



**INTEGRATED
REGULATORY
REVIEW SERVICE (IRRS)
FOLLOW-UP MISSION
TO
THE UNITED KINGDOM**

Liverpool, United Kingdom

29 September to 9 October 2013

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY



Office for Nuclear Regulation
An agency of HSE



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Mission date: *29 September to 9 October 2013*
Regulatory body: *HEALTH AND SAFETY EXECUTIVE (HSE)/OFFICE FOR NUCLEAR REGULATION*
Location: *HSE/ONR HQ in Liverpool, UNITED KINGDOM*
Regulated facilities and activities: *Nuclear power plants, RadWaste facilities*
Organized by: *International Atomic Energy Agency (IAEA)*

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IAEA-2013

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.

CONTENT

EXECUTIVE SUMMARY	7
I. INTRODUCTION	11
II. OBJECTIVE AND SCOPE.....	13
III. BASIS FOR THE REVIEW.....	14
1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES	16
2. GLOBAL NUCLEAR SAFETY REGIME	19
3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY.....	20
4. MANAGEMENT SYSTEM OF THE REGULATORY BODY.....	27
5. AUTHORIZATION	33
5.1. AUTHORIZATION FOR NUCLEAR FACILITIES	33
5.2. STATUS OF PROPOSALS ON NEW BUILD MADE IN APPENDIX 1 TO THE 2006 IRRS MISSION REPORT	34
6. REVIEW AND ASSESSMENT.....	38
7. INSPECTION.....	41
8. ENFORCEMENT.....	43
9. REGULATIONS AND GUIDES.....	44
10. EMERGENCY PREPAREDNESS AND RESPONSE	45
11. ADDITIONAL AREAS.....	49
11.1. OCCUPATIONAL RADIATION PROTECTION.....	49
11.2. CONTROL OF DISCHARGES, MATERIALS FOR CLEARANCE, AND CHRONIC EXPOSURES; ENVIRONMENTAL MONITORING FOR PUBLIC RADIATION PROTECTION	53
11.3. SUMMARY	54
12. SUPERVISION OF NON-NPP FACILITIES AND ACTIVITIES.....	55
12.1. RADIATION SOURCES APPLICATIONS	55
12.2. WASTE MANAGEMENT FACILITIES	57
12.3. DECOMMISSIONING ACTIVITIES	63
12.4. SUMMARY	66
13. REGULATORY IMPLICATIONS OF THE TEPCO FUKUSHIMA DAI-ICHI ACCIDENT.....	67
13.1. IMMEDIATE ACTION TAKEN BY THE REGULATORY BODY.....	67
13.2. TECHNICAL AND OTHER ISSUES CONSIDERED IN THE LIGHT OF THE ACCIDENT	68

13.3. PLANS FOR UPCOMING ACTIONS TO FURTHER ADDRESS THE REGULATORY IMPLICATIONS OF THE ACCIDENT.....	70
13.4. CONCLUSIONS BY REVIEWED AREAS	71
APPENDIX I – LIST OF PARTICIPANTS	78
APPENDIX II – MISSION PROGRAMME	79
APPENDIX III – SITE VISITS	80
APPENDIX IV – LIST OF COUNTERPARTS	81
APPENDIX V - RECOMMENDATIONS (R) AND SUGGESTIONS (S) FROM THE PREVIOUS IRRS MISSIONS THAT REMAIN OPEN	83
APPENDIX VI – RECOMMENDATIONS (RFF), SUGGESTIONS (SFF) AND GOOD PRACTICES (GPF).....	84
APPENDIX VII – CONCLUSIONS ON THE REGULATORY IMPLICATIONS OF THE TEPCO FUKUSHIMA DAI-ICHI ACCIDENT	90
APPENDIX VIII – ONR REFERENCE MATERIAL USED FOR THE REVIEW	93
APPENDIX IX – IAEA REFERENCE MATERIAL USED FOR THE REVIEW	108
APPENDIX X – ORGANIZATIONAL CHART	110

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 (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 then Department of Trade and Industry (DTI) asked HSE to contribute an expert report that included an assessment of the regulatory 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 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 extended follow-up 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 the regulatory organization as the Nuclear Directorate (ND) moves towards becoming a Statutory Corporation (SC).

At the request of the Government of the United Kingdom, an international team of senior safety experts met representatives of the Office for Nuclear Regulation (ONR) from 30 September to 9 October 2013 to conduct the third IRRS extended follow-up mission to the UK. The mission took place at the headquarters of ONR in Liverpool and included site visits to Sellafield and Berkeley. The purpose of the peer review was to review the national regulatory framework for the functions of the ONR relating to nuclear safety in the UK, including the measures undertaken following the recommendations and suggestions of the 2006 and 2009 IRRS missions. In addition, this mission was carried out to review additional areas, in order to ensure ONR has received an IRRS mission covering all ONR regulatory functions. The IAEA was also requested to review ONRs' approach to openness and transparency, as well as the recently implemented ONR operating model.

The review compared the UK regulatory framework for safety against IAEA safety standards as the international benchmark for safety. The mission was also used to exchange information and experience between the IRRS Team members and the UK counterparts in the areas covered by the IRRS.

The IRRS Team consisted of 12 senior regulatory experts from 11 IAEA Member States and 4 IAEA staff members.

The IRRS Team carried out a review of the measures undertaken following the recommendations and suggestions of the 2006 and 2009 IRRS missions in the following areas: responsibilities and functions of the government; the global nuclear safety regime; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body related to regulation of nuclear power plants and fuel cycle facilities, including authorization, review and assessment, inspection, enforcement, and the development and content of regulations and guides; emergency preparedness and response. In addition, the following additional areas were reviewed: control of discharges, materials for clearance and chronic exposure; occupational radiation protection; environmental monitoring for public radiation protection; radiation sources applications; and waste management facilities and decommissioning activities.

It should be noted that the peer review addressed only the facilities and activities regulated by ONR in the areas of environmental monitoring for public radiation protection, control of discharges, materials for clearance and chronic exposure and occupational radiation protection.

As recommended by the IAEA Nuclear Safety Action Plan, special attention was given to regulatory implications to the UK framework for safety in relation to the lessons learned from the TEPCO Fukushima Daiichi accident.

The mission included observations of regulatory activities, interviews and discussions with ONR staff, representatives from the Health and Safety Executive (HSE), the Department of Energy and Climate Change (DECC), the Department for Work and Pensions (DWP), the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA), Public Health England (PHE) and the Nuclear Decommissioning Authority (NDA) to help assess the effectiveness of the regulatory system. Visits were also made to Sellafield and Berkeley. The IRRS Team members observed the working practices during inspections carried out by ONR, including discussions with licensee personnel and management.

ONR provided the IRRS Team with advance reference material and comprehensive documentation including the results of the self-assessment in all areas within the scope of the mission.

Throughout the mission, the IRRS Team was extended full cooperation in regulatory, technical, and policy issues by all parties; in particular, the staff of ONR provided the fullest practicable assistance and demonstrated extensive openness and transparency.

The IRRS Team concluded that the recommendations and suggestions from the 2006 and 2009 IRRS mission have been taken into account systematically by a comprehensive action plan. Significant progress has been made in many areas and many improvements were carried out following the implementation of the action plan.

During this follow-up mission, the IRRS Team determined that all (10) recommendations and 12 of 13 suggestions made by the 2009 IRRS mission had been effectively addressed and therefore could be considered closed. The ONR should be commended for this accomplishment.

In view of the significant changes to the organization since the 2006 and 2009 Missions, the three Recommendations and six Suggestions in the area of the management system have been administratively closed. Instead, the topic has been reviewed as though it is a new Module of the review, which has resulted in the previous Recommendations and Suggestions being closed. The IRRS Team also concluded that the ONR should continue the implementation of its actions toward completion of the remaining findings.

The IRRS Team made the following general observations:

The UK nuclear regulatory body has been in a state of almost continuous transition from the first mission in 2006 until the current mission. There are numerous factors which have contributed to this situation including changing workloads, turnover of key staff, implementation of a new operating model, increased emphasis on implementation of administrative procedures, responding to the Fukushima Daiichi accident and transition of the organization to a statutory organization. Throughout this period the regulatory body has met its domestic and international obligations. While transition to a statutory organization provides a number of opportunities for improvement and advantages to the regulatory body, it will also contribute to the intensity of organizational changes. As a statutory corporation, the ONR will be held more accountable for demonstrating effective and efficient utilization of resources, will need to enhance communication effort with all stakeholders, and will need to assure that interfaces with other government departments remain effective.

ONR is placing increased emphasis on enhancing its openness and transparency. This topic was selected as one of the policy issues for this mission. This mission report documents numerous improvements that have been made to better communicate regulatory activities and improve public trust. While the improvements made to date are commendable the team found that the initiatives are not being applied consistently between all regulatory programs and areas.

One of the more significant change management challenges is the transition to the new operating model. Transitioning from a siloed, program-driven structure to a fully matrixed organization will take a strong and sustained commitment from the entire staff and management.

While not unique to ONR, the workforce age profile was noted by the team as a vulnerability. The significant number of experienced staff that are currently eligible to retire plus those who will become eligible in the next few years will be difficult to replace if adequate preparation is not made. The reviewers noted that ONR is well aware of this situation.

Completing design and implementation of the ONR management system has been in process since 2006 but is still not complete. The team believes that this activity needs to receive priority attention.

With regard to the management of radioactive waste further efforts will have to be made in the identification of coherent nationwide policy and strategy for all types of radioactive waste (RAW). The regulatory framework for the safe RAW management and decommissioning is established; however there are still some actions to be taken to complement the existing regulatory framework in accordance with international recommendations.

The programme for the development of geological disposal of radioactive waste is its initial stage and will have to ensure the adequate involvement of all stakeholders.

The actions taken by ONR immediately after the TEPCO Fukushima Dai-ichi accident were timely and effective in summarizing the implications of the accident. The Interim and Final reports by the ONR Chief Inspector covered in detail all aspects of the implications and clearly defined the conclusions and recommendations pertaining to both the regulator and to the UK nuclear industry. It is remarkable that not only the nuclear power generating facilities but also all other nuclear facilities were included in the investigations. The actions to be taken were summarized in a National Action Plan, implementation of which is on-going and is under continuous and strict supervision and evaluation by ONR.

The IRRS Team identified a number of good practices and made recommendations and suggestions that indicate where improvements are necessary or desirable to continue enhancing the effectiveness of regulatory functions in line with the IAEA safety standards.

Among the good practices identified by the IRRS Team are the following:

- Engagement with the prospective licensees in the area of organisational governance and on the future geologic disposal facility;
- Elaboration of detailed ONR guidelines and their application in the regulatory assessment;
- Use of “Radioactive Waste Management Cases” that describes how safety and environmental performance will be assured for all waste streams.

The IRRS Team identified certain issues warranting attention or in need of improvement and believes that consideration of these would enhance the overall performance of the regulatory system. This report includes 13 recommendations and 12 suggestions from the new review areas included in this mission. Key areas for improvement include:

- ONR should continue to ensure that it has the necessary human resources to fulfill its statutory obligations, reviewing its training program and developing a timetable for the full integration of its organization;
- ONR is urged to complete and fully implement its integrated management system that should include all requirements for managing the organization and to promote and support a strong safety culture;
- The Government together with devolved Administrations should continue to implement policy and develop strategies as necessary, specifying steps and responsibilities, for all radioactive waste streams in the UK.
- ONR should review the implementation of the present legal arrangements and ensure that all organizations responsible for the safety of decommissioning activities and of the management of radioactive waste are held accountable for their responsibilities and that their activities are coordinated;
- ONR should review its approach to authorising decommissioning plans and its guidance dealing with decommissioning.

An open finding by the IRRS Team of 2009 can be found in Appendix **V**.

The current IRRS Team findings are summarized in Appendix **VI**.

An IAEA press release was issued at the end of the mission.

I. INTRODUCTION

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 (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 then Department of Trade and Industry (DTI) asked HSE to contribute an expert report that included an assessment of the regulatory 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 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 extended follow-up 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 the regulatory organization as the Nuclear Directorate (ND) moves towards becoming a Statutory Corporation (SC).

At the request of the Government of the United Kingdom, an international team of senior safety experts met representatives of the Office for Nuclear Regulation (ONR) from 30 September to 9 October 2013 to conduct the third IRRS extended follow-up mission to the UK. The mission took place mainly at the headquarters of ONR in Liverpool. The purpose of the peer review was to review the national regulatory framework for nuclear and radiation safety in the UK, including the measures undertaken following the recommendations and suggestions of the 2006 and 2009 IRRS missions. In addition, this third extended follow-up mission was carried out to review additional areas, which were added to ensure ONR has received an IRRS mission covering all ONR regulatory functions over the three missions. The IAEA was also requested to review ONR's approach to openness and transparency, as well as the recently implemented ONR operating model. The review mission was formally requested by the Government of the UK in January 2013. A preparatory mission was conducted from 14 to 15 February 2013 at ONR Headquarters in Liverpool, to discuss the purpose, objectives, scope and detailed preparations of the review in connection with the previous IRRS missions, conducted in 2006 and 2009 and additional areas of review, selected for the 2013 IRRS mission.

The IRRS Team consisted of 12 senior regulatory experts from 11 IAEA Member States and 4 IAEA staff members.

The IRRS Team carried out a review of the measures undertaken following the recommendations and suggestions of the 2006 and 2009 IRRS missions in the following areas: responsibilities and functions of the government; the global nuclear safety regime; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body related to regulation of nuclear power plants and fuel cycle facilities, including authorization, review and assessment, inspection, enforcement, and the development and content of regulations and guides; emergency preparedness and response. In addition, the following additional areas were reviewed: control of discharges, materials for clearance and chronic exposure; occupational radiation protection; environmental monitoring for public radiation protection; radiation sources applications, waste management facilities and decommissioning activities. It should be noted that the peer review addressed only the facilities and activities regulated by ONR in the areas of environmental monitoring for public

radiation protection, control of discharges, materials for clearance and chronic exposure and occupational radiation protection.

As recommended by the IAEA Nuclear Safety Action Plan, special attention was given to regulatory implications to the UK framework for safety in relation to the lessons learned from the TEPCO Fukushima Daiichi accident.

The IRRS mission also included policy discussions on Openness and Transparency and Programme Working and ONR's Operating Model.

The UK conducted a self-assessment in preparation for the mission and prepared a preliminary action plan. The results of ONR's self-assessment and supporting documentation were provided to the team as advance reference material for the mission. During the mission, the IRRS Team performed a systematic review of all topics by reviewing the advance reference material, conducting interviews with management and staff from ONR and performed direct observation of ONR working practices during inspections at the Waste Vitrification plant, of the radiation source management activities at Sellafield and at the Caesium Removal Plant (Joint Sludge-Resin Retrievals) at Berkeley. Meetings with the HSE, DWP, DECC, NDA, PHE, SEPA and EA were also organized. All through the mission the IRRS Team received excellent support and cooperation from ONR and other organizations.

II. OBJECTIVE AND SCOPE

The purpose of the peer review was to review the national regulatory framework for nuclear and radiation safety in the UK, including the measures undertaken following the recommendations and suggestions of the 2006 and 2009 IRRS missions. In addition, this third extended follow-up mission was carried out to review additional areas, which were added to ensure ONR has received an IRRS mission covering all its regulatory functions in the three parts. The IRRS review scope addressed all facilities and activities regulated by ONR, including nuclear power plants, fuel cycle facilities and waste management facilities; and radiation sources applications on nuclear licensed sites. The review was carried out by comparison of existing arrangements against the IAEA safety standards.

It is expected that the IRRS mission will facilitate regulatory improvements in the UK and in other Member States from the knowledge gained and experiences shared by ONR and IRRS reviewers, as well as through the evaluation of the effectiveness of the ONR regulatory framework for nuclear safety and its good practices.

