - c. The management arrangements that ensure the surveillance programme provides sufficient lead-time to enable the stockpile to be decommissioned should the surveillance activities reveal that the safe stockpile life is shorter than that anticipated.
 - d. The management and engineering processes undertaken to assess the safety of the stockpile (for example, during service life assessment), including the derivation of the assessment criteria.
 - e. The process for reviewing and approving the output from such stockpile safety performance assessments.

f. The arrangements for reporting the outcome of activities such as service life assessment to interested organisations and for seeking an extension to the existing approved service life.

g. The arrangements for dealing with situations where examination, maintenance, inspection and testing reveals faults, or conditions which jeopardise safe operation or indicate a potentially unsafe condition, including the notification of the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 31 - WITHDRAWAL OF APPROVAL

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to give discretionary powers to the Defence Nuclear Safety Regulator (DNSR) to direct the Accreditee to withdraw Approval for service use of a nuclear weapon, component or relevant support equipment and to require the consent of DNSR prior to reinstating Approval.

Guidance on ADAC Compliance Statement

2. Consideration should be given to the following:
 - a. The management structure, responsibilities and interactions between the associated organisations, committees and individuals.
 - b. The processes and procedures employed by the Accreditee to implement a direction from DNSR to initiate withdrawal of Approval.
 - c. The arrangements for seeking DNSR consent to the reinstatement of Approval.

APPROVING & DESIGN AUTHORITIES CONDITION 35 - DECOMMISSIONING

GUIDANCE NOTE

Purpose

1. This Approving and Design Authorities Condition (ADAC) has been introduced to ensure the Accreditee has made adequate provisions for the decommissioning of a nuclear weapon, component and relevant support equipment.

Scope

2. This Condition relates to the decommissioning of those nuclear weapons, components and items of relevant support equipment that present nuclear or radiological hazards.

Guidance on ADAC Compliance Statement

3. Consideration should be given to the following:

a. The management structure, responsibilities and interactions between the associated organisations, committees and individuals.

b. The processes and procedures for ensuring that adequate capability exists to withdraw and decommission nuclear weapons, components and relevant support equipment, including:

(1) decommissioning as part of the normal CADMID cycle; and

(2) the maintenance of a continuous decommissioning capability sufficient to enable the early and safe withdrawal and decommissioning of stockpile items in response to, for example, unfavourable service life assessment findings.

c. The arrangements for the production, agreement and management of a decommissioning programme for nuclear weapons, components and relevant support equipment.

d. The processes and procedures for ensuring that all items within the stockpile remain capable of being withdrawn and decommissioned within their known safe life.

e. The arrangements for providing documentation to justify the safety of the proposed decommissioning and its submission to the Defence Nuclear Safety Regulator.

APPROVING & DESIGN AUTHORITIES CONDITION 36 - ORGANISATIONAL CAPABILITY

GUIDANCE NOTE

PURPOSE

1. The Approving and Design Authorities Condition (ADAC) has been introduced to ensure that the Accreditee maintains adequate financial and human resources to ensure the safe management of approval and design, and has arrangements to control changes to their organisational structure or resources that may affect safety. There must be provision within the arrangements to classify changes to the organisational structure or resources according to their safety significance and to provide adequate documentation to justify the safety of any proposed change.

SCOPE

2. This Condition relates to the arrangements the Accreditee has in place to maintain adequate financial and human resources, and to control any organisational changes. The scope of these changes range from high level change, e.g. management board reorganisations, to low level changes, including reduction of manpower in response to savings measures and the increased use of contractors. ADAC36 mirrors ADAC22 (modification to nuclear weapons, components or relevant support equipment), requiring the Accreditee to manage organisational change as a modification to an extant organisation.

GUIDANCE ON ADAC COMPLIANCE STATEMENT

3. Consideration should be given to the following:

Adequate Arrangements

4. The Accreditee should demonstrate that he has made and implemented adequate arrangements to provide and maintain adequate financial and human resources, and to control any changes to the organisational structure or resources. Such arrangements should include a description of the Accreditee:

- a. nuclear baseline;
- b. procedures for organisational change;
- c. arrangements for assessing and obtaining the financial resources necessary to continue to ensure the safe management of approval and design.

Nuclear Baseline

5. The nuclear baseline should be documented, and that documentation should identify and justify all safety significant aspects of the organisation, including:

- a. The purpose of the organisation.
- b. Senior management and their responsibilities.
- c. Lines of accountability from the workforce to senior management.

- d. Description of the staff comprising the organisation, including:
 - (1) numbers of staff required;
 - (2) identification of posts with safety responsibilities, including those with safety responsibilities to the Accreditee but not part of his organisation, requiring the post holders to be Suitably Qualified and Experienced Persons; there needs to be an emphasis on sufficient in-house technical resource and Intelligent Customer aspects;
 - (3) identification of posts with specific safety responsibilities requiring the post holders to be Duly Authorised Persons;
 - (4) terms of reference and job descriptions; and
 - (5) training, qualification and experience requirements plan.
- e. Arrangements for the employment of contractors.

Procedures for Organisation Change

- 6. a. Role of Senior Management. A statement of senior management commitment should be produced, including: acceptance of their responsibility; recognition that the management of safety is a key business objective; and a description of control of their organisation.
- b. Project Management. The arrangements for proactive management of the change should be described, including the means by which proposed changes are to be planned, developed, assessed and subsequently implemented.
- c. Review and Assessment. The arrangements for independent review and assessment, depending upon categorisation, should be described, including any arrangements for independent peer review.
- d. Audit and Feedback. The arrangements for audit of an organisation post implementation of change should be described, to provide assurance that the change has been correctly implemented, and that the arrangements are robust on completion.

Classification

7. As with equipment modifications, changes to the organisational structure or resources are to be classified according to their safety significance. This is to enable the application of a degree of scrutiny and review commensurate to the impact of the proposed change. This in turn should be based upon an assessment of the consequences of a management failure due to the organisational changes and the subsequent loss of control of a safety significant activity.

Documentation

- 8. The arrangements should provide for adequate documentation to justify any proposed change. This should include:
 - a. Recognition of the safety implicated aspects of the nuclear baseline arrangements.
 - b. Consideration of options.

- c. Principles for change.
- d. Demonstration of how the revised organisation is to function, highlighting the effect of change from the datum.

Submission

9. The Accreditee arrangements should cover the submission of any documentation called for review by Defence Nuclear Safety Regulator (DNSR).

Approval of Specified Arrangements

10. The Accreditee should recognise the need for DNSR to review any proposed change and be prepared to stop the change or operational programme if DNSR is not satisfied with the safety implications.

11. Organisations may use their Compliance arrangements for Authorisation Condition 22 as a framework.

12. The arrangements defining interactions with DNSR, including the submission of any documentation requested by DNSR and the procedures for seeking DNSR agreement.

Chapter 2 Guidance for DNSR Staff

Introduction

1. Part 1 Chapter 3 of this JSP outlines the regulatory processes that the Defence Nuclear Safety Regulator (DNSR) uses. It explains that safety submissions are assessed to inform the regulatory judgements when deciding whether to permission activities and agree submissions or not. DNSR staff (supported through contract) require guidance in order to apply consistent and acceptable approaches to their assessment and judgement. This chapter provides that guidance in the form of Safety Assessment Principles (SAP). It is published in this JSP in the interests of transparency so that Authorisees and Approving Authorities may have visibility of the approach that DNSR staff take.

2. The Office for Nuclear Regulation (ONR) undertook a review of its SAP, publishing a revised set at the end of 2006 which are routinely updated. DNSR engages closely with ONR to ensure the relevance of ONR SAP to activities and facilities in the Defence Nuclear Programme, and DNSR formally adopts and integrates them for use by DNSR staff. However, the ONR SAP do not address specific issues associated with the Nuclear Weapon Programme (NWP), and further interpretation is also published in respect of the Naval Nuclear Propulsion Programme (NNPP). This is explained below.

3. Both DNSR and ONR staff use SAP, together with the supporting Technical Assessment Guides (TAG) which are published separately, to guide regulatory judgements.

Structure

4. Figure 1 shows how SAP and interpretation for the Defence Nuclear Programme are structured. The applicability of any SAP (or its interpretation) in forming a judgement is determined by DNSR staff, in discussion if appropriate with the Authorisee or Approving Authority making a submission.

