



IAEA
International Atomic Energy Agency

A background image of a modern, multi-story building with a curved facade and large glass windows, likely a government or institutional building. The image is slightly faded to allow the text to be prominent.

**INTEGRATED
REGULATORY
REVIEW SERVICE (IRRS)
2ND MISSION
TO
The United Kingdom**

Liverpool

4 to 13 October 2009

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY





INTEGRATED REGULATORY REVIEW SERVICES IRRS

Under the terms of Article III of its statute, the International Atomic Energy Agency (IAEA) has the mandate to establish or adopt, in consultation and, where appropriate, in collaboration with competent organizations, standards of safety for protection of health and minimization of danger to life and property (including such standards for labour conditions), and to provide for the application of these standards to its own operations as well as to assisted operations and, at the request of the parties, to operations under bilateral or multilateral arrangements or, at the request of a State, to any of that State's activities concerning peaceful nuclear and radiation activities. This includes the publication of a set of Safety Standards, whose effective implementation is essential for ensuring a high level of safety. As part of its providing for the application of safety standards, the IAEA provides Safety Review and Appraisal Services, at the request of Member States, which are directly based on its Safety Standards.

In the regulatory framework and activities of the regulatory bodies, the IAEA had been offering, for many years, several peer review and appraisal services. These included: (a) the International Regulatory Review Team (IRRT) programme that provided advice and assistance to Member States to strengthen and enhance the effectiveness of their legal and governmental infrastructure for nuclear safety; (b) the Radiation Safety and Security Infrastructure Appraisal (RaSSIA) that assessed the effectiveness of the national regulatory infrastructure for radiation safety including the safety and security of radioactive sources; (c) the Transport Safety Appraisal Service (TransSAS) that appraised the implementation of the IAEA's Transport Regulations; and (d) the Emergency Preparedness Review (EPREV) that was conducted to review both preparedness in the case of nuclear accidents and radiological emergencies and the appropriate legislation.

The IAEA recognized that these services and appraisals had many areas in common, particularly concerning the requirements on a State to establish a comprehensive regulatory framework within its legal and governmental infrastructure and on a State's regulatory activities. Consequently, the IAEA's Department of Nuclear Safety and Security has developed an integrated approach to the conduct of missions on legal and governmental infrastructure to improve their efficiency, effectiveness and consistency and to provide greater flexibility in defining the scope of the review, taking into account the regulatory technical and policy issues.

In 2006 a new IAEA peer review and appraisal service, called the Integrated Regulatory Review Service (IRRS) was established. The IRRS is intended to strengthen and enhance the effectiveness of the State's regulatory infrastructure in nuclear, radiation, radioactive waste and transport safety, whilst recognizing the ultimate responsibility of each State to ensure the safety of nuclear facilities, the protection against ionizing radiation, the safety and security of radioactive sources, the safe management of radioactive waste, and the safe transport of radioactive material. The IRRS is carried out by comparisons against IAEA regulatory safety standards with consideration of regulatory technical and policy issues.

The IRRS is structured in modules that cover general requirements for the establishment of an effective regulatory framework, regulatory activities and management systems for the regulation and control in nuclear safety, radiation safety, waste safety, transport safety, emergency preparedness and response and security. The aim is to make the IAEA services more consistent, to enable flexibility in defining the scope of the missions, to promote self-assessment and continuous self-improvement, and

to improve the feedback on the use and application of the IAEA Safety Standards. The modular structure also enables tailoring the service to meet the needs and priorities of the Member State. The IRRS is neither an inspection nor an audit but is a mutual learning mechanism that accepts different approaches to the organization and practices of a national regulatory body, considering the regulatory technical and policy issues, and that contributes to ensuring a strong nuclear safety regime. In this context, considering the international regulatory issues, trends and challenges, and to support effective regulation, the IRRS missions provide:

- a balance between technical and policy discussions among senior regulators;
- sharing of regulatory experiences;
- harmonization of the regulatory approaches among Member States; and
- mutual learning opportunities among regulators.

Regulatory technical and policy discussions that are conducted during IRRS missions take into account the newly identified issues coming from the self-assessment made by the host organization, visits to installations to observe inspections and interviews with the counterparts.

Other legally non-binding instruments can also be included upon request of the Member States, such as the Code of Conduct (CoC) on the Safety and Security of Radioactive Sources, which was adopted by the IAEA Board of Governors in 2004 and for which more than eighty Member States have written to the Director General of the IAEA committing themselves to implementing its guidance, and the Code of Conduct on the Safety of Research Reactors, which was adopted by the IAEA Board of Governors in 2005.

The IRRS concept was developed by the IAEA Department of Nuclear Safety and Security and then discussed at the 3rd review meeting of the Contracting Parties of the Convention on Nuclear Safety in 2005. The meeting acknowledged the importance of the IAEA regulatory peer reviews now recognized as a good opportunity to exchange professional experience and to share lessons learned and good practices. The self-assessment performed prior to the IAEA peer review mission is an opportunity for Member States to assess their regulatory practices against the IAEA safety standards. These IAEA peer review benefits were further discussed at the International Conference on 'Effective Nuclear Regulatory Systems' in Moscow in 2006, at which note was taken of the value of IRRS support for the development of the global nuclear safety regime, by providing for the sharing of good regulatory practices and policies for the development and harmonization of safety standards, and by supporting the application of the continuous improvement process. All findings coming from the Convention on Nuclear Safety review meetings and from the Moscow conference are inputs for the IRRS to consider when reviewing the regulatory technical and policy issues.

In addition, the results of the IRRS missions will also be used as effective feedback for the improvement of existing safety standards and guidance and the development of new ones, and to establish a knowledge base in the context of an integrated safety approach. Through the IRRS, the IAEA assists its Member States in strengthening an effective and sustainable national regulatory infrastructure thus contributing towards achieving a strong and effective global nuclear safety and security regime.

The Global Nuclear Safety Regime has emerged over the last ten years, with international legal instruments such as safety Conventions and Codes of Conduct and significant work towards a suite of harmonized and internationally accepted IAEA safety standards. The IAEA will continue to support the promotion of the safety Conventions and Codes of Conduct, as well as the application of the IAEA safety standards in order to prevent serious accidents and continuously improve global levels of safety.



INTEGRATED REGULATORY REVIEW SERVICE (IRRS) 2nd MISSION TO THE UK

REPORT TO THE GOVERNMENT OF THE UNITED KINGDOM

Liverpool
4 to 13 October 2009

Mission date: 4 to 13 October 2009
Regulatory Body: Health and Safety Executive's Nuclear Directorate (ND)
Location: HSE Headquarters, Liverpool, United Kingdom
Regulated Facilities: Nuclear Power Plants and Fuel Cycle Facilities
Organized by: IAEA

IAEA Review Team:

BORCHARDT, Bill	(Team Leader, USA)
LAAKSONEN, Jukka	(Deputy Team Leader, Finland)
SCHMOCKER, Ulrich	(Switzerland)
SODA, Kuniyoshi	(Japan)
ELDER, Peter	(Canada)
MISAK, Jozef	(Czech Republic)
JANKO, Karol	(Slovak Republic)
WACK, Guillaume	(France)
COMETS, Marie-Pierre	(Observer, France)
CARUSO, Gustavo	(IAEA Team Coordinator)
KOBEIN, Marlene	(IAEA Admin. Support)

IAEA-2010
Issue date: 2010

FOREWORD

by the

Director General

The IAEA Integrated Regulatory Review Service (IRRS) programme assists Member States to enhance the organization and performance of their nuclear safety regulatory body. Such a regulatory body must work within the framework of its national legal system, which in turn should ensure both the independence and the legal powers available to the regulatory body. Additionally the national administrative and legislative system should ensure that the regulatory body has sufficient funding and resources to carry out its functions of reviewing and assessing safety submissions; licensing or authorizing nuclear safety activities, establishing regulations and criteria; inspecting nuclear facilities and enforcing national legislation. The regulatory body should be resourced and staffed by capable and experienced people to a level commensurate with the national nuclear programme. IRRS missions focus on all these aspects in assessing the regulatory body's safety effectiveness. Comparisons with successful practices in other countries are made and ideas for improving safety are exchanged at the working level.

An IRRS mission is made only at the request of a Member State. It is not an inspection to determine compliance with national legislation, rather an objective review of nuclear regulatory practices with respect to international guidelines. The evaluation can complement national efforts by providing an independent, international assessment of work processes that may identify areas for improvement. Through the IRRS programme, the IAEA facilitates the exchange of knowledge and experience between international experts and regulatory body personnel. Such advice and assistance will enhance nuclear safety in all nuclear countries. An IRRS mission is also a good training ground for observers from newly formed regulatory bodies in developing countries who follow the evaluation process. This approach, based on voluntary co-operation, contributes to the attainment of international standards of excellence in nuclear safety at the regulatory body level.

Essential features of the work of the IRRS experts and their regulatory body counterparts are the comparisons of regulatory practices with international guidelines and best practices, and a joint search for areas where practices can be enhanced. The implementation of any recommendations or suggestions, after consideration by the regulatory body, is entirely voluntary.

The number of recommendations, suggestions and good practices is in no way a measure of the status of the regulatory body. Comparisons of such numbers between IRRS reports from different countries should not be attempted.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
I. INTRODUCTION	4
II. OBJECTIVE AND SCOPE	5
III. BASIS FOR THE REVIEW	6
1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES	8
1.1. PRINCIPAL LAWS OR OTHER LEGAL PROVISIONS	8
1.2. POSITION AND RESOURCES OF THE REGULATORY BODY.....	9
1.3. OTHER REQUIREMENTS FOR GOVERNMENTAL RESPONSIBILITIES	10
2. AUTHORITY, RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	12
2.1. GENERAL SITUATION.....	12
3. ORGANIZATION OF THE REGULATORY BODY	14
3.1. GENERAL ORGANIZATION.....	14
3.2. STAFFING AND TRAINING.....	16
3.3. INTERNATIONAL CO-OPERATION.....	16
3.4. RELATIONS BETWEEN THE REGULATORY BODY AND THE OPERATOR.....	17
3.5. TRANSITION OF ND INTO A STATUTORY CORPORATION	17
4. AUTHORIZATION PROCESS	18
4.1. AUTHORIZATION FOR NUCLEAR FACILITIES	18
4.2. NUCLEAR FACILITY MODIFICATIONS	19
4.3. AUTHORISATION OF SELECTED LICENSEE PERSONNEL.....	20
5. REVIEW AND ASSESSMENT	22
5.1. ESTABLISHMENT AND USE OF REVIEW AND ASSESSMENT CRITERIA	22
5.2. MANAGEMENT OF REVIEW AND ASSESSMENT	22
5.3. AREAS OF EXPERTISE AND TECHNICAL SUPPORT ORGANISATIONS	24
5.4. REVIEW AND ASSESSMENT OF OPERATIONAL EXPERIENCE FEEDBACK	25
5.5. PERFORMANCE OF MAJOR REVIEW AND ASSESSMENT TASKS	26
5.6. USE OF PROBABILISTIC SAFETY ASSESSMENT.....	27
6. INSPECTION AND ENFORCEMENT	29
7. DEVELOPMENT OF REGULATIONS AND GUIDES	34
7.1. PROCESS FOR DEVELOPMENT OF REGULATIONS AND GUIDES.....	34
8. THE REVIEW OF THE MANAGEMENT SYSTEM	36
9. EMERGENCY PREPAREDNESS	40
9.1. THE ROLE OF THE NUCLEAR DIRECTORATE	40
9.2. CAPABILITIES AND RESOURCES	40
9.3. FUNCTIONAL REQUIREMENTS AND DECISION-MAKING IN EMERGENCY SITUATIONS.....	41
9.4. EXERCISES AND TRAINING	44
APPENDIX I- EXPERTS' OPINION ON NEW BUILD	46
APPENDIX II - TRANSITION OF ND INTO A STATUTORY CORPORATION	50
APPENDIX III – LIST OF PARTICIPANTS	53
APPENDIX IV – MISSION PROGRAMME	54
APPENDIX V – MISSION COUNTERPARTS	60
APPENDIX VI – SITE VISITS	62
APPENDIX VII – RECOMMENDATIONS/SUGGESTIONS/GOOD PRACTICES FROM THE 2nd IRRS MISSION	63
APPENDIX VIII – STATUS OF RECOMMENDATIONS/SUGGESTIONS FROM THE 2006 IRRS MISSION	67
APPENDIX IX – REFERENCE MATERIAL PROVIDED BY ND	74

APPENDIX X – IAEA REFERENCE MATERIAL USED FOR THE REVIEW75
APPENDIX XI – ND ORGANIZATIONAL CHART.....76

EXECUTIVE SUMMARY

In March 2006, at the request of the Government of the United Kingdom, an international team of six experts visited the UK Health and Safety Executive's (HSE), then Nuclear Safety Directorate (NSD), to conduct the first of a series of Integrated Regulatory Review Service (IRRS) modular missions. The request for the mission was made in the context of the energy policy review that had been announced in the UK. The Secretary of State at the Department of Trade and Industry (DTI) asked HSE to contribute an expert report that included an assessment of the risks associated with the new generation of nuclear power plants and the potential role of pre-licensing assessments of the candidate designs. The purpose of the first IRRS mission was to evaluate the effectiveness of both selected aspects of the current HSE/NSD regulation of existing nuclear power plants and HSE/NSD's preparedness to regulate and licence any new reactor designs.

In February 2009 the UK Government requested a second IRRS mission, to review the measures undertaken following the recommendations and suggestions of the 2006 IRRS mission. In addition, this second modular mission was carried out to consider: significant developments since the first mission; the regulation of operating power plants and fuel cycle facilities; and, as new areas for review, inspection and enforcement and emergency preparedness and response. The IAEA was also requested to review again aspects of regulatory organization as the Nuclear Directorate (ND) moves towards becoming a Statutory Corporation (SC).

The review was conducted from October 4th to 13th 2009 and the review team comprised eight senior regulators from eight Member States, one senior regulator as an observer, a staff member from the IAEA and an IAEA administrative assistant. HSE/ND had submitted to the IAEA, in advance of the mission, an information package on a dedicated HSE/ND extranet web-site, including a comprehensive new self-assessment and an action plan for improving its regulatory effectiveness.

The IRRS activities took place at the HSE/ND offices in Bootle, Liverpool and also through technical visits to the Sellafield site in Cumbria, the Heysham 1 nuclear power plant near Lancaster and the Strategic Control Centres (SCC) at Summergrove and Hutton.

Both regulatory technical and policy issues were addressed during the mission. The policy issue discussed was the transition of ND into a SC. The second IRRS mission included a series of interviews and discussions with key personnel at HSE/ND and new regulatory observations in the field, in addition to those carried out during the first IRRS mission, to provide additional insight to the review.

The team concluded that HSE/ND has taken initiatives to address, in a systematic manner, not only the recommendations and suggestions from the 2006 IRRS mission but also those new improvements identified through the self-assessment. There has been significant progress and many improvements have been carried out in significant areas following the implementation of a comprehensive action plan. The IRRS team believes that the action plan is thorough and addresses all the necessary improvements, and should continue to be implemented and monitored through to completion.

The IRRS team concluded that ND has developed and is implementing a comprehensive plan for making the transition to SC status. The plan addresses the important legal, policy and operational issues associated with becoming a SC. The team highlighted a number of important considerations that require continued management attention during and after this

transition. These considerations include: regulatory independence, autonomy in budgeting and staffing issues, roles and responsibilities of the board of the SC and international regulatory activities of the SC.

In addition to the strengths identified during the 2006 mission, the IRRS team during the 2009 mission made note of the following strengths:

1. ND has established a thorough transition programme and organization, dedicated to the handling of its transition to becoming a statutory corporation.
2. ND has developed and implemented a comprehensive recruitment and training programme for new employees.
3. ND is implementing a comprehensive programme for the design review of new reactors and has acquired the necessary resources. The programme includes active and transparent interaction with stakeholders.
4. ND has a comprehensive process in place to provide consistency in both inspection and assessment across the organization, and to provide effective prioritization of regulatory activities.
5. ND has established a 'Technical Support Framework' that will provide the necessary technical areas of expertise from external contractors.

During this mission the IRRS team determined that eight of the recommendations and eight of the suggestions made by the 2006 IRRS mission had been fully addressed and therefore could be considered closed. ND should be strongly commended for this. For the remaining five recommendations and five suggestions made by the 2006 IRRS mission, ND has made some progress but has not completed all the necessary actions and consequently these findings have been left open. The IRRS team believes that it is important that ND focus on these areas, including the process for review of appeals of regulatory decisions and the allocation of sufficient resources to improving further regulatory application of information gained from operating experience.

This report also includes a number of new recommendations and suggestions to further strengthen the regulatory body in the UK and to support the observed improvement activities.

1. ND should maintain a clear focus on its current safety responsibilities throughout its transition to a statutory corporation.
2. ND should strengthen the integration of nuclear safety, security and safeguards at the inspector level to improve delivery of strategic regulatory priorities.
3. ND should consider enhancing the use of inspection and assessment results as feedback information to licensees through written communication.
4. ND should review and assess whether sufficient inspector effort is being applied at nuclear power plants to achieve adequate assurance of safety, taking into consideration facility ageing.
5. ND management should make a clearer commitment to the timescales for improvement of the management system, through more active involvement.
6. ND should continue improvements in the training area with focus on emergency preparedness and inspection.

ND staff put significant effort into the preparation for the mission. During the review the administrative and logistical support was excellent and the team was extended full co-operation in technical discussions with HSE/ND personnel. HSE/ND counterparts were

enthusiastic and were interested in obtaining further advice relating to the way they conduct their work, and their plans for further development.

It is expected that a third IRRS mission will be carried out in the future to review the progress that ND has made against the findings from the first two missions and those improvement areas identified by the ND self assessment.

The UK self-assessment included consideration of two additional themes i.e. Radiation Protection and Radioactive Waste Management, and the option of reviewing these areas during a future IAEA mission was retained. Following discussion between IAEA and ND it has been agreed that consideration of these additional areas by IRRS will be included in the review of progress by UK to address the findings from the self-assessment, and therefore this work will be reported as part of the proposed third mission to UK in the future.

I. INTRODUCTION

BACKGROUND - FIRST IRRS MISSION

In 2006 at the request of the UK Government, an IAEA team of six experts and an IAEA administrative assistant visited the Health & Safety Executive (HSE), Nuclear Safety Directorate (NSD), in Bootle, Liverpool to conduct a modular Integrated Regulatory Review Service (IRRS) mission with reduced scope. This mission was conducted to assess the readiness to regulate and licence any new reactor designs in advance of any specific proposals for building a new nuclear power plant in UK, following the Energy Policy review announced by the UK Prime Minister and the Secretary of State for Trade and Industry (DTI) in 2005. The purpose of the 2006 mission was to conduct a review of the regulatory framework and the regulatory activities for nuclear power plants, to review the effectiveness of HSE/NSD and to exchange information and experience in the regulation of the areas considered by IRRS. In addition, the policy issue considered in this review was “regulatory activities for New Build” of nuclear power plants. This mission represented the first in a series of IAEA IRRS missions scheduled for the UK.