The key objectives of this mission were to enhance nuclear and radiation safety, as well as emergency preparedness and response by:

- Providing the UK and ONR, through completion of the IRRS questionnaire, with an opportunity for self-assessment of its activities covered in the scope of the mission against IAEA safety standards;
- Providing the ONR with a review of its regulatory programme and policy issues relating to nuclear and radiation safety, and emergency preparedness;
- Providing the UK and ONR with an objective evaluation of its nuclear and radiation safety within the scope of the mission, as well as emergency preparedness and response regulatory activities with respect to IAEA safety standards;
- Contributing to the harmonization of regulatory approaches among IAEA Member States;
- Promoting the sharing of experience and exchange of lessons learned;
- Providing reviewers from IAEA Member States and the IAEA staff with opportunities to broaden their experience and knowledge of their own fields;
- Providing key ONR staff with an opportunity to discuss their practices with reviewers who have experience with different practices in the same field;
- Providing the UK and ONR with recommendations and suggestions for improvement; and
- Providing other States with information regarding good practices identified in the course of the review.

III. BASIS FOR THE REVIEW

A) PREPARATORY WORK AND IAEA REVIEW TEAM

At the request of the Government of the UK, a preparatory meeting for the Integrated Regulatory Review Service (IRRS) was conducted from 14 to 15 February 2013. The preparatory meeting was carried out by the appointed Team Leader Mr Bill Borchardt, Deputy Team Leader Mr Ingemar Lund and the IAEA representatives, Ms Adriana Nicic, Mr Ahmad Al Khatibeh, and Mr Peter Zombori.

The IRRS mission preparatory team had discussions regarding the progress made by ONR in addressing measures undertaken following the recommendations and suggestions of the 2006 and 2009 IRRS missions, the self-assessment work conducted since 2009 and the relevant regulatory programmes for additional areas for review that were not addressed in 2006 and 2009. The ONR team was led by the senior management of ONR, represented by Mr Colin Patchett, Acting Chief Nuclear Inspector and included other senior management and staff. In addition, representatives from DECC participated in the meeting. The discussions resulted in agreement that the following areas of ONR regulatory programme were to be reviewed by the IRRS mission:

- Follow up of IRRS findings from the 2006 and 2009 missions;
- Waste management facilities and decommissioning activities;
- Public and environmental exposure control, materials for clearance and chronic exposure, with regard to ONR responsibilities only;
- Occupational radiation protection, within facilities and activities regulated by ONR;
- Safety and security of radioactive sources;
- Regulatory implications of the TEPCO Fukushima Dai-ichi accident and
- Selected policy issues.

ONR representatives made presentations on: ONR's structure, organisation, independence, responsibilities and activities; summary of IRRS related work from 2003 to date; 2013 IRRS Mission review scope and self-assessment areas; and the status of ONR programmes for each IRRS module to be included in the scope of the mission, including updates on outstanding findings from the 2006 and 2009 IRRS missions. The DECC representative provided a presentation on the role of DECC in the UK nuclear regime.

IAEA staff presented the IRRS principles, process and methodology. This was followed by a discussion on the tentative work plan for the implementation of the IRRS in the UK in September-October 2013.

The proposed IRRS Team composition (senior regulators from Member States to be involved in the review) was discussed and the size of the IRRS Team was tentatively confirmed. Logistics including meeting and work space, counterparts and Liaison Officer identification, proposed site visits, lodging and transportation arrangements were also addressed.

The ONR Liaison Officer for the preparatory meeting and the IRRS mission was Mr Gary Booth.

ONR provided the IAEA (and the review team) with the advance reference material for the review at the end of July 2013, including the self-assessment results. In preparation for the mission, the IAEA review team members conducted a review of the advance reference material and provided their initial review comments to the IAEA Team Coordinator prior to the commencement of the IRRS mission.

B) REFERENCE FOR THE REVIEW

The most relevant IAEA safety standards and the Code of Conduct on the Safety and Security of Radioactive Sources were used as review criteria. A more complete list of IAEA publications used as the reference for this mission is given in Appendix **IX**.

C) CONDUCT OF THE REVIEW

An opening IRRS Team meeting was conducted on Sunday, 29 September 2013, in Liverpool by the IRRS Team Leader and the IRRS IAEA Team Coordinator to discuss the general overview, the focus areas and specific issues of the mission, to clarify the basis for the review and the background, context and objectives of the IRRS and to agree on the methodology for the review and the evaluation among all reviewers. They also presented the agenda for the mission.

In addition, the IAEA Review Area Facilitator presented the expectations regarding the module on the “Regulatory Implications from TEPCO-Fukushima Dai-ichi Accident” to be applied.

The Liaison Officer was present at the opening IRRS Team meeting, in accordance with the IRRS guidelines, and presented logistical arrangements planned for the mission.

The reviewers also reported their first impressions of the advance reference material.

The IRRS entrance meeting was held on Monday, 30 September 2013, with the participation of ONR senior management and staff. Opening remarks were made by Mr Nick Baldwin, Chair of ONR, Mr John Jenkins, ONR Chief Executive, Mr Colin Patchett, Acting Chief Nuclear Inspector, Mr Chris Hayes, Labour Market Strategy Director from DWP, Ms Stefanie Murphy, Acting Director of the Nuclear Resilience and Assurance Directorate from DECC, Mr Bill Borchardt, IRRS Team Leader and Ms Adriana Nicic, IRRS Team Coordinator. Mr Colin Patchett gave an overview of ONR’s regulatory priorities and the ONR developments since 2009. ONR representatives presented a status of the progress made regarding previous IRRS findings, as well as of the regulatory programmes in the additional review areas to be assessed in this mission.

During the mission, a review was conducted for all the review areas with the objective of providing the UK and ONR with recommendations and suggestions for improvement as well as identifying good practices. The review was conducted through meetings, interviews and discussions, visits to facilities and direct observations regarding the national practices and activities.

The IRRS Team also reviewed the ONR response to the TEPCO Fukushima Daiichi accident. This review was performed by conducting interviews with involved ONR staff, reviewing associated documents and the results of the self-assessment completed by ONR. The results are provided in Section 13 of this report.

The IRRS Team performed its activities based on the mission programme given in Appendix **II**.

The IRRS exit meeting was held on Wednesday 9th October 2013. The opening remarks at the exit meeting were presented by Mr Nick Baldwin / Mr John Jenkins / Mr Colin Patchett and were followed by the presentation of the results of the mission by the IRRS Team Leader, Mr Bill Borchardt. Closing remarks were made by Mr Jim Lyons, Director, Division of Nuclear Installation Safety.

An IAEA press release was issued at the end of the mission.

1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES

TRANSITION TO A STATUTORY CORPORATION

In Section 3.5 of the 2009 IRRS Mission report, Transition of ND into a statutory corporation, the reviewers considered the aspect of the then Nuclear Directorate (which would later become Office for Nuclear Regulation, or ONR) becoming a statutory corporation, which was originally planned to occur in 2010, before the General Election and change of government delayed the process. The 2009 IRRS Team members identified a number of considerations that required management attention during and after the transition, including: assuring regulatory independence, autonomy in budgeting and staffing issues, role and responsibilities of the board of the planned new organization, and international regulatory activities. Those considerations were detailed in Appendix II of the 2009 report.

The 2013 IRRS Mission interviewed ONR and reviewed ONR's responses to the items in Appendix II of the 2009 report. One of the items of most interest in Appendix II was assuring that the new statutory corporation would be independent and free from undue pressure or constraint from either the industry or other parts of the Government. The 2013 reviewers determined that once the proposed Energy Bill 2012 is enacted, it will provide *de jure* independence, which will reinforce the *de facto* independence that ONR (and its predecessors) have enjoyed for many years. The Bill has been explicitly drafted to ensure that:

- ONR will be independent in its regulatory functions and continue to be independent in its decisions. Government will continue to be unable to direct ONR with respect to nuclear safety regulatory functions. This independence holds true for both routine regulatory decisions and emergency nuclear safety situations.
- The position of the Chief Nuclear Inspector, who will be responsible for ONR's nuclear regulatory decisions, will become a statutory post. As the authoritative regulatory head of ONR, the Chief Nuclear Inspector is responsible for providing independent regulatory advice to government departments and other government bodies on matters related to the safety, security, radioactive materials transportation, and safeguards of nuclear facilities and activities.
- ONR will have the financial and organisational flexibility to meet its business needs, including being able to continue to recover costs from the nuclear industry it regulates, and setting its own terms and conditions for staff.

The Department for Work and Pensions (DWP) will continue to support ONR as its sponsor in and to parliament.

Under the new law, ONR will continue to be separated from the Department of Energy and Climate Change (DECC), which is the department of the UK government that sets energy policy and is accountable for civil nuclear safety, security, safeguards, emergency planning and response and the transport of radioactive materials. While DECC has responsibility for policy matters concerning these areas, it will continue to have no direct influence on ONR's regulatory authority for nuclear safety (as defined in current legislation and the Energy Bill). As the ONR will become an independent body outside of any government department, under UK law it must continue to have a sponsor within the Government that can continue to represent ONR and its activities in parliament.

In anticipation of the Energy Bill 2012 being enacted into law, ONR is developing a 'framework agreement' with DWP and a memorandum of understanding (MOU) with DECC to ensure there is a clear understanding of roles and responsibilities among the three organizations. These agreements are expected to be in place around the same time as ONR becomes a statutory body.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2006 MISSION

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.)
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RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION

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	This suggestion was moved from Module 1 in the 2009 IRRS report to Module 3 in the 2013 report, since the remaining issue is related to how the advisory committee will be implemented.

2006 Recommendation R1: Through interviews and review of documentation produced by ONR, the 2013 Mission determined that ONR has now developed a formal process to allow duty holders (nuclear operators) to appeal regulatory decisions made by ONR. ONR Instruction ONR-PER-IN-006, Revision 2, “Decision Review Process,” issued in July 2013, provides the duty holder an opportunity to engage in both an informal and formal appeal process in a gradual/graded manner that includes increasingly higher levels of ONR management, in order to resolve disputed regulatory findings. The process begins when a duty holder disputes the regulatory decision. The duty holder may discuss the dispute with the relevant inspector in order to resolve the issue. If that effort is unsuccessful, the relevant ONR inspector and the Deputy Chief Nuclear Inspector discuss the disputed decision with the complainant and attempt to resolve the dispute. If the issue is not resolved, the Chief Nuclear Inspector discusses the dispute with the duty holder. If the issue still cannot be resolved, the duty holder may write to the ONR Chief Executive Officer (CEO) to request a review of the decision, and an acknowledgement of the request is expected to be sent to the requestor within 2 days of receipt. Within 5 days, the CEO requests the ONR inspector to provide an explanation for the regulatory decision. The CEO appoints expert advisors from within ONR, if they have not been involved in the dispute, or may go outside of ONR if necessary. The CEO then discusses with the expert advisors and makes a final decision, usually within 10 days of receiving all the relevant information.

2009 Suggestion SF1: Through interviews with ONR personnel and review of the self-assessment material provided, it was determined that significant progress has been made in engaging stakeholders, not only for the new build sector, but in other activity areas. In the new build sector, ONR has established strategies for early communications with stakeholders, including prospective applicants, vendors, and members of the public, who are interested in ONR’s General Design Approval (GDA) process. These strategies have made the GDA process more easily understood by all concerned, and provide potential applicants with a better understanding of the information that needs to be included as they prepare applications for ONR review. Additional information on stakeholder engagement in areas beyond GDA is discussed in Module 3.

Status of the findings in the initial missions

2006 Recommendation R1 is closed. The 2013 Mission determined that ONR has now developed a formal process to allow duty holders (nuclear operators) to appeal regulatory decisions made by ONR.

2009 Suggestion SF1 is closed. The 2013 Mission determined ONR (ND’s successor) has documented and published its process for General Design Approval, so that interested parties can understand what is needed in an application for a GDA. In addition, ONR has made significant strides in stakeholder engagement in other areas since 2009.

New observations from the follow-up mission

Observation: In discussions with ONR about the Decision Appeal Process, the 2013 Mission learned that the final outcome of the appeal process would be made publicly available. The 2013 Mission agreed that making the outcome of the disputed decision is appropriate. One observation that ONR may wish to consider as it moves forward is the possibility of making the disputed decision publicly available once an applicant writes a letter to the ONR CEO, rather than after the final decision is made, in order to enhance openness and transparency. While the timelines described in the ONR Instruction for resolving the disputed decision at the CEO level are short enough that making the information public after the CEO makes a final decision is acceptable, in practice, it seems that disputes rising to the CEO level would be rare, and perhaps somewhat complex if the issue could not be resolved at the Chief Nuclear Inspector level. It is possible that it might take longer than the 10 days described in the procedure to select the expert advisors, and have a meaningful discussion in order to make a final regulatory decision. If so, letting the public know that there is a disputed regulatory decision in front of the CEO for final resolution may be helpful in demonstrating openness and transparency in the appeal process.

Observation: ONR should consider addressing human and organizational resources for effective regulatory oversight of the GDF project, taking into account the need to cover the broad range of activities related to this long term project. The IRRS Team learned that ONR currently has only 2 staff members working on this project, and there appears to be a need to dedicate sufficient resources to increase the number of ONR employees. This issue is discussed in further detail in Module 12.3.3 of this report.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 1 Req. 16 states that <i>“The regulatory body shall structure its organization and manage its resources so as to discharge its responsibilities and to perform its functions effectively; this shall be accomplished in a manner commensurate with the radiation risks associated with facilities and activities.”</i>
SFF1	Suggestion: ONR should ensure sufficient resources with the appropriate skillsets are available to meet planned timescales and provide effective regulatory oversight of the GDF project.

2. GLOBAL NUCLEAR SAFETY REGIME

There were no findings in this area during the initial IRRS missions.

3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2006 MISSION	
S4	Suggestion: NSD should review, document and publicize its internal practices and procedures for the appeal of technical decisions.
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.
RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION	
RF1	Recommendation: ND should strengthen the integration of nuclear safety, security and safeguards at the inspector level to improve delivery of strategic regulatory priorities.
SF2	Suggestion: ND should institute a programme for the reconstitution of an advisory committee on nuclear safety.

Changes since the initial IRRS missions

Suggestion 4: As stated in the discussion of the closeout of the 2006 Recommendation 1, discussed in Module 1 of this report, ONR has implemented a documented Decision Review Process. The outcome of the appeal, along with the reason for approval or denial, is made publicly available.

Recommendation 3: The 2009 IRRS mission followed up on the recommendation from 2006 and determined that although progress was made on hiring and staffing since 2006, the annual planning process in place at the regulatory body (which was changed from NSD to ND, and later to ONR) did not fully address the prioritization of work or clearly identify what must be completed. As a result, the recommendation from 2006 was left open by the 2009 IRRS mission.

ONR has developed an Annual Plan that sets out key priorities for the organization. Then, the Operating Plan translates these priorities into Key Deliverables. ONR has created an Operating Model that implements a matrixed organization which includes seven Programmes that are responsible for Regulatory Assurance, Sellafield, Decommissioning, Fuel and Waste, Civil Nuclear Reactors, Defence, Security, Transport, and Corporate Services. Each of these Programmes is supported by Specialisms where the actual technical and administrative staffs reside. The Specialisms are Engineering; Operational Inspection; Radiological Protection, Criticality and Emergency Preparedness; Systems; Safeguards, Conventional Safety and Environmental impact; Security; Transport; Business Support; and Corporate Services and Policy.

ONR's Corporate Management Office under the Deputy Chief Executive & Director of Finance works with the Programmes to identify, prioritize, plan and develop resource needs to meet the Operating Plan's Key Deliverables. This process is being used to develop the budget for the next fiscal year, which begins on April 1, 2014.