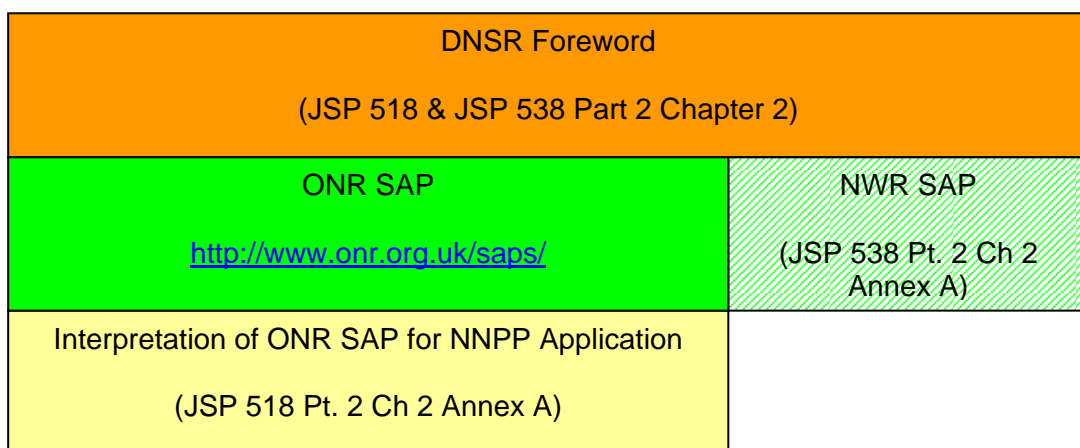


Figure 1

Annex A to Chapter 2: NWR Safety Assessment Principles

Introduction

Nuclear Weapon Programme Fundamental Principles

Warhead Design

 Single and Multi-Point Safety

 Explosive Composition

 Safety Analysis

 Warhead Arming State

 Warhead Assembly and Disassembly

 Surveillance

 Warhead Security

Lines of Defence

Warhead Arrays

Logistic Issues

Numerical Targets

NWR SAP Glossary

Introduction

1. These NWR Safety Assessment Principles (SAP) are for use, in concert with applicable ONR SAP, when forming the judgements necessary to permission activities in any life-cycle phase (LCP) and agree intrinsic safety submissions in the Nuclear Weapons Programme (NWP). They are complementary to ONR SAP and cover specific issues found in NWP, providing in particular, guidance on safety attributes that should be demonstrated from the design of a nuclear warhead.

2. NWR SAP explicitly provide guidance on assessments associated with warheads. During research, development and surveillance in support of warheads and components, it is likely that activities will be conducted with “nuclear explosive like assemblies”; these may be scaled-down nuclear devices intended to allow the examination of warhead materials under conditions approached during warhead detonation. In this situation, and in common with the general use of SAP, the relevance of all SAP to the submission being assessed should be considered, applying the principles as necessary.

Nuclear Weapon Programme Fundamental Principles

3. The Nuclear Weapons Programme Fundamental Principles (NWPFP) are considered to be the foundation for the safety assessment principles below. They replicate the language of the Fundamental Safety Requirements in Part 1 Chapter 2 of this JSP.

4. All reasonably practical measures must be taken to reduce the residual risk from yield or the release of radioactive (RA) material to As Low As Reasonably Practical (ALARP), preferably via inbuilt warhead features. For guidance on the interpretation of ALARP see [ONR website](#).

NWP principles	Fundamental	Nuclear yield	NWPFP.1
Nuclear yield ⁴ must not occur except when a nuclear warhead is used in an authorised operational role.			

NWP principles	Fundamental	Release of radioactive material	NWPFP.2
Warhead radioactive material must not be released into the environment ⁵ except when a nuclear warhead is used in an authorised operational role.			

Warhead Design

5. Certain warhead design approaches are of prime importance in achieving acceptable safety in the NWP. These should be used to assess the merits of the design of a warhead.

Single and Multi-Point Safety

6. The safety of a warhead would be significantly improved if the design is single point safe (SPS)⁶ and this follows directly from NWPFP.1. Conceivable situations exist where the

⁴ Nuclear yield is defined as a nuclear energy release greater than 2kg of TNT equivalent. The value of 2kg of TNT equivalent is selected as it is approximately the level of yield at which the prompt radiation hazard exceeds the hazard from the conventional explosive.

⁵ See JSP 815, Defence Environment and Safety Management.

⁶ A WH is defined as being single point safe if, in the event of a detonation initiated at any point in the high explosive (supercharge), the probability of achieving a nuclear yield greater than 2 kg of TNT equivalent is less than 10^{-6} .

supercharge can be initiated directly, at a single point, as a result of direct abnormal stimulus rather than through the Arming, Fuzing and Firing (AF&F) System. Such explosive events may be partial, or run to detonation and, in the latter case, could compress the fissile core asymmetrically but sufficiently to reach a brief state of supercriticality for a very short period. In such circumstances, the design of the neutron initiator should ensure that it remains inoperative.

7. It is possible to conceive of situations where the supercharge is initiated at several points e.g. by a shower of fragments from a nearby explosion. Resistance to inadvertent nuclear yield would be increased if the warhead were Multi-Point Safe (MPS)⁷ i.e. a design which is inherently safe in that detonation of the supercharge at multiple points in any credible scenario would not have inadvertent nuclear yield as a credible consequence.

8. At the time of writing, formal demonstrability of MPS involves an impossibly complex level of computational capability. As computational capability improves, MPS demonstrability may become more practicable.

Warhead design	Inherent safety	WHD.1
The underpinning aim for any warhead should be an inherently safe Primary design.		

9. It should be demonstrated that the warhead is SPS and MPS at all times, including during assembly and disassembly, and under any credible “situation”.

10. Any reduction in the probability or size of yield from single or multi point initiation of the supercharge is desirable.

11. There should be an assessment to show that when the supercharge is subjected to insults the neutron initiator remains inoperative or that any output does not match critical timing requirements and that other neutron sources can be discounted.

12. The possibility of inadvertent initiation by stray/inadvertent neutrons should be prevented.

Explosive Composition

13. MOD Policy⁸ requires the use of Insensitive Munitions (IM) which contributes to the reduction of risks to ALARP by minimising the probability of inadvertent initiation and severity of any subsequent explosive event. There are three important terms used in relation to explosive compositions:

- a. Sensitivity – is a measure of how readily an explosive will respond to a design stimulus; it is not a measure of how susceptible an explosive is to accidental stimuli;
- b. Sensitiveness – is a measure of how readily (not violently) an explosive responds to an accidental stimulus such as being dropped, penetrated or involved in a fire; the response could be anything from a minor fire to a detonation;
- c. Explosiveness – is a term used to describe the violence or response; this can vary from no response through burning, deflagration, explosion to full detonation.

14. A warhead incorporating a supercharge, detonators and explosive trains/boosters of low sensitiveness and explosiveness would contribute towards compliance with MOD Policy and

⁷ In the event of unintentional detonation of the supercharge, initiated at any number of points (normally taken to be in the design mode), the probability of any nuclear yield exceeding more than 2 kg of TNT equivalent is less than 10⁻⁶.

⁸ See JSP 520 issue 1.1.

would offer significant potential benefits in relation to both NWPFP.1 and NWPFP.2. Whilst the design safety advantages may appear to be clear, use of such an explosive may pose both performance and ageing challenges. In general, explosives with lower sensitiveness and explosiveness are likely to develop less power when properly detonated; larger quantities may therefore be needed to produce the required compression of the pit. Lower sensitiveness and explosiveness may also require the use of more exotic materials whose behaviours over the lifetime of a warhead may be less well characterised. This may require a planned refurbishment with newly manufactured supercharges.

Warhead design	Explosive composition	WHD.2
The supercharge, detonators and explosive trains of warheads should be manufactured from explosive of the lowest sensitiveness and explosiveness.		

15. Attention should be given to the qualification evidence for the supercharge explosive, explosive trains and detonators. Safety analysis should support the choice of explosive.

16. It should be demonstrated that lifetime risks, including the effects of ageing, have been analysed and support the choice of supercharge explosive, explosive trains and detonators.

17. The use of explosive with low sensitiveness and low explosiveness should be encouraged, but this should be balanced by consideration of the additional risk from disassembly and reassembly should refurbishment be planned.

18. Warhead performance requirements should not compromise safety.

19. At suitable update/upgrade opportunities, the consideration of improved IM compliance for legacy warheads should be encouraged.

Safety Analysis

20. Warhead safety, as opposed to radioactive dispersal, depends crucially upon preventing design mode initiation of the Primary and excluding stray/inadvertent energy or information compatible with initiation of detonation critical components. This, in turn, depends upon the integrity and robustness of the AF&F, its exclusion regions, its containment and the dedicated lightning protection. Inoperability, Independence, Incompatibility and Isolation (4 Is) are important. These together with a number of specific safety measures have been collectively described as Enhanced Nuclear Detonation Safety.