The selected areas for review were: legislative and governmental responsibilities; authority, responsibilities and functions of the regulatory body; organization of the regulatory body; authorization process; review and assessment; development of regulations and guides and the management system.

In 2006 the IRRS activities took place mainly in the new HSE offices. In addition, the members of the IRRS team participated on a technical visit at the Wylfa Nuclear Power Plant in Wales.

SECOND IRRS MISSION

In February 2009 the UK Government requested a 2nd IRRS modular mission, to review the measures undertaken following the recommendations and suggestions presented in the report of the 2006 IRRS mission, which principally focussed on ND’s capability to regulate potential new build. Additionally this second mission considers significant developments since the first mission; the regulation of operating power plants and fuel cycle facilities; two new areas for review being inspection and enforcement, and, emergency preparedness and response and a complete review of the regulatory organisation as it moves towards becoming a Statutory Corporation (SC).

The review was conducted from October 4th to 13th 2009 and consisted of eight senior regulatory experts from eight Member States, one senior regulator as observer, one staff member from the IAEA, and an IAEA administrative assistant (Appendix III). IRRS activities took place at the HSE/NSD offices at Redgrave Court in Bootle, Merseyside, and members of the IRRS team participated in technical visits to the Sellafield site in Cumbria, the Heysham 1 nuclear power plant near Lancaster, and the Strategic Control Centres (SCC) at Summergrove and Hutton.

II. OBJECTIVE AND SCOPE

The key objectives of the IRRS mission are to enhance safety by:

- Providing the host country (regulatory body and governmental authorities) with a review of their nuclear and radiation safety regulatory technical and policy issues;
- Providing the host country with an objective evaluation of their nuclear and radiation safety regulatory practices with respect to international safety standards;
- Contributing to the harmonization of regulatory approaches among Member States;
- Promoting sharing of experience and exchange of lessons learnt;
- Providing key staff in the host country with an opportunity to discuss their practices with reviewers who have experience of other practices in the same field;
- Providing the host country with recommendations and suggestions for improvement;
- Providing other States with information regarding good practices identified in the course of the review;
- Providing reviewers from States and the IAEA staff with opportunities to broaden their experience and knowledge of their own field; and
- Providing the host country through completion of the IRRS self-assessment of a comparison of its activities against international safety standards and thereby identifying potential areas for improvement.

The purpose and scope of the second IRRS mission was to continue the work of improving regulatory effectiveness by reviewing:

- HSE/ND's progress in response to the 2006 IRRS mission's recommendations and suggestions,
- Regulatory developments since the 2006 IRRS mission;
- The regulation of operating nuclear power plants and fuel cycle facilities
- The inspection and enforcement programme for nuclear power plants and fuel cycle facilities,
- The emergency preparedness and response arrangements; and
- A complete review of the regulatory organization as it moves towards becoming a Statutory Corporation,

III. BASIS FOR THE REVIEW

A) PREPARATORY WORK AND IAEA REVIEW TEAM

The preparatory work for the mission was carried out by the IRRS IAEA Coordinator Mr Gustavo Caruso, SH-NSNI/ IAEA and the appointed Liaison Officer, Mr Rob Campbell, HM Principal Inspector HSE/ND.

An IRRS preparatory meeting was held on 5 and 6 February 2009 to discuss the technical and administrative details of the second mission to the UK. It took place in the Health & Safety Executive (HSE) offices in Bootle, Liverpool, UK with the participation of the appointed IRRS Team Leader Mr R W Borchardt, Executive Director of Operations, United States Nuclear Regulatory Commission (USNRC) and Mr Gustavo Caruso, the IAEA coordinator. The preparatory meeting was opened by Mr Mike Weightman, HM Chief Inspector of Nuclear Installations, Nuclear Directorate (ND) who provided an organizational overview and the main issues and changes to the UK regulatory regime. All the preliminary organizational aspects of the mission were defined during the preparatory meeting with the participation of Mr Weightman, Mr Kevin Allars, Director GDA, ND, Mr Len Creswell, Deputy Chief Inspector, ND, Mr Robbie Gray, Deputy Chief Inspector, ND, Mr Andy Hall, Deputy Chief Inspector, ND, Mr Colin Patchett, Deputy Chief Inspector, ND and Mr Rob Campbell.

During the preparatory meeting discussions it was agreed that the advance reference material (ARM), including the output from the self-assessment, would be provided to the IAEA in June 2009. In addition, the scope of the second IRRS mission was agreed to include: progress made to address the 2006 IRRS mission findings; the changes since the first mission; the regulation of fuel cycle facilities; the inspection and enforcement programme for nuclear power plants and fuel cycle facilities; the emergency preparedness and response arrangements and the review of the regulatory organization as it moves towards becoming a Statutory Corporation. The final aspect was recognized as not being an established situation but subject to change and thus the IAEA reviewers took account of this fact. On-site reviews and visits, the ARM and the main agenda items were discussed and agreed. This included agreeing to visits to the Sellafield site in Cumbria, the Heysham 1 nuclear power plant near Lancaster and the Strategic Control Centres (SCC) at Summergrove and Hutton.

Discussions were also held regarding a policy issue that was proposed to be included in the second IRRS mission, namely aspects of the transition of ND to a Statutory Corporation. Mr Caruso presented an overview of the IAEA's IRRS mission objectives, purpose and methodology to a large group of interested ND staff.

In accordance with the request from HSE/ND, and taking into account the scope of the second mission as indicated above, it was agreed that the IAEA review team would comprise eight experts from eight Member States (namely Canada, Czech Republic, Finland, France, Japan, Slovak Republic, Switzerland and the United States of America), an IAEA Team Coordinator, a senior regulator from France as observer and an IAEA administrative assistant (see Appendix III). The working areas and the HSE/ND counterparts were nominated as outlined in Appendix V.

During the preparatory phase all documents comprising the ARM were made available to the IAEA review team through a dedicated web-site, called the 'IRRS Web-community'.

Significant work was carried out by the reviewers and by the IAEA staff before the mission in order to prepare initial impressions on the ARM, to review the ND self-assessment output, to

prepare for the interviews and additional observations and to identify additional relevant material necessary to review during the mission.

An initial IAEA team meeting took place on Sunday 4th October 2009 and was attended by the IRRS team and the UK Liaison Officer. The IRRS Team Leader and the IRRS IAEA Coordinator discussed specific aspects of the mission and the main issues from the IRRS in 2006, the basis for the review, background, context and objectives of the IRRS and IRRS methodology for the review and the evaluation were also agreed among all of the mission reviewers. The Liaison Officer presented the logistical and other aspects of the 2nd mission.

B) REFERENCES FOR THE REVIEW

The main reference documents provided by HSE/ND for the review mission are indicated in Appendix IX. The most relevant IAEA Safety Standards and other reference documents used for the review are indicated in Appendix X.

C) CONDUCT OF THE REVIEW

The entrance meeting was held on Monday, 5th October with the participation of the Ms Judith Hackitt, HSE Chairperson; Mr Geoffrey Podger, HSE Chief Executive; Mr Kevin Myers, HSE Deputy Chief Executive; Mr Mike Weightman, HM Chief Inspector of Nuclear Installations and Director of ND; Mr Kevin Allars, Director New Nuclear Build Generic Design Assessment (GDA); Mr Len Creswell, Deputy Chief Inspector ND; Mr Robbie Gray, Deputy Chief Inspector ND; Mr Andy Hall, Deputy Chief Inspector ND; Mr David Senior, Deputy Chief Inspector, ND; Mr. Colin Patchett, Deputy Chief Inspector, ND; and Mr Rob Campbell, HM Principal Inspector ND and other participating ND staff contributing to the mission..

Opening remarks were made by Ms. Hackitt, Mr. Weightman, Mr. Borchardt and Mr. Caruso. During the mission, a systematic review was conducted of all the areas from the IRRS 2006 with the objective of establishing progress by HSE/ND in response to 2006 recommendations and suggestions, as well as identifying new good practices and covering the new areas for review stated in the scope of the mission. The review was conducted through meetings, interviews and discussions with HSE/ND personnel, assessment of the ARM, and direct observations regarding the national practices and activities.

The team performed its activities in accordance with the Mission Programme, outlined in Appendix IV

The exit meeting was held on Tuesday, 13th October 2009 with the Mr Mike Weightman, HSE/ND Chief Inspector; Mr Kevin Myers HSE Deputy Chief Executive; Mr Kevin Allars, Director of GDA; all Deputies Chief Inspectors, all counterparts and the ND's management staff. The main conclusions of the second IRRS mission were presented by the IRRS Team Leader Mr Borchardt, and closing remarks were made by Mr Tomihiro Taniguchi, IAEA Deputy Director General and by Mr Mike Weightman. The draft technical notes were handed over to HSE/ND at the end of the meeting.

1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES

1.1. PRINCIPAL LAWS OR OTHER LEGAL PROVISIONS

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- S1) **Suggestions:** *HSE should make arrangements to charge fees for pre-licence application work.*
- R1) **Recommendation:** *HSE should review and document the legislative authority that allows the appeal and review of technical basis for regulatory decisions in addition to the procedural review that is currently allowed, and take appropriate actions. (S1 of section 2.1.1. addresses the NSD internal practices and procedures related to this recommendation.)*
- S2) **Suggestion:** *HSE should initiate actions to establish and document the role of the public in the regulatory process.*

Changes since the IRRS 2006 Mission

The 2006 mission determined that UK legislation provided the then Nuclear Safety Directorate (NSD), located within the Health and Safety Executive, with the necessary authority to carry out its assigned responsibilities.

Since the IRRS mission in April 2006, there have been some significant developments in the legal framework, organization of government provisions and in the work undertaken by the Nuclear Directorate (ND).

During April 2007, the Office for Civil Nuclear Security (OCNS), the Government's security regulator for the civil nuclear industry, and the operational nuclear safeguards work of the UK Safeguards Office became a part of the HSE. This consolidated the regulation of the safety and security activities and safeguards activities of the Government in a single organization, enabling more effective and efficient regulatory oversight of the industry. To reflect these changes and the wider portfolio of work being undertaken the Nuclear Safety Directorate was renamed the Nuclear Directorate (ND).

The legal provisions directly affecting the regulation of nuclear, radiation, waste and transport safety have remained largely unchanged. A re-organisation within the UK government led to the creation in October 2008 of the Department of Energy and Climate Change (DECC). DECC now deals with all energy policy matters and the departmental Secretary of State is also responsible for reporting to Parliament on civil nuclear safety matters. ND's sponsoring department within government remains unchanged and is the Department for Work & Pensions (DWP).

The Health and Safety Fees Amendment Regulations, which amends the Health and Safety Fees Regulations 2007, came into force on 2 July 2007. It provides HSE with the authority to charge fees for the work it performs in relation to the assessment of a proposal for any new nuclear installation. This includes all matters relating to the installation's construction, commissioning, operation and decommissioning, which are to be assessed by HSE prior to any application for a nuclear site licence under the Nuclear Installations Act 1965 (NIA65) that may be made based upon the particular design proposal that has been assessed.

ND has evaluated the regulatory decision appeal process and while it's process does not fully comply with IAEA standards, ND's current process is in compliance with UK law. Section 44 of the Health and Safety at Work Act 1974 (HSWA74) specifically precludes the right of nuclear licensees to appeal licensing decisions made under the NIA65. This reflects the nature of the hazard being regulated and the particularly complex technical arguments that underpin most key licensing decisions.

There exist different forms of administrative appeal mechanisms, but no formal legal process for appeal exists. A draft procedure of the process the licensees can pursue in the event that they wish to press a challenge to a regulatory decision has been issued, but needs to be reviewed and implemented.

The public currently has the opportunity for an active role in the new build area. The public has the opportunity to comment on the Safety, Security and Environment Report published by the companies via their websites. The UK Nuclear Regulators are overseeing the public involvement process. They will monitor the comments and responses and at key stages will publish reports summarizing relevant issues raised during the process. Although progress has been made regarding the public's involvement in new build, additional work is warranted throughout ND's areas of responsibilities.

Findings from the 2009 Follow-up

Recommendation 1 is open: The ND review of the appeals of regulatory decisions will be conducted through the transition arrangements for the creation of the SC.

Suggestion 1 is closed: Enactment of The Health and Safety Fees Amendment Regulations in July 2007 provided HSE with the authority to charge fees for new build work.

Suggestion 2 is closed: Some activities have been initiated in the new build sector. The public has the opportunity to comment on the Safety, Security and Environment Report published by the companies via their websites. The UK Nuclear Regulators are overseeing the public involvement process and they will monitor the comments and responses and at key stages will publish reports summarizing relevant issues raised during the process.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-1 Section 2.4 (16) states that *“the legislation shall define how the public and other bodies are involved in the regulatory process.”*

(2) **BASIS:** GS-R-1 Section 3.3.(6) states that *“In order to discharge its main responsibilities, as outlined in para. 3.2, the regulatory body: (6) shall communicate with, and provide information to, other competent governmental bodies, international organizations and the public;”*

SF1 Suggestion: ND should continue, in the new build sector as well as in its other activity areas, to develop and implement its stakeholder engagement work, and document and publish the processes.

1.2. POSITION AND RESOURCES OF THE REGULATORY BODY

This subject is discussed further in sections 3 and 6.

1.3. OTHER REQUIREMENTS FOR GOVERNMENTAL RESPONSIBILITIES

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

S3) **Suggestion:** NSD should take an initiative to clarify

- What is the NDA's responsibility for safety in view of its authority to decide on activities and their financing at the nuclear sites; and
- Whether the NSD should, regulate the NDA activities and what means it would have available for such regulation.

Changes since the IRRS 2006 Mission

The Nuclear Decommissioning Authority (NDA) was established just prior to the 2006 mission. NDA has ownership of several nuclear sites that are operated by other companies (the site licence holders) under contract to the NDA. These contracts allow NDA to set strategic priorities for the operators and could affect specific authorities and arrangements that are normally specified through site license conditions. It was not clear how effective regulatory oversight of NDA would be accomplished.

ND has reviewed its interaction with NDA to establish where arrangements need clarifying or enhancing and identified the topics where clarification is needed.

ND has also discussed with NDA their responsibilities and emerging ways of working with the licensees in the context of the nuclear licensing regime. ND has established working relationships with NDA at multiple levels in the organization allowing ND positions on safety issues to be effectively communicated into NDA.

ND has determined that NDA is a duty holder as an owner under HSWA74 and NDA has accepted that it is a duty holder for the sites it owns. This has allowed the Site Licence Companies to clearly maintain the primary responsibility for safety as NDA has been minimizing activities that could have a direct impact on site safety. ND continues to work with NDA and the Site Licence Companies to ensure that each organization's responsibilities are properly understood.

Findings from the 2009 Follow-up

Suggestion 3 is closed: ND has determined that NDA is a duty holder under HWSA74.

New Findings from the 2009 Mission

UK has legislation to enable the creation of advisory committees. UK custom and practice has been to constitute advisory committees in relation to activities in the nuclear sector. The Health and Safety Commission formed two committees to provide independent expert technical advice; these were:

- the Nuclear Safety Advisory Committee (NuSAC)
- the Ionising Radiations Advisory Committee (IRAC).

In April 2008, the Health and Safety Commission and the Health and Safety Executive merged into HSE. NuSAC's term of office expired on 31 October 2008. In order for ND to be able to get independent expert technical advice on Safety issues and to fully comply with

IAEA standards, an advisory committee should be formed.

**RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE
2009 MISSION**

(1) BASIS: GS-R-1 Section 4.9 states that *“The government or the regulatory body may choose to give formal structure to the processes by which expert opinion and advice are provided to the regulatory body; the need or otherwise for such formal advisory bodies is determined by many factors. When the establishment of advisory bodies is considered necessary, on a temporary or permanent basis, such bodies shall give independent advice. The advice given may be technical or non-technical (in advising, for example, on ethical issues in the use of radiation in medicine). Any advice offered shall not relieve the regulatory body of its responsibilities for making decisions and recommendations.”*

SF2 Suggestion: ND should institute a programme for the reconstitution on an advisory committee on nuclear safety.

2. AUTHORITY, RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

2.1. GENERAL SITUATION

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- R2) **Recommendation:** *processes should be developed and documented that describe the steps to be followed for the issuance or amendment of a licence, including the activities, responsibilities, inputs and outputs.*
- S4) **Suggestion:** *NSD should review, document and publicize its internal practices and procedures for the appeal of technical decisions.*

Changes since the IRRS 2006 Mission

In April 2007, the Office for Civil Nuclear Security (OCNS) and the U.K Safeguards Office (UKSO) became part of ND to consolidate the safety, security and safeguards activities in a single organization. It has recently been proposed to integrate the Radioactive Material Transport Team (RMTT) into the new Statutory Corporation.

Otherwise the responsibilities and functions of the regulatory body haven't changed. Based on the self-assessment ND complies with the majority of areas of the corresponding IAEA standards of GS-R-1, chapter 3.

In preparation for new reactor build the GDA process has been set up and guidance for applicants on applying for a nuclear site licence has been published in August 2008 ("Applying for a nuclear site licence for new nuclear power stations: A step-by-step guide"). For the review and assessment work of ND in responding to a site application for a new nuclear reactor, ND developed and published in September 2009, the specific guideline INS/036 "Licensing Procedure: The Processing of Licence Applications for New Nuclear Sites".

For the issuance or amendment of a licence or for a re-licence of existing nuclear installations the specific guideline INS/037 "Licensing Procedure: The Processing of Applications for Replacement Licences for Existing Licensed Nuclear Sites" has been developed and published in September 2009.

Both processes for new and existing plants give detailed review and assessment instructions for the inspectors and assessors. In addition the processes contain examples on how to write a nuclear site licence; it contains also a template for structuring the licence document.

ND confirmed that currently there is no formal procedure to provide an explanation of rejection of an application submission from licensees. The only formal requirement is for ND to write a response to the application. In practice, ND explains to the licensees, at least verbally and in advance, the reasons for a proposed rejection. ND recognizes that in order to be more transparent and traceable it is needed to document and publish the reasons for rejecting a submission. ND is aware that the corresponding process (BMS AST/001) should be extended to include explicitly that reasons for a rejection (or approval) have to be documented properly. However the substantive requirement in relation to appeal of technical decisions (see also Recommendation 1) has still to be progressed.

Findings from the 2009 Follow-up

Recommendation 2 closed: The IRRS team is of the opinion that the Recommendation 2 of the 2006 IRRS mission is satisfactorily addressed and this issue is closed. The two processes should be incorporated into the BMS as soon as possible.

Suggestion 4 open: ND decided to address both, Recommendation 1 and Suggestion 4, in one working package (*See section 5.5, suggestion 9*).