Follow-up Recommendation 1: As part of the government's effort to reform nuclear regulation, the Radioactive Materials Transport team moved from the Department of Transport to ONR in 2011. In addition, ONR now has responsibility for industrial safety at nuclear facilities, though some matters such

as construction safety remain with HSE as identified in a Memorandum of Agreement between ONR and HSE. ONR has integrated the new functions into the organization as part of its new Operating Model that features Programmes and Specialisms, as described in the discussion of 2006 Recommendation R3. For example, as part of a recent materials consolidation project that moved radioactive material from one site to another, the overall project manager met with inspectors for security, safeguards, transport, and the site inspectors for the two sites involved to ensure each specialism understood the requirements for each aspect of the project. In this way, the inspectors for each specialism gained a greater understanding and appreciation the roles and responsibilities of the other inspectors. Another way ONR is working to integrate the inspectors into the organization is through the monthly meetings held for each Programme (called governance meetings). As part of the governance meetings held by each Programme, the inspectors from each of the specialisms are invited to attend in order to better understand how their specialism relates to the Programme, and help them gain an appreciation that they may called upon to support various Programmes as time goes on.

Another tool that ONR is using to promote integration across the specialisms, is the Nuclear Equivalence process, which ONR developed previously, and has used effectively to recruit mid-career safety professionals from other high hazard industries, such as oil or gas, into ONR, and then teach them about nuclear safety regulation. Such professionals are brought into ONR and given Limited Warrants. After completing the requisite training courses and passing an oral examination by a panel of qualified inspectors, the Limited Warrant inspectors are then Fully Warranted. Some of the security and safeguards inspectors have expressed interest in this program, particularly since the nuclear safety inspectors enjoy a higher salary than the other inspectors within ONR.

2009 Suggestion SF2: In response to the 2009 suggestion, ND was developing a plan to reconstitute an advisory committee when the elections occurred in 2010, and a general reorganization of the regulatory authority took place and they became ONR. The development of the advisory committee was placed on hold during the reorganization activities in 2010 and 2011. The ONR Board agreed to establish an advisory committee on nuclear safety in March 2012. The Terms of Reference for the committee were agreed upon in September 2012. The goal was to advertise for members of the committee, have HSE administrate the recruiting process, and select members of the committee by the summer of 2013. However, while there were several highly qualified applicants, ONR determined that the advisory committee would need a diverse group of members with backgrounds from a wide range of scientific, engineering, academic, and industry experience, in order to provide advice to the Chief Nuclear Inspector on the range of issues that ONR may face moving forward. At this time, ONR plans to wait until a permanent Chief Nuclear Inspector is selected, tentatively by the end of 2013, before determining what additional expertise is needed on the committee and if another solicitation for membership needs to be issued. If all goes well, the committee may be in place by the spring of 2014.

Status of the findings in the initial missions

2006 Suggestion S4 is closed. As stated in the discussion of the closeout of the 2006 Recommendation 1, discussed in Module 1 of this report, ONR has implemented a documented a Decision Review Process, that allows license holders to appeal ONR decisions. The outcome of the appeal, along with the reason for approval or denial, is made publicly available.

2006 Recommendation R3 is closed based on progress and confidence. ONR has developed an Annual Plan that sets out key priorities for the organization. Then, the Operating Plan translates these priorities into Key Deliverables.

2009 Recommendation RF1 is closed based on progress and confidence. ONR has made progress in integrating nuclear safety, security, safeguards, and most recently transportation of radioactive materials into the ONR organization.

2009 Suggestion SF2 remains open. Although ONR has good intentions of implementing an advisory committee, and the Terms of Reference for the advisory committee provide some discussion of the attributes for membership and responsibilities of the committee, the makeup of this advisory body, and just how it will be used to advise the Chief Nuclear Inspector will not be known, until a new Chief Nuclear Inspector is selected to lead ONR later this year, and committee members are selected and the advisory committee has been implemented. ONR recognizes the importance of staffing the advisory committee with experts that are highly qualified, capable, and respected by a wide range of stake holders. The IRRS Team acknowledged that ONR had made progress on this suggestion, and it commends ONR for establishing high standards for the qualifications of the experts selected to be members of the advisory committee in the terms of reference. This suggestion was moved from Module 1 in the 2009 IRRS report to Module 3 in the 2013 report, since the remaining issue is related to how the advisory committee will be implemented.

New observations from the follow-up mission

Observation: Concerning SF2 from the 2009 report, the Terms of Reference developed for the new advisory committee indicates the committee will meet twice a year and its members will be appointed for 4-year terms. The materials for the meetings, along with the discussions and decisions that are made are to remain confidential. One of the qualities required of the members is a strong record of accomplishment of working in the nuclear sector. One observation from the IRRS Mission that ONR may wish to consider is staggered terms for committee members, so that not all members would be replaced every 4 years. This provision would allow the Chief Nuclear Inspector more flexibility in being able to select members with particular skillsets or experience that are suited for issues on which the Chief Nuclear Inspector may need additional expert advice going forward, or to remove a certain expertise on the committee when it is no longer needed. By having staggered terms, the burden of selecting members in the future would be greatly reduced at any given time, as well as allowing for better continuity on the committee, since only a few members would be replaced at any one time. Another observation is that the requirement for a strong background in the nuclear sector may be too narrowly focused and could discourage candidates from applying for membership. ONR may wish to consider expanding the areas of expertise in which it is interested, in order to allow more diverse membership to provide a broader perspective on issues it discusses. A third observation is that while it is understandable that certain discussions and decisions may need to remain confidential, particularly items of a strategic or policy nature, ONR may wish to consider publishing meeting summaries with some explanation of the basis for decisions that may impact public health and safety, in order to promote openness and transparency. This issue should be addressed as part of the follow up of SF2 from the 2009 IRRS report.

Observation: While ONR has made sufficient progress in developing and implementing a plan to integrate the other specialisms into the organization to close the Recommendation from the 2009 IRRS mission, ONR may wish to develop a timetable with milestones for when all of the newer organizations will be fully integrated into the organization.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 1, Section 4.5 states that <i>“The regulatory body has the responsibility for structuring its organization and managing its available resources so as to fulfil its statutory obligations effectively. The regulatory body shall allocate resources commensurate with the radiation risks associated with facilities and activities, in accordance with a graded approach....”</i>
SFF2	Suggestion: ONR should consider developing a timetable with milestones for when all

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

of the previously separate organizations will be fully integrated within ONR.

Observation: ONR has made strides in communicating with all of its stakeholders as it now provides updates on issues of interest to the public for all of its areas of responsibility at the “news centre” on its public website, a monthly e-bulletin on its activities to 15,000 subscribers, a quarterly newsletter that provides more detailed information on ONR’s activities, and ONR has recently developed a communication strategy to keep stakeholders better informed of its activities. In addition, ONR recently began making its permission assessments (staff assessments of licensee requests for changes to nuclear facilities) publicly available, so that the public can understand the rationale for ONR’s decisions allowing changes to nuclear facilities. All of these recent activities demonstrate ONR’s commitment to be more open and transparent.

Of particular note is ONR’s communication strategy of holding a meeting with non-governmental organizations (NGOs) twice a year to hear from public stakeholders that have a keen interest in nuclear safety, and may hold different opinions of the ONR’s oversight of nuclear safety. While many nuclear regulatory bodies hold public meetings with NGOs, ONR takes the unusual step of asking one of the NGOs to chair the meeting, rather than ONR filling that role, in order to promote participation by interested NGOs. ONR noted that they gain valuable insights from these interactions with the NGOs, and having an NGO representative chair the meeting lends additional credibility to ONR’s efforts to operate in an open and transparent manner.

During the Mission, ONR reported that it had documented a strategy to better facilitate communications with stakeholders, entitled Communications Strategy 2012/16, and posted it on the ONR website in May 2012. However, the document has been temporarily removed from the website in 2013 in order to make additional revisions to the strategy to include information about ONR becoming a statutory corporation and to better map the ONR stakeholders and communities of interest. The revised communications strategy will be presented to the ONR Board in October and is expected to be issued by the end of 2013.

ONR should follow through to publish the revised communications strategy document when it is completed. In addition, ONR may want to make the communication strategy a living document that is periodically reviewed and updated as needed, in order to keep pace with changing technology that produces new forms and methods of communication.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 1, Requirement 36, states that <i>“The regulatory body shall promote the establishment of appropriate means of informing and consulting interested parties and the public about the possible risks associated with facilities and activities, and about the processes and decisions of the regulatory body”</i>
SFF3	Suggestion: ONR should follow through to publish the revised communications strategy document when it is completed.

Observation: At present, all Inspectors have to take a mandatory Legal Update Course every five years that is a refresher of five legal courses that are administered to new hires. Many Inspectors had fallen behind on this refresher training, despite the course being mandatory, though this situation has now been remedied.

Because of the Energy Bill that is now going through Parliament, ONR is preparing re-Warranting training that will be followed by a Structured Interview, resulting in either a full or limited Warrant being issued. However, ONR does not yet have a process in place to perform refresher training and to remove a Warrant from an Inspector or move that person to a Limited Warrant should they fail to take or fail to pass such training within a reasonable period of time.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GS-G-1.3 Para. 3.1 states that <i>“The management within the regulatory body of inspection activities is an important element of the authorization process. Consideration should be given to assigning managerial responsibility to a single individual or organizational unit. These responsibilities should include:</i></p> <p style="padding-left: 40px;">... — <i>qualification and training of inspectors.”</i></p>
(2)	<p>BASIS: GS-G-1.2 Para. 2.3 states that <i>“Management within the regulatory body of the review and assessment process is an important part of the process. Consideration should be given to assigning managerial responsibility to a single individual or organizational unit. The management of review and assessment should include responsibility for:</i></p> <p style="padding-left: 40px;"><i>(m) Qualification and training of the personnel engaged in the review and assessment process.”</i></p>
SFF4	<p>Suggestion: ONR should develop a process to administer refresher training for Inspectors once they have been re-Warranted and to take appropriate action should an Inspector fail to take or fail to pass such training within the prescribed period.</p>

Observation: While the evidence for closing Follow-up Recommendation 4 in Module 7 of this report was presented by ONR and reviewed by the IRRS Team, there are significant future pressures on ONR regarding the human resources available for it to carry out its duties proportionately to the number of various nuclear installations. Taking into account the current and the expected duties (with consideration of the expected new builds and the anticipated retirement rate of ONR staff) ONR may face serious difficulties in providing the necessary trained and experienced manpower. ONR has recognised this and has undertaken a study on the medium and long term challenges, identified its resource requirements against a number of scenarios over the next 3 years, and is seeking agreement from Government for further recruitment to meet these requirements. ONR has also identified that it will need to apply a refined prioritization so that necessary inspectors’ resources can be allocated, and consider greater use of technical support from outside of ONR.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GSR Part 1 Req. 16 Para. 4.4 states that <i>“... that, the government shall be responsible for ensuring that the regulatory body has sufficient resources to fulfil its statutory obligations.”</i></p>
SFF5	<p>Suggestion: ONR should continue to assess whether it has the necessary human resources to fulfil its statutory obligations.</p>

Observation: Specific radiation protection training is given to ONR inspectors, but no formal training on high-activity radioactive sealed sources (HASS). ONR’s current practice is to recruit specialists with the appropriate skills and experience to work in this area. However, in the long run, ONR and EA should amend the existing training course, agree on a roll-out strategy for HASS training and ensure that it is fully implemented. See Module 12.1.5 of this report for further discussion.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 1 Para. 4.7 states that <i>“In order to ensure that the proper skills are acquired and that adequate levels of competence are achieved and maintained, the regulatory body shall ensure that its staff members participate in well-defined training programmes. This training should ensure that staff is aware of technological developments and new safety principles and concepts.”</i>
SFF6	Suggestion: ONR should review its training programme and revise as necessary to include the full range of duties regarding radioactive sources

Observation: The IRRS Team was informed that ONR’s view is that the risk due to GDF is low, and therefore it does not require as much regulatory attention as some other activity with high risk. ONR’s prioritisation process does recognise that risk should not be the only factor considered. Experience in other countries has shown that it is a long process to gain public acceptance for geological disposal, and the involvement of the regulatory body right from the beginning plays an important role as a reliable source of information and critical reviewer.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 1 Req. 36 states that <i>“The regulatory body shall promote the establishment of appropriate means of informing and consulting interested parties and the public about the possible radiation risks associated with facilities and activities, and about the processes and decisions of the regulatory body.”</i>
SFF7	Suggestion: As part of its communication strategy, ONR is encouraged to promote the establishment of an appropriate means of informing and consulting interested parties and the public about the possible radiation risks associated with facilities and activities, associated with GDF, and about the processes and decisions of the regulatory body.

Policy Issue: Openness and Transparency

It is important that the regulatory body establish effective means of informing and consulting the public and all other interested parties regarding all appropriate activities. Openness and transparency in regulatory activities promotes public confidence as well as continuous improvement. It is made even more important in the UK as the regulator transitions to a public corporation status. This appendix provides our experts’ opinions for consideration by ONR on how to further enhance openness and transparency.

Discussions between IRRS mission experts and ONR staff were conducted to explore 1) the strategies for engagement of stakeholders, 2) the level of stakeholder involvement in regulatory decision making, 3) the use of up-to-date electronic and internet communication tools and social media, and 4) factors for determining the appropriate content of outreach communications.

The regulatory body has made progress in becoming a more open and transparent organization since the 2006 and 2009 IRRS missions. It has significantly increased the amount of information available on its website including:

- Intervention report summaries and quarterly site reports
- Project assessment reports
- Decisions on periodic safety reviews
- Freedom of information requests
- ONR strategy, organizational structure and board meeting minutes
- Extensive generic design assessment information

ONR has transitioned to a presumption of disclosure and they are actively engaging key industry stakeholders, NGOs, the press and local communities in an attempt to further advance openness and transparency. However, ONR lacks a framework document that provides the holistic vision of how the organization intends to meet the principles of openness and transparency.

ONR is to be commended for the progress that they have made in this important area. The following is a list of ideas, experiences and practices that have been identified by the IRRS mission experts for consideration by ONR. The list is not exhaustive and ONR should take advantage of the numerous sources of information available on public communication as well as the applicable IAEA and NEA documents and multilateral activities.

Items for Consideration:

- Publish a framework document or a communications strategic plan to align on objectives, desired outcomes, methods and measures
- Build relationships with the press and select key stakeholders before an event occurs
- Implement a flexible and adaptive process that initiates the correct level of outreach for the situation
- Develop short plain language pamphlets that communicate key messages to the general public
- Hire or train communication specialists that take the lead for routine activities and help senior officials during high profile situations
- Reach out to the press and key stakeholders before important announcements and public meetings
- Utilize social media but realize that it will take continual resources
- Realize that during fast breaking events the regulator must use social media to communicate accurate information and to correct the misinformation that gets posted
- Make it clear to the industry that they have a separate and important role. The regulator cannot represent the industry's interests
- Some regulators require licensees to have communication plans
- Consider creation of a plain language summary of highly technical documents
- Develop a communication plan for all significant regulatory actions and events

4. MANAGEMENT SYSTEM OF THE REGULATORY BODY

ONR is managed via a top-down process that starts at the document ‘Our Strategy’, which sets the Vision for the organization, through the ‘Annual Plan’, that sets the Outcomes that must be achieved and the budgets allocated to each Programme, to the ‘Operating Plan’ that provides more detail about what ONR is planning to achieve during the year.

The 2009 Review found that only one of the five findings on the Management System from the 2006 Review could be closed; that of a senior manager being given responsibility for the Management System, the person responsible for developing the Management System reporting to that senior manager. The 2009 Review then raised a further five findings on the topic.

There have been many changes in the organization since then. ONR is now nearing the end of the transition to becoming a ‘Statutory Corporation’, which started in 2011. It is simultaneously re-shaping itself into a ‘matrix’ organization, re-vamping its senior management structure and undergoing a large number of internal, administrative changes. As a result, its management system is in a state of flux. Although considerable progress has been made, much more remains to be done. In order for the organization be able to function effectively and efficiently, it is important that the work underway on the management system be completed. It is also important that the effort needed to make the numerous changes underway not detract from its staff’s focus on safety.

The Mission Statement for ONR is ‘Securing the protection of people and society from the hazards of the nuclear industry’, though, following a recent review, this is to be changed to speak of ‘regulating’ the nuclear industry. The Vision for ONR is that the organization is “Universally respected for securing confidence in nuclear safety and security”; this is not to be changed in the short term. However, ONR has identified that the organizational structure needs to be changed from one where staff works in separate divisions to a ‘delivery-focussed’ model, in which work is grouped into programmes that reflect nuclear industry sectors. This will involve a radical change in that no staff will be assigned permanently to a programme but instead will all be grouped into specialisms, from where they will be assigned to programmes as needed (the ‘matrix’ model).