21. There may be other acceptable design approaches that isolate those features of the AF&F which are critical to the initiation of the warhead in its design mode and that also protect against the ingress of stray/inadvertent energy.

Warhead design	Safety analysis	WHD.3
Warhead design concepts should allow safety analysis and demonstration.		

22. The design approach should enable simplified analysis and formal demonstrability of the intrinsic safety of the warhead.

23. The design should be compliant with the 4 Is concept.

24. It should be demonstrated that those features of the AF&F, which are critical to the initiation of the Primary in its design mode, also afford adequate protection against the ingress of stray/inadvertent energy compatible with the form used for initiation.

- 25. There should be evidence that the warhead is “not armed” and will remain so, when assembled, transported, handled, stored, processed, deployed and disassembled.
- 26. Where Strong Links (SLs) are used, they should be designed on different and incompatible principles such that the possibility of common mode failure is avoided.
- 27. Where Weak Links (WLs) are employed, it should be demonstrated that a WL will fail in advance of a related SL when subjected to the hazard they are claimed to defeat.
- 28. It should be demonstrated that critical firing components are protected from stray/inadvertent energy by isolation within any claimed Exclusion Region (ER).
- 29. It should be demonstrated that the only access point into any claimed ER, for the correct initiating energy for the Primary, is through SL that only operate when exposed to unique “authorising” stimuli.
- 30. If SLs, WLs or ERs, or any combination thereof, are claimed as Full Line(s) of Defence (LODs) (see paragraph 55 below) against a given hazard, they should be demonstrated as meeting the LOD criteria.
- 31. Where necessary (e.g. due to the complexity of the arming system) the analysis of modes of operation and signal paths should be separated into a small number of logically independent processes so that the safety of all modes and paths can be demonstrated.

Warhead Arming State

32. SLs, WLs and ERs within the warhead may be claimed as vital in ensuring safety; consequently it is highly desirable that their integrity and status can be readily determined at appropriate times. Undetected operation of one of the SLs, represents a loss of safety, which for example, could have serious consequences if the warhead were to be subsequently involved in a “situation”.

Warhead design	State monitoring	WHD.4
The warhead arming state should be able to be determined.		

- 33. It should be demonstrated that the integrity and status of SLs, WLs and ERs can be readily determined at appropriate times and after any departure from the normal⁹ environment.
- 34. The operation of any “self-diagnosing” components should be demonstrated.
- 35. Where it is not practicable to determine the integrity and status of SLs, WLs or ERs directly, provision should be made to monitor an associated function that will give a reliable indication.
- 36. It should be demonstrated that any method of determining the integrity and status of the warhead arming state does not of itself prejudice safety for example by breaching ERs.
- 37. It should be possible to obtain internal images of the warhead (e.g. by radiography). These should be of a sufficient quality to provide evidence of the warhead safety status when combined with other measures.

⁹ The Normal Environment is that which the warhead expects to see and in which it is expected to remain safe and suitable for service. This includes any environmental insult that is predicted to occur at a frequency greater than 10⁻³ events per year.

Warhead Assembly and Disassembly

38. Ageing processes occurring during service can result in departure of some of the components from their “as manufactured” dimensions, compositions or other characteristics. Of particular potential concern are operations which include the handling of Primaries and supercharges; these operations should be possible without causing unacceptable stress to explosive or radioactive materials.

Warhead design	Design for assembly and disassembly	WHD.5
Warheads should be able to be assembled and disassembled safely.		

39. There should be evidence that components that could potentially affect safety are designed so that it is not possible to assemble or disassemble them incorrectly or unsafely in all configurations.

40. It should be demonstrated that warheads can be assembled and disassembled safely in all configurations that might occur during normal assembly and disassembly.

41. It should be shown that operations which include the handling of Primaries, supercharge/explosive trains/detonators can be done without causing unacceptable stress to explosive or radioactive materials or other safety critical/hazardous materials and components within the warhead.

42. There should be measures to ensure that any ageing processes do not adversely affect safety during assembly (notably after refurbishment which reuses components) or in particular disassembly.

43. There should be arrangements to ensure that safety critical items are identified and that all aspects of their manufacture, assembly and disassembly are appropriately managed.

Surveillance

44. It will be necessary to conduct stockpile safety assessment (surveillance) to provide evidence in support of assessments of warhead life predictions and stockpile health. The evidence should also be used for the periodic review and reassessment of safety cases and safety information. Such evidence is drawn from analysis of stockpile components and materials and knowledge of the conditions that warheads have experienced.

45. Any components that are part of the planned surveillance programme, that may need to be analysed, should ideally be withdrawn from representative service warheads in a condition that facilitates analysis.

46. Information should be collected about the environments that warheads have actually experienced whilst in the logistic cycle. Sensors that are physically close to warheads, ideally integrated within them, can provide the least ambiguous information, but alternative arrangements (e.g. monitoring associated with transport or storage containers) may also prove acceptable.

Warhead design	Surveillance	WHD.6
Warhead surveillance evidence should be provided.		

47. The warhead design should be such that surveillance samples can be recovered in the least damaged state possible.
48. There should be an adequate stockpile surveillance programme to support the periodic review of safety.
49. Warhead components used to support the surveillance programme should be representative of the stockpile and be undamaged during disassembly, thus enabling subsequent inspection and analysis to be undertaken.
50. It should be possible to provide information on the conditions experienced by a warhead. Sensors should ideally be built into or associated with the warhead, but without compromising safety.

Warhead Security

51. Many of the features typically built into a warhead including the overall robustness associated with the vehicle structure (e.g. those responding to only unique trajectory environments or encoded signals) can provide a significant degree of resistance to unauthorised initiation. Other features specifically aimed at preventing unauthorised control, interference with, or initiation of the warhead may also be incorporated. Some of these features may operate by rendering the warhead permanently inoperable by a variety of methods. Security features may, however, compromise safety in themselves or pose challenging post-operation situations with the potential to affect safety. Safety should not be compromised.

Warhead design	Security	WHD.7
There should be features to prevent unauthorised arming or initiation of the warhead.		

52. There should be security features (ideally passive) that do not rely on control measures or human intervention.
53. There should be evidence that adequate security features have been provided to protect a warhead against any specified security risk.
54. Warhead security features should not prejudice, or bypass safety features or in any way detract from correct safety functionality.

Lines of Defence

55. In addition to features built into the warhead, adequate external protection of the warhead should be provided to minimise the probability of direct insults to the supercharge, explosive trains, AF&F and radioactive materials. Appropriately designed facilities, storage and transport containers and fragment barriers in magazines, storage areas and assembly facilities are some of the measures that may provide such protection in any situation where exposure to such hazards might possibly occur. If the measures provide adequate protection to the warhead against yield and RA release they may be considered as LOD during that particular configuration or scenario.
56. A LOD may be a physical/engineered item or procedure that either reduces the probability of a particular hazard happening or protects against the consequence of a hazardous event.
57. A LOD may be effective against a variety of hazards/environments or against only one. LOD may be characterised as:

- a. Full LOD - It should either be demonstrated that the probability of failure on demand is less than 10^{-3} or substantive evidence provided that at least this level of protection has been achieved. It should be qualified, redundant or automatic. It is not permitted to aggregate a Full LOD that is better than 10^{-3} , with a LOD that fails to meet the requirements of a Full LOD, to make two Full LOD;
- b. Physical/Engineered or Procedural – depends on whether they rely on physical/engineering features or on human adherence to specified instructions. Engineered LODs are preferred over procedural; and
- c. Active or Passive - depends on whether the protection afforded relies on the system responding actively or passively to the hazard to provide the protection. Passive LOD are preferred over active LOD.

58. Specific circumstances associated with a “situation” or accident cannot be predicted accurately and the response will depend on the hazards created and the associated risk.

59. If it is judged that the Primary retains a credible capability of producing inadvertent yield then the immediate response should be to restore, as far as possible, 3 Full LOD to prevent yield and LOD as appropriate to prevent the release of RA material.

Lines of defence	Defence against yield	LOD.1
There should be full lines of defence to prevent unintended nuclear yield.		

60. There should be at least three, demonstrably independent Full LOD to prevent unintended nuclear yield.

61. The three LOD, which should function independently, should ideally be passive physical/engineered LOD. The number of LOD that are built into the warhead should be maximised.

62. If a procedural Full LOD is claimed, there should be substantial human factors evidence to justify its status.

63. Where a Full LOD relies on a combination of SL and WL, it should be demonstrated that the WL fails safe before the SL operates or any ER(s) fail unsafe.