3. ORGANIZATION OF THE REGULATORY BODY

3.1. GENERAL ORGANIZATION

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- R3) **Recommendation:** *It is recommended that NSD clearly define and document the minimum elements of its annual responsibilities (in relation to its strategic goals and key business activities (KBA)) and estimate the resources required to accomplish those elements. Future budget requests would then be based on these minimum resource needs plus an allocation for additional work as appropriate.*
- S5) **Suggestion:** *NSD resources necessary to accomplish new build activities need to be established and included into budget planning.*

Changes since the IRRS 2006 Mission

The 2006 mission recognized the challenge that the Nuclear Safety Directorate had to allocate current year available resources to the highest priority work and to provide a clear estimate of resources necessary to accomplish future years' planned activities. Without a well structured process for determining the minimum resources required to accomplish its core mission it was not possible to determine the additional resources needed to accomplish new build regulatory work. - ND plans to further develop its functional workload analysis of its annual responsibilities (in relation to its strategic goals and Key Business Activities (KBA) and estimate the resources required to accomplish those elements. Future budget requests would then be based on these minimum resource needs plus an allocation for additional work as appropriate.

While significant progress has been made on issues related to staff hiring and training there has been limited progress in documenting the resource requirements to accomplish ND's strategic goals and key business activities. The current annual planning process does not fully address prioritisation of work or clearly identify what must be completed. This work has not been fully documented, however further work has begun to consistently document the "ND Organisational Establishment" required to enable ND to fulfil its functions.

The activities related to the original recommendation will remain important as ND makes the transition to a Statutory Corporation (SC). The SC will be responsible for developing a complete multi year budget planning and implementation process in order to meet its regulatory responsibilities.

As discussed below, ND has been very proactive and successful in establishing organizational staffing levels and areas of expertise for both current license oversight and for the work associated with new build.

Findings from the 2009 Follow-up

Recommendation 3 is open: While some progress has been made to address this recommendation it still needs further work as the organization makes the transition to a SC.

Suggestion 5 is closed: The new build budget and resource requirements are fully integrated with the rest of the ND activities.

New Findings from the 2009 Mission

As mentioned earlier in this report, the Office for Civil Nuclear Security (OCNS) and UK Safeguards Office became part of ND in 2007 (NSD became ND after the combination), and it is proposed to integrate the Radioactive Material Transport Team (RMTT) and potentially HSE staff responsible for conventional safety at nuclear facilities, into the new Statutory Corporation.

ND has been preparing for the transition to the NSC in a structured way and has assigned dedicated staff to transition, including one member of the ND Management Board. As part of this transition planning, ND has conducted an in-depth assessment of its staffing needs and has identified gaps and possible means to address the gaps through acquiring new staff.

At the same time, ND has been working to establish a more strategic approach to regulation that includes senior level discussions between the various nuclear safety and security regulators and the duty holders or licensees, that has led to the development of a Regulator Nuclear Interface Protocol (RNIP). The RNIP is an agreement that sets out a shared vision and provides a framework for more effective ways of working between the regulators and duty holders, whilst respecting each others distinct and different roles and responsibilities. It also allows opportunities for strategic dialogue on key issues affecting the whole nuclear industry.

The recent and proposed integration of most nuclear regulatory elements into ND provides an opportunity for this strategic approach to regulation to be implemented at the inspector level. There is evidence that this starting to occur within the nuclear safety divisions of ND but should be expanded across ND.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-1 Section 4.1 states that *“The regulatory body shall be structured so as to ensure that it is capable of discharging its responsibilities and fulfilling its functions effectively and efficiently. The regulatory body shall have an organizational structure and size commensurate with the extent and nature of the facilities and activities it must regulate, and it shall be provided with adequate resources and the necessary authority to discharge its responsibilities. The structure and size of the regulatory body are influenced by many factors, and it is not appropriate to require a single organizational model. The regulatory body’s reporting line in the governmental infrastructure shall ensure effective independence from organizations or bodies charged with the promotion of nuclear or radiation related technologies, or those responsible for facilities or activities.”*

RF1 Recommendation: ND should strengthen the integration of nuclear safety, security and safeguards at the inspector level to improve delivery of strategic regulatory priorities.

GF1 Good Practice: ND has established a thorough transition programme and organization, dedicated to the handling of its transition to the Statutory Corporation, especially the implementation of a detailed and thorough staffing programme.

3.2. STAFFING AND TRAINING

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- R4) **Recommendation:** *It is recommended that NSD consider developing and implementing an integrated recruitment, retention and training programme that hires staff, with appropriate technical qualifications into all levels of an appropriately sized organization.*
- R5) **Recommendation:** *NSD should review current and anticipated expert staffing needs for all relevant safety assessment positions. This review should consider which areas of expertise require a staffing defence-in-depth approach by having more than a single expert in the organization.*

Changes since the IRRS 2006 Mission

In 2006, NSD was understaffed and experiencing difficulty hiring new staff fast enough to keep pace with the demands of regulatory work. Since that time, new salary authorizations and the development of a well integrated and comprehensive hiring and training programme has greatly improved the outlook. Nonetheless, ND is currently staffed below target levels and together with the age profile of existing staff, this area will required continued focus for the foreseeable future.

Recent improvements to inspectors' salaries and the option for new recruits to work in satellite offices (in Cheltenham and London) have resulted in a fairly successful recruitment campaign during 2008, which continues into 2009. Thirty one new inspectors were recruited in 2008/09, however eight left the organisation through retirement or resignation. However, the current level of recruitment will need to be sustained for several years.

Staffing profiles have been prepared for a number of years ahead. These are based on current and anticipated workloads and make various assumptions on the retention of staff beyond the normal retirement age of 60.

In addition, each of ND's 7 Divisions has prepared organograms that show the Division's organisational structure and identifies the current and anticipated staff requirement in terms of technical discipline. As well as identifying current vacancies it also identifies potential future pressure points where staff are scheduled to retire in the short and medium term, and where there is a vulnerability caused by having only a single expert.

This new approach has enabled ND to carry out a proactive and successful targeted recruitment campaign.

Findings from the 2009 Follow-up

Recommendations 4 and 5 are closed: An effective integrated recruitment, retention and training programme has been implemented.

3.3. INTERNATIONAL CO-OPERATION

Recommendations and Suggestions from IRRS 2006 Report

No recommendations or suggestions were made in this section during the IRRS 2006 mission.

3.4. RELATIONS BETWEEN THE REGULATORY BODY AND THE OPERATOR

Recommendations and Suggestions from IRRS 2006 Report

No recommendations or suggestions were made in this section during the IRRS 2006 mission.

3.5. TRANSITION OF ND INTO A STATUTORY CORPORATION

The reviewers considered aspects of the impending change of status of ND into a new organisation called a Statutory Corporation in the UK. This change is envisaged to take place some time in 2010. The team identified a number of important considerations that require continued management attention during and after this transition, including: regulatory independence, autonomy in budgeting and staffing issues, roles and responsibilities of the board of the new organisation and international regulatory activities. More detail of the IRRS Team's considerations are contained in Appendix II.

4. AUTHORIZATION PROCESS

4.1. AUTHORIZATION FOR NUCLEAR FACILITIES

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

R6) **Recommendation:** *Processes should be developed and documented for potential new build nuclear power plants that describe the steps to be followed by an applicant for the issuance of a site licence, including pre-licensing phase. Respectively, formal guidance should be developed on the content and format of required safety submissions, to improve efficiency and effectiveness of the entire licensing process (see also suggestion 1.1.1/S1 on financing the regulatory work in pre-licensing phase, and more detailed proposals given in separate Appendix for the authorization of potential new builds).*

Changes since the IRRS 2006 Mission

ND has developed, established, and well documented a process that provides necessary advice for communication with the companies interested in new build. Development has been done in parallel with Government decisions on energy policy and legislative changes aiming towards new build of nuclear power plants.

An important step was issuing a new HSE document, *The licensing of nuclear installations*, in March 2007. It was based on the UK Government's energy policy that was set out in the report on the Energy Review and published in July 2006. More practical guidance was provided in another HSE document issued in August 2008, *Applying for a nuclear site licence for new nuclear power stations, A step-by-step guide*. In 2009, HSE has issued two further guides as part of their internal Business Management Manual: *Licensing Procedure, The Processing of Applications for Replacement Licenses for Existing Licensed Nuclear Sites* and *Licensing Procedure, The Processing of License Applications for New Nuclear Sites* (see also sections 2.1 and 7.1).

Useful guidance on the content and format of required safety submissions is given in a Technical Assessment Guide T/AST/051 which is in the final stage of being revised. However, it is not intended to be a detailed prescription of the technical content of safety submissions. Instead, the applicants have freedom to use the format and contents they prefer to use.

Major steps towards effective regulation of potential new build were made by: enacting the Health and Safety Fees Amendment Regulations on 2 July 2007 (see section 1.1); establishing a Generic Design Assessment (GDA) concept for new designs that could be referred to later in the site licensing processes; and establishing a new division within the ND to manage the GDA. Furthermore, in order to ensure good co-operation between ND and the Environment Agency, these organizations established a joint office as a single point of contact providing advice in all regulatory matters related to nuclear new build.

In the 2006 IRRS mission report the experts provided their opinion on aspects they considered important in the area regulating new nuclear power plants. Further review and discussions took place on the progress made towards regulation of new build and the results of this review is contained in Appendix I.

Findings from the 2009 Follow-up

Recommendation 6 is closed: The IRRS team is of the opinion that the Recommendation 6 of the 2006 IRRS mission is being satisfactorily addressed and this issue is closed. More information will be needed when progressing towards new build but there are now a dedicated organisation and a proper framework in place for that purpose.

4.2. NUCLEAR FACILITY MODIFICATIONS

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

R7) **Recommendation:** *Enhance the process to ensure a more systematic NSD review of the safety classification of planned modifications, and a consideration of the need for NSD review.*

Changes since the IRRS 2006 Mission

Modifications are controlled through Licence Condition 22 (LC22) attached to the standard nuclear site licence. In accordance with LC 22, the classification of the modifications into categories is the licensee's responsibility. Classification is based on a system proposed by the licensee and accepted as adequate by ND. Modifications in the highest category (or even in lower categories if so decided by the inspector) can not be implemented without the agreement of ND. As an example, rules for categorization of modifications used by British Energy Generation Limited were provided to the reviewers. Verification of the categorization proposed by the licensee is done by the ND inspectors on the basis of sampling. During the IRRS review, potential difficulties arising from wrong classification of "minor" modifications were discussed.

During the 2006 mission, the concern was whether existing arrangements provide for due consideration of the correctness of the safety classification from a risk point of view, taking into account the potential for omitting important modifications from regulatory review. After the 2006 mission an extensive dialogue took place internally in ND with the conclusion that the existing system works efficiently and does not necessitate any major change, except that the guidance in Technical Inspection Guidance (TIG) 022 on Modification or Experiment on Existing Plant should be updated to contain more detail. The modification was taken as an action of high priority. The approved version of TIG 022, which is ready for publication was made available to the reviewers. The modified TIG 022 underlines the need for adequate time for ND to assess any safety documentation in support of the release of any holdpoint. In addition to routine site inspector review, ND has recently been conducting focussed inspections on classifications of modifications using TIG 022.

Findings from the 2009 Follow-up

Recommendation R7 is closed: There has been due consideration of the issue, adequate safety classification is in place at sites, and an updated guidance document TIG 022 has been issued.

New Findings from the 2009 Mission

Fuel Cycle Facilities

At the request of ND, the 2009 Mission considered the regulation of fuel cycle facilities, which were not covered in the 2006 IRRS Mission. ND uses the same approach to authorization for all nuclear facilities including fuel cycle facilities. Generally, this approach is appropriate with the same good practice noted in the original mission report. The findings on authorization, discussed in the section above, apply equally to the fuel cycle facilities. However, there is one feature of some fuel cycle facilities that poses some unique authorization challenges.

There are a number of older facilities undergoing decommissioning that are considered to be high hazard/risk facilities in their current condition. These facilities are located on a site owned by the NDA but the licence holder is a separate company. ND has been recently working with NDA, other regulatory agencies and the licence holder to discuss strategies aimed at reducing the level of risk at these facilities. This is considered by the IRRS team to be appropriate for a regulator since the goal is a clear improvement to nuclear safety and there is evidence that ND is regulating to ensure a high level of operational nuclear safety at the facilities. However, such a collaborative approach requires ND to look at modifications to the facilities in a different light than those for operating facilities. The end goal of overall risk reduction needs to be considered when reviewing individual modifications associated with advancing decommissioning or remediation. Good cooperation between the different areas of ND (i.e. safety, security and safeguard) and other regulators (e.g. the environmental authorities) is also important in furthering the overall goal of risk reduction.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 IRRS MISSION

(1) **BASIS:** GS-R-1 Section 5.11 states that “*Any modification to safety related aspects of a facility or activity (or having an indirect but significant influence on safety related aspects) shall be subject to review and assessment, with the potential magnitude and nature of the associated hazard being taken into account.*”

SF3 Suggestion: ND should develop a methodology and guidance on balancing risk to take into consideration long-term hazard and risk reduction when approving modifications for facilities undergoing decommissioning or remediation.

4.3. AUTHORISATION OF SELECTED LICENSEE PERSONNEL

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

R8) **Recommendation:** *Consider developing an approach that includes appropriate levels of direct evidence on adequate qualification of licensee’s control room operators and other personnel in positions with direct influence on safety, and also ensures verification of consistent qualification requirements throughout the UK nuclear industry.*

Changes since the IRRS 2006 Mission

ND inspectors reviewed, in 2007, and early 2008 at two licensed British Energy Generation Limited (BEGL) sites, the arrangements made under LC 10 – Training and LC 12 – Duly Authorized and other suitably qualified and experienced persons (DAP’s). The reviews

resulted in ND concluding that the guidance from licensees at a corporate level required improvement to ensure a consistent approach to high quality training and assessment of the competence of DAP's at different sites. Consequently ND suggested in a generic letter to BEGL that the situation should be addressed and remedial actions be undertaken as necessary. In response, BEGL has strengthened the training of DAP's and has issued internal guides on management of authorizations and instruction on authorization for each DAP position.

In discussions during the IRRS 2009 mission ND staff presented a view that the improvements made by the industry were now adequate and a formal authorization given by ND would not contribute anything further to increase the competence of DAPs. Instead of formally examining qualifications of DAPs as part of their regulatory authorization, ND has in 2008 issued a new TAG for Assessment of Licensee's Arrangements for Training and Assuring Personal Competence. This guide identifies Licence Conditions that could be used for assuring that DAPs in various positions are properly trained and that they are suitably qualified and experienced.

When observing inspections conducted by the site inspectors at a nuclear power plant and a fuel cycle facility during the mission, the IRRS reviewers noted that the qualifications of DAPs were actually verified when the inspectors discussed specific topics with them.

Findings from the 2009 Follow-up

Recommendation 8 is closed: The IRRS team is of the opinion that the Recommendation 8 of the 2006 IRRS mission is satisfactorily addressed and this issue is closed. Site inspectors should continue to take the opportunity to discuss with DAPs in connection with all inspections that permit to verify DAP qualifications.

5. REVIEW AND ASSESSMENT

5.1. ESTABLISHMENT AND USE OF REVIEW AND ASSESSMENT CRITERIA

There is a well established procedure of using the ND Safety Assessment Principles (SAP) as guidance for review and assessment activities. The latest update of the SAPs document was concluded in December 2006. More detailed guidance is provided in an extensive set of Technical Assessment Guides (TAG), which during the time of the 2009 review contained 69 guides. The SAPs and the TAGs are discussed in more detail in section 7.1.

The IRRS 2006 mission found the review and assessment criteria to be adequate for operating facilities, and no recommendations or suggestions were made. After update and extension of the guidance, the criteria are now ready for new build as well.

5.2. MANAGEMENT OF REVIEW AND ASSESSMENT

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- S6) **Suggestion:** *When a project is completed, a formal audit of the review and assessment process should be performed to identify lessons learned.*
- S7) **Suggestion:** *NSD should develop a process for recording and analyzing its observation of Human Factors and organizational aspects of the licensees activities in a systematic and auditable way.*

Changes since the IRRS 2006 Mission

The issue identified by the 2006 IRRS mission was the lack of a routine mechanism for identification of lessons learned from review and assessment (Suggestion S6), and inadequate attention to systematic recording and analysing safety implications of the licensees' human factor and organisational (HOF) aspects (Suggestion S7).

Some progress was observed in the intervening period since the 2006 mission regarding lessons learned from review and assessment (Suggestion S6). BMS procedure PI/FWD, "ND BMS: Permissioning Inspection – Managing the Permissioning Inspection KBA", (reviewed in October 2008) covers the procedural steps for conducting assessment. Process Step 5.2 allows for a case review for the benefits of learning. Any person involved in a case can propose a review with involvement of all participants in the project to consider important issues arising from the assessment. Step 5.2 also lists the criteria for proposing a review. Such case reviews can be used for complex, high profile cases with the objectives of allowing all participants to share their perceptions and any concerns, clarifying key lessons and identifying opportunities for future improvements in the assessment process. There were cases where an assessment report was produced including lessons learned. A recent report of that type – the graphite safety case (Oldbury Power Station, Graphite Core safety Case), was made available to the reviewers. Similarly, for new reactor build, Step 2 of GDA was reviewed to identify the lessons learned from the assessment. In addition, several lessons learned from the assessments are discussed internally. However, this is not used routinely.

BMM Annex7B "Corporate Assessment Liaison Meeting (CALM) Terms of Reference ", issued in June 2009 presents the terms of reference (TOR) for CALM, which has been

established to co-ordinate assessment approaches across ND. The TOR does not explicitly cover review of completed assessment projects. Some experiences and lessons learned from safety cases and plant inspections have been discussed at CALM, but it was not demonstrated that recommendations were followed up. It is noted that BMM Annex 7B states that the work of CALM includes "coordinate assessment approaches across ND to promote consistency and proportionality" and "establish and promote good practice". This could imply the need for review of completed assessments but currently the reviews are not routinely carried out. The work will continue to incorporate a graded approach to "lessons learned reviews" into the BMS arrangements. Implementation of these plans is supported by the IRRS team.

In the area of human factor (HF) issues (Suggestion S7), the situation since 2006 has changed significantly. While in 2006 ND had only one expert, from November 2009 there will be 6 specialists working in the area. Two further HF expert vacancies are still available to be filled later on. The internal resources are further augmented by consultants and subcontractors. While previously the work was mainly devoted to HF issues in the new reactor designs, currently the work is directed to interacting with the licensees to support their reporting of the operational events. In the last 3 years eight HF related guides have been developed or are under preparation. In addition, there are several TAGs devoted to organizational matters. A cross-directorate HF practitioner group (one of the Nuclear Topic Groups) has been established because these practitioners are working in different parts of the organization. The group meets once a month to discuss human factors issues and methodologies across the licensees.