A recent strategic review has identified three regulatory priorities for the organization; one of these being Regulatory Assurance. This is a strong indication of the intent of the Board and of senior management to realize the benefits of a ‘matrix’ organization. Given that the earlier Mission findings did not translate into concrete action on the Management System in place at the time, it is important that the current transition be completed successfully. It is also important that there continue to be strong cohesion among senior management on their interpretation of the vision for the organization, the goal for the management system and the path that the organization will take to get there. These must be communicated and repeated frequently to staff in order to maintain traction as ONR re-invents its way of working. This cohesion must be maintained even in the face of potential staffing changes at senior level.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF 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

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2006 MISSION

	improved.
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.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION

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 management system and to propose improvements and changes.

Changes since the initial IRRS missions

Recommendation 12: ONR's strategy has moved on from the referenced Strategic Plan; an updated Strategy, an Annual Plan and an Operating Plan have been issued, all of which are available on their intranet platform, known as 'HOW2'. Together, these explain in detail how ONR will achieve its strategic objectives. Work to fully populate HOW2 is on-going in order to put in place all of the policies, processes and procedures necessary to deliver the Annual Plan and Operating Plan. Although much progress has been made, much more remains to be done before HOW2 can be regarded as complete, consistent and current, in order to be fully usable.

Suggestion 12: All ONR processes that describe how work is to be prepared, reviewed, carried out, recorded, assessed and improved will be contained on HOW2. A new Management System Manual, which sits at the top of the Management System hierarchy and will point to the processes in HOW2, is being developed.

Suggestion 13: Section 7.11 of the draft Management System Manual requires that the Executive Management Team periodically carries out management system review to ensure the continuing suitability and effectiveness of the management system.

Suggestion 14: Section 7.4 of the draft Management System Manual describes how independent assessment may be performed by the Regulatory Assurance group. Section 7.7 describes how independent third party audits are a feature of regulatory assessment in ONR.

Follow-up Recommendation 5: ONR Senior Management is committed to complete the preparation of the current Management System, as evidenced in various documents.

Follow-up Suggestion 6: ONR Senior Management is committed to complete the preparation of the current Management System, as evidenced in various documents.

Follow-up Suggestion 7: ONR Senior Management is committed to complete the preparation of the current Management System, as evidenced in various documents.

Follow-up Suggestion 8: ONR Senior Management is committed to complete the preparation of the current Management System, as evidenced in various documents.

Follow-up Recommendation 6: An Audit plan for 2013/14 identifies two HOW2 compliance checks.

Status of the findings in the initial missions

In view of the significant changes to the organization since the 2006 and 2009 Missions, the Recommendations and Suggestions in this area are no longer relevant. Instead, the topic has been reviewed as though it is a new Module of the review, which has resulted in the previous Recommendations and Suggestions being closed. In order to bring the findings up to date and in order to highlight the need for the organization to complete the current management system, they are replaced by one new Recommendation and one new Suggestion.

Recommendation 12 is closed.

Suggestion 12 is closed.

Suggestion 13 is closed.

Suggestion 14 is closed.

Follow-up Recommendation 5 is closed.

Follow-up Suggestion 6 is closed.

Follow-up Suggestion 7 is closed.

Follow-up Suggestion 8 is closed.

Follow-up Recommendation 6 is closed.

New observations from the follow-up mission

Observation: ONR has embarked upon an ambitious project to re-shape the way in which the organization discharges its mandate and to formalize this by changing the organizational structure accordingly. This project is proceeding more successfully than previous attempts but in order that this initiative itself not fall by the wayside or be overtaken by events, it is important that it be completed expeditiously. It must therefore be assigned a high priority and be resourced appropriately. To do otherwise would invite cynicism on the part of staff and engrain resistance to any future attempts to change.

Observation: No overall plan exists to show the path forward to complete implementation of the management system.

Observation: The draft Management System Manual contains no mention of Safety Culture.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GS-R-3 Para. 2.1 states that <i>“A management system shall be established, implemented, assessed and continually improved. It shall be aligned with the goals of the organization and shall contribute to their achievement”</i></p>
(2)	<p>BASIS: GS-R-3 Para. 2.8 states that <i>“The documentation of the management system shall include the following:</i></p> <ul style="list-style-type: none"> - <i>The policy statements of the organization;</i> - <i>A description of the management system;</i> - <i>A description of the structure of the organization;</i> - <i>A description of the functional responsibilities, accountabilities, levels of authority and interactions of those managing, performing and assessing work;</i> - <i>A description of the processes and supporting information that explain how work is to be prepared, reviewed, carried out, recorded, assessed and improved.”</i>
(3)	<p>BASIS: GS-R-3 Para. 5.1 states that <i>“The processes of the management system that are needed to achieve the goals, provide the means to meet all requirements and deliver the products of the organization shall be identified, and their development shall be planned, implemented, assessed and continually improved”</i></p>
(4)	<p>BASIS: GS-R-3 Para. 6.1 states that <i>“The effectiveness of the management systems shall be monitored and measured to confirm the ability of the processes to achieve the intended results and to identify opportunities for improvement”</i></p>
RFF1	<p>Recommendation: The management system should be completed and fully implemented as quickly as possible. This should include all the requirements for managing the organization, in particular those mentioned in the earlier Recommendations and Suggestions that have been closed.</p>
(1)	<p>BASIS: GS-R-3 Para. 2.8 states that <i>“The documentation of the management system shall include the following:</i></p> <ul style="list-style-type: none"> - <i>The policy statements of the organization;</i> - <i>A description of the management system;</i> - <i>A description of the structure of the organization;</i> - <i>A description of the functional responsibilities, accountabilities, levels of authority and interactions of those managing, performing and assessing work;</i> - <i>A description of the processes and supporting information that explain how work is to be prepared, reviewed, carried out, recorded, assessed and improved.”</i>
SFF8	<p>Suggestion: A high-level timeline should be prepared to affirm Senior Management’s determination to complete the preparation of the Management System by showing the steps involved, such as:</p>

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

	<ul style="list-style-type: none"> - Issuing the Management System Manual - Approving the Policy Framework - Issuing the Policy Document - Populating HOW2 with the existing processes - Reconciling and updating HOW2 to make the processes consistent <p>The Management System may then be used to support the goal of continuous improvement, such as by performing audits/evaluations of HOW2 usage.</p>
(1)	<p>BASIS: GS-R-3 Para. 2.5 states that <i>“The management system shall be used to promote and support a strong safety culture by:</i></p> <ul style="list-style-type: none"> - <i>Ensuring a common understanding of the key aspects of safety culture within the organization;</i> - <i>Providing the means by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between individuals, technology and the organization;</i> - <i>Reinforcing a learning a questioning attitude at all levels of the organization;</i> - <i>Providing the means by which the organization continually seeks to develop and improve its safety culture.”</i> <p><i>See also GS-R-3 Sections 3.13, 6.2 and 6.3.</i></p>
SFF9	<p>Suggestion: Changes should be made to relevant parts of the management system to indicate that one of its purposes is to promote and support a strong safety culture.</p>

Policy Issue: Operating Model and Programme Working

General Note: ONR should beware of trying to do too much at one time since staff is already fatigued from recurring improvements initiatives. The suggestions below should be prioritized; focus on a few suggestions, rather than try to take on all of the issues at once.

Sharing of experiences of pros and cons of ways of working and organizational design

- Don't allow the transition to lessen the organization's emphasis on safety.
- Almost any kind of organization can work; staff goodwill and buy-in are key elements.
- Form must follow function; you can't change the way of working without also changing the structure of the organization.
- Transition needs a strong champion at the senior management level and consistent support from all managers;
- Communicate, communicate, communicate, but avoid sloganeering.
- Be open and honest with staff about what you are trying to achieve; avoid favouritism.
- In a matrix organization, staff needs to be clear as to who is their boss.
- Recognize that transition stresses managers and staff; accommodate behaviours.

Advice on regulatory effectiveness, especially competence and resilience

- Maintain management system up-to-date.
- Perform regular audits of effectiveness and efficiency of the management system.
- Embed feedback request when reporting on each project/major deliverable.
- Seek regular input from staff to maintain buy-in.
- Competence – a training program, including refresher training, appropriate for each staff position is needed, with completion of the training being considered in the staff and management's performance appraisal to demonstrate its importance
- Resilience – knowledge management and mentoring of junior staff by senior staff experts, especially in critical skill sets, is important. Where there are only one or two staff with specialized expertise, hiring and training replacements should be considered.

Sharing of experience on management of regulatory risks

- Various methods exist for risk-informed decision-making.
- All are ways of systematizing and documenting the judgment calls that any decision involves, so that it can be examined and challenged to learn lessons.
- Developing a process to document the technical or regulatory basis for all regulatory decisions is helpful, to be a reference for staff for similar situations in the future.

Advice on developing a learning organization

- Lead from the top; management demonstrate behaviours they wish staff to emulate.
- Be open; reinforce a learning and questioning attitude at all levels.
- Embed learning into performance contracts (but don't over-bureaucratize the review).
- Hire a credible outside advisor to facilitate group sessions to discuss/brainstorm.

Advice on setting priorities of programmes

- Begin with an environmental scan (ask major licensees and policy makers of their future intents).
- Document assumptions and rationales, in order to be able to improve next time.
- Decide iteratively (allocate resources, review, re-allocate); do it on a peer group basis.
- Allow for flexibility to adjust as the year unfolds and reactive events happen.

5. AUTHORIZATION

5.1. AUTHORIZATION FOR NUCLEAR FACILITIES

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF 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 /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).
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RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION

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.
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Changes since the initial IRRS missions

Recommendation 6: It should be noted that R6 (2006) was closed by the IRRS mission in 2009. However, significant progress has been made since that time with a number of additional improvements therefore it is appropriate to consider these in this report. Of particular note is that ONR has issued a new document: Licensing Nuclear Installations, in June 2012 (version 2 was issued in August, 2013). This document sets out in detail the process that ONR follows when considering whether to grant a nuclear site licence, and includes the steps that a licence applicant would need to follow in order to apply for, and obtain a licence. ONR has also produced an internal document setting out the procedure for processing licence applications (NS-PER-IN-003 Rev 2), and this was revised in March 2013 to ensure consistency with Licensing Nuclear Installations. NS-PER-IN-003 Rev 2 also sets out examples of licence format and content.

The documents referred in the previous paragraph also make the related 2009 self-assessment findings (A4.1, A4.2 & A4.3) eligible for closing.

Follow-up Suggestion 3: Note that this issue is strongly related to Module 6, where the regulatory Review and Assessment process is covered. As part of implementing the new ONR Operating Model, internal guidelines have been introduced on the implementation of the ALARP principle in *permissioning* activities, which are integrated into the ONR's HOW2 system (eg. NS-TAST-GD-026). The inspectors have received structured training courses on the application of the ALARP process. A new guidance document (TAG) has been drafted recently on *optioneering*, which is specifically applicable for balancing risks in regulatory decision making, also in consideration with the risks other than radiation. ONR is continuing to refine that document before it is formally issued in the coming months.

Status of the findings in the initial missions

Recommendation 6 was closed in the 2009 mission.

Follow-up Suggestion 3 is closed on the basis of progress made and confidence in effective completion, since all necessary instruments have already been elaborated and their pilot application is being started.

New observations from the follow-up mission

Observation: In the course of its 2009 self-assessment, ONR has recognised that the Standard Licence Conditions, constituting the backbone of the UK nuclear safety regulations, have not been systematically reviewed for a relatively long period of time (A4.5.1). A regular review has not been scheduled within the former regime of operation. Now ONR recognises the importance of reviewing the Standard Licence Conditions to ensure that they remain fit for purpose; incorporate, where appropriate, learning from their application, feedback from licensees and other sources; and take account of developing technical and organisational standards and wider developments in law and the nuclear industry.

Due to the significant change associated with the creation of ONR as a statutory corporation it was deemed inappropriate to proceed with a review of the licence conditions until this work has been completed. Therefore, the first full review will be completed within 2 years of the ONR achieving its new status.

Further reviews will be scheduled every 10 years with the option for more regular reviews to react to events- for example EU directives, developments in best practice or international/domestic incidents.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GS-G-1.4 Para. 3.28 states that <i>“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.”</i>
SFF10	Suggestion: ONR should complete its first full review of the Standard Licence Conditions as scheduled.

5.2. STATUS OF PROPOSALS ON NEW BUILD 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. As part of the IRRS mission in 2009, the IAEA experts conducted a review under Module IV of the progress made in the regulation of new build in relation to the four proposals. In addition, two new proposals were raised for further consideration by ND/ ONR.

During the 2013 IRRS mission, the IAEA experts reviewed the additional information and supporting evidence provided by ONR as part of the self-assessment and discussed with them the progress made in addressing the proposals from the 2006 and 2009 IRRS missions.

The IRRS Team concluded that ONR has taken into consideration the four proposals from the 2006 IRRS mission and made significant progress in addressing them, by issuing guidance on the Generic Design Assessment (GDA) process, revising its licensing process to reflect legal and policy developments, and establishing additional regulatory guidance which describes the ONR approach not only through the licensing process, but also into construction, commissioning, operation, decommissioning and de-licensing (removal from regulatory regime). Regarding enhanced cooperation with foreign regulators, the

team was informed that having exchange meetings with overseas counterparts was very beneficial for ONR, as was its participation in the NEA working group on regulation of new reactors and meetings of the Multinational Design Evaluation Programme (MDEP).

STATUS OF PROPOSALS ON NEW BUILD MADE IN APPENDIX 1 TO THE 2009 IRRS MISSION REPORT

ONR has made good progress on the proposals made by the IRRS 2009 mission and made the necessary enhancements for increasing its organisational capability in the area of human factors and leadership and management of safety, providing clear expectations for the applicants, as well as developing regulatory documents guiding the specialist Inspector's interactions with a licence applicant and supporting a consistent regulatory approach.

The overall ONR licensing process has been further developed to support an integrated approach to the licensing of new reactors and has been implemented in the licensing of Hinkley Point C. ONR will seek continued assurance that the licensee will continue to develop its organisational capability to secure safety throughout construction and the full lifecycle of the installation.

ONR has set out clear expectations and guidance regarding the role and influence of parent bodies, whether they are UK or overseas-based. ONR acknowledges that parent bodies might have a strategic influence on their subsidiaries, but ONR seeks assurance that parent bodies understand the need for the licensee to be in control of nuclear safety at all times, and that the licensee therefore needs to have authority to make decisions in the interests of safety. The guidance is implemented through interactions with prospective licence applicants, and ONR is prepared to continue its engagement with prospective foreign utilities at an early stage of any UK nuclear power venture

2009 OBSERVATION 1

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.

STATUS OF 2009 OBSERVATION 1

The team noted that, in response to the **2009 Observation 1 on new build**, ONR has taken a number of actions, including:

- augmented its specialist Inspector resources in the area of leadership and management for safety to support the new build programme
- issuance of a comprehensive suite of ONR technical assessment guides, guiding the specialist Inspector's interactions with a licence applicant and supporting a consistent regulatory approach (http://www.hse.gov.uk/nuclear/operational/tech_asst_guides/index.htm)
- issuance of documents (e.g. "Licensing Nuclear Installations" , paragraphs 76-85 , August 2013) describing ONR expectations regarding licence applicant organisational capability
- issuance of ONR's intervention strategy on organisational capability for engaging with prospective new licensees
- early engagement with prospective licensees, through meetings, workshops, relationship-building events etc.

The team was informed that ONR has engaged systematically with the prospective licensee for Hinkley Point C to build constructive relationships, ensure that they understand regulatory expectations, develop their organisational capability accordingly, and put in place suitable arrangements. ONR considers that they have exercised significant influence on development of the prospective licensee’s organisational governance, structures, competencies and resources, leading up to licensing in December 2012. These interactions are continuing – and will do so throughout all phases of construction into operation.