64. There should be evidence that a Full LOD is effective against the hazard/environment for which it is qualified.

65. Where tests are not statistically significant to provide comprehensive evidence to qualify the LOD, qualitative evidence and soundly based engineering judgement may be considered.

66. Evidence should be provided to show that each LOD functions independently from all other LOD against a specific hazard/environment. If any common cause failure mechanism of two LOD cannot be shown to be at least unlikely¹⁰ and ideally very unlikely¹¹, then only one of them can be attributed.

¹⁰ Unlikely means probability (events per demand or consequences per insult) $\leq 10^{-3}$.

¹¹ Very unlikely means probability (events per demand or consequences per insult) $\leq 10^{-6}$.

Lines of defence	Defence against release of radioactive material	LOD.2
There should be full lines of defence to prevent release of radioactive material.		

67. There should be at least three, demonstrably independent Full LOD to prevent an inadvertent major release of RA material¹².

68. There should be at least two, demonstrably independent Full LOD to prevent a significant release of RA material¹³

69. There should be at least one, Full LOD, with an objective of two, to prevent a minor release¹⁴ of RA material¹⁵.

70. There should be evidence that priority is given to the prevention of major and significant releases of RA material rather than a minor RA release.

Warhead Arrays

71. Placing groups of unprotected (or lightly containerised) warheads arranged in close proximity presents a possibility that detonation of the supercharge in one warhead could produce sympathetic detonation in others through blast or fragment impact. Arrangements should therefore minimise the possibility by limiting the number of warheads that can be placed together and wherever possible barriers or some other system should also be incorporated. Any situation where bare (e.g. not significantly protected by containers or barriers) warheads are stored, transported, handled or processed in close proximity to each other needs careful attention.

72. In addition to the RA dispersal hazards, a nuclear safety hazard known as “popcorning”¹⁶ can arise if the sequence of sympathetic detonations were to occur where the warheads are arranged in close array. A warhead Primary, unboosted and without neutron initiation, should not compromise the SPS, and additionally, no interaction between neighbouring warheads including sympathetic detonation and neutron arrival should lead to overall compromise of the SPS criterion for the array taken as a whole.

Warhead arrays	Sympathetic detonation and “popcorning”	WHA.1
Arrays of warheads should be arranged so that sympathetic detonation and “popcorning” is minimised.		

73. Arrangements for arrays of warheads including procedural controls for storage, handling, transportation and processing should:

¹² A major release of RA material could give a Plutonium release or equivalent effect (as fully respirable aerosol) of >30kg.

¹³ A significant release of RA material could give a Plutonium release or equivalent effect (as fully respirable aerosol) of 3g to 30kg.

¹⁴ A minor release of RA material could give a Plutonium release or equivalent effect (as fully respirable aerosol) of <3g.

¹⁵ It is not intended that this be applied where high pressure gas (eg. tritium) permeates its containment as a result of the physical nature of gas and container.

¹⁶ The phenomenon whereby neutrons from one accidental detonation of a nuclear WH can enhance the potential nuclear yield of a nearby accidentally-detonating WH. Popcorning can occur only when there is a relationship between the detonations, which depends in turn on the geometry of the WH array.

- a. limit the number in any array;
- b. wherever practicable incorporate barriers to prevent sympathetic detonation; and
- c. provide evidence that the possibility of popcorning has been minimised.

74. Proposed arrays of warheads should be configured such that, in the event of a series of single-point detonations, the probability of nuclear yield exceeding 2 kg TNT equivalent should be less than 10^{-6} for the whole array, given that the initiation has occurred. If a calculation to this effect is not presented, there should be qualitative evidence that the risk from popcorning has been reduced to ALARP.

Logistic Issues

75. The fitment of components, essential to the design-mode functioning of the warhead, as late as possible in the logistic cycle can enhance safety and security, for example boosting material and neutron initiators might not be fitted during transportation on public roads or whilst warheads are in store. Other warhead components (especially associated with the AF&F) are likely to be essential in maintaining safety and security as soon as the warhead is assembled. Decisions in this context could be finely balanced and should be supported by safety cases and comprehensive ALARP considerations including safety, security and the overall risk in the NWP as well as to operators at sites.

Logistic issues	Component fitment	LOG.1
Components should be fitted into the warhead as late as practical in the logistic cycle.		

76. Boosting material, neutron initiators and any other features which facilitate or enhance the production of yield should not be fitted or be made ineffective for as much of the warhead life cycle as possible. They should normally be held separate from the warhead until they are required to be fitted to meet operational requirements.

77. Evidence should be provided in safety cases or ALARP arguments that safety, security and overall risk in the NWP has been given the appropriate consideration and that the approach taken to component fitment complements logistic, maintenance and operational requirements and minimises the radiological risks to the workforce.

Numerical Targets

78. Safety cases should be assessed to judge the extent to which numerical targets have been achieved. The targets are for accident conditions and are guides in judging whether the nuclear and radiological safety is being managed adequately and how far risks have been reduced to ALARP. The targets are used to inform decisions on whether additional safety measures are needed. The targets are not mandatory.

79. Activities undertaken during certain LCP are likely to be spasmodic and only occupy a fraction of the calendar year, however it is considered appropriate to apply the same targets for each LCP rather than apportioning targets to individual LCP.

80. The expression of targets and the way they should be interpreted is as presented in ONR SAP.

Frequency of unintended yield	NW Target 1
The target for the frequency of unintended nuclear yield from all warheads in a life-cycle phase is 10^{-8} per year.	

81. Target 1 is stated as a single figure, in effect a Basic Safety Level (BSL). It is not practicable to achieve a convincing quantitative demonstration of frequencies below 10^{-8} per year; consequently no Basic Safety Objective (BSO) is specified but it should be demonstrated that the frequency of unintended nuclear yield is ALARP. A single BSL value is applicable for all levels of yield above a nominal 2kg TNT equivalent because there are difficulties in accurately predicting the magnitude of yield events.

Individual risk to the public from accidents		NW Target 2	
The targets for the predicted frequencies of accidents which could give an effective dose at 1km are:			
Effective dose mSv		Total predicted frequency per annum	
		BSL	BSO
< 0.1		n/a	n/a
0.1	$1^{17\ 18}$	10^{-1}	10^{-4}
1	10	10^{-2}	10^{-5}
10	100	10^{-3}	10^{-6}
100	1,000	10^{-4}	10^{-7}
1,000	10,000	10^{-5}	10^{-8}
10,000	100,000 ¹⁹	10^{-6}	10^{-9}

82. Target 2 reflects the perceived enhanced public concern associated with nuclear weapons²⁰ and the corresponding BSO has been set at a factor of 1000 below the BSL. The rationale is that it is considered to be reasonably achievable and when the BSO has been met, the loss of one LOD will not result in the risk being above the BSL.

83. Target 2 is the risk of activities with warheads in each life-cycle phase of the NWP and is irrespective of the number of warheads present.

84. During assembly or disassembly, a warhead is considered to exist for risk estimates when radioactive material can be dispersed by a reaction of the supercharge. ONR SAP Target 8 applies to all activities in the assembly/disassembly facilities and NWR SAP Target 2 applies additionally to activities with warheads.

¹⁷ Indicates the effective dose from a minor release at 1km.

¹⁸ A significant release is defined as any release that results in an effective dose between that from a minor and a major release.

¹⁹ Indicates the effective dose from a major release at 1km.

²⁰ Reference: Risk: Analysis, Perception and Management. Report of a Royal Society Study Group pages 103-104, dated Oct 2001.

NWR SAP GLOSSARY

Accident. Any unintended event, including operator errors, equipment failures or other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection or safety²¹.

In this document, and when used generally, the term 'accident' includes any undesired circumstances which give rise to ill health or injury; damage to property, plant, products or the environment; production losses or increased liabilities.

When referring to nuclear safety, 'accident' refers to a fault sequence resulting in a dose greater than 0.1 mSv to a worker, or greater than 0.01 mSv to a person outside the site, or in a substantial unintended relocation of radioactive substances within the facility.

Arming, Fuzing and Firing (AF&F). Warhead (WH) control system responsible for correct arming, when authorised, and which maintains safety in other circumstances. The AF&F constitutes a major component of the nuclear WH safety chain.

Effective Dose. The quantity obtained by multiplying the equivalent dose to various tissues and organs by a weighting factor appropriate to each and summing the products. Measured in Sieverts (Sv)²².