HF assessments are included and recorded as part of integrated inspections with other disciplines. With the objective to gather information systematically to form an integrated and wider view of a licensee's performance in HOF, ND is developing a strategy which is looking more systematically to capture relevant information. Focus is on improvements in safety management, building safety culture and leadership in normal business rather than looking at man-machine issues as in the early years of introducing HF experts to nuclear work. HF experts are also active in making the site inspectors aware of the importance of HF issues (a training workshop was planned for October 2009). A TAG has been prepared for site inspectors containing guidance on gathering information, good practices, concerns, and formulating feedback. The ND believes that the approach goes beyond the usual practice worldwide. The work will continue to develop further the processes for capturing the HOF information more systematically and using it in the regulatory review process.

Findings from the 2009 Follow-up

Suggestion S6 remains open: The IRRS team supports ND plans to identify lessons learned from the review and assessment as a systematic approach used across the ND.

Suggestion S7 is closed: ND has a clear strategy, adequate manpower and guidance documents to consider human factor and organizational aspects that are relevant for nuclear safety.

New Findings from the 2009 Mission

Fuel Cycle Facilities

For fuel cycles facilities, review and assessment is based on ND's SAPs, as is the case for all regulated facilities. ND has produced a common set of TAGs and the use of Nuclear Topic Groups allows for a degree of consistency in the application of the TAGs for fuel cycle facilities. This allows the TAGs to be used effectively on a wide range of facilities in a fashion graded to the facility risks.

The overall assessment priorities are established in a controlled manner by the Division level Intervention Strategy Group, supported by Intervention Management Groups. These groups manage the implementation of the overall strategy for a specific site (e.g., Sellafield) or group of site (commercial fuel cycle facilities). Below these groups are Intervention Progress Groups (IPG) that plan and conduct the activities.

There is good cooperation and coordination of assessment activities and inspection activities through the IPGs that comprise both inspectors and assessment staff. These facility specific groups meet on a regular basis to coordinate and align both assessment and inspection activities to the strategic regulatory direction. They also collaborate on planning and the revision of the strategic direction for the facility and have recently been used to track and manage technical issues at the facilities. This approach can result in well-focused and coordinated assessments. However, the IRRS team noted that this approach has just recently been introduced and is not completely implemented across ND.

ND's approach to external technical support is flexible and allows each ND Division to identify and get funded the required technical support on an annual basis. For fuel cycle facilities, the Division uses both the IPG and strategic level reviews to identify the required support.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 IRRS MISSION	
(1)	BASIS: GS-R-1 Section 5.10 states that: <i>“The regulatory body shall prepare its own programme of review and assessment of the facilities and activities under scrutiny. The regulatory body shall follow the development of a facility or activity, as applicable, from initial selection of the site, through design, construction, commissioning and operation, to decommissioning, closure or closeout.”</i>
GF2	Good Practice: The establishment of Nuclear Topic Groups to provide consistency across ND in technical assessment areas and to provide guidance for reviews is considered a good practice.
SF4	Suggestion: ND should further document the processes associated with Intervention Progress Groups, including management of technical issues, with the goal of increasing the level of consistency throughout the directorate.

5.3. AREAS OF EXPERTISE AND TECHNICAL SUPPORT ORGANISATIONS

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION	
R9)	Recommendation: <i>NSD should identify expertise and technical support available inside UK or abroad to support it in its review and assessment work. This should include the possibilities to perform independent analysis and validation of codes in areas such as PSA, Thermal Hydraulics, Severe Accident Analyses. Appropriate arrangements should be made to assure that for all safety relevant topics high qualified expertise can be identified by NSD.</i>

Changes since the IRRS 2006 Mission

The issue identified by the 2006 IRRS mission was uncertain situation with external technical support organizations for the areas where adequate internal manpower and expertise was lacking.

Major progress has made since 2006 IRRS. In addition to the access to technical support bodies inside the HSE, ND has made a number of framework agreements with national and foreign Technical Support Contractors (TSC) and it has also signed Information Exchange Agreements (IEA) with foreign nuclear regulators. Recently established Technical Support Framework (TSF) includes 31 Technical Support Contractors (TSC) selected out of 79 bidders based on their technical expertise and independence so that to ensure high quality support and to avoid conflict of interest. The process of selection was systematic and transparent. The TSF covers 15 complex technical areas including specific areas mentioned in the 2006 Recommendation. Sufficient resources are available to contract technical support organisations whenever necessary. A cross-reference table is available showing areas of expertise for each organisation, so that placing a specific contract can be arranged without undue delay. The TSF is available to all divisions and ND inspectors.

Findings from the 2009 Follow-up

Recommendation 9 is closed: ND has established an extensive network of expert organizations for getting fast and competent support for the review and assessment work.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 IRRS MISSION

(1) **BASIS:** GS-R-1 Section 4.3 states that *“If regulatory body is not entirely self-sufficient in all the technical or functional areas necessary to discharge its responsibility for review and assessment or inspection, it shall seek advice or assistant, as appropriate, from consultant”*.

GF3 Good Practice: Establishment of the Technical Support Framework based on systematic and transparent selection of independent contractors that are pre-qualified for specific areas of expertise, and overall arrangements for contracting necessary technical support without undue delay is a good practice.

5.4. REVIEW AND ASSESSMENT OF OPERATIONAL EXPERIENCE FEEDBACK

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

R10) **Recommendation:** *NSD should review its processes and resources to ensure that assessment of events from UK plants as well as from foreign plants is carried out. A formal process for reviewing events should put in place to ensure that lessons learned are available in due time.*

R11) **Recommendation:** *NII should further develop a means by which it can ensure that the operators share operating experience among them, analyse the international operating experiences and take appropriate corrective action.*

Changes since the IRRS 2006 Mission

ND has started to develop an Operating Experience Feedback (OPEX) process. Some guidance for screening, analysis, monitoring, and review of operating experience from the UK and from foreign nuclear power plants has been incorporated into the Business Management Manual in May and June 2009. Furthermore, ND has been active in encouraging industry participation in international OPEX work. A general goal has been to learn and implement lessons for improving safety of the nuclear plants in the UK.

It has been recognized that lessons can be learned from foreign plants, especially on human and organizational issues, although the UK gas cooled reactors are different from the LWR plants predominantly in operation elsewhere in the world.

Nevertheless, little evidence was seen of implementation of a new OPEX system in practical regulatory application. It is apparent that more priority and resource needs to be given to OPEX within ND. There is currently only one inspector working full time in this area.

Findings from the 2009 Follow-up

Recommendation 10 is open: ND should allocate sufficient resources to the operational experience work and start implementation of a systematic program that would bring information on foreign and UK power plant operation for consideration of regulatory and licensee experts. This information should be used to enhance safety of the UK nuclear power plant operation and regulation.

Recommendation 11 is open: ND should incorporate assessment of the licensee's operational experience activities into its site inspections programmes. Such inspection should focus on the practices to collect, screen and analyse OPEX information received through industry co-operation channels, and on the use of this information for safety enhancement.

5.5. PERFORMANCE OF MAJOR REVIEW AND ASSESSMENT TASKS

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- S8) **Suggestion:** NSD should carry out audits and inspections themselves or/and through a contractor on the QA process of manufacturer and vendors on important safety components (e.g. the fabrication of a new vessel head).
- S9) **Suggestion:** When NSD issue a formal regulatory decision the basis of its decision should be sent to the licensee.

Changes since the IRRS 2006 Mission

There were two issues identified by the 2006 IRRS mission in this area: firstly, one of limited inspections at vendors and manufacturers sites (Suggestion S8) and secondly, one of the need to provide the basis for regulatory decisions to the licensees (Suggestion S9).

Regarding inspections at vendors and manufacturers, there is long-standing practice in the UK nuclear industry to use an independent third-party inspection agent (ITPIA) by the licensee. Lloyds Register was appointed as an ITPIA for the original construction and also for the new vessel head manufacturing for Sizewell B. The main duty of the ITPIA was to verify the manufacturing procedures within a framework of milestones and hold-points. ND had free access, as needed to the independent third-party inspection agent. ND took a view on the suitability of the manufacturing procedures claimed for the components. In addition, ND conducted its own strategic regulatory inspections and QA audits. Apart from primary circuit pressure boundary components, the manufacturers of a wide range of other important safety components were subjected not only to inspection of QA processes but full inspection. The detailed visit reports from the ITPIA's visits to the fabrication facility were made available to ND and were taken into account in ND's overall assessment of the vessel head replacement project. New build vendors are being advised that this process will also apply to their designs.

In addition, ND may carry out inspections at manufacturers, designers or vendors on important safety components for current operating plants. For example, during the last year,

inspections have been carried out on components for AGR boilers and facilities to support graphite safety cases.

The issue of communicating regulatory decisions to the licensees has been partially addressed. ND confirmed that currently there is no requirement to provide the detailed findings of the assessments to the licensees. It is instead expected that the dialogue between ND and licensee during the assessment of a safety case would provide the licensee with the sufficient basis for the regulatory decision. Nevertheless, some ND divisions provide information to the licensees on assessment findings. ND Division 2 provides quarterly feedback to the licensees on assessment outcomes. The findings of the assessments of Periodic Safety Reviews are sent to the licensees and made available to the public. Some assessment reports on graphite safety cases were also sent to the licensees. From April 2010 ND is planning to publish all project reports on the web site. The main assessment results of new reactor designs (GDA), together with other information on review progress, are published in quarterly reports on the HSE website and also made available to the requesting parties and other stakeholders.

The current approach of providing the basis for the decision to the licensee is not systematic, since it is not followed consistently by all divisions. Therefore it is important that a common approach be formalized. ND considers that in particular for a foreign applicant, not familiar with the UK regulatory regime, explanatory notes will be useful even in the case of a positive approval of the submission.

Findings from the 2009 Follow-up

Suggestion S8 is closed: The IRRS team found that the UK set of arrangements is equivalent to the approach suggested.

Suggestion S9 is open: The IRRS team considered that the suggestion is still valid. The objective in the future is to write and issue a summary of the basis of the regulatory decision for each decision made. (*See also recommendation 1 and suggestion 4*).

5.6. USE OF PROBABILISTIC SAFETY ASSESSMENT

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

*S10) **Suggestion:** NSD should review the completeness of the PSA model of each plant to ensure it reflects the actual state of the modelled plant. This should be carried out periodically to assure that the insights gained from the analyses are sound and robust.*

Changes since the IRRS 2006 Mission

In the 2006 mission the issue was a dependence on a few experienced inspectors, especially in the PSA area. Since the number of nuclear installations is large and PSA methodology is extensively used, improvement in this area was very much needed.

After discussions it was understood that ND would need to utilize contractor assistance in order to supplement its own resources to carry out a review of the completeness of the PSA model of each plant in full. Detailed periodic reviews of the PSAs (currently there are about 40 PSAs) would require resources well beyond the current ND capabilities. However, significant progress has been made recently. In February 2009 the ND issued an extended and enhanced Technical Assessment Guide (TAG) T/AST/030 "Probabilistic Safety Analysis", including a detailed table of assessment expectations. Use of this guide will ensure that all

PSA reviews carried out by ND (with or without TSC support) will be conducted consistently and with the level of detail in line with modern standards. It will also help to enhance the quality of the UK PSAs and to push them towards state-of-the-art. Currently ND has increased the number of PSA inspectors (4 inspectors working full time) and has also significantly increased the use of the outside technical support. Five TSCs have been offered contracts to support ND assessment of PSA in the future. In plans for future improvements ND wants to continue in reviewing its arrangements for the assessment of PSA models to ensure their appropriate validation. In the discussion it was underlined by the reviewers that equal attention should be paid also to the ND capabilities in the deterministic safety analysis area, in view of the fact that nuclear power plants in the UK are designed according to deterministic safety requirements and design codes.

The issue has been adequately addressed.

Findings from the 2009 Follow-up

Suggestion S10 is closed: A detailed guidance document on Probabilistic Safety Analysis (TAG030) has been issued for ensuring consistent review of the PSA's, the number of in-house PSA experts has been increased and significant review support from external Technical Support Framework has been made available.

6. INSPECTION AND ENFORCEMENT

Inspection and enforcement carried out by the ND was not reviewed during the 2006 IRRS mission and this is one area ND requested be covered in this mission. ND implements an extensive and comprehensive inspection and enforcement programme and conducts reactive inspections as need arises at all the licensed nuclear sites in the UK (currently there are 39) including nuclear power plants, research reactors, radioactive waste management facilities, fuel processing facilities and defence related sites. Inspections are also carried out at the corporate centres of licensees on such activities as procurement and conduct of engineering.

In addition to inspections focusing on licensed facilities and activities, ND inspects how the licensee manages and controls the supply of contracted services and products. Most of these inspections are conducted under licence condition 17 and their aim is to verify that the licensee's arrangements are adequate to ensure items and services supplied for use on a licensed nuclear site are of requisite quality. ND inspects the on-site activities of licensees' contractors and suppliers during plant outages and other safety significant plant modifications to provide confidence that they are complying with safety requirements. ND does not routinely visit suppliers' premises away from the licensed site. However, such inspections may occasionally be conducted, for example in the case of some safety critical activities or large modification such as I&C, primary containment component manufacture, or testing.

6.1. INSPECTION PLANS

ND inspects all nuclear licensed sites in accordance with a planned inspection programme designed to ensure that the licensee complies with the licence conditions, the arrangements made under them and other relevant legal requirements.

The inspection programme covers all nuclear licensed sites in the UK as part of the process for monitoring compliance with:

- i) the 36 standard licence conditions for nuclear site e.g., Operating Rules, Modifications and Maintenance;
- ii) the Health and Safety at Work etc Act (HSWA) 1974 and its relevant statutory provisions; and
- iii) regulations made under the HSWA, for example the Ionising Radiations Regulations (IRRs) 1999.

The inspection planning process referred is described in the BMS instruction "Intervention Planning" INS/008 and its supplementary guidance "Guidance for Intervention Planning" G/INS/008. Site inspection plans are a component of targeted intervention strategies for each nuclear licensed site taking into account ND priorities; local issues; events and changes in the industry. According to the site, the inspection program can be split into sub-programs (for instance in the case of the Sellafield, a fuel cycle site with multiple facilities). Within the intervention strategies for each site, it is expected that permissioning and compliance inspections comprise a significant proportion of the planned inspection interventions. These inspections are focused on the elements of compliance, which contribute most to the licensee's safety management performance, and seek to reduce the likelihood of significant nuclear safety events. For each site, 'cornerstone' licence conditions are identified which are considered to be essential to provide assurance of adequate control of nuclear safety by the licensee. The list of the 'cornerstone' licence conditions vary with the site and facility but are identical for similar facilities (e.g. operating nuclear power plants). The frequency for inspection of 'cornerstone' licence conditions is normally at least bi-annually and is set

considering the risk posed by the facility. Compliance with other licence conditions, regulations or strategic projects are added to the site annual inspection plan taking into account the recent inspection experience, current regulatory issues and plant performance.

Inspection programmes within ND are developed through consideration of the hazard potential and postulated consequences. The main emphasis is in prevention of major nuclear accidents but also regulation of risks to workers has a high priority. Integrated planning of inspection programmes is provided by the Intervention Progress Groups that are functioning at various management levels.

While reactive or emergent inspection work cannot be explicitly included in the inspection plans, a proportion of time available on site is set aside to allow for such work focus during the year. Reactive inspections are carried out by individuals or teams in response to an unexpected, unplanned situation or incident in order to assess its significance and implications and the adequacy of corrective actions.

On a periodic basis (typically quarterly), inspection and assessment inspectors hold regulatory review meetings, where outcomes are reviewed by groups of inspectors who are aligned to a particular licensee. The aim of these reviews is to provide a forum whereby generic or emerging issues can be identified and allows the re-prioritisation or changes to inspection plans. Often areas are identified that can be targeted for team inspections on matters of potential regulatory importance, either site specific or generic. Similarly, the effectiveness of the inspections is reviewed against the intended outcome of the intervention allowing for a change in inspection strategy. Also site inspectors from similar plants occasionally make joint inspections to benchmark how certain activities are conducted at their respective plants. This process was noted as a good practice (G6) in the 2006 mission.

6.2. INSPECTION PROCESS

The majority of ND site inspections are announced in advance to the licensee. However NII inspectors may carry out unannounced inspections if the circumstances warrant such action. Inspectors also undertake plant inspections with or without operations staff to observe plant conditions and converse with operational staff. Inspections out of daytime hours or at weekends occasionally occur during planned demonstrations of emergency arrangements. The inspector is expected to make for him/herself a detailed written inspection plan in advance.

ND intends to cover every licence condition by a Technical Inspection Guides (TIGs) and there are guides available for almost all licence conditions. The extent to which these guides are used to prepare the inspection plan or referred to by inspectors is variable. Inspectors' use of the TIGs is influenced by the fact that many are awaiting revision, although ND is implementing a plan to review and update all of the TIGs.

ND verbally communicates the results of inspections to the licensees during the course of the inspection, and at an inspection closing meeting with an appropriate member of the site management team. This feedback provided by discussion, is the norm, unless there is a serious safety concern, which may need more formal enforcement.

The IRRS team had a consistent view that ND should consider enhancing its arrangements to ensure that all regulatory findings from inspections, both positive and negative, are confirmed formally to the operator in writing. The current practice of verbal communication during inspection exit meetings about findings, corrective actions to be taken, advice and identification of good practises should be made more robust and formal in order to more deeply inform the licensee and allow tracking of the issues raised.

The outcomes from inspections are detailed in ND internal inspection reports, letters to

licensees for enforcement purposes and are summarized in quarterly reports to stakeholder groups. Site inspectors ascribe a rating to each inspection they perform and this is recorded both in their inspection report and on their Site inspection plan. There is a procedure entitled Production of Site Visit and Contact Reports INS/003 requiring an internal inspection report after each inspection. The delivery time, format and content of this report is outlined in the procedure.

It is incumbent on the inspector (Section 5.5 of INS/003) to track any actions raised with the licensee to ensure that appropriate corrective action is taken; in some situations licensees' tracking arrangements may be used to achieve this (for instance using the commitment record database of the licensee).

In addition each site has a periodic Safety Review meeting (usually held annually), with the nominated site inspector and Superintending Inspector. The meeting assesses a site's safety performance over the preceding period and looks forward to the next operating period.

6.3. SAFETY INSPECTORS

ND's policy is to recruit highly qualified and experienced professional staff, having a proven background in nuclear operations, engineering and applied science. The staff become warrant holders as Safety Inspectors soon after appointment, and therefore have legal powers of access, inspection and taking enforcement action. This appointment is immediately conferred under HSE policy, upon the staff joining ND. However, new inspectors are assigned initially to assessment activities and are monitored during training and development.

For each licensed site a lead ND site inspector is nominated and he/she will carry out inspections at the site covering all stages of the installation lifecycle. In broad terms an operational twin power reactor site has a single non-resident nominated site inspector, spending around 50 days a year on site. A large nuclear chemical processing site with many facilities will have a team of several inspectors allocated to it e.g. the Sellafield team has 11 nuclear inspectors. Other facilities such as decommissioning reactors, radio-chemical and research reactors are allocated less regulatory inspection resource in proportion to their radiological hazard.