In particular, the licence applicant was required to produce a safety management prospectus which demonstrates how it has established, and will continue to develop, an organisational capability to lead and manage for safety (http://www.hse.gov.uk/nuclear/operational/tech_asst_guides/tast072.pdf). ONR has indicated that, during their interactions with the prospective licensee, they have stressed the need for the licence applicant to establish, promote and maintain a positive safety culture in its workforce. They have monitored the activities applicants have taken forward, using international guidance, ONR experience and the principles arising from joint IAEA/NEA-CSNI international workshops organised and hosted by ONR in 2007 and 2011.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GSR Part 1 Para. 4.3 states that <i>“The objective of regulatory functions is the verification and assessment of safety in compliance with regulatory requirements. The performance of regulatory functions shall be commensurate with the radiation risks associated with facilities and activities, in accordance with a graded approach. The regulatory process shall provide a high degree of confidence, until the release of facilities and activities from regulatory control, that:”</i></p> <p><i>(f) Authorized parties have the human, organizational, financial and technical capabilities to operate facilities safely or to conduct activities safely under all circumstances until their release from regulatory control.”</i>...</p>
(2)	<p>BASIS: GSR Part 1 Para. 4.3 states that <i>“The regulatory body shall issue guidance on the format and content of the documents to be submitted by the applicant in support of an application for an authorization.”</i></p>
(3)	<p>GSR Part 1 Requirement 25 states that: <i>“The regulatory body shall review and assess relevant information —whether submitted by the authorized party or the vendor, compiled by the regulatory body, or obtained from elsewhere — to determine whether facilities and activities comply with regulatory requirements and the conditions specified in the authorization. This review and assessment of information shall be performed prior to authorization</i></p>
GPFF1	<p>Good Practice: Systematic engagement with a prospective licensee in the area of organisational governance, structures, competencies and resources, based on documented regulatory requirements and expectations, is considered a good practice that contributes to successful implementation of the licensing process. The regulatory review and assessment is based on technical assessment guides, directing the regulatory body’s staff interactions with an applicant and supporting a consistent regulatory approach. This approach fostered a constructive relationship based on trust and mutual recognition of the other party’s roles, responsibilities and expectations.</p>

2009 OBSERVATION 2

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.

STATUS OF 2009 OBSERVATION 2

The team noted that, in response to the **2009 Observation 2 on new build**, ONR has taken a number of actions, including:

- In addition to the provisions of the UK legal and regulatory system, in which the nuclear licensee has a clear and absolute responsibility for safety, ONR has issued guidance regarding the role and influence of parent bodies, whether they be UK or overseas-based, in Licensing Nuclear Installations (<http://www.hse.gov.uk/nuclear/licensing-nuclear-installations.pdf>, paragraphs 66-75)
- ONR issued guidance on the Safety Management Prospectus, Intelligent Customer and Design Authority. The need for a licensee to maintain an adequate intelligent customer and design authority capability to enable it to take decisions is clearly stated in these documents
- ONR implemented this guidance through a series of interactions with prospective licence applicants, and have also held governance discussions with members of the licensee Boards and parent bodies
- ONR has revised its Licence Conditions to implement Article 6(5) of the Nuclear Safety Directive 2009/71/Euratom which requires member states to ensure that licensees are required to provide and maintain adequate financial and human resources to fulfil their obligations in respect of nuclear safety.
- Extensive interaction has taken place with Directors of the prospective licensee for Hinkley Point C to ensure legal positions and expectations are fully understood.

The team was informed that ONR will continue to engage with prospective foreign organizations at an early stage of any UK nuclear power venture to ensure that the latter understand and respect the legal requirements and regulatory expectations summarised above.

6. REVIEW AND ASSESSMENT

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF 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.
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 themselves, analyse the international operating experiences and take appropriate corrective action.
S9	Suggestion: When NSD issue a formal regulatory decision the basis of its decision should be sent to the licensee.
RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION	
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.

Changes since the initial IRRS missions

Suggestion 6: The approach taken by ONR to resolve the issue is generic – applicable to all ONR’s processes.

A single ‘Review Learn and Improve’ (RLI) process within ONR is being implemented. Stage 1 is completed at the time of the Mission, while Stage 2 is planned to be completed by the summer of 2014. Prime responsibility for carrying out these reviews has been given to the Delivery Management Groups, though others such as Professional Leads and Programme Directors can also initiate reviews. The Delivery Management Groups have a practically identical role to the former Intervention Progress Groups (IPG), but the title of these groups has been changed to reflect changes made to ensure consistent working across all the Programmes of ONR (see Follow-up Suggestion 4 below). From many aspects this approach goes far beyond compared to what was suggested.

Recommendation 10: A Regulatory Intelligence (RI) team has been created having the role of analysing information from incidents and events. ONR’s new Operating Model has enabled necessary inspector resource to be deployed to the RI team. An Incident Report Database was created and is being maintained. The database covers all events, incidents, anomalies which are available for the Regulator. The database items are categorized according to several aspects, including the severity, the possible hazards involved, type of installation etc. The way of use (filtering) of the database aligns with the new matrix structured Operational Model. It is supporting regulatory intervention planning, as well as allocation of experts of different specific knowledge. The RI findings may be used to test the assumptions in the safety case of the related installation or activity (e.g. PSA assumptions). In the longer term it is hoped that the approach will also help ONR judge the effectiveness of its inspections.

ONR employs an external contractor to review international incidents to identify lessons for the UK in regular reports and any relevant lessons for the UK. This feedback, combined with learning from UK events, is provided in the weekly briefings the RI Team provides to all staff and the Advice Notes regularly issued to the inspectors. These notes provide general or specific advice to the inspectors, providing them with important insights to use in their judgements and pioneering activities.

Recommendation 11: ONR is currently progressing how the industry uses operational experience through engagement with the Safety Directors Forum (SDF) and ONR has influenced the SDF in reviewing its strategic priorities. ONR gains assurance that licensees are sharing operational experience through its engagement with SDF Operational Experience Learning Group (OELG) and the Safety Performance Indicator Sub-Group (SPISG). As of June 2013, ONR has implemented feedback forms to enable ONR to gather feedback on actions taken in response to Advice Notes (see above), particularly by licensees. ONR has also issued a Technical Position Statement on ‘Organisational Learning’. This outlines ONR’s regulatory expectations of licensees in this respect.

A UK Operational Experience National Framework is being developed. This will be fundamental to providing international and national assurance on the adequacy of UK arrangements. One of its main tools is the National Intelligence Database, which is being built to cover all events (including those non-reportable events which may have indirect influence on nuclear safety), even those that are not available for the Regulator. The Framework will formalise the UK’s infrastructure for operational experience, and the roles and responsibilities of all UK organisations with regards reporting of incidents, screening, analysis and dissemination of information and advice across the UK.

Suggestion 9: ONR produces Project Assessment Reports (PAR) to justify all its key regulatory decisions, including all permissions granted under site licences. These reports include an “Executive Summary” created according to a pre-defined template. These executive summaries are published through the ONR website (<http://www.hse.gov.uk/nuclear/pars/>). Currently, some ONR Programmes publish the complete PARs (after editing out any protected information) and in the longer term this is going to be the general practice.

Following issue of the PAR, but prior to publication on the website, the Executive Summary (or where relevant, the full PAR) is consulted on with the relevant licensee for factual accuracy. According to these current practices, the original bases of the suggestion are no longer valid.

Follow-up Suggestion 4: The issue of management groups has been under continuous development during the last decade. Before the process was introduced, site inspectors were responsible for determining the regulatory strategy and practices for each site. This later became the responsibility of the Intervention Progress Groups (IPGs), ensuring consistency among each type of licensees. By this approach ONR’s assessment staff and project inspectors were able to influence regulatory strategies. Within the new Operational Model these groups are to be renamed (*Delivery Management Group* is the title currently proposed) and the guidance updated to ensure that best practice is replicated in all Programmes. The Delivery Management Groups are responsible for managing Regulatory Issues. Several internal guides have been issued (or re-issued) recently to control and support the related activities (e.g. INS/008, G/INS/008, ONR-RI-GD-002 and ONR-RI-GD-002-003) and a Regulatory Issues Database has been set up. These arrangements provide sufficient basis that the regulatory issues are being managed in a consistent and efficient way throughout the different Programmes of ONR.

ONR’s 2009 self-assessment has also revealed shortcomings in relation to the consistency of assessment reporting and management (AFI A5.8 & A5.9). These problems have been completely resolved by issuing the new versions of internal guides AST/003 and AST/005.

Status of the findings in the initial missions

On the basis of the progresses made recently, as outlined above:

Suggestion 6 is closed.

Recommendation 10 is closed.

Recommendation 11 is closed on the basis of confidence of full completion of the already started activities.

Suggestion 9 is closed.

Follow-up suggestion 4 is closed.

New observations from the follow-up mission

Observation: In close relation to the Graded Approach and the ALARP (As Low As Reasonably Practicable) principle, the ONR is generally practicing the so-called Sampling. This approach is applied not only in the assessment, but also during inspections. The Sampling is controlled by appropriate internal procedures (Guidance on Sampling and Guidance on Mechanics of Assessment) which are integrated into the ONR's HOW2 management system.

The elaboration of detailed guidelines and their application in the practices of ONR on the application of Graded Approach and the ALARP principle for regulatory assessment is a Good Practice.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR 4 Req. 1 states that <i>“A graded approach shall be used in determining the scope and level of detail of the safety assessment carried out in a particular State for any particular facility or activity, consistent with the magnitude of the possible radiation risks arising from the facility or activity.”</i>
(2)	GSR Part 1 Para. 4.33 states that <i>“Prior to the granting of an authorization, the applicant shall be required to submit a safety assessment [8], which shall be reviewed and assessed by the regulatory body in accordance with clearly specified procedures. The extent of the regulatory control applied shall be commensurate with the radiation risks associated with facilities and activities, in accordance with a graded approach.”</i>
GPPF2	Good Practice: The elaboration of detailed ONR guidelines and their application in the practices of ONR on the application of Graded Approach and the principles for regulatory assessment.

7. INSPECTION

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION	
RF2	<u>Recommendation:</u> ND should ensure that its inspectors have followed a specific training programme before being issued with a warrant.
RF3	<u>Recommendation:</u> ND should consider enhancing its arrangements to ensure that results of all inspections are communicated in written form to the licensee.
SF5	<u>Suggestion:</u> 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.
RF4	<u>Recommendation:</u> 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.

Changes since the initial IRRS missions

Follow-up Recommendation 2: According to the new system of inspectors competency programme introduced in 2011, the newly recruited inspectors only receive a “Limited Warrant” upon appointment. Depending on the prior experiences of the inspector, this status remains in effect for up to 18 months, while the inspector undergoes a series of dedicated general and specific training programmes. Then he/she needs to pass the “Full Warrant Competence Assessment” before receiving the full warrant, entitling them to perform independent inspections. An inspector with a limited warrant may participate in inspection only with other inspectors who hold full warrants. ONR has presented the related internal procedures and documents, which are integrated into the HOW2 system.

Follow-up Recommendation 3: Since March 2013 the practice of sharing the full Intervention Report has become the recommended practice. The details of the procedures are enclosed within the HOW2 process management system of ONR. The revised guidance on intervention planning was issued in May 2013. This covers the generic procedures applicable for all programmes of ONR. The IRRS Team found that the full disclosure practice is not fully implemented in all areas.

Follow-up Suggestion 5: As each regulatory issue is related to some regulatory intervention, and the Intervention Reports are shared with the licensee, that part of the issue is resolved. The regulatory issues are recorded in the Regulatory Issue Database. The procedures and the database were demonstrated to be capable of supporting a consistent and proportionate way of resolving the issues.

Follow-up Recommendation 4: ONR could demonstrate that by applying prioritization through the Corporate Programme Management Office, as well as by prioritization through the ONR Prioritization Framework, along with resource allocation through the ONR Deliverable Resource per Programme, the necessary resources – in terms of inspectors of the necessary specialism – could be assigned to the identified ageing reactors from 2013 on. These efforts are also supported by the documents (issued in 2012): Civil Nuclear Reactors Programme Strategy of ONR and the Regulatory Strategy and guidance for the CNRP NGL Operating Reactors Sub-Programme.

Status of the findings in the initial missions

On the basis of the progress made recently, as outlined above:

Follow-up Recommendation 2 is closed.

Follow-up Recommendation 3 is closed on the basis of progress and confidence of the full implementation.

Follow-up Suggestion 5 is closed.

Follow-up Recommendation 4 is closed on the basis of confidence of the maintainability of the prioritization framework.

8. ENFORCEMENT

There were no findings in this area during the initial IRRS missions.

The IRRS Team noted that the enforcement arrangements became integral elements of the new Operational Model of ONR.

Previous 2006 and 2009 IRRS missions did not cover the areas of RAW management and decommissioning. New observation on this subject related also to enforcement can be found in chapter 12.2.3.

9. REGULATIONS AND GUIDES

One Suggestion from the initial Mission “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” was closed by the Follow-up Mission on the grounds that “Most of the guidance documents (other than those with identified security implications) are published on the HSE website”. This has had the benefit of providing licensees with information regarding the expected scope and content of their submissions.

The various types of Regulations and Standards, according to the draft Management System Manual, are Regulations, Licence Conditions, Safety Assessment Principles (SAPs) and the set of Technical Assessment Guides (TAGs) and Technical Inspection Guides (TIGs). The latter three (SAPs, TAGs and TIGs) constitute Relevant Good Practice that is regarded within the UK system as satisfying the law, once a licensee’s proposal has been accepted and is being applied appropriately.

The Licence Conditions are explained in the Licence Condition Handbook, issued October 2011. Since the 2009 Mission, the TAGs and TIGs have all been reviewed and are now regarded as fit-for-purpose, two TAGs having been withdrawn and seven TAGs replaced by Professional Lead Advice Notes. A sustaining program has been put in place, with a project plan and adequate resources to keep the Guides in good condition. Security and Transport Guides will eventually be added to the set. The Safety Assessment Principles have not been updated since 2006 but this is being done at the present time. Once the SAPs have been re-issued, the TAGs will be updated to match.

No Recommendations or Suggestions are made.

10. EMERGENCY PREPAREDNESS AND RESPONSE

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES OF THE 2009 MISSION	
RF7	<u>Recommendation:</u> 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	<u>Suggestion:</u> The process for setting up the ERG, and the availability of ERG staff, could be enhanced by a more formal process.
RF8	<u>Recommendation:</u> 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	<u>Suggestion:</u> 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.
SF11	<u>Suggestion:</u> 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	<u>Suggestion:</u> 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	<u>Suggestion:</u> 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.

Changes since the initial IRRS missions

Follow-up Recommendation 7: Internal (ONR) training courses (N1-N4) have been established to underpin and enhance ONR’s emergency response capability. These courses provide an overview and understanding of the principles of command and control and ONR’s role in a crisis. They also provide familiarisation with the Redgrave Court Incident Suite (RCIS) and its operation, emergency management in the nuclear industry, inspector training for attending and/or assessing emergency exercises, etc. Training courses have been incorporated into ONR Business Management System (HOW2). Currently, ONR Emergency Response training or briefings against clear role descriptions are available for all Emergency Response Group (ERG) roles. Additional resources have been allocated for further continued improvements to the role specific training program for the key ERG roles. This development is supported also by the on-going implementation of some other improvements to training activities as a) Government Technical Advisor (GTA) training, b) desktop exercises (to be introduced to further enhance experience of RCIS operations), c) Strategic Coordination Centre awareness training (developed to improve ONR effectiveness during an off-site emergency response).

Follow-up Suggestion 9: Currently, ONR has assigned pools of professional staff to different ERG roles, which are detailed in the Emergency Arrangements Contact Directory. This is a key element of ONR’s Emergency Handbook, is linked clearly to RCIS procedures, and is incorporated in ONR’s Business Management System. The existing arrangements are tested as part of the exercise programme, are

activated (at least partially) during any real ‘out of hours’ notifications by duty holders, and were robustly tested during the 3-4 weeks following the Fukushima accident. These confirm the ability of ONR to sustain a resilient RCIS and wider ONR response.