'Effective dose' is frequently abbreviated to 'dose'

Exclusion Region. A region of the Arming, Fuzing and Firing system containing one or more critical firing devices and which is protected from stray energy by an exclusion boundary.

Explosiveness. Is a term used to describe the violence or response; this can vary from no response through burning, deflagration, explosion to full detonation.

Inherent Safety. The ability of an Ordnance System, Munition or Explosive device to retain its safety under specified stimuli (both intended and accidental) due to the nature of its design, its safety features and material employed as an inseparable part of that system.

Insensitive Munitions. Munitions which reliably fulfil their performance, readiness and operational requirements on demand, but which minimise the probability of inadvertent initiation and severity of subsequent collateral damage to weapon platforms, logistic systems and personnel when subjected to unplanned stimuli.

Life Cycle Phase. A period in the life of a warhead during which management and safety responsibilities rest within one management unit.

Line of Defence (LOD). An approach used to present a structured deterministic argument to demonstrate that sufficient protection is provided. LOD analysis is a qualitative method that critically assesses the effectiveness of control measures in preventing an accident event sequence leading to undesired consequences.

Multi-Point-Safe. In the event of unintentional detonation of the supercharge, initiated at any number of points (normally taken to be in the design mode), the probability of any nuclear yield exceeding more than 2kg of TNT equivalent is less than 10^{-6} .

²¹ IAEA Safety Glossary. Terminology used in nuclear, radiation, radioactive waste and transport safety, IAEA Safety Glossary V2.0 2006

²² Living with Radiation, NRPB 1998.

Normal Environment. The Normal Environment is that which the weapon expects to see and in which it is expected to remain safe and suitable for service. This includes any environmental insult that is predicted to occur at a frequency greater than 10^{-3} events per year.

Nuclear Explosive-Like Assembly (NELA). An assembly which represents a Nuclear Explosive in its basic configuration (main charge and fissile material, or nuclear core of a gun-type weapon) and any subsequent level of assembly up to its final configuration, or which represents a weaponised Nuclear Explosive such as a warhead, bomb, re-entry vehicle or artillery shell. A NELA in any configuration does not contain an arrangement of high explosive and fissile material capable of producing a nuclear detonation.

Nuclear Warhead. A Nuclear Explosive assembled and configured for in-service use.

Nuclear Yield. The energy released in the detonation of a nuclear warhead, usually quoted in TNT weight equivalent. In the context of this document, a yield is defined as a nuclear energy release greater than 2kg of TNT.

Pit. The sealed fissile component of the primary stage of a nuclear warhead.

Popcorning. The phenomenon whereby neutrons from one accidental detonation of a nuclear warhead (WH) can enhance the potential nuclear yield of a nearby accidentally-detonating WH. Popcorning can occur only when there is a relationship between the detonations, which depends in turn on the geometry of the WH array.

Procedural Control. A formally established, documented and proven sequence of actions.

Primary. A core (or pit) of fissile material, normally hollow, surrounded by a supercharge of high explosive which, when initiated by detonators, compresses the core into supercritical configuration; a neutron initiator provides a timed pulse of neutrons to initiate the chain reaction, the yield of which may be “boosted” by prior injection of fusionable material into the pit

Risk. Risk is the chance that someone or something is adversely affected in a particular manner by a hazard²³.

Sensitiveness. Is a measure of how readily (not violently) an explosive responds to an accidental stimulus such as being dropped, penetrated or involved in a fire; the response could be anything from a minor fire to a detonation.

Sensitivity. Is a measure of how readily an explosive will respond to a design stimulus. If the explosive is designed to detonate it is a measure of how readily that explosive will respond to a shock stimulus from a detonator or booster explosive.

NB it is not a measure of how susceptible an explosive is to accidental stimuli

Single-Point-Safe. A warhead is defined as being Single-Point-Safe if, in the event of a detonation initiated at any point in the high explosive, the probability of achieving a nuclear yield greater than 2kg of TNT equivalent is less than 10^{-6} per event.

Situation. Accident or security incident.

Strong Link. A Strong Link (SL) is a nuclear safety device used to provide a LoD by physically isolating key elements of the warhead firing chain from energy. The device is most commonly an electromechanical device that is strong both in terms of its physical construction and the nature of the inputs required to close the safety break. Modern SLs use a ‘Unique Signal’ to control the closure of the ‘Safety Break’ transitioning the device from the safe-reset position to

²³ Reducing risks protecting people.

an enabled position. Strong Links are designed to be so physically strong that they can maintain the physical 'Safety Break' through normal and abnormal environments with an assured margin. Strong links may also be called Strong Link Safety Break (SLSB)

Supercharge. In current designs of nuclear warheads, the main conventional explosives charge.

Unauthorised. Without permission or approval or not in accordance with regulations.

Unlikely. A probability of occurrence less than or equal to 10^{-3} events per demand or a frequency of less than or equal to 10^{-3} events per year.

Very Unlikely. A probability of occurrence less than or equal to 10^{-6} events per demand or a frequency of less than or equal to 10^{-6} events per year.

Weak Link. A Weak Link (WL) is designed to fail safe or become irreversibly inoperative before SLs become potentially unsafe and failure of a WL renders the WH non-functional. The key characteristics of a WL must be carefully designed in association with SLs so that the margin between the WL 'operating' and the SL failing is significant and assured.

Annex B to Chapter 2: DNSR Technical Assessment Guides (TAGs)

Status of DNSR Technical Assessment Guides (at July 2014)

TAG Ref	Title	Issue Date
TAG/001	Emergency Arrangements	Issue 1 Oct 09 Issue 1.1 Dec 13
TAG/002	Operational Berths	Issue 1 Oct 09 Issue 2 Dec 13
TAG/003	Lines of Defence	Issue 1 Jul 11
TAG/D004	Hydrodynamic Experiments	Issue 1 Aug 12
TAG/005	Numerical Targets 1 & 2	Issue 1 Feb 10
TAG/D006	See Note 1	--
TAG/D007	Management of Ageing in Defence Nuclear Programmes	Issue 1 Jan 14
TAG/008	Radioactive Discharges	Issue 1 Mar 11
TAG/D009	Radioactive Material Transport Package Approval	Issue 1 Nov 11
TAG/D010	Control of Lifting Operations	Issue 1 Apr 12
TAG/D011	Safety Analyses and Safety Case Interfaces	Issue 1 Aug 12
TAG/D012	High Reliability Due Process	Issue 1 Apr 14

Note 1: DNSR Guidance on INY provided in AWE Report 52/12 issued January 2012

GLOSSARY

This section provides a common JSP 518/538 glossary of the meaning of terms as used specifically in regulatory documents.

Accident. Any unintended event, including operator errors, equipment failures or other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection or safety²⁴.

Accreditation. A regulatory mechanism through which the Head of the Defence Nuclear Safety Regulator sets the Conditions permitting an Accreditee to establish his own safety arrangements where adequacy must be demonstrable to the satisfaction of the Defence Nuclear Safety Regulator (DNSR).

Accreditation Certificate. A certificate provided by DNSR-Hd defining the scope of activities Accredited.

Accreditee The post-holder Authorised by DNSR-Hd to operate in compliance with the Approving and Design Authorities Conditions.

Agreement.

Explanation: An Agreement allows an Authorisee/Accreditee to proceed in accordance with its own arrangements.

Reason for use: Where the need to obtain DNSR's Agreement is written into the Authorisee/Accreditee's arrangements, it prevents an Authorisee/Accreditee from proceeding unless the course of action has been agreed. Agreement is a non-prescriptive means to foster ownership of safety management in the Authorisee/Accreditee, and it is more economic than it would be for DNSR to use its primary powers to specify all the consents that it would need to deploy.

ALARP. Shorthand for achieving (generally nuclear) risk that is As Low As Reasonably Practicable.

Approval.

Explanation: An Authorisee/Accreditee is required to submit its arrangements for Approval if so specified by DNSR.

Reason for use: An Approval is used to freeze an Authorisee/Accreditee's arrangements. Once approved no alteration or amendment can be carried out without further Approval by DNSR.

Approve. The action used throughout the Conditions (AC and ADAC), in which context it has the purpose of freezing arrangements and giving permission to proceed. Once regulatory Approval is given to a set of arrangements, they must not be changed or varied unless and until the changes have been formally re-approved.

Explanation: An Authorisee, Accreditee, Approving Authority or Design Authority is required to submit its arrangements for Approval if so specified by DNSR.

Approving and Design Authority (JSP 518). The Approving and Design Authority has the responsibility for safety across life cycle boundaries and delivery of a through life Design Authority function.