Site inspectors are supported, as necessary, by other nuclear inspectors who carry out specialist assessments or inspections in a particular technical area.

6.4. INSPECTION RESOURCES

Most of the nuclear power plants in the UK are experiencing ageing phenomena that are increasing the challenges to keep plants in good operational condition. It is also evident that the focus of ND's assessment and inspection efforts has gradually moved from postulated design basis hazards to consideration of risks related to ageing and obsolescence. This results in an increasing need for qualified inspector resources to follow and assess the changes in the safety condition of each plant in a reliable and comprehensive manner. In spite of the well organized and managed inspection work conducted by experienced persons, the resources available and the total effort put into the inspections seem less than in most other countries, taking into account the size and condition of the fleet of operating nuclear power plants.

6.5. ENFORCEMENT

ND takes enforcement action in accordance with the HSE Enforcement Policy Statement and accompanying guidance, under the primary UK health and safety legislation (Section 20 of HSWA 1974). This contains five principles that require enforcement action to be proportionate, targeted, consistent, transparent and accountable. The enforcement management model (EMM) adopted by ND sets out the principles inspectors should apply

when determining what enforcement action to take in response to non-compliances with health and safety legislation. The use of a common enforcement policy throughout HSE has resulted in a system that is easily understandable to the public and provides for consistency across different industries.

The EMM seeks to define proportionate enforcement by reference to a risk gap between the actual, or potential, risk arising from the licensees' activities and the risk accepted by the law or guidance. The different enforcement powers that can be used are: information or advice (verbally or in writing), improvement and prohibition notices, create or vary licence conditions, vary and revoke licences, and initiate prosecutions in a court of law. To assist ND inspectors in deciding on enforcement action, guidance is provided in the Enforcement Management Model (EMM) in ND (G/INS/30) that interprets the application of the HSE enforcement policy for nuclear facilities.

The first enforcement level (verbal warnings or advice to the licensee's managers following an inspection or notification to ND of an incident) and the second enforcement level (a regulatory letter to the licensee) are the predominant enforcement measures in daily use by ND inspectors in dealing with non-compliances or deviations. More serious non-compliances may lead to formal enforcement notices or directions under the licence conditions being issued. Ultimately further penalties may be sought by ND through prosecuting a duty-holder in court. This occurs infrequently but ND has successfully prosecuted duty holders in recent years.

ND management arrangements mean that inspectors do not usually issue enforcement notices without first consulting ND management. They must justify issuing an enforcement notice through a report countersigned by a Unit Head. Other enforcement measures, such as those available under licence conditions, must be signed by a designated ND senior officer (defined in BMM Management Manual Annex 2). Thus they cannot be issued without consultation and approval by senior officers of ND.

In circumstances where urgent action is required in the interests of safety, a licensee would follow established arrangements to ensure safety, including ceasing activities, if this is necessary. If the licensee failed to take such actions then ND has the power under Licence Condition 31 to direct the licensee to shutdown specified operations. To resume the activity, ND's Consent is then required. If there is risk of serious personal injury the inspector may serve a Prohibition Notice which has the effect of immediately prohibiting the use of a particular item of plant or equipment or undertaking an activity. The notice is not lifted until adequate levels of safety are restored.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 IRRS MISSION

(1) **BASIS:** GS-R-1 section 4.7 states *“In order to ensure that the proposer skills are acquired and that adequate levels of competence are achieved and maintained, the regulatory body shall ensure that its staff member participate in well defined training programme”*

RF2 Recommendation: ND should ensure that its inspectors have followed a specific training programme before being issued with a warrant.

(1) **BASIS:** GS-R-1 section 5.19 states that regarding issues of minor safety significance, in part : *“In such circumstances, the regulatory body shall issue a written warning or directive to the operator which shall identify the nature and regulatory basis of each violation and the period of time permitted for taking remedial action.”*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 IRRS MISSION

- (2) **BASIS:** GS-G-1.4 section 5.6 states that *“Inspection findings should be forwarded to the operator so that the necessary corrective actions can be taken. In some States, the full inspection report is forwarded to the operator.”*
- (3) **BASIS:** GS-G-1.3 section 2.7 states that *“Any findings from an inspection should be formally communicated to the operator”,* §4.35 states *“Whenever corrective action is needed, a formal communication including findings detailed in inspection reports should be sent to the operator as part of the enforcement procedures”.*
- RF3** **Recommendation:** ND should consider enhancing its arrangements to ensure that results of all inspections are communicated in written form to the licensee.
- SF5** **Suggestion:** ND should provide guidance on the creation, recording, use and management of regulatory issues to ensure that licensees are informed of issues recorded by NII and are treated in a consistent and proportionate manner in resolving them.
- (1) **BASIS:** GS-R-1 section 5.18 states that in part *“Enforcement actions are designed to respond to non-compliance with specified conditions and requirements”*
- GF4** **Good practice:** HSE/ND has developed and implemented a public and formal enforcement policy statement and enforcement management model.
- (1) **BASIS:** GS-R-1 section 5.14 states that *“.....The extent to which inspection is performed in the regulatory process will depend on the potential magnitude and nature of the hazard associated with the facility or activity.”*
- RF4** **Recommendation:** ND should review and assess whether sufficient inspector effort is being applied to nuclear power plants to achieve adequate assurance of safety taking into consideration facility ageing.

7. DEVELOPMENT OF REGULATIONS AND GUIDES

7.1. PROCESS FOR DEVELOPMENT OF REGULATIONS AND GUIDES

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

S11) **Suggestion:** *That the NII issue by formal means the various internal guides that indicate ways of meeting general regulatory requirements, such as the current 36 licence conditions.*

Changes since the IRRS 2006 Mission

The issue identified by the 2006 IRRS mission was that while a number of Technical Assessment Guidelines (TAGs) exist for the internal ND use, they were not all available to the licensees. Therefore the licensees did not have sufficient information regarding expected scope and content of their submissions.

Since the 2006 IRRS, most of the guidance documents (other than those with identified security implications) have been published on the HSE/ND website, together with the programme for their review under the SAPs 2006 homepage. In addition, several guidance documents both for the licensees and for ND regarding new build have been developed and there are plans to develop other guidance documents explaining how to comply with the LCs. In particular, the following documents are available:

- The licensing of nuclear installations (March 2007)
- Applying for a nuclear site licence for new nuclear power stations, A step-by-step guide (August 2008)
- INS/036, Licensing procedure: The processing of licence applications for new nuclear sites (September 2009); and
- INS/037, Licensing procedure: The processing of applications for replacement licences for existing licensed nuclear sites (September 2009).

All the documents are also available via the HSE/ND website, although not so well organised and easily available. Further improvements are planned regarding the distribution of information on the HSE/ND website with a view to ensuring that all published guidance is placed logically and consistently on the website.

ND intends to bring the whole suite of TAGs (and Technical Inspection Guides) up-to-date. There is a comprehensive TAG and TIG Review Programme in place addressing the review, update and completion of the suite in order to accord with the SAPs and other guidance documents available internationally. The programme specifies responsibilities for each individual document and for overall coordination, as well as time schedule for the whole process, taking into account the importance of the TAGs and resource availability. The current total number of TAGs is 69 of which 19 are new. Total reviewed and reissued since 2006 mission is 21 TAGs with an additional 5 awaiting publication (i.e. ~ 40 % of total are now revised). The programme is an agenda item for the Corporate Assessment Liaison Management meeting, which is actively prioritising the remaining TAGs for resource allocation.

One of the major steps towards better guidance on format and content of safety cases associated with various licensees' submissions is revision of the TAG 051 "Guidance on the Purpose, Scope and Content of Nuclear Safety Cases. The key changes to this TAG will be to integrate the relevant SAPs into the TAG (SC1 to SC8), since the current version of the TAG was written before the safety case SAPs were produced in 2006.

Comparison between systems of regulations and guides used in many countries and the UK system was discussed during the review with the conclusion that from the point of view of factual information provided to the licensees two approaches are equivalent in spite of differences in their legislative force. In detail, ND uses the Safety Assessment Principles (SAPs) as a reference for technical judgments on the adequacy of licensees' safety cases to determine whether the law has been met. Level of details provided by SAPs is at least equivalent to that usually provided by the regulations of other countries. In addition, ND provides a range of guidance to its inspectors, in addition to the SAPs are Technical Assessment Guides (TAGs) and Technical Inspection Guides (TIGs). Although the majority of them are not directed at licensees, these are made available via HSE/ND's website and so are, in effect, non-mandatory guides on how to comply with regulatory requirements. The level of detail provided by TAGs and TIGs is considered to be equivalent to regulatory guides published in other countries.

The issue of applicability of the new SAPs and TAGs to existing plants was discussed. In the UK's approach the new documents explicitly apply to existing plants as well as new ones, but the extent of the application is subject to individual evaluations. Since the SAPs provide only guidance to ND assessors and not to force specific plant modifications, it is up to the licensees and ND to reach consensus on what is an acceptable or an ALARP level of safety. A detailed comparison of compliance with new regulatory standards or requirements is normally performed during the decennial Periodic Safety Review (PSR) carried out by all UK licensees.

Findings from the 2009 Follow-up

Suggestion 11 is closed: Most of the guidance documents (other than those with identified security implications) are published on the HSE website.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 IRRS MISSION

(1) **BASIS:** Section of 3.28 of IAEA GS-G-1.4 states that *"The regulatory body should ensure that regulations and guides are kept up to date, and procedures should be established for their periodic review. Experience in implementing the regulations should be examined, and any problems or difficulties which may have arisen should be duly considered. The status of applicable requirements should also be examined in the light of new developments in relation to nuclear safety..."*

GF5 Good Practice: Development and implementation of a comprehensive programme for review, update and completion of the suit of guidance documents with clear responsibilities for each individual document and for overall coordination, including detailed time schedule for the whole process, taking into account the importance of the TAGs and resource availability is a good practice.

8. THE REVIEW OF THE MANAGEMENT SYSTEM

Recommendations and Suggestions from IRRS 2006 Report

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2006 MISSION

- R12) **Recommendation:** *the development of the BMS be continued in order that the BMM can contain the policies, processes and procedures necessary to describe the functioning of the organization. As an initial step, the BMM should be made consistent with Annex 4 of the Strategic Plan 2004-2010, or contain the information directly.*
- S12) **Suggestion:** *The Business Management Manual should include all the processes that describe how work is to be prepared, reviewed, carried out, recorded, assessed and improved.*
- R13) **Recommendation:** *A senior manager should be given responsibility for the management system. The person responsible for developing the management system should report directly to the senior manager.*
- S13) **Suggestion:** *A process should be developed to describe the means by which the Business Management Manual is maintained up-to-date. This for example may permit immediate updating for minor alternations to the document, whereas changes to the BMS itself would be identified on some regular basis and approval given by the Management Board before the Manual is revised.*
- S14) **Suggestion:** *A process for conducting independent assessments (audits) should be developed and a means by which they be performed proposed. This could require the establishment of an internal unit or use of external resources.*

Changes since the IRRS 2006 Mission

The 2006 mission performed a short review of ND's Business Management System (BMS), which is described in the Business Management Manual (BMM). At the time of the 2006 mission only a draft of the IAEA Management Systems Requirements, GS-R-3, was available and a formal review against IAEA requirements was therefore not possible. That short review identified that the BMS was not yet complete and some processes were missing or not up-to-date. In 2006, the BMS did not contain a Management process reflecting the realization of the Strategic Plan 2004-2010 and a clear commitment by the top management was not evident. In addition, processes to continuously improve the BMS were not in place. These observations resulted in two recommendations and 3 suggestions.

It has to be recognized that the BMS for ND is part of a wider HSE management system. A number of processes and procedures that are common across HSE such as inspection or enforcement are not necessarily developed to meet ND specific needs. For some Key Business Activities (KBA), ND has developed specific processes. Changes or improvements of these processes are easier to consider and authorize than the ones common with HSE. In summary, the fact that ND does not have total control over all elements of the wider management system make it difficult to reflect changing ND needs or to maintain and update it when necessary. ND itself recognized in its self-assessment report (July 2009) that "over the last few years the system has not been maintained, monitored, reviewed and revised on a systematic basis". ND recognized that limited work had been performed to address the requirements and suggestions of the 2006 IRRS mission.

Recently ND performed a very detailed self-assessment of its BMS against GS-R-3. This self-assessment has identified a significant number of areas in which the BMS has to be improved

to reflect the current organization, duties and actual operational practices. Of particular importance is the need to reintroduce effective monitoring and review processes to ensure that the BMS fully and accurately reflects organizational and procedural arrangements and can be used as a living Management system for continuous improvement of ND’s business.

ND has recognized that the BMS has to be improved and completed and also become a tool which is used by the staff on a daily basis. ND is fully aware that a management system is a living system. It evolves continuously, but it is recognized that there is always room for improvement. The continuous improvement of the system is a positive indicator for the staff's commitment and for a learning organization, which fits perfectly with ND’s vision. ND is currently developing and implementing a very challenging project plan to improve the BMS to become an integrated management system which includes all ND activities (managerial, key business activities, support activities like finance and controlling, human resources, improvement) which will fulfill both GS-R-3 and the ISO-9001 requirements. Based on project planning an ISO certification is foreseen for the end of 2010. Recently ND has engaged a dedicated Assurance Manager to lead the work to implement an integrated management system within ND. The integrated management system will reflect the new organization and duties of the Statutory Corporation.

Findings from the 2009 Follow-up

Recommendation 12 open: this recommendation will be addressed in the BMS improvement project.

Recommendation 13 is closed based on progress and confidence: a dedicated Assurance Manager has been assigned to lead the work for the implementation of the integrated management system. The Assurance Manager shall report to a designated senior manager who has the ultimate responsibility for the development and implementation of the management system.

Suggestions 12 to 14 are open: While some progress has been made to address these suggestions, the BMS improvement project has to address these suggestions in more detail in order to close them out.

New Findings from the 2009 Mission

Management Commitment

The IRRS team is of the opinion that the recently initiated BMS improvement project to make BMS an integrated management system fulfilling the GS-R-3 and ISO 9001 requirements is an excellent way forward to solve the deficiencies of the current management system. This process is challenging and will need the clear and strong continuing commitment of management at all levels. In line with the requirements of GS-R-3 the IRRS team underlines the importance of this commitment.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-3 Section 3.1 states that “*Management at all levels shall demonstrate its commitment to the establishment, implementation, assessment and continual improvement of the management system and shall allocate adequate resources to carry out these activities.*”

RF5 Recommendation: ND’s management should be actively involved in the development of the integrated management system and ensure that enough resources are allocated to this activity.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-3 Section 3.10 states that “*Senior management shall ensure that measurable objectives for implementing the goals, strategies and plans are established through appropriate processes at various levels in the organization.*”

SF6 Suggestion: Senior managers should be involved in the development of the management processes needed to reflect the goals and strategies outlined in ND’s strategic plan.

(1) **BASIS:** GS-R-3 Section 3.11 states that “*Senior management shall ensure that the implementation of the plans is regularly reviewed and that actions are taken to address deviations from the plans where necessary*”

SF7 Suggestion: Senior managers should be closely involved in project realisation and its progress and should ensure that deviations from the plans are addressed in a timely manner.

Process implementation

The development and implementation of the new, integrated management system is a challenge and an opportunity for improvements to be implemented. Clear guidance on how to develop or update the different processes is required.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-3 Section 5.4: states that “*The development of each process shall ensure that the following are achieved:*

- *Process requirements, such as applicable regulatory, statutory, legal, safety, health, environmental, security, quality and economic requirements, are specified and addressed.*
- *Hazards and risks are identified, together with any necessary mitigatory actions.*
- *Interactions with interfacing processes are identified.*
- *Process inputs are identified.*
- *The process flow is described.*
- *Process outputs (products) are identified.*
- *Process measurement criteria are established.*”

(2) **BASIS:** GS-R-3 Section 5.6 states that “*For each process a designated individual shall be given the authority and responsibility for:*

- *Developing and documenting the process and maintaining the necessary supporting documentation;*
- *Ensuring that there is effective interaction between interfacing processes;*
- *Ensuring that process documentation is consistent with any existing documents;*
- *Ensuring that the records required to demonstrate that the process results have been achieved are specified in the process documentation;*
- *Monitoring and reporting on the performance of the process;*
- *Promoting improvement in the process;*
- *Ensuring that the process, including any subsequent changes to it, is aligned with the goals, strategies, plans and objectives of the organization.*”

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

SF8 Suggestion: The project plan to update BMS to a fully integrated management system should include a detailed procedure on how to develop processes. To each process a process owner should be assigned and his/her duties and responsibilities should be clearly outlined, approved by the senior management and included in the revised BMS.

Management system improvements and review

A management system is a living system. It evolves continuously, as there is always room for improvement. Although it is resource intensive, continuous improvement of the management system should be encouraged by the senior management. The senior management plays a key role in this continuous improvement process: it has to be a shining example in using the management system and in fulfilling its objectives in a timely manner.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

- (1) **BASIS:** GS-R-3 section 6.7 states that “*A management system review shall be conducted at planned intervals to ensure the continuing suitability and effectiveness of the management system and its ability to enable the objectives set for the organization to be accomplished.*”
- (2) **BASIS:** GS-R-3 section 6.8 states that “*The review shall cover but shall not be limited to:*
—*Outputs from all forms of assessment;*
—*Results delivered and objectives achieved by the organization and its processes;*
—*Non-conformances and corrective and preventive actions;*
—*Lessons learned from other organizations;*
—*Opportunities for improvement.*”
- (3) **BASIS:** GS-R-3 section 6.10 states that “*The review shall identify whether there is a need to make changes to or improvements in policies, goals, strategies, plans, objectives and processes.*”

RF6 Recommendation: The senior management should perform a management review at regular frequency (typically once or twice a year) to identify strengths and weaknesses of the management system and to propose improvements and changes.

9. EMERGENCY PREPAREDNESS

The requirements for infrastructure and functional requirements for emergency preparedness are given by Safety Standards GS-R-1, Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety and GS-R-2, Preparedness and Response for a Nuclear or Radiological Emergency. This section of the report assesses the role, resources and capabilities of Nuclear Directorate (ND) against these safety standards.

9.1. THE ROLE OF THE NUCLEAR DIRECTORATE

The functions of ND in relation to emergency preparedness and response have been established by the legal framework and legal requirements have been developed through different legislative instruments and guidance. The legal basis assigns the regulatory responsibility to ND for planning, preparedness and response, particularly making recommendations, providing advisory assistance at local and national level. ND recommendations are the technical basis for decision-making at national level with local or national level impact.

Emergency plans to respond to radiation emergencies are established at on-site and off-site levels. ND, in establishing guidance, has an important role in planning and preparedness (providing conditions and guidance on on-site planning as in terms of scope, structure, use etc. and participating in a similar manner in off-site activities) including a regulatory and coordinating role in this area. Activities to be performed in relation to licensed nuclear sites are regulated through various legal requirements and ND's internal inspection guidance. The activities in relation to emergency response for sites not regulated by ND are regulated by other parts of HSE or by other government departments. ND's internal procedures ensure that if such an event is notified to ND, the appropriate authority is contacted.