Further improvements of the existing system for establishing the ONR emergency response organisation for operation of the RCIS and delivery of the ONR response are under development. In particular, ONR is reviewing different options for making further improvements to the resilience of its immediate response and response team structure. A few options are under consideration and it is expected that a final decision will be accepted and implemented in the near future. A proposal for establishing a formal ‘on Duty’ Inspector (24h/7d) supported by an ‘on Duty’ Business support staff member (24h/7d) has been prepared and endorsed by ONR’s Regulatory Strategy Group (RSG).

Follow-up Recommendation 8: The planning basis for developing emergency plans for nuclear facilities requires that a hazard and risk assessment be performed, and on and off-site plans are developed based on results of site/plant specific safety cases and comprehensive safety analyses. The basic requirements on hazard assessment and legislative guidance for preparation of both on and off-site emergency plans are given by REPPiR (Radiation Emergency and Preparedness and Public Information Regulations 2001) and, for on-site responses, are reflected in guidance relating to standard Licence Condition 11 (Emergency Arrangements). REPPiR requires detailed emergency planning for reasonably foreseeable radiation emergencies. A new Nuclear Safety Technical Assessment Guide (NS-TAST-GD-082) (2013) introduced additional guidance addressing radiation emergencies which are more severe than those considered to be reasonably foreseeable but could in principle occur. The Guide makes further references to IAEA standards in terms of hazard (threat) assessment and determination of planning zones. The ongoing amendment of the guidance incorporates the description of GS-R-2 Threat (hazard) Categories, and will include the results of the categorization of UK nuclear sites.

Follow-up Suggestion 10: REPPiR provides a legal framework for proportionate emergency planning to ensure the protection of the public from reasonably foreseeable radiation emergencies. The new Nuclear Safety Technical Assessment Guide (NS-TAST-GD-082) introduced additional guidance addressing radiation emergencies more severe than those considered to be reasonably foreseeable. To address this possibility, ONR guidance also considers the basis for dealing with radiation emergencies which are not reasonably foreseeable through the concept of extendibility. This provision is noted also within NEPDC Consolidated Guidance Chapter 9. Adoption of this approach will ensure arrangements are in place to respond to situations where the emergency may be more severe and additional measures may be needed.

Follow-up Suggestion 11: In the UK, nuclear emergencies are classified based on a classification system for NPP using three principal categories (Building Emergency, Site Incident, Off-Site Nuclear Emergency). The classification for the power reactors is based on the status of the plant (operational status of decommissioning lifecycle stage) in line with IAEA guidance, and on the precise nature and significance of the emergency. Based on the UK experience and position on this issue, these categories (3 classes) are sufficient to trigger appropriate response activities in the event of a domestic radiation emergency. In the event of an emergency at a nuclear installation in the UK, the Department of Energy and Climate Change (DECC) is responsible for notifying other countries and initiating requests for international assistance according to international agreements and conventions. This communication process includes the European Community, the IAEA, and countries with which the UK has bilateral agreements and arrangements, and relates to the accident and its likely course and effects. The national radiation monitoring network and emergency response system (RIMNET) has been appointed to carry out international notifications on DECC’s behalf. RIMNET, supported by the ONR (and also NEBR), has full capability to prepare and receive international notifications on nuclear accidents using the internationally accepted terminology, including emergency declarations in accordance with GS-R-2.

Follow-up Suggestion 12: ONR has initiated a discussion with Public Health England (the responsible authority in the UK) on the issue related to the review of criteria for implementation of countermeasures in the event of a radiation emergency. Based on its on-going review, PHE has considered changing the criteria (Emergency Reference Level) for iodine prophylaxis, proposing the setting of the upper value to 100 mGy. PHE have previously applied derived interventional levels (DERL's) but found that they did not meet the requirements of existing UK response arrangements (e.g. *automatic implementation of protective measures in DEPZ, assessment of measured values from the monitoring systems, etc.*), and they concluded the approach should be based upon dose averted (e.g. upper and lower ERL's). However, the PHE assessment of the UK approach is that it provides at least the same level of protection of the public (or better) and is more suitable for the existing emergency arrangement in the UK. The on-going UK ERL revision process is planned to be finished in early 2014. The new EU BSS will be implemented after approval by the European Council.

Follow-up Suggestion 13: In order that an Emergency Plan be prepared, Detailed Emergency Planning Zones (DEPZs) are established around nuclear installations where there is the potential for an off-site release of radioactivity that would justify the implementation of the protective countermeasures. These zones are defined based on the most significant release of radiation from an accident that can be reasonably foreseen. The emergency plan also provides the framework to respond to very low frequency, high consequence (severe) radiation emergencies. Such extended responses would also require the use of generic emergency plans that have been developed through the Civil Contingencies Act 2004. ONR's Regulatory Strategy Group (RSG) has endorsed principles for DEPZ determination. ONR's Nuclear Safety Technical Assessment Guide (NS-TAST-GD-082) provides further guidance to the legal framework for ONR's recognition of the reasonably foreseeable reference accident approach to derive the technical basis for the DEPZ. The Nuclear Safety Technical Assessment Guide was issued in 2013 and refers to appropriate IAEA standards (Chapter 4). IAEA planning zones - Precautionary action zone (PAZ), Urgent protective action planning zone (UPZ) have similar features to the area affected by a radiation emergency, the DEPZ and a more extensive area which may be used to address the extendibility of detailed plans. In case of a need for extendibility of detailed plans (e.g. in case of a severe nuclear accident) the coordination and response would utilise plans that have been developed under the Civil Contingencies Act 2004 (CCA). Site specific on and off-site plans developed under industrial emergency planning legislation should link with plans required under the CCA if there is a potential for consequences beyond the pre-designated areas. REPPIR guidance supplemented by the wider legal framework established by the CCA significantly contributes to an effective management of severe nuclear accident consequences under different complex conditions and territorial impacts.

Status of the findings in the initial missions

On the basis of the progress made recently, as outlined above:

Follow-up Recommendation 7 (RF7) is closed.

Follow-up Suggestion 9 (SF9) is closed on the basis of progress made and confidence in effective completion.

Follow-up Recommendation 8 (RF8) is closed on the basis of progress made and confidence in effective completion.

Follow-up Suggestion 10 (SF10) is closed.

Follow-up Suggestion 11 (SF11) is closed.

Follow-up Suggestion 12 (SF12) is closed.

Follow-up Suggestion 13 (SF13) is closed.

New observations from the follow-up mission

The Emergency Preparedness and Response (EPR) aspects relating to waste management facilities were discussed in line with the extended scope of the mission. As regarding the waste management facilities, the UK adopts the same proportionate approach to EPR as for the other nuclear facilities (e.g. NPP, reprocessing units). The related hazard assessment, and planning and response arrangements adopt the same approach as is case for other nuclear facilities, in compliance with IAEA guidance. No specific deviations or problems which would require particular attention were recognized.

Observation: ONR has established a reference set of information that provides a basis for assurance that ONR has a full understanding of the Emergency Preparedness and Response issues for all nuclear sites (both on-site and off-site). This information has been captured within Emergency Preparedness and Response Capability Maps. Assessment of capability is made from ONR’s judgements from licensee and duty holder compliance inspection, on-site and off-site testing, and assessment of emergency plans. Regular reviews of the evidence and benchmarking of duty holder performance are conducted as part of the ONR assurance processes. The reviews identify areas of relevant good practice, areas for improvements or areas for closer regulatory attention (including trends and themes). ONR’s Regulatory Strategy Group, which is chaired by the Chief Nuclear Inspector, will perform an annual review (as a part of its public annual reporting process) of the reference set of information to inform its view on the adequacy of the capability of the UK nuclear industry.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GS-R-2 Para. 3.8 states that <i>“The regulatory body shall ensure that such emergency arrangements are integrated with those of other response organizations as appropriate before the commencement of operation. The regulatory body shall ensure that such emergency arrangements provide a reasonable assurance of an effective response, in compliance with these requirements, in the case of a nuclear or radiological emergency...”</i>
GPFF3	Good Practice: The development of a method based on the use of comparative emergency capability maps for estimation of the level of on-site and off-site emergency readiness enables an early identification of gaps, performing a benchmarking and facilitates further development in the area of EPR.

11. ADDITIONAL AREAS

11.1. OCCUPATIONAL RADIATION PROTECTION

Legal and regulatory framework

The legal and regulatory framework on occupational exposure is based on:

- the Health And Safety at Work etc. Act 1974 (HASWA74),
- the Ionising Radiations Regulations 1999 (IRR99),
- the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR01),
- the Management of Health and Safety at Work Regulations 1999 (MHSWR99).

Radiation safety on nuclear sites is mainly regulated by means of IRR99, MHSWR99 and REPPIR01 which define the main objectives to be reached. They are laid before Parliament before publication. They are supported by Approved Codes of Practice (ACoPs) and/or guidance.

The Nuclear Installations Act 1965 (NIA 65), which sets down the main requirements relating to the licensing process and the control of nuclear installations, also contains general requirements with an impact on radiation protection of workers and one licence condition which relates specifically to requirements for the assessment and notification of average effective dose for certain classes of workers (Standard Licence Condition 18).

Responsibilities of the regulatory body specific to occupational exposure

HSE is the “owner” of the regulations relating to safety at work and, therefore, has the overall responsibility of issuing regulations and controlling occupational exposure in medical, industrial and research establishments.

The responsibilities of ONR concerning occupational exposure cover licensed nuclear sites and a number of nuclear defence sites which are not licensed under NIA65. ONR is therefore consulted on draft regulations and guides related to this subject. Furthermore, ONR has the responsibility to assess radiation protection arrangements in the licensing process of nuclear sites.

Inspections of radiation protection on nuclear sites are usually performed by ONR inspectors. However, other organisations also have the competence to carry out radiation protection inspections on nuclear sites:

- HSE, concerning site radiography,
- Environmental agencies, in the case of High Activity Sealed Sources being used by an operator different from the site licensee.

Memoranda of understanding have been established between HSE and the environmental agencies. A general review of these arrangements will have to be carried out when ONR becomes a Public Corporation.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)

BASIS: GSR Part 3 Para. 2.36 states that *“The regulatory body shall establish mechanisms for communication and discussion that involve professional and constructive interactions with relevant parties for all protection and safety related issues.”*

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

GPF4	Good Practice: The HSE website provides access to a large range of information on radiation protection, available to employers and workers, including Radiation Protection News.
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General responsibilities of registrants, licensees and employers

General responsibilities of employers, registrants and licensees are set down in the legal and regulatory framework described in an earlier paragraph. These texts put a general obligation on employers concerning the protection and safety of their employees.

In the case of co-activity (i.e. where employees are engaged in work involving radiation sources that are not under the control of their employer), all the employers in the task are required to cooperate so that each employer can comply with the requirements set down in the regulations.

Observation: Approved Codes of Practice and guidance provide further information concerning the practical aspects of cooperation in case of co-activity, but there is no arrangement requiring the respective responsibilities of each employer to be documented.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 3 Para. 3.86 states that “Cooperation between the employer and the registrant or licensee shall include, where appropriate, [...] a clear allocation and documentation of the responsibilities of the employer and those of the registrant or licensee for protection and safety.”
RFF2	Recommendation: HSE and ONR should ensure that the allocation of responsibilities is documented when employees are engaged in work involving radiation sources that are not under the control of their employer.

General responsibilities of workers

The obligations put on workers by HASWA74 and IRR99 are globally consistent with GSR Part 3 requirements. In particular, workers are responsible for complying with the rules set by the employer and to report any difficulty that might jeopardize radiation protection.

Dose limits

New dose limits have been established in GSR Part 3 for the lens of the eye (20 mSv per year averaged over 5 consecutive years (100 mSv in 5 years) and 50 mSv in any single year for workers over the age of 18 years).

Observation: These new limits have not yet been integrated into UK regulations, but ONR has defined an action plan to take them into account during the implementation of the revised EURATOM Basic Safety Standards (BSS) Directive by the end of 2017.

Requirements for radiation protection programmes

UK regulations require risks assessments to be carried out prior to new activities involving work with ionising radiations in order to implement the optimisation principles.

The use of dose constraints is recommended as part of the optimisation process. Reference levels are provided in the guidance associated with the assessment of safety cases for nuclear sites.

Based on the results of risk assessments, the operator has the responsibility to designate controlled and supervised areas. The definitions of these areas in IRR99 are consistent with those set down in GSR Part 3. Additional criteria have been introduced in the regulations, based on annual dose levels likely to be received by workers regularly working in these areas.

Observation: Concerning the access to designated areas, although the UK legal and regulatory framework contains provisions that would make the exposure of young persons under the age of 16 years very unlikely, such exposure is not explicitly forbidden. ONR has defined an action plan to take this into account during the implementation of the revised EURATOM BSS by the end of 2017.

Observation: Both IRR99 and REPPER01 contain requirements on the information and training of workers who work with ionising radiations. Concerning the recording of the training provided to workers, provisions are set down in NIA65 and associated guidance for nuclear installations. However, there is no such formal requirement for small scale installations.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 3 Para. 3.26 states that <i>“The government or the regulatory body shall establish and the regulatory body shall enforce compliance with the dose limits specified in Schedule III for occupational exposures and public exposures in planned exposure situations.”</i>
(2)	BASIS: GSR Part 3 Para. 3.115 states that <i>“Employers, registrants and licensees shall ensure that no person under the age of 16 years is or could be subject to occupational exposure.”</i>
(3)	BASIS: GSR Part 3 Para. 3.110 (c) states that <i>“Employers, in cooperation with registrants and licensees, shall maintain records of the training provided to individual workers”</i>
RFF3	<p>Recommendation: HSE and ONR should ensure that the regulatory framework contains specific requirements addressing:</p> <ul style="list-style-type: none"> • consideration of the new dose limits for the lens of the eye, • explicit prohibition concerning the occupational exposure of persons under the age of 16 years, • maintenance of records for training provided to all employees in the non-nuclear sector who are engaged in work with ionising radiation.

Assessment of occupational exposure and workers’ health surveillance

UK regulations require occupational exposure to be assessed for classified persons and more generally for every person entering a controlled area. Employers are also required to make suitable arrangements for the making and maintenance of dose records relating to classified persons. In particular, they must contract with approved dosimetry services that will keep the dose records until workers have attained the

age of 75 years and for at least 50 years from when they were made. These services are responsible for feeding a national database on dose records (Central Index of Dose Information), which is administered by Public Health England.

Arrangements are set down for the health surveillance of classified workers, employees who have received an overexposure, employees engaged in work with ionising radiation subject to conditions imposed by an appointed doctor or employment medical adviser, and workers receiving an emergency exposure.

Observation: The definition of “classified person” only includes workers who are likely to receive an annual effective dose greater than 6 mSv or an equivalent dose which exceeds three-tenths of any relevant dose limit. Workers regularly working in supervised areas have no special status under IRR99, although they could theoretically receive a maximum annual dose of 6 mSv or an equivalent dose which exceeds three-tenths of any relevant dose limit according to the definition of supervised areas. Therefore, no approved dose assessment or dose recording and no health surveillance is required for these workers.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	BASIS: GSR Part 3 Para. 3.101 states that <i>“For any worker who regularly works in a supervised area or who enters a controlled area only occasionally, the occupational exposure shall be assessed on the basis of the results of workplace monitoring or individual monitoring, as appropriate.”</i>
(2)	BASIS: GSR Part 3 Para. 3.103 states that <i>“Employers, registrants and licensees shall maintain records of occupational exposure for every worker for whom assessment of occupational exposure is required in paras 3.99–3.102.”</i>
(3)	BASIS: GSR Part 3 Para. 3.76 (f) states that <i>“Employers, registrants and licensees shall ensure, for all workers engaged in activities in which they are or could be subject to occupational exposure, that necessary health surveillance and health services for workers are provided”</i>
RFF4	Recommendation: HSE and ONR should define and ensure the implementation of arrangements concerning the assessment of doses received by workers who regularly work in supervised areas, the recording of their occupational exposure and their need for health surveillance.