Approving and Design Authorities (JSP 538). The Approving and Design Authorities have the responsibility for the intrinsic safety of the nuclear weapon including components and relevant support equipment across the NWP life cycle boundaries which are subject to their Approval and delivery of a through life Design Authority function.

²⁴ IAEA Safety Glossary 2007. Terminology used in nuclear, radiation, radioactive waste and transport safety.

Approving and Design Authorities Conditions. Those obligations that are applied by the DNSR-Hd as a condition of being Accredited to conduct specified activities in relation to the Nuclear Weapon Programme.

Assurance. The action taken to report to another party that the specified arrangements, organisation, situation or activities are in place in accordance with expectations. The process includes monitoring, audit, inspection and sampling, but excludes direct involvement to alter or take responsibility for specific actions or decisions. This does not preclude the ability to instruct operations to cease.

Audit. A systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.

Authorisation. A regulatory mechanism through which the DNSR-Hd sets the Conditions permitting an Authorisee to establish their own safety arrangements whose adequacy must be demonstrable to the satisfaction of the DNSR.

Authorisation Certificate. A certificate provided by DNSR-Hd defining the scope of activities Authorised.

Authorisation Conditions. Those obligations that are applied by DNSR-Hd as a condition of being Authorised to conduct specified activities in relation to the Defence Nuclear Programme (DNP).

Authorised Site. A defined site within which nuclear activities are controlled by an Authorisee in compliance with the Authorisation Conditions and Further Authorisation Conditions.

Authorisee. The post-holder Authorised by the DNSR-Hd to operate in compliance with the Authorisation Conditions and Further Authorisation Conditions.

Authority. DNSR-Hd is charged with Authorising the conduct of defined activities that may entail a direct or indirect risk to nuclear safety, and with providing assurance that the requisite level of nuclear safety is being achieved.

Barrier. A means to:

- a. prevent or inhibit the movement of people or radioactive substances, or some other phenomenon (e.g. fire);
- b. provide shielding against radiation;
- c. protect against some other potentially hazardous event.

Broadly Acceptable. A level of risk that is low enough that it should not cause particular concern to informed individuals potentially affected by it. The regulatory authorities consider that while even broadly acceptable risks should be rendered as low as reasonably practicable, they are unlikely to seek positive demonstration that such risks have been minimised.

Cause. The origin, sequence or combination of circumstances leading to a hazardous event.

Commissioning. The process by means of which systems and components of facilities and activities, having been constructed, are made operational and verified to be in accordance with the design and to have met required safety criteria²⁵.

Competence. The ability to put skills and knowledge into practice in order to perform a job in an effective and efficient manner to an established standard.

²⁵ IAEA Safety Glossary 2007. Terminology used in nuclear, radiation, radioactive waste and transport safety

Compliance Statement. A statement which identifies the management arrangements to achieve compliance with the Authorisation Conditions, Further Authorisation Conditions or Approving and Design Authorities Conditions.

Consent.

Explanation: A Consent is required before an Authorisee/Accreditee can carry out any activity for which DNSR has so specified.

Reason for use: A Consent is used to ensure an Authorisee/Accreditee does not carry out an activity before DNSR has been satisfied that the proposed course of action is safe and all necessary procedures and controls are in place, or that pre-requisites from a hold point control document have been met.

Consequence. The (usually undesirable) outcome deriving directly or indirectly from a hazardous event or a combination of events and circumstances.

Constraint. A limiting value of dose imposed by an operating authority on an employee or group of employees for a specified period, as an additional restriction to the legal limits, in order to further enforce the minimisation of individual dose.

Decommissioning. Administrative and technical actions taken to reduce hazards progressively and thereby allow the removal of some or all of the regulatory controls from a facility.

Defence. Many defence activities are conducted by contractors or partner organisations; the term “Defence” encompasses these as well as organisations within the Ministry of Defence.

Defence Nuclear Material. A generic term covering nuclear weapons and Special Nuclear Materials for the DNP.

Defence Nuclear Programme (DNP). The Defence Nuclear Programme comprises the Naval Nuclear Propulsion Programme (NNPP) and the Nuclear Weapon Programme (NWP).

Defence Safety and Environmental Authority (DSEA). DSEA regulates safety and environmental protection for those conducting defence activity, be they Armed forces personnel, MOD civilians, or contractors.

Design Authority. An approved Duty Holder who manages the system that ensures that vital features of the nuclear weapon system, facility, utility or nuclear plant are identified and maintained throughout life. The Design Authority is responsible for the provenance of the design documentation included in the safety case together with the through life specification of technical requirements and configuration management to maintain the design intent.

Design Intent. The Design Intent refers to the plan that the designer had for a particular component, system or subsystem to deliver a specific function. This function itself will be part of a plan for the delivery of key design parameters and attributes, including safety performance, set by the customer; this represents the highest level design intent. The design intent should be documented at various levels by functional and procurement specifications, design drawings, design descriptions and substantiations, including safety justifications. Where it is referred to in this JSP it must be taken to mean the Design Intent at the appropriate level according to context.

Design Organisation. An organisation responsible for designing a specific type of equipment.

Direction.

Explanation: A Direction requires an Authorisee/Accreditee to take a particular action.

Reason for use: A Direction is used for matters of major or immediate importance.

Diversity. The presence of two or more systems or components to perform an identified function, where the systems or components have different attributes so as to reduce the possibility of common cause failure, including common mode failure²⁶. See also Redundancy.

Dose. See Effective Dose.

Duly Authorised Persons (DAP). Suitably Qualified and Experienced Persons who are Authorised to control and supervise operations which may significantly affect nuclear or radiological safety, where those responsibilities go beyond their normal managerial duties or across line management responsibilities. See also AC12 in Annex B to Chapter 2.

Duty Holder. A person who has direct responsibility for, and control of, activities that influence, directly or indirectly, the safety of the DNP.

Effective Dose. The quantity obtained by multiplying the equivalent dose to various tissues and organs by a weighting factor appropriate to each and summing the products. When comparing effective doses received to annual limits the contributions from external exposure and the committed effective dose from intakes of radionuclides in the same period should be included. Effective dose is measured in Sieverts (Sv).

Emergency Arrangements. Arrangements which are put in place in advance to enable the implementation of the emergency plan when required.

Emergency Plan. A plan designed to secure, so far as is reasonably practicable, the health and safety of persons who may be affected by such reasonably foreseeable emergencies as have been identified in a hazard identification and risk evaluation.

Endorse. To endorse a document is to express agreement to its content. Endorsement does not apply to subsequent revisions unless these too are subject to separate assessment and endorsement.

Environment. The total set of all external natural or induced conditions to which a materiel is exposed, during a specified period of time.

Event. An event is any occurrence:

- a. that has or could have resulted in an unintended release of radioactive material, a failure of a line of defence or protection or a similar occurrence;
- b. that could have given rise to a significant radiological consequence, on or off site;
- c. that could significantly prejudice the requirements of a safety case or a breach of safety case requirements;
- d. that may affect the safe operation or safe condition;
- e. of safety interest or concern, including:
 - (1) human error;
 - (2) equipment or process failures that cause near misses;
 - (3) abnormal occurrences.

External Hazard. Natural or man-made hazards to a site and facilities that originate externally to both the site and the process, i.e. the Duty Holder may have very little or no control over the initiating event.

Facility. That part of a nuclear site identified as being a separate unit for the purposes of nuclear or radiological risk. This may be a single reactor, a group of processing plants as on a nuclear fuel-cycle facility or a dock and its support systems containing a naval reactor plant.

²⁶ IAEA Safety Glossary 2007. Terminology used in nuclear safety and radiation protection.

The term 'Facility' includes both the terms 'nuclear installations' as defined in the Nuclear Installations Act 1965 (as amended) and 'plant' as used in nuclear site licences granted by ONR. It also includes nuclear weapons, components and relevant support equipment.

Fissile Material. Any matter containing Uranium 233, Uranium 235 (>0.72%), Plutonium 239 or Plutonium 241, either singly or in any combination.

Further Authorisation Conditions. Conditions that address issues unique to the DNP (mobility of submarines and weapons for which there are no equivalent Licence Conditions).

Hazard. The potential for harm arising from an intrinsic property or disposition of something to cause detriment²⁷.

Hold Point. A point in any project or operation in the DNP beyond which progress is prohibited until predetermined criteria which provide safety assurance or risk mitigation are satisfied.

Incident. An undesired circumstance or near miss that has the potential to cause an emergency.