ND provides a nominated inspector to fulfill the National Officer role, to monitor the INES (International Nuclear and Radiological Event Scale) system in the UK. In this respect ND supports the activities of the Department of Energy and Climate Changes (DECC) to perform its role as the National Competent Authority in relation to the provision of the Convention on Early Notification of a Nuclear Accident and consequently the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. With respect to the current arrangement ND's procedures should ensure that this response is consistent with the INES Officer role where reports for all radiation events are required.

9.2. CAPABILITIES AND RESOURCES

In order to be able to carry out its response functions, ND has created a formal Emergency Response Group (ERG) complementary to its normal working organization and has established the necessary arrangements for operation of this group within the ND Business Management System. Although ND has a process in place for setting up the ERG it could be enhanced by a more formal approach to staff availability.

Technical and logistical support has been created mainly by establishing the Redgrave Court Incident Suite (RCIS) at ND's headquarters. The RCIS is at the centre of the operating structure established by ND to undertake the corresponding functions in the event of a nuclear or radiological emergency, for which it is equipped with suitable human and technical resources. The principles of operation of this centre are given by ND's Emergency Response Plan. In spite of establishing the RCIS and the ERG, ND has not yet formally identified the full scope of knowledge and competencies which various staff that performs roles in an emergency should possess.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-2 section 5.31 states that “...response organization shall identify the knowledge, skills and abilities necessary to be able perform the functional requirements...make arrangements for the selection of personnel and for training to ensure that the personnel have the requisite knowledge, skills, abilities, equipment and procedures and other arrangements to perform their assigned response functions...”

RF7 Recommendation: Considering the role of ND in responding to a nuclear or radiation emergency ND should, as a priority, further develop suitable training for all the ERG roles.

SF9 Suggestion: The process for setting up the ERG, and the availability of ERG staff, could be enhanced by a more formal process.

ND according to the overall conditions for emergency preparedness and response has developed its own emergency plan. The purpose of the Emergency Response Plan is to define ND's responsibilities/functions in case of a nuclear emergency and describe the arrangements which ND has established for the response to such events.

The commitment of ND management is evident from recent upgrades made to the RCIS, its allocation of human and financial resources and support to activities related to planning, preparedness and response in case of a nuclear or radiological emergency. This creates the necessary conditions for a timely, managed, controlled, coordinated and effective response by ND.

In 2007 ND established an Emergency Preparedness and Response Improvement Project, the purpose of which was to carry out an in-depth review of ND's emergency response arrangements in the context of changes in the regulatory framework in the UK and the evolution of emergency response internationally. Based on the results of the recent self assessment a medium term plan for implementation of areas for improvement (AFI) has been prepared. The plan (AFI) covers emergency preparedness and response addressing 22 issues supporting the development of planning, training, preparedness and conditions for the response. The implementation of this project and the good progress to date is considered to be an appropriate approach to pursuing these improvements.

9.3. FUNCTIONAL REQUIREMENTS AND DECISION-MAKING IN EMERGENCY SITUATIONS

The emergency plans for nuclear or radiological emergencies are prepared according to the nuclear or radiation related threats and possible consequences of accidents. The requirements on structure and contents are given by legislation and regulations made under the Health and Safety at Work etc. Act and ND guidance on an extended release scenario. (e.g. Outline Emergency Planning For Licensed Nuclear Power Stations).

According to the regulations, legal responsibility is with the operator “...and the operator or carrier is responsible for assessing whether it is reasonable foreseeable that a radiation emergency may arise”. Operators are required to carry out an assessment to identify the hazards and evaluate the risk from the work with radiation and operation of nuclear facilities, develop necessary arrangements and to assist the Local Authority in preparing its off-site emergency plan.

The emergency plans and level of preparedness are developed in accordance with the potential magnitude and nature of the threat associated with the facility or activity. To formalize this approach in accordance with the terms of the IAEA guidance ND should, within its regulatory responsibilities, consider extending guidance on nuclear and radiological emergencies introducing IAEA threat assessment categories into regulations and guides and into the on-site and off-site plans. At a later date consideration should be given by the UK to a review by IAEA of the scope of GS-R-2 in a national context to cover those parts not regulated by ND.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-1 section 5.28 states that *“In developing regulations and guides, the regulatory body shall take into consideration comments from interested parties and the feedback of experience. Due account shall also be taken of internationally recognized standards and recommendations, such as IAEA safety standards.”*

(2) **BASIS:** GS-R-2 section 3.15 states that *“The nature and extent of emergency arrangements [for preparedness and response] shall be commensurate with the potential magnitude and nature of the [threat]... associated with the facility or activity.”* (Ref. [10], para. 6.4.) *... events shall be considered in the threat assessment. In the threat assessment, emergencies involving a combination of a nuclear or radiological emergency and a conventional emergency such as an earthquake shall be considered. ... threat assessment shall be so conducted as to provide a basis for establishing detailed requirements for arrangements for preparedness and response by categorizing facilities and practices consistent with the five threat categories shown in Table I.”*

RF8 Recommendation: ND should, within its regulatory responsibilities, consider extending guidance on radiological emergencies introducing IAEA threat assessment categories into its guidance for the development of on-site and off-site plans.

SF10 Suggestion: ND should provide guidance to ensure that a range of reference accidents is developed to cover the threat categories appropriate to the sites it regulates.

In the UK nuclear emergencies are classified based on a classification system for NPP using two categories (Site Incident, Off-Site nuclear emergency) and three categories for multi-facility sites (including Building Emergency). The classification for the power reactors is based on the status of the plant (conditions and/or radiation data) in accordance with IAEA guidance (given by GS-R-2). The categories are comparable with General emergency (at threat categories I and II), Site area emergency, and Facility emergency.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-2 section 4.19 states that *“...the operator of a facility or practice ...shall make arrangements for the prompt identification of an actual or potential nuclear or radiological emergency and determination of the appropriate level of response. This shall include a system for classifying all potential nuclear and radiological emergencies that warrant an emergency intervention to protect workers and the public, in accordance with international standards, which covers emergencies of the following types at facilities (1–4) and other emergencies such as (5) below:*

- (1) *General emergencies at facilities in threat category I or II involving ...*
- (2) *Site area emergencies at facilities ...*
- (3) *Facility emergencies at facilities ...*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(4) Alerts ...

(5) Other emergencies ...

SF11 Suggestion: ND should consider developing guidance extending and introducing the use of the full IAEA scale of emergency declarations contributing to a common definition of emergencies to ensure clarity of its communication about an event as part of international notification.

In the case of an emergency the intervention levels are the basis for taking urgent protective actions. The criteria for the early phase are clearly indicated in guidance and plans as Emergency Reference Levels (ERL). These levels for urgent protective actions clearly establish a Lower and Upper level.

For operational criteria (Operational Intervention Levels – OIL) the Derived ERL (DERL) are introduced. The values for DERL are indicated in terms of activity [Bq] for different isotopes (spectrometry). While ERLs and operational criteria (DERLs) are in place a comparison of ERL with Generic Intervention Levels (GIL) and DERLs with OILs, for early countermeasures, should be performed.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

- (1) **BASIS:** GS-R-2 section 4.42 states that “... Urgent protective action, in accordance with international standards, shall be taken to prevent to the extent practicable the occurrence of severe deterministic health effects and to avert doses”
- (2) **BASIS:** GS-R-2 section 4.45 states that, “Optimized [national] intervention levels [for taking urgent protective actions] shall be [established that are in accordance with international standards³⁹], modified to take account of local and national conditions, such as...”
- (3) **BASIS:** GS-R-2 section 4.71 states that “...arrangements shall be made for promptly assessing the results of environmental monitoring and monitoring for contamination on people in order to decide on or to adapt urgent protective actions to protect workers and the public, including the application of operational intervention levels (OILs)...”

SF12 Suggestion: A review of ERL and Generic Intervention Levels (GIL) and DERL against the IAEA concept for use of “OIL”, for early countermeasures, should be performed.

The UK concept is to plan in detail for reasonably foreseeable emergencies and then to use the concept of extendibility for larger emergencies. The concept of extendibility was endorsed by the Inspectors at the public enquiries for Sizewell B and Hinkley Point C, and captured in the Nuclear Emergency Planning Liaison Group (NEPLG) consolidated guidance.

The UK’s planning zones achieve an equivalent capability to those of IAEA but the terminology used is different. Detailed Emergency Planning Zones (DEPZ) are adopted in the UK and ND is responsible for determining these zones. The DEPZ, the zone around the facility (up to about 3 km) has certain features similar to the IAEA Precautionary Action Zone (PAZ) (GS-R-2). Severe deterministic health effects are considered within the concept of extendibility. According to the plan the food restriction area could be established up to 50km for certain installations.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

(1) **BASIS:** GS-R-2 section 4.48 states that *“For facilities in threat category I or II arrangements shall be made for effectively making and implementing decisions on urgent protective actions to be taken off the site. ...these arrangements shall include the following:*

(a) The specification of off-site emergency zones for which arrangements shall be made for taking urgent protective action. These emergency zones shall be contiguous across national borders, where appropriate, and shall include:

(i) A precautionary action zone, for facilities in threat category I, for which arrangements shall be made with the goal of taking precautionary urgent protective action...in order to reduce substantially the risk of severe deterministic health effects.

(ii) An urgent protective action planning zone, for facilities in threat category I or II, for which arrangements shall be made for urgent protective action to be taken promptly, in order to avert doses off the site in accordance with international standards.”

SF13 Suggestion: In developing ND guidance for the determination of the Detailed Emergency Planning Zones and the Public Information Zones relevant IAEA standards should be taken into consideration.

9.4. EXERCISES AND TRAINING

Emergency exercises involving ND’s participation are performed according to the annual plan agreed with the industry. In a typical year ND evaluates 39 tests of On Site Emergency Plans, 9 tests of Off Site Emergency Plans, 1 of the 9 tests is a National Civil Test involving play by central government in Whitehall, and or Edinburgh depending on where the exercise is located. Different, lower level exercises (including drills, group training, table top etc.) are frequently attended by ND staff within routine inspection activities.

During the visit to the nuclear sites (Sellafield and Heysham) and the off-site Strategic Control Centres (Summergrove and Hutton) the main areas related to the planning, preparedness and response activities were discussed. The on-site conditions for the preparedness and response at Sellafield site confirmed a high level of readiness, good coordination on-site between Sellafield Emergency Coordination Centre (SECC), Incident Coordination Centre and emergency (“Blue Light”) facilities and clearly defined and established interfaces to the off-site and other organizations of the national emergency response structures. Emergency plans and available documents on training and preparedness have similarly demonstrated good preparedness and confirmed the well organised and trained liaison between the on-site and off-site organisations involved in the response. Off-site plans and documented exercises showed the excellent coordination of participating organisations.

Similarly, well organised and tested conditions were also present in the case of Heysham NPP and Hutton Strategic Coordination Centre; as they were for Sellafield and for Summergrove. The emergency management and response capabilities have been established following the IAEA guidance applying the Incident Command System and integrated planning principles. Systematic and frequent use of emergency facilities during exercises, on both sites, confirmed the high level of readiness to respond to radiation emergencies and so meet the goals of preparedness and response. Activating the Recovery Advisory Group early in the emergency phase of the response, brings an opportunity to consider the implications of the decisions made to better coordinate the recovery decision making both in the early phase and in the longer term.

Based on the presentation of the training and exercise practices at site centres it could be concluded, that in addition to the exercises formally witnessed by ND the extent of planning and training of licensee and duty holder staff fully utilizes the available emergency facilities which significantly contribute to a high level of readiness.

The dissemination of information regarding the overall emergency arrangements, role of agencies, lessons learned from events and exercises are publicly available at the internet pages of DECC, where the information is managed by the Nuclear Emergency Planning Liaison Group (NEPLG). The availability of this information, not only helps in coordination of arrangements necessary for effective response, but helps to provide the public with useful information and contributes to public education regarding nuclear emergency preparedness and response.

ND provides advice to response organisations to help develop capabilities for the response to nuclear and radiation emergencies. ND is conducting a systematic review of the Local Authority Off-Site Emergency Plans, prepared under REPPiR, to evaluate the current status of each selected Off-Site Emergency Plan. The review, supported by external organisations, has also included the NEPLG consolidated guidance and the IAEA Safety Requirements of GS-R-2. ND is in the process of providing feedback to the Local Authorities to allow them to make improvements where necessary, and will conclude the review with the development of a good practice framework document for guidance on off-site plans.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES FROM THE 2009 MISSION

- (1) **BASIS:** GS-R-2 section 3.10 states that: *“In planning for, ... the regulatory body shall act as an adviser to the government and [response organizations] in respect of nuclear safety and radiation protection.”*
 - (2) **BASIS:** GS-R-2 section 5.10 states that: *“...Arrangements for the co-ordination of emergency response and protocols for operational interfaces between operators and local, regional and national governments shall be developed,*
- GF6 Good Practice:** The establishment of an emergency preparedness framework (NEPLG) and benchmarking (off-site plans) with external organizations is a good practice.

APPENDIX I- EXPERTS' OPINION ON NEW BUILD

Proposals made in Appendix 1 to the 2006 IRRS Mission Report

In 2006, at the request of the UK, the IRRS experts provided their opinion, and made four proposals for consideration by UK authorities, in relation to how HSE/ND regulates proposed new nuclear power stations. The four proposals are repeated below: _

Proposal 1: *The Government authorities who have a decision making role in new plant licensing should establish a contact forum with the aim of producing a joint plan for an integrated licensing process. The objective should be to separate the political decision making process from the technical review to be conducted later by the NSD. The integrated process should provide a logical order of decisions needed from different authorities and it should ensure the consistency of all regulatory requirements. The joint plan should incorporate the public inquiry under the Electricity Act 1989, and seek for an early decision on how and when the inquiry will be implemented. The public inquiry should be held as early as possible, in order to permit public input at the stage where all safety concerns can be adequately addressed and taken into account in the NSD review process. A preferred time might be soon after the NSD decision has been achieved on the design safety requirements, and after the site relevant design conditions have been specified by the competent authorities.*

Proposal 2: *The NSD should develop a process for stepwise licensing of new nuclear power plant projects that may be proposed by power generation companies including pre-licensing steps. The process could start as soon as a company has expressed its intention to apply for a new nuclear power plant site licence and has committed to cover the costs of the related regulatory work in the pre-licensing stage. NSD should inform the potential applicants on:*

- *the integrated licensing process that takes into account all legislation relevant for issuing a site licence*
- *the contents and expected schedule for safety submittals to the NSD and their review, both during the pre-licensing stage and after issuing the site licence*
- *the hold-points and the related NSD decisions during the entire process*

Proposal 3: *The stepwise approach for combined assessment of new nuclear power plant design, site, and licensee organization should include at least the following steps:*

- *as first step in the pre-licensing stage, an early NSD review and approval of the proposed design safety requirements for the plant in question*
- *as second step in the pre-licensing stage, review of the key features of the new design, as needed to identify safety issues (potential "show-stoppers") that would require modifications, further development, or additional analysis to achieve a regulatory approval of the design*
- *in parallel with the above design review, assessment of the site-specific aspects of the prospective sites and the organization of the licence applicant, as needed to identify the issues that need to be adequately addressed to achieve regulatory approval of the site and organization*

- *in site licensing stage, review and assessment of the safety relevant design features that would be costly to modify after construction start; the review should cover also deterministic and probabilistic safety analysis as needed to verify the design safety*
- *in parallel with the above design review, assessment of the technical strength and management structure of the licence applicant;*

after construction start, review and assessment of the detailed design of systems, structures, and components.

Proposal 4: *NSD may want to seek co-operation with regulatory bodies that have reviewed and possibly licensed the nuclear power plant designs proposed to be built in the UK. However, it should be kept in mind that an in-depth review by the NSD's own staff is necessary for gaining the thorough knowledge, which is needed for regulation of the plant during its operating stage. Foreign regulatory advice could make the licensing process more efficient and effective by providing direct information on*

- *technical issues discussed at length elsewhere and the respective technical judgment of the resolution adopted;*
- *independent analytical work done by the foreign regulators or their consultants to resolve complicated technical issues;*
- *experiments used to support the approval of specific technical solutions or to qualify the analytical models used for licensing assessment;*
- *information on audits conducted by a foreign regulator to verify adequate third party qualification of vital safety systems and equipment (e.g., environmental testing of equipment, qualification of digital I&C software and hardware);*
- *information on observations made during audits to the vendor, to the equipment manufacturers, and to other contractors;*
- *quality problems encountered during manufacturing and construction.*

As part of the review under Module IV the IAEA experts were invited to review progress made in the regulation of new build in relation to the four proposals. The following sections provide the experts' views and also include two new proposals for further consideration by ND.

Changes since the IRRS 2006 Mission

Actions related to proposal 1

The IRRS 2006 mission provided one of the inputs to the report that the Government requested from the HSE as part of its energy review. In its report to the Government the HSE discussed, in addition to the health and safety issues, the potential role of pre-licensing assessment of nuclear reactor designs. The Government issued its Energy Review Report on 11 July 2006.

In the Energy Review report the Government addressed the potential barriers to new nuclear build, and requested the HSE and other principal regulators – Environmental Agency (EA), the Scottish Environment Protection Agency (SEPA), and the Office for Civil Nuclear Security (OCNS) – to work together, developing their processes and providing guidance on pre-licensing assessments of potential nuclear power stations. In response, the regulators arranged a number of joint events and developed their processes for closer co-operation. Today the work of regulators is well integrated when the OCNS has been incorporated into

the HSE's Nuclear Directorate (ND) and there is a Joint Programme Office as a single gateway to communicate with the ND and EA on new build. Meanwhile the SEPA has withdrawn from co-operation because there are no current plans on new build in Scotland.

A decision on a "pre-authorization" system for candidate reactor designs was made in 2006. It is referred to as a Generic Design Assessment (GDA) and first guidance on it was published 11 January 2007. The guidance was aimed primarily towards those companies that may wish to offer their designs for potential construction and operation in the UK. More detailed guidance has been provided along with the progress of the GDA process.

Public participation to the GDA process has been arranged through the HSE's website where public comments on the involved reactor designs can be provided. Open communication on the progress and on the results of the GDA is also provided on the web. An important communication tool is the quarterly report that is published jointly by the HSE and the EA. Legislative changes are underway with a goal to have the regulatory infrastructure for siting in place in spring 2010. The revised legislation will still incorporate local hearings with an opportunity to local objectors to express their views but the aim is to reach decisions needed for site license more quickly than in the past.

Actions related to proposal 2

The GDA process has been developed for implementation in four steps. For financing of the ND's input, the issuance of *Health and Safety Fees Amendment Regulations* on 2 July 2007 was crucial, and the revised act now permits provisions to get adequate resources for the work. A new Division 6 established within the ND for the GDA now employs 64 persons in total, including administration and support staff.