Monitoring programmes and technical services

UK regulations require employers to monitor levels of ionising radiations in designated areas and to keep working conditions under review. Details relating to this requirement are provided in the associated Approved Code of Practice.

UK regulations also contain provisions relating to the approval of dosimetry services and the recognition of radiation protection advisers.

11.2. CONTROL OF DISCHARGES, MATERIALS FOR CLEARANCE, AND CHRONIC EXPOSURES; ENVIRONMENTAL MONITORING FOR PUBLIC RADIATION PROTECTION

Legal and regulatory framework

The requirements of GSR Part 3 in planned exposure situations apply to public exposure due to a practice or a source within a practice. The government or the regulatory body shall establish the responsibilities of relevant parties that are specific to public exposure; shall establish and enforce requirements for optimization and the regulatory body shall enforce compliance with dose limits for public exposure.

The UK has the basis for this in the Environment Act 1995, Environment Permitting Regulations 2010 and the Radioactive Substances Act 1993 (RSA 93). In this legislation the BSS 1996 EU forms the basis for radiation protection.

The Environmental Agency, Natural Resources Wales and the Scottish Environment Protection Agency are the Regulatory Bodies for the control of radioactive discharges and materials for clearance. They work closely together with ONR on authorization, review and assessment, inspection and enforcement. In 2002 the environment agencies in collaboration with the National Radiological Protection Board (now incorporated within Public Health England) and the Food Standards Agency produced a set of principles and interim guidance on the assessment of public doses for the purpose of authorising discharges of radioactive waste to the environment. As a consequence the document enabled radiological assessments to be produced in a more consistent and transparent manner.

In 2012 the Environment Agencies collaborated with the Health Protection Agency and the Food Standards Agency to produce an update of the 2002 interim guidance and principles for assessing doses.

Observation: Despite of the fact that operational limits for discharges are set up by the government and they meet the requirements of the GSR Part 3, and these limits are based upon a low risk level, they are based on the criteria of BSS 1996 EU and not the criteria of the GRS Part 3 as mentioned in the tables III-2D, III-2E, III-2F, III-2G and III-2H. The new revision of the EU BSS is anticipated and is consistent with IAEA GSR Part3.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: GSR Part 3 Para. 121 states that <i>“The government or the regulatory body shall establish, and the regulatory body shall enforce compliance with the dose limits specified in schedule III for public exposure.”</i>
RFF5	Recommendation: The government should ensure that the operational limits and conditions are based on the latest international standards in GSR Part 3.

Responsibilities of the licensees and regulatory bodies specific to control of discharges and clearance of materials

The licensees are responsible for measuring the radiation and radioactive discharges of the site and for determining the doses to the most critical reference groups of the public. They also are responsible for checking the materials that leave the site for clearance.

ONR is responsible for the control of the direct radiation from the nuclear sites to the public. The Environmental Agencies are responsible for the control of discharges of radioactive materials and clearance of materials from the nuclear sites and the consequent dose to the public. They are assisted by

Public Health England that carries out measurements and checks on the figures and models that are used by the licensees in their reporting.

The Environmental monitoring for public radiation protection

The Food Standards Agency and environmental agencies produce a yearly overview report (title: Radioactivity in Food and the Environment) with information of the doses to the public from the nuclear sites and other sources. The information from the nuclear sites is provided by the licensees and random checked by the responsible regulatory bodies, including ONR for radiation from the nuclear sites to the most critical groups, and the Public Health England.

11.3. SUMMARY

Requirements set down in the legal and regulatory framework (including Approved Codes of Practice) and Guidance, are globally consistent with IAEA requirements relating to occupational exposure and to public exposure from discharges of radioactive materials in planned exposure situations.

The main issues relating to occupational exposure concern the status of workers that are not considered as classified workers according to UK regulations, but who could receive a maximum annual effective dose of 6 mSv. Although these workers cannot be considered as members of the public, no arrangements have been set down concerning dose assessment/recording and health surveillance for them.

Some other points will need improvement:

- consideration of the new dose limits for the lens of the eye,
- documentation of the allocation of responsibilities when several employers/operators are engaged in a task involving radiation sources,
- explicit prohibition of exposure for young working people under the age of 16 years,
- obligation to record the information and the training of workers related to radiation protection, especially outside licensed nuclear sites.

Concerning public exposure, the only recommendation relates to the fact that the operational limits and conditions are based on the BSS96 (EU) and not on GRS part 3.

12. SUPERVISION OF NON-NPP FACILITIES AND ACTIVITIES

12.1. RADIATION SOURCES APPLICATIONS

12.1.1. Regulations and Guides

Control of radioactive materials has been in place in the United Kingdom (UK) for decades. The main responsibilities for providing safety of radioactive sources (RS) always lies with the owners of the sources. The regulators check that these responsibilities are being taken by source owners.

The main elements of the legal and regulatory framework concerning safety of RS are: the Radioactive Substances Act 1993 (RSA1993); the Health and Safety at Work Act 1974 (HASWA1974); the Ionising Radiations Regulations 1999 (IRR99); High-activity Sealed Radioactive Sources and Orphan Sources Regulations 2005 (HASS2005); Environmental Permitting Regulations 2010 (EPR2010); Ionising Radiations (Medical Exposure) Regulations 2000.

12.1.2. Authorisation of Radiation Sources Applications

The following regulatory authorities are responsible for regulatory control of RS:

- Office for Nuclear Regulation (ONR);
- Defence Nuclear Safety Regulator (DNSR);
- Environment Agency (EA);
- Natural Resources Wales;
- Environmental and Heritage Service (EHS);
- Scottish Environment Protection Agency (SEPA).

The Office of Nuclear Regulation (ONR) is responsible for regulation and safety of High-activity Radioactive Sealed Sources (HASS) on Nuclear Licensed Site (NLS). For NLSs, ONR issues only one licence called a Site Licence; this covers all stages of the facility life and all facilities (including non-mobile HASS). Authorization is not based on evidence on meeting prescriptive regulations; instead the authorization is managed through Licence Conditions (LC), which requires the licensee to implement the design requirements and other arrangements needed for ensuring safety.

Observation: Many responsibilities relating to the regulation of radioactive sources are cross-cutting between regulatory authorities. The main aspects of the responsibility of ONR and other regulatory authorities on licensed sites are: review and assessment of facilities and activities; inspection of facilities and activities; enforcement of regulatory requirements; regulatory functions relevant to emergency exposure situations and existing exposure situations; and declarations for shipments to UK for licensed sites. Thus, the interaction between ONR and other regulatory authorities should be more effectively documented.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)

BASIS: GSR1 Para. 2.5 states that *“If other authorities, which may fail to meet the requirement of independence set out in item (2) of para. 2.2, are involved in the granting of authorizations, it shall be ensured that the safety requirements of the regulatory body remain in force and are not modified in the regulatory process.”*

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(2)	<p>BASIS: GSR1 Para. 2.6 states that <i>“The regulatory body shall have the authority: ...(13) to liaise and co-ordinate with other governmental or non-governmental bodies having competence in such areas as health and safety, environmental protection, security, and transport of dangerous goods; and...”</i></p>
RFF6	<p>Recommendation: The interaction between ONR and other regulatory bodies (RBs) should be agreed to and better documented for implementation of effective cooperation in regulating radioactive sources (legislation, authorization, regulatory functions relevant to emergency exposure situations, registration of RS, inspection and enforcement)</p>

12.1.3 The register of HASS

The database of HASS was established from 2005 and is now operational. In UK, 35 NLS have around 100-200 HASS. ONR requires NLS to provide operational records under LC 25(4). Each HASS must have a unique identifying number, which is stamped on the capsule. The specifications issued under LC 25(4) require the licensees to inform ONR of all movements of HASS to and from their sites.

The locations of all HASS sources within the UK are recorded on a secure electronic database that is maintained by the environmental agencies. The database will alert the users if a HASS has left one location but not arrived at its destination. Mobile radioactive sources on NLS are regulated by the relevant environment agency. ONR and other regulatory authorities should agree on a mechanism for implementation of effective cooperation between the regulating database of used RS or disused RS and the register of radioactive waste.

12.1.4. Management of Disused Sealed Sources in UK

On nuclear licensed sites LC4 (Restrictions on Nuclear Matter) ensures that the licensee carries out its responsibilities to control the entry and storage of nuclear material (including sources) on the NLS. In all cases, IRR99 Part VI applies, covering the arrangements for the control of radioactive substances, articles and equipment for licensed sites. ONR has identified recognised installations for the long-term storage of disused sources. On licensed sites the financial provisions for disused sources are presumed to be a small part of the overall decommissioning provisions.

Also, the Environment Agency managed a ‘Surplus Source Disposal programme’ (SSDP) funded by the UK Government between 2004 and 2009. A wide variety of domestic and imported radioactive sources were recovered under that programme: medical sources used for radiotherapy and blood irradiation, sources used for irradiating materials in university research; historical items such as radium-luminised equipment, laboratory chemicals, and sources used for teaching. The programme has been a major success in arranging safe management, recycling and disposal of a legacy of over 11,000 disused radioactive sources throughout the UK. In addition financial provision is required to cover the cost of managing disused sources safely, including in the eventuality of the holder becoming insolvent or going out of business.

12.1.5. Inspection and Enforcement of Radiation Sources Applications

ONR undertakes a sampling regime for all inspections including source inspections during IRR99 inspections, with Guidance given in NS-INSP-GD-054 Revision 2 (Inspection Guidance for IRR99).

RMT and CNS of ONR may also undertake inspections on sources for compliance with their specific regulations. Licensees arrangements and implementation of those arrangements for: recording type, nature and location of sealed sources: unique identification of sealed sources; accounting for sealed sources; assessing contact dose rates (not to exceed 2 mSv/h); recording of HASS movements notified to ONR (including annual confirmation), leak tests, auditing the arrangements, assessment of adequacy of storage facilities: security, waterproofness, ventilation, dose rates from store, liaison with ONR Security and Safeguards specialists (for HASS).

Observation: Specific radioactive protection training is given to ONR inspectors, but no formal training on HASS. However, specialists are recruited and trained to carry out the regulatory functions related to the HASS area. ONR, in consultation with EA, should amend the existing training course, and agree on a roll out strategy for training and ensure that it is fully implemented.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	BASIS: GSR Part 1 Para. 4.7 states that <i>“In order to ensure that the proper skills are acquired and that adequate levels of competence are achieved and maintained, the regulatory body shall ensure that its staff members participate in well-defined training programmes. This training should ensure that staff is aware of technological developments and new safety principles and concepts.”</i>
SFF11	Suggestion: ONR should complete development and implementation of training to include the full range of duties regarding radioactive sources

12.2. WASTE MANAGEMENT FACILITIES

The primary legislation for radioactive waste (RAW) management and decommissioning on nuclear sites is the Nuclear Installations Act 1965. It prohibits the installation or operation of a nuclear installation without a licence being granted by HSE. At the same time it gives HSE powers to attach such conditions to licences as they think fit with respect to the handling, treatment and disposal of nuclear matter. Any failure to comply with a Licence Condition is a criminal offence.

A nuclear site licence issued by ONR has the same content and structure for each licensee including RAW management and decommissioning. It contains 36 Licence Conditions and some one of them are specifically devoted to RAW accumulation, disposal of RAW and decommissioning. To perform a specific safety significant operation covered by the licence the licensee may have to apply for permission using the licensee’s arrangements under the appropriate licence condition. During the discussions with the IRRS Team, ONR indicated that, at these safety significant stages ONR will pull together various parts of its assessment into a Project Assessment Report (PAR) to set out the reasons why ONR believes that the safety case or decommissioning plans are adequate (or not) for the next phase of operations. ONR believes that this is equivalent to what IAEA requirements term “approval”. ONR then issues a permission and the PAR (made available on the website). In this respect the ONR “permission” can be considered as a licence as defined by the IAEA Safety Glossary (“A legal document issued by the regulatory body granting authorization to perform specified activities related to a facility or activity”).

Observation: National RAW management policy and strategy is well defined for Low Level Radioactive Waste (LLW) for the whole territory of UK. However for so called “Higher Activity Radioactive Waste” (HAW) not complying with WAC for LLW Repository Ltd., there are separate policies for England (geological disposal facility - GDF), Scotland (no GDF) and Wales (to be decided later). The Team also noticed from UK National Report under Joint Convention on the Safety of RAW Management and on the Safety of the Spent Fuel Management that for Scotland the policy is the long term storage and, if

appropriate, disposal of HAW (in Scotland this term does not include HLW and radioactive substances and material which are not currently classified as RAW, such as spent nuclear fuel, Pu, U or other such radioactive fuels and materials) in near surface facilities. In addition, as RAW management is a matter devolved to UK constituent nations, further work is necessary to implement policy and develop strategy as necessary for the management of legacy waste and the application of the waste hierarchy in the management of waste streams.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GSR Part 5 Req. 2 states that <i>“To ensure the effective management and control of radioactive waste, the government shall ensure that a national policy and a strategy for radioactive waste management are established. The policy and strategy shall be appropriate for the nature and the amount of the radioactive waste in the State, shall indicate the regulatory control required, and shall consider relevant societal factors. The policy and strategy shall be compatible with the fundamental safety principles [2] and with international instruments, conventions and codes that have been ratified by the State. The national policy and strategy shall form the basis for decision making with respect to the management of radioactive waste”</i></p>
(2)	<p>BASIS: SSR-5 Req. 1 states that <i>“The government is required to establish and maintain an appropriate governmental, legal and regulatory framework for safety within which responsibilities shall be clearly allocated for disposal facilities for radioactive waste to be sited, designed, constructed, operated and closed. This shall include: confirmation at a national level of the need for disposal facilities of different types; specification of the steps in development and licensing of facilities of different types; and clear allocation of responsibilities, securing of financial and other resources, and provision of independent regulatory functions relating to a planned disposal facility.”</i></p>
RFF7	<p>Recommendation: The Government together with devolved Administrations should continue to implement policy and develop strategies as necessary, specifying steps and responsibilities, for all radioactive waste streams in the UK.</p>

12.2.1. Authorization of Waste Management Facilities

As the disposal facilities in UK are regulated by several regulatory bodies there is a need to closely cooperate in the regulatory activities. The Environment Agency (EA), Natural Resources Wales, the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment Agency (NIEA) are responsible for regulating the disposal of radioactive waste in England and Wales, in Scotland, and in Northern Ireland respectively. Where these disposal facilities are on nuclear licensed sites, ONR is responsible for regulating accumulation and storage of radioactive waste. In order to take into account the interdependencies of different waste management steps and the long- and short term safety aspects it is important that their tasks and activities are closely coordinated.

Observation: Based on the discussion about the status of low level waste disposal facility (LLWR Ltd. licensed by ONR as storage facility; only Vault 8 is permitted by EA as disposal facility) it was noticed that at present time there is a well-developed cooperation between several regulatory authorities (in particular EA and ONR). Nevertheless, in the future, the status of the LLWR Ltd. is expected to be changed from a storage facility into a disposal facility. At this moment it is not clear what will be the role and responsibility of different regulatory authorities in this process and that is why they have to be further

clarified. According to the opinion of the IRRS Team there is a need for further considerations of this process by Government, ONR and EA.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	BASIS: GSR Part 1 Req. 7 states that <i>“Where several authorities have responsibilities for safety within the regulatory framework for safety, the government shall make provision for the effective coordination of their regulatory functions, to avoid any omissions or undue duplication and to avoid conflicting requirements being placed on authorized parties.”</i>
SFF12	Suggestion: ONR in collaboration with other relevant regulatory authorities should consider ensuring the coordination of regulatory responsibilities dealing with licensing and permitting/authorisation of Low Level Waste disposal facilities such that all safety aspects are comprehensively considered and so that both short and long-term aspects are taken into account. .

ONR and EA established Joint Teams to deal with all regulatory issues related to development of GDF and Generic Design Assessment (new builds). The Joint Teams are established according to the MoU between HSE and EA on the matters of mutual concern at nuclear sites licensed in England and Wales and the disposal or discharge of RAW on or from those sites.