Independent Nuclear Safety Assessment (INSA). Provides an independent assessment of the adequacy of the Safety Justification documentation with regard to its basis, completeness and whether it demonstrates that the risk presented is acceptable in terms of the Safety Principles and Safety Criteria. INSA is independent of the organisation which generates the Safety Justification. INSA provides a continuous wide ranging independent review of the DNP in the context of national and international nuclear safety standards and Safety Principles and Safety Criteria.

Independent Peer Review (IPR). The examination of safety justification documentation by suitably qualified and experienced persons independent of the project to consider its acceptability and completeness and whether the safety case presented is acceptable when compared to established standards and criteria. The IPR will be commissioned by the organisation responsible for making the Safety Justification. Independence can stem from the use of resources outside the department producing the Safety Justification. An IPR will be done against well-defined terms of reference.

Individual Risk. The risk to any individual of premature death from cancer or other radiation effects as a result of exposure to ionising radiation during any one year, whether the death occurs during the year of exposure or subsequently.

Initiating Event. The cause and start point of a fault sequence which may originate either outside or inside a site or facility.

Inspection: The mechanism used to scrutinise management arrangements and the capability to carry out specified activities.

Intelligent Customer. The Duty Holder should have the necessary expertise and capability to be able to control and supervise its contractors, so as to maintain the ultimate responsibility for safety – this is referred to as 'intelligent customer' capability. The concept of the 'intelligent customer' relates to the organisation as a whole rather than the capabilities of individual personnel. The Duty Holder should retain sufficient intelligent customer capability to know what is required, to fully understand the need for a contractor's services, to specify requirements, to supervise work and to technically review the output before, during and after the work.

Internal Hazard. A hazard to plant and structures that originates within the site boundary and over which the Duty Holder has some form of control over the initiating event.

²⁷ Reducing risks, protecting people: HSE's decision making process, HSE Books 2001 ISBN 0 7176 2151 0.

Joined-up Regulation. The Duty Holder produces information once on a given topic and receives one response from one regulator, which incorporates the judgement of the other²⁸.

Licensed Site. A site in respect of which a Nuclear Site Licence has been granted by ONR under the Nuclear Installations Act 1965 (as amended), whether or not that Licence remains in force.

Licensee. The body corporate that has been granted a Nuclear Site Licence under the Nuclear Installations Act 1965 (as amended), which permits it to carry out a defined scope of activities on a delineated site.

Management Arrangements. Documented methods which describe how particular operations or activities will be controlled to meet the requirements of the Authorisation Conditions or relevant Safety Cases.

Modification. Any alteration to buildings, plants, operations, processes or safety cases including any replacement, refurbishment or repairs to existing buildings, plants or processes and alterations to the design of plants during the period of construction.

Naval Reactor Plant. The significant systems fundamental to the operation of the Nuclear Steam Raising Plant (NSRP). A meaning assigned to a nuclear reactor comprised in a nuclear powered warship (NPW), interpreted as if the NIA65 (as amended) applied.

Naval Reactor Plant Authorisee (NRPA). The Internal Safety Authority for the Naval Reactor Plant, authorised by DNSR for at-sea operation of the plant, and as Approving Authority for all phases of the plant life.

Normal Operation. Operation within specified operational limits and conditions²⁹.

Note. To acknowledge the existence of a document or arrangements. Noting a document does not imply that DNSR has examined the document or arrangements.

Notification. When so notified, an Authorisee, Accreditee, Approving Authority or Design Authority is required to submit information to DNSR.

Nuclear Emergency. This refers to a reactor accident, nuclear fuel accident, neutron source accident or a nuclear weapon accident, which may lead to a release of fissile or radioactive material or fission products.

Nuclear Matter. Subject to any exceptions prescribed in NIA and the Nuclear Installations (Excepted Matter) Regulations 1978, nuclear matter is:

- a. any fissile material in the form of uranium metal, alloy or chemical compound (including natural uranium), or of plutonium metal, alloy or chemical compound, and any other fissile material which may be prescribed; and
- b. any radioactive material produced in, or made radioactive by exposure to the radiation incidental to, the process of producing or utilising any such fissile material as aforesaid.

Nuclear Safety. The state achieved when the probability and potential consequences of a Nuclear Emergency have been reduced to an acceptably low level and the potential for

²⁸ Definition from the LoU between ONR and UK DNSR states that: 'Joint regulation is an aspiration for Duty Holders to provide once, on a given topic, and receive co-ordinated responses from the regulators. In practice, it will be achieved by close alignment of Licence and Authorisation Conditions, common understanding of risks and hazards by regulators, sharing of information, and the adoption of common regulatory principles and philosophies.

²⁹ IAEA Safety Glossary 2007. Terminology used in nuclear safety and radiation protection.

personnel exposure arising from normal work with ionising radiation has been reduced to levels which are as low as reasonably practicable.

Nuclear Safety Related. An equipment or system that provides a supporting role to nuclear safety and where failure leads to erosion of nuclear safety margins.

Nuclear Steam Raising Plant. A pressurised water reactor within a primary circuit and those other (non-nuclear) systems necessary to generate steam to enable propulsion.

Nuclear Weapon (NW). In this JSP the term is used to describe a nuclear device or warhead, excluding the delivery system.

Nuclear Weapon System. The entire stockpile of nuclear weapons, including facilities, activities and equipment necessary for operational use and safety.

Operating Instructions. Referred to in Authorisation Condition 24, in which they are defined as written instructions that:

- a. provide step by step instructions on how to carry out an operation to ensure that it is done in the way assumed in the safety case;
- b. ensure that operating conditions and limits are implemented;
- c. are necessary in the interests of safety.

Operating Organisation. A body empowered to conduct nuclear operations within the DNP, either by itself or through prescription of a safe boundary and limits to an approved Duty Holder who is the respective operating authority.

Operating Rules. Referred to in Authorisation Condition 23 and are defined as the conditions and limits which bound the safety case from which they were derived. The conditions and limits ensure that the operation is conducted safely and could arise from consideration of:

- a. the calculated limits of performance, to ensure that the limits and conditions of the design basis are not exceeded;
- b. the limits of analysis, beyond which the performance of the system is unknown;
- c. the limitations in the scope of safety case;
- d. the need to ensure that engineered safeguards are in place.

Operational Berth. Any berth outside an Authorised site and not covered by an Authorised site's arrangements, which may be visited by a NPW. An Operational Berth may be in the UK, a British Overseas Territory (BOT) or a foreign country.

Operation(s). Operation includes maintenance, examination, testing and operation of the plant and the treatment, processing, keeping, storing, accumulating or carriage of any radioactive material or radioactive waste. "Operating" and "Operational" shall be construed accordingly.

Periodic Review of Safety. A comprehensive assessment of equipment, operations and safety cases against current standards required at appropriate intervals to demonstrate that the risks continue to be as low as reasonably practicable and that ageing and other time-related phenomena will not render operations unsafe before the next review.

Permissioning. The mechanism by which DNSR regulates hazardous activities, through the imposition of formal requirements on, for example, Operators³⁰, Designers, Builders or Maintainers to gain permission before conducting certain defined activities. The term 'permissioning' is used to encompass the regulatory controls 'consent', 'approval' and 'agreement'.

³⁰ i.e. those effecting safety related work subject to regulatory controls

Radiation Emergency. Any event (other than a pre-existing situation) which is likely to result in any member of the public being exposed to ionising radiation arising from that event in excess of any of the doses set out in Schedule 1 (of REPPiR) and for this purpose any health protection measure to be taken during the 24 hours immediately following the event shall be disregarded.

Radiation Safety. An integral part of nuclear safety and requires the implementation of radiation protection measures which ensure that personal exposure arising from normal work with ionising radiation is kept to levels which are as low as reasonably practicable.

Radioactive Material. Radioactive material is as defined in the Radioactive Substances Act 1993.

Radioactive Substance. Radioactive substance is as defined in Ionising Radiations Regulations 1999.

Radioactive Waste. Radioactive waste is as defined in Radioactive Substances Act 1993.

Reactor Accident. An unexpected event which is likely to lead to, or has resulted in, a release of fission products external to the fuel cladding.

Redundancy. Provision of alternative (identical or diverse) structures, systems or components, so that any one can perform the required function regardless of the state of operation or failure of any other³¹. See also Diversity.

Risk. The chance that someone or something is adversely affected in a particular manner by a hazard³².

Risk Assessment. The quantitative evaluation of the likelihood of undesired events and the likelihood of harm or damage being caused, together with the value judgements made concerning the significance of the results.