The stakeholders in the GDA process have been kept well informed on the process through guides and instructions issues along the process (*see section 4.1. for additional information*). Easy access to all information is provided by extensive use of the dedicated website www.hse.gov.uk/newreactors/index.htm.

Actions related to proposal 3

The 1st step of the GDA was started in May 2007, and by August 2007 four different designs had been qualified for the next step of the review. The 2nd step, review of fundamental safety features and principles, ended with issuing evaluation reports of all four candidate designs in March 2007. Soon after that one of the candidate designs was withdrawn by its sponsor. The third assessment step, overall design safety review, was started with the three remaining designs in June 2008. In August 2008, one of the three design sponsors asked to temporarily suspend the review. Today the GDA continues on two designs and the results of step 3 will be published on November 27th 2009. The 4th and final step is a detailed design assessment and it is scheduled to end in June 2011. If the designs are found to be acceptable for construction in the UK, the site licensing consideration can then be started without any additional design review, taking into account any site-specific changes from the generic design.

As a parallel measure to GDA, a Strategic Siting Assessment is underway on 11 sites selected for this process.

Actions related to proposal 4

ND has established close contacts both at the expert and the management level with regulatory organizations working on similar designs as those undergoing GDA. Technical experts and inspectors have been exchanged with foreign regulators and this has been beneficial. These steps have proven to be valuable not only to make design assessment more efficient and professionally solid but also to influence in an effective manner to the quality of

the design. Consequently, a parallel assessment of similar designs by several regulatory organizations and exchange of observations and results of the assessment can be expected to enhance safety of the design.

An important multinational co-operation forum is the Multinational Design Evaluation Programme (MDEP) where regulators of ten countries involved in nuclear new build are co-operating. ND is an active member of MDEP, which serves not only design evaluation but also harmonization of standards and requirements for component manufacturing and inspections at the component manufacturers. Furthermore, the MDEP provides direct information to its members on the experiences in construction and component manufacturing and on qualification of the manufacturers.

In addition to co-operation with foreign regulators, the ND has established an extensive network of technical support organizations (TSOs). Some of the TSOs are foreign organizations that have worked on the plant types being assessed in the GDA process. The expert network provides an easy and fast access to expert evaluation in 15 different technical areas, and ND is well resourced to contract a TSO when needed.

Findings from the 2009 Follow-up

ND has proceeded well in line with the proposals made by the IRRS 2006 mission and is preparing in a determined manner for the expected era of nuclear new build in the UK. Necessary changes have been completed or are being made in the legislation to provide a smooth and efficient licensing process that is also effective for assuring a high level of safety for potential new plants. The licensing process is being prepared with pre-assessment of the designs and sites, and the work has progressed in schedule that would permit timely licensing of new build. Even though these proposals have been adequately addressed it is important to continue this effort, especially to arrange appropriate stakeholder involvement in the site licensing process, and to further strengthen international cooperation.

New proposals from the 2009 Mission

- *In order to ensure that good progress continues into the future, it is now most important to make an early assessment of the prospective site licence applicant organizations. Those organizations will carry the prime responsibility for safety of the operating nuclear power stations. This requires an active involvement of the licence holder throughout the construction stage to ensure that the quality of the construction is acceptable and the necessary safety culture is built into the organization during the construction phase.*
- *It appears very likely that foreign utilities will invest in the future of nuclear power generation in the UK and will have a role in the licensee's decision making. The potential impact of foreign investors into safety related decisions needs to be assessed carefully, and a determination made if legislative or other measures are necessary to ensure the licence holder maintains responsibility for safety.*

APPENDIX II - TRANSITION OF ND INTO A STATUTORY CORPORATION

Following the January 2008 publication of a Government White Paper on Nuclear Power, Dr Tim Stone was commissioned by Government to carry out a review of the nuclear regulatory regime. The purpose of the review was to further enhance the transparency and efficiency of ND in meeting the challenges posed by new nuclear power stations, and to seek to maintain, and improve where appropriate, the effectiveness of ND. His review was concluded in December 2008 and his report made 14 recommendations in relation to strengthening ND and its Nuclear Installations Inspectorate (NII) in the short and medium term.

The UK Government accepted the recommendations, and committed to implement them in a timely manner. To meet its commitment to implement the Stone Review recommendations, Government decided that ND should become a different type of public body described in the UK as a Statutory Corporation (SC). Work has commenced to facilitate this significant organisational change for ND, and the expectation is that the transition into a SC will take place in 2010.

The transition to a Statutory Corporation is intended to provide a legal and organizational structure that will enable ND to accomplish its mission of “protecting people and society” while adapting to a rapidly changing nuclear environment over the foreseeable future. The Nuclear Statutory Corporation (NSC) is expected to have its own legal identity, its own board, have responsibility for its own budget development and execution (including statutory accounts), and have autonomy that will allow it to be flexible and responsive. The transition will also provide added assurance that recent improvements to personnel practices and policies, as well as a move toward increased transparency and accountability to all stakeholders, will continue to be made in a way that supports the organization’s mission.

While ND conducts activities related to the transition to a NSC it must also maintain its focus on its core regulatory responsibilities and activities including:

- Existing operating nuclear facilities;
- GDA process;
- Civil new build power stations;
- Defence nuclear installation major Investment programmes;
- NDA site major investment programmes; and
- Waste Repository assessment and licensing.

The transition to a NSC is a challenging and resource intensive activity. There are changes to the business aspects such as statutory accounts, insurance, HR processes and supplier contracts as well as to the operational aspects such as implementing improvements to ND staff activities, and work force cultural changes. ND has developed a detailed implementation strategy that will enable ND to meet its current responsibilities and make a smooth transition to the new organization.

The IRRS team reviewed the Stone Report Summary Recommendations, the ND transition programme, and held discussions with HSE and ND senior management. It was not possible for the IRRS team to compare a Nuclear Statutory Corporation to agency standards since it has not yet been put in place, however the IAEA safety Fundamentals Principles – SF-1, in

particular principle No. 2 “Role of the Government” was reviewed in relation to this case. The IRRS team believes that the following issues deserve close attention prior to, and, during the transition to a NSC.

- The new NSC must be able to perform its functions and make regulatory decisions under its authorities without undue pressure or constraint from either the industry or other parts of the government. To maintain its effective independence, the new NSC has to ensure that in its liaison with interested parties it has a clear separation from organizations or bodies that have been assigned responsibilities for operation of facilities or activities or their promotion.
- Authorizing legislation should provide NSC with adequate authorities to carry out all of ND’s current responsibilities and meet applicable IAEA standards. NSC should strive to have both “*de facto*” and “*de jure*” independence.
- The NSC authorizing legislation should allow the means for necessary transparency and openness. In particular, informing the public about regulatory issues associated with facilities and activities, and about the processes and regulatory decisions.
- The Chief Inspector must be able to give independent regulatory advice to government departments and governmental bodies on matters relating to the safety, security and safeguards of nuclear facilities and activities.
- NSC should have sufficient autonomy and authority to implement budget, staffing and operational changes that are necessary to meet its regulatory responsibilities and make adjustments based upon the changing environment.
- The roles and responsibilities of the NSC board should be formally defined. The composition and qualifications of the board members must be appropriate to meet the board’s functions.
- NSC should continue as the lead UK Government representative in international regulatory activities for civil nuclear matters within its authorities.

Transition Issues

- ND should consider early in transition how any new regulatory responsibilities and staff will be integrated into the NSC to maximize effectiveness.
- Close management attention and effective communication with the entire ND staff and external stakeholders will be vital throughout the change management process.
- The organization must maintain a clear focus on its current safety responsibilities. Retention of regulatory mission responsibilities and public servant core values should be emphasized.
- As significant numbers of new employees join the staff it will be important to emphasize the independence aspects, regulatory aspects and safety considerations of being a nuclear regulator, in addition to developing the necessary technical competences.



APPENDIX III – LIST OF PARTICIPANTS

INTERNATIONAL EXPERTS:		
1. Bill BORCHARDT	US Nuclear Regulatory Commission	Bill.Borchardt@nrc.gov
2. Jukka LAAKSONEN	Radiation and Nuclear Safety Authority (STUK)	Jukka.Laaksonen@stuk.fi
3. Marie-Pierre COMETS	Autorité de sûreté nucléaire (ASN)	Marie-Pierre.COMBES@asn.fr
4. Peter ELDER	Canadian Nuclear Safety Commission (CNSC)	Peter.Elder@cnsccsn.gc.ca
5. Karol JANKO	Nuclear Regulatory Authority of the Slovak Republic (UJD SR)	Karol.janko@ujd.gov.sk
6. Jozef MISAK	Nuclear Research Institute Rez plc	mis@ujv.cz
7. Ulrich SCHMOCKER	Swiss Federal Nuclear Safety Inspectorate (ENSI)	Ulrich.Schmocker@ensi.ch
8. Kuniyisa SODA	Nuclear Safety Commission (NSC)	kuniyisa.soda@cao.go.jp
9. Guillaume WACK	Autorité de sûreté nucléaire (ASN)	Guillaume.wack@asn.fr
IAEA STAFF MEMBERS		
1. Gustavo CARUSO	Division of Nuclear Installation Safety	G.Caruso@iaea.org
2. Marlene KOBEIN	Division of Nuclear Installation Safety	M.Kobein@iaea.org
OFFICIAL ND LIAISON OFFICER:		
1. Rob CAMPBELL	Nuclear Directorate	Rob.Campbell@hse.gsi.gov.uk

APPENDIX IV – MISSION PROGRAMME

SUNDAY, 4 OCTOBER 2009		
IRRS OPENING TEAM MEETING RADISSON HOTEL		
14:00-17:00	- <i>Opening remarks by</i>	<i>Mr. Borchardt (IRRS Team Leader)</i>
	- <i>Self Introduction of entire</i>	<i>IRRS Team</i>
	- <i>IRRS Methodology by</i>	<i>Mr. Caruso (IAEA IRRS Coordinator)</i>
	- <i>IRRS Logistical Arrangements by</i>	<i>Mr. Campbell (Liaison Officer)</i>
MONDAY, 5 OCTOBER 2009		
09:00-13:00	ENTRANCE MEETING	
	Welcome and Introduction	<i>Judith Hackitt Mike Weightman</i>
	IAEA Opening Remarks	<i>Bill Borchardt Gustavo Caruso</i>
	Self-Introduction - Reviewers and Counterparts	<i>IRRS Review Team</i>
	Overview of Legislative, Governmental and Regulatory Body Developments since the 2006 IRRS Mission	<u>Nuclear Directorate</u> <i>Mike Weightman</i>
	Module I, II & III – Presentation on progress with 2006 IRRS findings	<u>Nuclear Directorate</u> <i>Len Creswell</i>
	Module IV, V & VII - Presentation on progress with 2006 IRRS findings.	<u>Nuclear Directorate</u> <i>Andy Hall</i>
	Module VIII – Progress with 2006 IRRS findings.	<u>Nuclear Directorate</u> <i>Rob Gray</i>
	OVERVIEW PRESENTATION OF NEW REVIEW AREAS:	
	- <i>Module VI – Inspection & Enforcement</i>	<u>Nuclear Directorate</u> <i>Rob Gray</i>
	- <i>Theme 1- Emergency Preparedness</i>	<u>Nuclear Directorate</u> <i>David Senior</i>
- <i>Briefing on ND's Self Assessment & Action Plan</i>	<u>Nuclear Directorate</u> <i>Colin Patchett</i>	
13:30-16.30	Group 1: Module III Organisation of the RB: Background to transition to a Statutory Corporation.	<u>IRRS Reviewers</u> <i>W Borchardt, K Soda U Schmocker, M-P Comets</i>

HSE/ND
*L Creswell, J Hackitt
G Podger, M*

		<i>Weightman</i>
	Group 2: Module V Review & Assessment <i>Operating NPPs</i>	<u>IRRS Reviewers</u> <i>J Laaksonen, J Misak</i> <u>Nuclear Directorate</u> <i>A Hall, D Shepherd</i> <i>R Nevell, P Brighton</i> <i>S Frost</i>
	Group 2: Module VI Inspection & Enforce. Fuel Cycle Facilities	<u>IRRS Reviewers</u> <i>P Elder, G Wack</i> <u>Nuclear Directorate</u> <i>R Gray, N Hobson</i> <i>M Foy</i>
	Group 3: Theme 1 Emergency Prep & Response – Overview of UK Arrangements	<u>IRRS Reviewers</u> <i>K Janko, G Wack</i> <u>Nuclear Directorate</u> <i>D Senior, P Hughes</i> <i>B Powell, S Mackie</i>
16:30-18:00	Daily Team Meeting	<i>IRRS Reviewers, LO</i>
TUESDAY, 6 OCTOBER 2009		
09:30-16.15	INTERVIEWS	
	Group 1: - Follow up to 2006 Findings - <i>Module I</i> Legislative & Govt Responsibilities - <i>Module II</i> Respon's & Functions of the RB - <i>Module III</i> Organisation of the RB	<u>IRRS Reviewers</u> <i>W Borchardt, K Soda,</i> <i>U Schmocker, M-P</i> <i>Comets</i> <u>Nuclear Directorate</u> <i>L Creswell, B West</i> <i>P Brown, A Lindley</i> <i>A Curran, N Jones</i>
09:00-12.30	Group 2: Module V & VII - <i>Review and Assessment</i> - <i>Development of Regulations and Guides. (Fuel Cycle Facilities)</i>	<u>IRRS Reviewers</u> <i>P Elder, J Misak</i> <u>Nuclear Directorate</u> <i>A Hall, A Hart, R</i> <i>Nevell, A Ball</i>
	Group 2: Module VI - <i>Inspection & Enforcement - NPPs</i>	<u>IRRS Reviewers</u> <i>J Laaksonen, G Wack</i> <u>Nuclear Directorate</u> <i>R Gray, C Patchett, T</i> <i>Davenport, G Booth, L</i> <i>Bruce</i>
09.00-12.30	Group 3: Theme 1 <i>Emergency Preparedness and Response, (ND's Role in a Nuclear Emergency)</i>	<u>IRRS Reviewers</u> <i>K Janko</i> <u>Nuclear Directorate</u> <i>D Senior, P Hughes, B</i> <i>Powell, S Mackie</i>
13.30-16.30	Group 2: Module V & VII - <i>Review and Assessment</i> <i>Development of Regulations and Guides. Follow up to 2006 findings and Operating NPPs</i>	<u>IRRS Reviewers</u> <i>J Laaksonen, J Misak</i> <u>Nuclear Directorate</u> <i>A Hall, D Shepherd, R</i> <i>Nevell, I Britten, K</i>

		<i>McDonald, A Hart</i>
16.30-18.00	Daily Team Meeting	<i>IRRS Reviewers, LO</i>
SITE VISITS: Cumbria activities		
14.00	Group 2 & 3: Module VI and Theme 1 Travel to Ravenglass in Cumbria with NII inspectors	<u>IRRS Reviewers</u> P Elder, G Wack & K Janko <u>Nuclear Directorate</u> P Hughes, B Powell M Foy
Overnight	Pennington Hotel, Ravenglass	IAEA Reviewers and NII inspectors
WEDNESDAY 7 OCTOBER 2009		
09.00-16.15	INTERVIEWS	
	Group 1: Module III Organisation of the RB (Including Transition to a Statutory Corporation)	<u>IRRS Reviewers</u> W Borchardt, K Soda, U Schmocker, M-P Comets <u>Nuclear Directorate</u> L Creswell (part), R Gray, B West, P Brown, A Lindley, I Britten, G Burt
	Group 1: Module VIII Management Systems (Follow up and new review aspects)	<u>IRRS Reviewers</u> W Borchardt, K Soda, U Schmocker, M-P Comets <u>Nuclear Directorate</u> R Gray, D Derbyshire, C Lavender, I Britten, C Voelger,
09.00-11.00	Group 2: Module IV Authorisation (Follow Up to 2006 Findings)	<u>IRRS Reviewers</u> J Laaksonen, J Misak <u>Nuclear Directorate</u> C Patchett, C Reiersen, T Davenport
11.00-16.30	Group 2 Module IV Authorisation (Experts' Opinion on New Build)	<u>IRRS Reviewers</u> J Laaksonen, J Misak <u>Nuclear Directorate</u> L Creswell, K Allars
16:30-18:00	Daily Team Meeting – Teleconference with Group 2 & 3 from Sellafield Site.	<i>IRRS Reviewers, LO</i>
18.00	Module VI: J Laaksonen to be collected and taken to Holiday Inn, Lancaster to join other IAEA reviewers	<u>IRRS Reviewers</u> J Laaksonen <u>Nuclear Directorate</u> G Booth
SITE VISITS: Sellafield & Lancaster		

07:45-16:30	Group 2: Module VI Observe conduct of routine Inspection at Sellafield	<u>IRRS Reviewers</u> P Elder, G Wack <u>Nuclear Directorate</u> G Smith, R Cooper
	Group 3: Theme 1 Emergency Preparedness & Response - ND's regulatory role both on and of-site.	<u>IRRS Reviewers</u> K Janko <u>Nuclear Directorate</u> M Foy, P Hughes, B Powell.
16:30-18:00	Daily Team Meeting – IAEA Reviewers on Tele/Video conference from Sellafield Site, Coniston Room, B582 1st floor North.	<i>IRRS Reviewers, LO</i>
18:00-20:00	Travel to Lancaster Holiday Inn to drop-off Mr G Wack	<u>IRRS Reviewers</u> G Wack, K Janko (Joined by J Laaksonen)
20:00 approx	Meet NII Site Inspectors in the hotel	<u>IRRS Reviewers</u> G Wack, K Janko, J Laaksonen <u>Nuclear Directorate</u> Inspectors
19.30-21.00	Travel to Liverpool to drop Mr Elder off at the Radisson Hotel, Liverpool	<u>IRRS Reviewers</u> P Elder <u>Nuclear Directorate</u> M Foy

THURSDAY 8 OCTOBER 2009

09.30-12:00	INTERVIEWS	
	Group 1: Module III Organisation of the RB, (Background to restructuring)	<u>IRRS Reviewers</u> W Borchardt, G Caruso DECC – T Stone <u>Nuclear Directorate</u> M Weightman
09.00-16.30	Group 2: Module V Review & Assessment Module VI Inspection & Enforcement (Follow-up to site visit)	<u>IRRS Reviewers</u> P Elder <u>Nuclear Directorate</u> A Hall, M Bassett, M Foy, A Hart, G Smith
	Group 1: Module VIII Management Systems (Follow up and new review aspects)	<u>IRRS Reviewers</u> K Soda, U Schmocker, M-P Comets, W Borchardt (pm only) <u>Nuclear Directorate</u> R Gray, D Derbyshire, C Lavender, I Britten, C Voelger
17.00-18.00	Daily Team Meeting	<i>IRRS Reviewers, LO</i>

SITE VISITS: Hevsham & Preston site Visit

09:00-14:30	Group 2: Module VI Inspection and Enforcement Observe conduct of routine inspection at Heysham 1	<u>IRRS Reviewers</u> G Wack, Y Laaksonen <u>Nuclear Directorate</u> G Booth, L Bruce
09.00-12.30	Group 3: Theme 1 Emergency Preparedness & Response	<u>IRRS Reviewers</u> K Janko <u>Nuclear Directorate</u> P Hughes, B Powell
13:30-15:00	Group 3: Theme 1 Emergency preparedness & response (Strategic Control Centre at Hutton)	<u>IRRS Reviewers</u> K Janko <u>Nuclear Directorate</u> P Hughes, B Powell
14:30 & 15:00	Group 2 & Group 3: Travel back separately from Heysham and Preston to Redgrave Court, Bootle –	<u>IRRS Reviewers</u> Y Laaksonen, G Wack with G Booth <u>IRRS Reviewers</u> K Janko <u>Nuclear Directorate</u> P Hughes and B Powell
17:00-18:00	Daily Team Meeting	<i>IRRS Reviewers, LO</i>
FRIDAY 9 OCTOBER 2009		
09.30-12.30	Policy Issues discussions	<u>IRRS Reviewers</u> ND all Counterparts & Senior staff
13.30-16.00	Final Discussions with Counterparts	<u>IRRS Reviewers</u> and Counterparts
15.00-17.00	Commence Drafting the Mission Report:	<u>IRRS Reviewers</u>
SATURDAY, 10 OCTOBER 2009		
10 October 10.00 am	IAEA Team Meeting, Waterloo Room, Radisson Hotel	<i>IRRS Reviewers, LO</i>
19.30	IRRS Mission Dinner at “Restaurant Bar & Grill”	<u>IRRS Reviewers</u> & ND senior managers.
SUNDAY, 11 OCTOBER 2009		
11 October	Waterloo Room, Radisson Hotel	<u>IRRS Reviewers</u>
MONDAY 12 OCTOBER 2009		
a.m.	Team Review of the Draft Report	<u>IRRS Reviewers</u> and LO
13.00	Handover of Draft Report to ND	ND senior managers, LO
13.00-17.00	Preparation for Exit Meeting	<u>IRRS Reviewers</u>

17.00	Initial ND Comments on draft Mission Report back to IAEA	<i>IRRS Reviewers, LO</i>
TUESDAY 13 OCTOBER 2009		
a.m.	Finalization of the Report	<i>IRRS Reviewers, LO</i>
a.m.	Preparations for the Exit Meeting	<u>IRRS Reviewers</u>
11:00-12.00	IRRS Exit Meeting	<u>IRRS Reviewers</u> and HSE/ND participants
Departure of IAEA team from Liverpool		

APPENDIX V – MISSION COUNTERPARTS

SUBJECT AREA	IRRS EXPERTS	COUNTERPART	
1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES	Mr. W Borchardt Mr. K Soda Mr. U Schmocker Ms. M-P Comets	Mr. L Creswell Mr. P Brown Mr. A Lindley Mr. A Curran	
2. AUTHORITY, RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	Mr. W Borchardt Mr. K Soda Mr. U Schmocker Ms. M-P Comets	Mr. L Creswell Mr. P Brown Mr. A Lindley Mr. A Curran	
3. ORGANIZATION OF THE REGULATORY BODY	Mr. W Borchardt Mr. K Soda Mr. U Schmocker Ms. M-P Comets	Mr. L Creswell Mr. J Hackitt Mr. G Podger Mr. M Weightman Mr. P Brown Mr. G Burt	Mr. A Lindley Mr. A Curran Ms. N Jones Mr. R Gray Mr. I Britten
4. AUTHORISATION PROCESS	Mr. P Elder Mr. J Misak Mr. J Laaksonen	Mr. A Hall Mr. A Hart Mr. R Nevell Mr. A Ball Mr. C Patchett	Mr. C Reiersen Mr. T Davenport Mr. L Creswell Mr. K Allars
5. REVIEW AND ASSESSMENT	Mr. J Laaksonen Mr. J Misak	Mr. A Hall Mr. D Shepherd Mr. A Hart Mr. R Nevell Mr. P Brighton Mr. S Frost	Mr. I Britten Mrs. K McDonald Mr. M Bassett Mr. M Foy

SUBJECT AREA	IRRS EXPERTS	COUNTERPART	
6. INSPECTION AND ENFORCEMENT	Mr. P Elder Mr. G Wack Mr. J Laaksonen	Mr. R Gray Mr. N Hobson Mr. M Foy Mr. R Cooper Mr. C Patchett Mr. T Davenport Mr. G Booth Mr. L Bruce Mr. G Smith	Mr. P Hughes Mr. B Powell Mr. G Smith Mr. R Cooper Mr. A Hall Mr. M Bassett Mr. M Foy Mr. A Hart
7. DEVELOPMENT OF REGULATIONS AND GUIDES	Mr. P Elder Mr. J Misak Mr. J Laaksonen	Mr. A Hall Mr. R Nevell Mr. P Brighton	Mr. D Shepherd Mr. A Hart
8. THE REVIEW OF THE MANAGEMENT SYSTEM	Mr. Schmocker Ms. M-P Comets Mr. W Borchardt	Mr. R Gray Mr. D Derbyshire Mr. C Lavender Mr. I Britten Mr. C Voelger	
9. EMERGENCY PREPAREDNESS	Mr. K Janko Mr. G Wack	Mr. D Senior Mr. P Hughes Mr. B Powell Mr. S Mackie Mr. M Foy	

APPENDIX VI – SITE VISITS

Site Visits	
1	Heysham 1 Nuclear Power Plant
2	Hutton SCC
3	Sellafield including Summergrove SCC

APPENDIX VII – RECOMMENDATIONS/SUGGESTIONS/GOOD PRACTICES FROM THE 2nd IRRS MISSION

AREAS	RF: Recommendations, SF: Suggestions, GF: Good Practices	RECOMMENDATIONS, SUGGESTIONS OR GOOD PRACTICES ARISED FROM THE SECOND MISSION
1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES	SF1	Suggestion: ND should continue, in the new build sector as well as in its other activity areas, to develop and implement its stakeholder engagement work, and document and publish the processes.
	SF2	Suggestion: ND should institute a programme for the reconstitution on an advisory committee on nuclear safety.
2. AUTHORITY, RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	No recommendations or suggestions where made in respect of this Module.	
3. ORGANIZATION OF THE REGULATORY BODY	RF1	Recommendation: ND should strengthen the integration of nuclear safety, security and safeguards at the inspector level to improve delivery of strategic regulatory priorities.
	GF1	Good Practice: ND has established a thorough transition programme and organization, dedicated to the handling of its transition to the new Statutory Corporation, especially the implementation of a detailed and thorough staffing programme.
4. AUTHORISATION PROCESS	SF3	Suggestion: ND should develop a methodology and guidance on balancing risk to take into consideration long-term hazard and risk reduction when approving modifications for facilities undergoing decommissioning or remediation.
5. REVIEW AND ASSESSMENT	GF2	Good Practice: The establishment of Nuclear Topic Groups to provide consistency across ND in technical assessment areas and to provide guidance for reviews is considered a good practice.

	SF4	Suggestion: ND should further document the processes associated with Intervention Progress Groups, including management of technical issues, with the goal of increasing the level of consistency throughout the directorate.
	GF3	Good Practice: Establishment of the Technical Support Framework based on systematic and transparent selection of independent contractors that are pre-qualified for specific areas of expertise, and overall arrangements for contracting necessary technical support without undue delay is a good practice.
6. INSPECTION AND ENFORCEMENT	RF2	Recommendation: ND should ensure that its inspectors have followed a specific training programme before being issued with a warrant.
	RF3	Recommendation: ND should consider enhancing its arrangements to ensure that results of all inspections are communicated in written form to the licensee.
	SF5	Suggestion: ND should provide guidance on the creation, recording, use and management of regulatory issues to ensure that licensees are informed of issues recorded by NII and are treated in a consistent and proportionate manner in resolving them.
	GF4	Good practice: HSE/ND has developed and implemented a public and formal enforcement policy statement and enforcement management model.
	RF4	Recommendation: ND should review and assess whether sufficient inspector effort is being applied to nuclear power plants to achieve adequate assurance of safety taking into consideration facility ageing.
7. DEVELOPMENT OF REGULATIONS AND GUIDES	GF5	Good Practice: Development and implementation of a comprehensive programme for review, update and completion of the suit of guidance documents with clear responsibilities for each individual document and for overall coordination, including detailed time schedule for the whole process, taking into account the importance of the TAGs and resource availability is a good practice.

8. THE REVIEW OF THE MANAGEMENT SYSTEM	RF5	Recommendation: ND's management should be actively involved in the development of the integrated management system and ensure that enough resources are allocated to this activity.
	SF6	Suggestion: Senior managers should be involved in the development of the management processes needed to reflect the goals and strategies outlined in ND's strategic plan.
	SF7	Suggestion: Senior managers should be closely involved in project realisation and its progress and should ensure that deviations from the plans are addressed in a timely manner.
	SF8	Suggestion: The project plan to update BMS to a fully integrated management system should include a detailed procedure on how to develop processes. To each process a process owner should to be assigned and his/her duties and responsibilities should be clearly outlined, approved by the senior management and included in the revised BMS.
	RF6	Recommendation: The senior management should perform a management review at regular frequency (typically once or twice a year) to identify strengths and weaknesses of the system and to propose improvements and changes.
9. EMERGENCY PREPAREDNESS	RF7	Recommendation: Considering the role of ND in responding to a nuclear or radiation emergency ND should, as a priority, further develop suitable training for all the ERG roles.
	SF9	Suggestion: The process for setting up the ERG, and the availability of ERG staff, could be enhanced by a more formal process.
	RF8	Recommendation: ND should, within its regulatory responsibilities, consider extending guidance on radiological emergencies introducing IAEA threat assessment categories into its guidance for the development of on-site and off-site plans.
	SF10	Suggestion: ND should provide guidance to ensure that a range of reference accidents is developed to cover the threat categories appropriate to the sites in regulates.

	SF11	Suggestion: ND should consider developing guidance extending and introducing the use of the full IAEA scale of emergency declarations contributing to a common definition of emergencies to ensure clarity of its communication about an event as part of international notification.
	SF12	Suggestion: A review of ERL and Generic Intervention Levels (GIL) and DERL against the IAEA concept for use of “OIL” for early countermeasures should be performed.
	SF13	Suggestion: In developing ND guidance for the determination of the Detailed Emergency Planning Zones and the Public Information Zones relevant IAEA standards should be taken into consideration.
	GF6	Good Practice: The establishment of an emergency preparedness framework (NEPLG) and benchmarking (off-site plans) with external organizations is a good practice.

APPENDIX VIII – STATUS OF RECOMMENDATIONS/SUGGESTIONS FROM THE 2006 IRRS MISSION

	Areas	IAEA Comment No <i>R: Recommendations, S: Suggestions, G: Good practices</i>	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
A	Legislative and governmental responsibilities	S1 <i>HSE should make arrangements to charge fees for pre-licence application work.</i>	Closed
		R1 <i>HSE should review and document the legislative authority that allows the appeal and review of technical basis for regulatory decisions in addition to the procedural review that is currently allowed, and take appropriate actions. (S1 of section 2.1.1. addresses the NSD internal practices and procedures related to this recommendation.)</i>	Open
		S2 <i>HSE should initiate actions to establish and document the role of the public in the regulatory process.</i>	Closed
		S3 <i>NSD should take an initiative to clarify</i> <ul style="list-style-type: none"> ▪ <i>What is the NDA's responsibility for safety in view of its authority to decide on activities and their financing at the nuclear sites; and</i> <i>Whether the NSD should, regulate the NDA activities and what means it would have available for such regulation.</i>	Closed

	Areas	IAEA Comment No <i>R: Recommendations, S: Suggestions, G: Good practices</i>	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
B	Authority, responsibilities and functions of the regulatory body	R2 <i>processes should be developed and documented that describe the steps to be followed for the issuance or amendment of a licence, including the activities, responsibilities, inputs and outputs.</i>	Closed
		S4 <i>NSD should review, document and publicize its internal practices and procedures for the appeal of technical decisions.</i>	Open
C	Organization of the Regulatory Body	R3 <i>It is recommended that NSD clearly define and document the minimum elements of its annual responsibilities (in relation to its strategic goals and key business activities (KBA)) and estimate the resources required to accomplish those elements. Future budget requests would then be based on these minimum resource needs plus an allocation for additional work as appropriate.</i>	Open
		S5 <i>NSD resources necessary to accomplish new build activities need to be established and included into budget planning.</i>	Closed

	Areas	IAEA Comment No <i>R: Recommendations, S: Suggestions, G: Good practices</i>	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
		R4 <i>It is recommended that NSD consider developing and implementing an integrated recruitment, retention and training programme that hires staff, with appropriate technical qualifications into all levels of an appropriately sized organization.</i>	Closed
		R5 <i>NSD should review current and anticipated expert staffing needs for all relevant safety assessment positions. This review should consider which areas of expertise require a staffing defense-in-depth approach by having more than a single expert in the organization.</i>	Closed
D	Authorization process	R6 <i>Processes should be developed and documented for potential new build nuclear power plants that describe the steps to be followed by an applicant for the issuance of a site licence, including pre-licensing phase. Respectively, formal guidance should be developed on the content and format of required safety submissions, to improve efficiency and effectiveness of the entire licensing process (see also suggestion 1.1.1/S1 on financing the regulatory work in pre-licensing phase, and more detailed proposals given in separate Appendix for the authorization of potential new builds).</i>	Closed

	Areas	IAEA Comment No R: Recommendations, S: Suggestions, G: Good practices	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
		R7 <i>Enhance the process to ensure a more systematic NSD review of the safety classification of planned modifications, and a consideration of the need for NSD review.</i>	Closed
		R8 <i>Consider developing an approach that includes appropriate levels of direct evidence on adequate qualification of licensee's control room operators and other personnel in positions with direct influence on safety, and also ensures verification of consistent qualification requirements throughout the UK nuclear industry.</i>	Closed
E	Review and assessment	S6 <i>When a project is completed, a formal audit of the review and assessment process should be performed to identify lessons learned.</i>	Open
		S7 <i>NSD should develop a process for recording and analyzing its observation of Human Factors and organizational aspects of the licensees activities in a systematic and auditable way.</i>	Closed

	Areas	IAEA Comment No <i>R: Recommendations, S: Suggestions, G: Good practices</i>	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
		R9 <i>NSD should identify expertise and technical support available inside UK or abroad to support it in its review and assessment work. This should include the possibilities to perform independent analysis and validation of codes in areas such as PSA, Thermal Hydraulics, Severe Accident Analyses. Appropriate arrangements should be made to assure that for all safety relevant topics high qualified expertise can be identified by NSD.</i>	Closed
		R10 <i>NSD should review its processes and resources to ensure that assessment of events from UK plants as well as from foreign plants is carried out. A formal process for reviewing events should put in place to ensure that lessons learned are available in due time.</i>	Open
		R11 <i>NII should further develop a means by which it can ensure that the operators share operating experience among themselves, analyse the international operating experiences and take appropriate corrective action.</i>	Open
		S8 <i>NSD should carry out audits and inspections themselves or/and through a contractor on the QA process of manufacturer and vendors on important safety components (e.g. the fabrication of a new vessel head).</i>	Closed

	Areas	IAEA Comment No R: Recommendations, S: Suggestions, G: Good practices	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
		S9 <i>When NSD issue a formal regulatory decision the basis of its decision should be sent to the licensee.</i>	Open
		S10 <i>NSD should review the completeness of the PSA model of each plant to ensure it reflects the actual state of the modeled plant. This should be carried out periodically to assure that the insights gained from the analyses are sound and robust.</i>	Closed
G	Development of regulations and guides	S11 <i>That the NII issue by formal means the various internal guides that indicate ways of meeting general regulatory requirements, such as the current 36 licence conditions.</i>	Closed
X	The Review of the Management System	R12 <i>the development of the BMS be continued in order that the BMM can contain the policies, processes and procedures necessary to describe the functioning of the organization. As an initial step, the BMM should be made consistent with Annex 4 of the Strategic Plan 2004-2010, or contain the information directly.</i>	Open
		S12 <i>The Business Management Manual should include all the processes that describe how work is to be prepared, reviewed, carried out, recorded, assessed and improved.</i>	Open

	Areas	IAEA Comment No <i>R: Recommendations, S: Suggestions, G: Good practices</i>	Status of Recommendations, Suggestions or Good Practices from the 2006 Mission
		R13 <i>A senior manager should be given responsibility for the management system. The person responsible for developing the management system should report directly to the senior manager.</i>	Closed
		S13 <i>A process should be developed to describe the means by which the Business Management Manual is maintained up-to-date. This for example may permit immediate updating for minor alternations to the document, whereas changes to the BMS itself would be identified on some regular basis and approval given by the Management Board before the Manual is revised.</i>	Open
		S14 <i>A process for conducting independent assessments (audits) should be developed and a means by which they be performed proposed. This could require the establishment of an internal unit or use of external resources</i>	Open

APPENDIX IX – REFERENCE MATERIAL PROVIDED BY ND

Note: This information was provided to the IAEA reviewers through a web-based extranet secure application called the “IRRS Web community”.

[1]	Module I Questionnaire + Supporting Documents
[2]	Module II Questionnaire + Supporting Documents
[3]	Module III Questionnaire + Supporting Documents
[4]	Module IV Questionnaire + Supporting Documents
[5]	Module V Questionnaire + Supporting Documents
[6]	Module VI Questionnaire + Supporting Documents
[7]	Module VII Questionnaire + Supporting Documents
[8]	Module VIII Questionnaire + Supporting Documents
[9]	ND Self-Assessment Report
[10]	NSD Public Health Questionnaire + Supporting Documents
[11]	NSD Radiation Protection Questionnaire + Supporting Documents
[12]	NSD Emergency Preparedness Questionnaire + Supporting Documents
[13]	ND IRRS Actions Plan
[14]	IAEA 2006 IRRS Mission Report

APPENDIX X – IAEA REFERENCE MATERIAL USED FOR THE REVIEW

- [1] **No. GS-R-1** – Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety
- [2] **No. GS-R-2** – Preparedness and Response for a Nuclear or Radiological Emergency
- [3] **No. GS-R-3** – The Management System for Facilities and Activities
- [4] **No. GS-G-1.1** – Organization and Staffing of the Regulatory Body for Nuclear Facilities
- [5] **No. GS-G-1.2** – Review and Assessment of Nuclear Facilities by the Regulatory Body
- [6] **No. GS-G-1.4** – Documentation for Use in Regulatory Nuclear Facility
- [7] **No. GS-R-2** – Preparedness and Response for Nuclear and Radiological Emergencies Requirements
- [8] **No. GS-G-2.1** – Arrangements for Preparedness for a Nuclear or Radiological Emergency
- [9] **No. NS-R-1/2** – Safety Requirements of Nuclear Power Plants: Operation and Design
- [10] **No. NS-R-4** – Safety Requirements of and Fuel Cycle Facilities

APPENDIX XI – ND ORGANIZATIONAL CHART