Safety Case. In this document, 'safety case' refers to the totality of an Authorisee's, Accreditee's or Duty Holder's documentation to demonstrate safety. It must include a justification for the activity and demonstration of ALARP nuclear risk. A fuller definition of the requirements of a Safety Case is given in ONR TAG No. T/AST/051, "Guidance on the purpose, scope and content of nuclear safety cases".

Safety Category. The classification of nuclear weapons, nuclear plant, modifications or engineering work, or operations according to the potential consequences of failure.

Safety Clearance Letter. A letter issued by the NRPA signifying agreement that the nuclear risk to the public, workers and crew from initial criticality and subsequent operation of the "as-built" Naval Reactor Plant is ALARP. See also JSP 518 Annex C to Chapter 3 for details of the process to agree NRP criticality.

Safety Criteria. The numerical values against which the calculated risks arising from activities are compared as an aid in judging whether those risks are acceptable.

Safety Principle. A point of accepted best practice in corporate and engineering management which is (or is to be) adopted in the pursuit of nuclear safety.

Safety System. A system that acts in response to a fault to prevent or mitigate a radiological consequence.

³¹ IAEA Safety Glossary 2007. Terminology used in nuclear, radiation, radioactive waste and transport safety

³² Reducing risks, protecting people: HSE's decision making process, HSE Books 2001 ISBN 0 7176 21510

Site Safety Case. The documentation which demonstrates that sites and organisations supporting nuclear weapons and nuclear powered warships at various stages in their Defence Nuclear Programme life cycle maintain ALARP nuclear risk while so doing³³.

Special Nuclear Material. Plutonium, High Enriched Uranium (HEU) and Tritiated materials.

Specification:

Explanation: A Specification issued by DNSR requires an Authorisee/Accreditee to implement the specified arrangements.

Reason for use: A Specification is the means by which DNSR can implement discretionary control over an Authorisee/Accreditee's arrangements.

Suitably Qualified and Experienced Persons. The term used in Authorisation Conditions 12 & 26 which is defined as those persons whom the Authorisee, Approving Authority or Design Authority considers suitably qualified and experienced to perform duties which may affect nuclear and radiological safety.

Target. A value of individual dose or collective dose set by an intelligent customer, or may be self-imposed by an operator or designer, so that in the design of new nuclear plant, nuclear weapon or component or in the planning of an activity involving radiation exposure, dose is minimised by good dose management and dose limiting values are not exceeded.

Transport. The deliberate physical movement of radioactive material (other than that forming part of a means of propulsion) from one place to another³⁴. From a regulatory perspective 'transport' comprises all operations and conditions associated with, and involved in, the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of radioactive material and packages [from IAEA SSR-6 para 106].

Unacceptable. A level of risk that is high enough to cause serious concern to informed individuals who are subjected to it. The regulatory authorities consider that such a risk should not be permitted in normal circumstances, and only permitted in order to avert greater risks in the course of serious emergency.

Utility. A supporting plant system such as a power distribution system which has no inherent radiological hazard but which is safety related because failure could have an adverse effect on the safety of another facility or nuclear plant.

³³ The ALARP justification may include consideration of risks in other stages of the life cycle. Note that specific or unusual site activities in response, for example, to emerging defects, might require individual ALARP justifications.

³⁴ IAEA Safety Glossary 2007. Terminology used in nuclear, radiation, radioactive waste and transport safety

ABBREVIATIONS

This section provides a common JSP 518/538 list of abbreviations as used specifically in regulatory documents.

AA	Approving Authority/Authorities
AC	Authorisation Condition(s)
ADA	Approving and Design Authority
ADAC	Approving and Design Authorities Conditions
AF&F	Arming Fuzing and Firing
ALARP	As Low As Reasonably Practicable
ASND	Autorité de Sûreté Nucléaire et à la radioprotection pour les activités et installations intéressant la Défense
AWE	Atomic Weapons Establishment
BR	Book of Reference
BSL	Basic Safety Level
BSO	Basic Safety Objective
CASD	Continuous at Sea Deterrence
CBA	Cost Benefit Analysis
CLOSO	Conditions and Limits of Safety Operation
CSSE	Chief Strategic Systems Executive
DA	Design Authority
DAP	Duly Authorised Person(s)
DBA	Design Basis Analysis
DfT	Department for Transport
DMR	Defence Maritime Regulator
DNESB	Defence Nuclear Environment and Safety Board
DNM	Defence Nuclear Material
DNP	Defence Nuclear Programme
DNRF	Defence Nuclear Regulatory Forum
DNRSC	Defence Nuclear Regulation Stakeholder Committee
DNSC	Defence Nuclear Safety Committee
DNSR	Defence Nuclear Safety Regulator
DO	Design Organisation
DOSR	Defence Ordnance Safety Regulator
DRDL	Devonport Royal Dockyard Ltd
DSTL	Defence Science and Technology Laboratory
DSEA	Defence Safety & Environment Authority
EA	Environment Agency
EAC	Environmentally Assisted Cracking
ECSS	Emergency Core Cooling System
EIMT	Examination, Inspection, Maintenance and Testing
EOP	Emergency Operating Procedures
EPR	Environmental Permitting Regulations
ESDA	Excessive Steam Demand Accident
EU	European Union
FAC	Further Authorisation Condition(s)
GoG	Government of Gibraltar
HASS	High Activity Sealed Source
HAZID	Hazard Identification
HIRE	Hazard Identification and Risk Evaluation
HMNB	Her Majesty's Naval Base
HS&EP	Health, Safety and Environmental Protection
HSE	Health and Safety Executive
HSWA	Health and Safety at Work etc. Act 1974
IAEA	International Atomic Energy Agency

ICRP	International Commission for Radiological Protection
IM	Insensitive Munitions
INES	International Nuclear Event Scale
INSA	Independent Nuclear Safety Assessment
IoF	Incredibility of Failure
IP	Intervention Plan
IRR	Ionising Radiations Regulations
IS	Intervention Strategy
ISR	Immediate Safety Requirement
JSP	Joint Service Publication
LC	Licence Condition(s)
LCP	Life Cycle Phase
LLC	Local Liaison Committee
LOCA	Loss of Coolant Accident
LOD	Line(s) of Defence
MAA	Military Aviation Authority
MOD	Ministry of Defence
MPS	Multi-Point-Safe
NEBUST	Nuclear Emergency Backup Support Team
NBC	Naval Base Commander
NIA	Nuclear Installations Act 1965?
NNPP	Naval Nuclear Propulsion Programme
NPR	Nuclear Propulsion Regulator
NPW	Nuclear Powered Warship
NR(EIAD)R	Nuclear Reactor (Environmental Impact Assessment of Decommissioning) Regulations
NRP	Naval Reactor Plant
NRPA	Naval Reactor Plant Authorisee
NRTE	Naval Reactor Test Establishment
NRW	Natural Resources Wales
NSC	Nuclear Safety Committee
NT	Numerical Target
NW	Nuclear Weapon
NW ADA	Nuclear Weapon Approving and Design Authority
NWP	Nuclear Weapon Programme
NWR	Nuclear Weapon Regulator
NW SPSC	Nuclear Weapon Safety Principles and Safety Criteria
OB	Operational Berth
OECD	Organisation for Economic Cooperation and Development
ONR	Office for Nuclear Regulation
PRS	Periodic Review of Safety
PLEX	Plant Life Extension
PRT	Power Range Testing
PSA	Probabilistic Safety Analysis/Assessment
PSI	Pre-Service Inspection
PUS	Permanent Under Secretary
QA	Quality Assurance
RA	Radioactive
RAM	Radioactive Material
R&D	Research and Development
REPIIR	Radiation Emergency (Preparedness and Public Information) Regulations
RPC	Regulatory Policy Committee
RPV	Reactor Pressure Vessel
RSA	Radioactive Substances Act 1993?
RSD	AMEC Regulatory Support Business Area
SAP	Safety Assessment Principle(s)
SEPA	Scottish Environment Protection Agency

SFAIRP	So Far As Is Reasonably Practicable
SFC	Single Failure Criterion
SI	Statutory Instrument
SIN	Safety Improvement Notice
SINS	Security-Informed Nuclear Safety
SJ	Safety Justification
SMDC	Safety Mechanisms, Devices and Circuits
SNM	Special Nuclear Material
SNMR	Special Nuclear Material Requirements
SofS	Secretary of State
SOL	Start-of-Life
SPS	Single-Point-Safe
SPSC	Safety Principles and Safety Criteria
SQEP	Suitably Qualified and Experienced Persons
SSC	System, Structure or Component
Sv	Sievert
SW PT	Strategic Weapons Project Team
TAG	Technical Assessment Guide
TEA	The Energy Act 2013
WH	Warhead