This MoU relates principally to the regulation of nuclear safety and RAW management on nuclear sites and the disposal or discharges of radioactive waste on or from those sites. The MoU establishes the relationship between both organizations in relation with any regulatory decision defining in each case which will be the body having the primary responsibility in relation to each of the regulatory interfaces established in this Memorandum.

The Team was informed that for any application for an authorization on RAW management or decommissioning a Project Manager is designated and ONR specialists from all the relevant specialisms (radiation protection, engineering, safety assessment, etc.) for the review and assessment of the application are called to participate. In the frame of the MoU with EA it is decided the body having the primary responsibility with the facility will be the normal contact point for the operator for all matters relevant to that particular interface. This will not, however, remove the requirement for the operator to obtain all necessary permits, licences or other consents required from EA or HSE. The Team was informed that these regulatory bodies are sharing information on any application received and the authorization is issued only with the written acceptance of the other regulatory body.

As a result of this cooperation, the already mentioned Joint Guidance (JG) has been developed. JG deals with details of the regulatory process, RAW management cases, RAW minimisation, characterisation and segregation, RAW conditioning and disposability, storage of RAW and managing information and records. Although this guidance is a good one, developed according to WENRA, IAEA and other international recommendations and providing uniform guideline for licensee accepted by all regulators, it should be noticed that it is not binding for them. For example the developed in details concept on “Radioactive Waste Management Case” covered in the Joint Guidance Part 2 and requested from the licensees to be developed, is not formally approved by ONR.

Observation: As far as HLW disposal concerns a working group has been established to discuss and exchange positions on the expectations of the future GDF. The working group in particular is composed of regulators and potential operators namely NDA/RWMD.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: SSR-5 Req. 2 Para. 3.9 states that <i>“The regulatory body has to engage in dialogue with waste producers, the operators of the disposal facility and interested parties to ensure that the regulatory requirements are appropriate and practicable. It also has to maintain competent staff, to acquire capabilities for independent assessment and to undertake international cooperation, as necessary, to fulfil its regulatory functions.”</i>
GPF5	Good Practice: The establishment of a working group to exchange views between regulators and potential operators on the future GDF is a good practice.

The Guidance on Requirements for Authorisation (GRA) on “Near Surface Disposal Facilities on Land for Solid Radioactive Waste” states that there will be active institutional control and the regulatory approach will be to apply a risk guidance level.

Observation: A regulatory principle in the UK is that authorisations for disposal will not be granted unless it is shown that the continued isolation of the waste from the accessible environment shall not depend on actions by future generations to maintain the integrity of the disposal system. However this principle does not take into account the possible need for passive institutional control based on the results of safety assessment and the transition from active management of the facility.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	BASIS: SSR-5 Req. 22 states that <i>“The period after closure and institutional controls Plans shall be prepared for the period after closure to address institutional control and the arrangements for maintaining the availability of information on the disposal facility. These plans shall be consistent with passive safety features and shall form part of the safety case on which authorization to close the facility is granted.”</i>
(2)	BASIS: SSR-5 Req. 22, Para. 5.7 states that <i>“The risk of intrusion into a disposal facility for radioactive waste may be reduced over a longer timescale than that foreseen for active controls by the use of passive controls, such as the preservation of information by the use of markers and archives, including international archives.”</i>
RFF8	Recommendation: Regulatory authorities should review their Guidance on Requirements for Authorisation (GRA) to consider a need for passive institutional control of the site of a near surface disposal facility. The responsible legal body should be defined and the process of any transfer of regulatory responsibilities should be established.

12.2.2. Review and Assessment for Waste Management Facilities

Observation: The Team was informed that ONR is a “regulatory sampling organisation” and does not review the whole safety case elaborated and presented by the applicant. It examines those parts that they consider have a high significance for safety based on the expert judgement of the ONR staff. ONR license is then issued after the review of the safety case but there is no safety case/safety assessment approval process established. Once the safety case/safety assessment is reviewed and permission issued, the operation permitted cannot be changed without further notice to ONR. However, producing a safety case and supporting safety assessment for RAW management facilities, and in particular for a GDF is a demanding task and should be prepared using a step-by-step approach. For these facilities at the

international level it is recommended that the safety case/safety assessment should be presented to the regulatory body for review and approval at each step in their development.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	BASIS: SSR-5 Req. 12 states that <i>“A safety case and supporting safety assessment shall be prepared and updated by the operator, as necessary, at each step in the development of a disposal facility, in operation and after closure. The safety case and supporting safety assessment shall be submitted to the regulatory body for approval. The safety case and supporting safety assessment shall be sufficiently detailed and comprehensive to provide the necessary technical input for informing the regulatory body and for informing the decisions necessary at each step.”</i>
(2)	BASIS: GSR-5 Req. 3 states that <i>“The regulatory body shall establish the requirements for the development of radioactive waste management facilities and activities and shall set out procedures for meeting the requirements for the various stages of the licensing process. The regulatory body shall review and assess the safety case and the environmental impact assessment for radioactive waste management facilities and activities, as prepared by the operator both prior to authorization and periodically during operation. The regulatory body shall provide for the issuing, amending, suspension or revoking of licences, subject to any necessary conditions. The regulatory body shall carry out activities to verify that the operator meets these conditions. Enforcement actions shall be taken as necessary by the regulatory body in the event of deviations from, or noncompliance with, requirements and conditions.”</i>
RFF9	Recommendation: ONR should further develop their assessment capabilities to be able to review the whole safety case and safety assessment of RAW management facilities.

12.2.3. Inspection and Enforcement of Waste Management Facilities

Three members of the IRRS team visited the Sellafield site and observed the final part of an ONR inspection which had been going on for previous two days. The inspection focused on the transfer route between WVP (Waste Vitrification Plant) and MBGWS (Miscellaneous Beta Gamma Waste Store) for used filters and also the accumulation of RAW in break down cells. This inspection was a system inspection.

This inspection was the third in a series of ONR’s inspections completed during the last fifteen months on the facility. The main observation of the ONR inspection was that the licensee has not fully complied with LC32 requirements. WVP lines 1-3 receive highly active liquid (HAL) waste from irradiated fuel reprocessing operations and the HAL is converted into glass via a vitrification process. Intermediate level wastes are also accumulated in the plant from maintenance activities and filter change operations. Despite previous requests from the regulator for SL to reduce intermediate level waste accumulations, limited progress had been made. The reasons for the lack of action from the Sellafield Ltd. are unavailability of the used filter export flask and lower priority by Sellafield Ltd. to utilise the available route for transfer from the break down cell.

Observation: According to ONR’s inspection findings and requests the unavailability of a sufficient working buffer storage capacity for future arising within the facilities presents a significant risk to continue to operate the vitrification plants to reduce site High Activity Liquid stocks. ONR is currently seeking a commitment from SLC for a net reduction rate of 10 t/a and is using the regulatory process to require the SLC to meet this objective. The Team noted that ONR had made a number of requests on this

matter and the mission also considers would be achievable and the target should be agreed with ONR. The continuous situation that Sellafield Ltd. does not fully comply with a Licence Condition set by ONR. The Mission team was informed that ONR will consider taking more robust enforcement action if a firm commitment from Sellafield is not forthcoming. Nevertheless, its is the Mission team’s view that ONR should review its criteria in the use of the EMM in relation to RWM. and does not take measures despite of ONR’s repeated requests appears to weaken ONR’s position as regulatory body.

The Team noticed good skills and knowledge of the licensee’s personnel as well as the ONR inspectors.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GSR Part 5 Req. 3 states that <i>“The regulatory body shall establish the requirements for the development of radioactive waste management facilities and activities and shall set out procedures for meeting the requirements for the various stages of the licensing process. The regulatory body shall review and assess the safety case and the environmental impact assessment for radioactive waste management facilities and activities, as prepared by the operator both prior to authorization and periodically during operation. The regulatory body shall provide for the issuing, amending, suspension or revoking of licences, subject to any necessary conditions. The regulatory body shall carry out activities to verify that the operator meets these conditions. Enforcement actions shall be taken as necessary by the regulatory body in the event of deviations from, or noncompliance with, requirements and conditions.”</i></p>
RFF10	<p>Recommendation: ONR should review the criteria in the use of the Enforcement Management Model to ensure compliance with regulatory requirements in relation to RAW management activities.</p>

Observation: The visit ended with a discussion with the senior management of Sellafield Ltd. who among others acknowledged the NDA’s role by setting strategies. However it has been emphasized that the SLC should be more independent from NDA in carrying out its functions and be accountable.

NDA is the Authority for Decommissioning in the UK. According to the NDA operating model (DOC NSG 31) under key principle F: “All the parties in the NDA model have responsibilities for safe operation of the nuclear licensed sites – all are legally users of the site, though prime responsibility and accountability in law resides with the SLC. Under UK law all parties with safety responsibilities have a duty to cooperate with each other.”

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	<p>BASIS: GSR Part 1 Req. 7 states that <i>“Where several authorities have responsibilities for safety within the regulatory framework for safety, the government shall make provision for the effective coordination of their regulatory functions, to avoid any omissions or undue duplication and to avoid conflicting requirements being placed on authorized parties.”</i></p>
(2)	<p>BASIS: GSR Part 1 Req. 7, Para. 2.19 states that <i>“The government should review the present legal arrangements and ensure that all organizations involved in decommissioning activities and in the management of the radioactive waste, responsible for safety, are held accountable for that responsibility and that their activities are coordinated.”</i></p>

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

RFF11	<p>Recommendation: Considering that the legal arrangements are in place ONR should review the implementation of the present legal arrangements and ensure that all organizations involved in decommissioning activities and in the management of the radioactive waste, responsible for safety, are held accountable for their responsibilities and that their activities are coordinated.</p>
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12.2.4. Regulations and Guides for Waste Management Facilities

At various steps in the predisposal management of RAW it shall be characterized and classified in accordance with requirements established or approved by the regulatory body. RAW may be classified for different purposes, and different classification schemes may be used in the successive steps in waste management. The most common classification is that made from the perspective of its future disposal. The Team was informed that in UK, for practical purposes the classification scheme introduced the term HAW which means HLW (for England and Wales only), ILW and such LLW as cannot be disposed of at present. There is not any other specification in this regards in the regulatory framework.

Observation: JG on “The Management of Higher Activity Radioactive Waste on Nuclear Licensed Sites” has been developed by HSE, EA and SEPA. But the concept of safety cases in a RAW management context, as described in JG, is not transparent enough as aspects relating to waste streams will exist in a number of different plant safety cases. To provide for such a transparency a Radioactive Waste Management Case (RWMC) should indicate how the key elements of long-term safety and environmental performance will be covered during the management of each waste stream. However, RWMC is applied only in the context of describing radioactive waste streams that will be considered in a number of different plant safety cases. The RWMC indicates how the key safety and technological elements will be performed for the proper management of the waste stream. In this way the RWMC demonstrates how interdependencies among all steps in RAW management, from the generation up to disposal are taken into account. It is developed for every single RAW stream and provides complementary information to safety cases of relevant RAW management facilities.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	<p>BASIS: GSR Part 5 Req. 6 states that “<i>Interdependences among all steps in the predisposal management of radioactive waste, as well as the impact of the anticipated disposal option, shall be appropriately taken into account.</i>”</p>
GPF6	<p>Good Practice: The use of Radioactive Waste Management Case for every single waste stream contributes to the demonstration that the interdependences among the various steps in the predisposal management of RAW are considered in a comprehensive way.</p>

12.3. DECOMMISSIONING ACTIVITIES

12.3.1. Authorization of Decommissioning Activities

The Nuclear Decommissioning Authority (NDA) proposes and gains political endorsement from DECC for a decommissioning strategy which is consistent with national decommissioning and waste management policy. The site operator’s role is to provide the plan to implement the strategy. The decommissioning strategy will take into account that until authorization has been given to implement the final decommissioning plan, the facility shall be considered an operating facility. All applicable

requirements for the facility shall then remain in place unless the regulatory body has agreed to their reduction on the basis of a reduction of the hazards (e.g. the removal of nuclear material from the facility).

During implementation of final decommissioning plan revisions or amendments may subsequently be needed as the activity progresses. In UK, a term “lifetime plan” is used instead of decommissioning plan for facilities located on sites owned by NDA. Lifetime plans (and decommissioning plans) are expected to be updated continuously and according to ONR and NDA there is an on-going dialogue between the organizations about them. After a facility has been shut down there is no formal time limit or an alternative schedule for the final decommissioning plan to be submitted to ONR for approval.

Observation: Under LC35 the licensee prepares a Site Decommissioning Programme to define the schedule of activities performed at the nuclear site under decommissioning to implement NDA’s strategy. The Programme is supported by appropriate justifications and processes that represents a subset of the relevant lifetime plan which contains obligations for the NDA. But the Team noticed that similar to RAW management safety case a lifetime plan (final decommissioning plan) is not presented to ONR for authorisation.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)	<p>BASIS: WS-R-5 Req. 1.3 states that <i>“Decommissioning can be divided into preparatory and implementation phases, both of which are discussed in this publication. Preparations for decommissioning include the development of a decommissioning strategy, initial decommissioning planning and radiological characterization of the facility. Implementation of decommissioning includes preparation of a final decommissioning plan and its submission to the regulatory body for authorization or approval, management of the project and implementation of the plan, management of the waste and demonstration that the site meets the end state criteria defined in the plan.”</i></p>
RFF12	<p>Recommendation: The ONR should review its approach to authorising decommissioning plans.</p>

12.3.2. Inspection and Enforcement of Decommissioning Activities

Other members of IRRS team visited the site of NPP Berkeley within the scope of inspection of ONR site inspector. NPP Berkeley is the first commercial NPP in the UK to be decommissioned. It came into service in 1962 and after 27 years of operation the twin reactor station closed in 1989. The site is expected to be cleared in 2085. Prior to the visit the LC35 Decommissioning Programme for Berkeley site has been provided by ONR to the IRRS Team.

The members of the IRRS team visited the Caesium Removal Plant (CRP) used during the operation period of the NPP to treat liquid RAW. Nowadays only two tanks containing 10.6 m³ of sludge and 12.4 m³ of resins remained in the facility. The licensee, Magnox Ltd., is performing an inactive test for joint sludge resin retrieval from tanks using vacuum based retrieval technology. The technology incorporates not only the vacuum system, HEPA filters, pipelines, etc. but also Ductile Cast Iron Containers (DCIC). These containers will be filled in CRP and dried on site to minimize the volume of RAW. Once dried it is expected that about 2 DCICs containing sludge and 5 DCICs with resins will be stored on site. There will be another 800 DCICs filled with solid RAW (620 t of fuel element debris and 5500 containers incl. 1400 sludge cans) placed currently in vaults 1-3 of ILW storage facility. Once RAW retrieval operations in CRP are finished, both tanks will be removed and the whole facility will be demolished. Once the site reaches the care and maintenance period (2028), only three installations will be there – two reactor units and a storage place for DCIC containers.

Discussions with ONR site inspectors, NDA representative and Magnox Berkeley Lead Team (with the site director leading) focused on the use of hazard categories in assessment and authorization of RAW management and decommissioning activities as well as inventory and properties of loaded DCICs for disposal purposes in the future. Clarification of responsibilities with safety of the licensee and the NDA was performed.

Operations in CRP are categorized according to their potential hazards in four categories. Depending on the categorization the safety case prepared by the licensee is a subject of internal safety assessment, review by Nuclear Safety Committees and if needed submitted to ONR for review. The criteria for decision if a safety case will be submitted to ONR are annual dose rate to workers, amount and potential hazards / environmental risks of RAW managed within the project, criticality concerns, challenging wastes, materials or processes, etc.

The Team noticed good skills, knowledge and safety culture of the licensee's personnel as well as the ONR inspectors.

12.3.3. Regulations and Guides for Decommissioning Activities

The TAGs of ONR do not consider final decommissioning plans. This plan should define how the project will be managed, including: the site management plan, the roles and responsibilities of the organizations involved, safety and radiation protection measures, quality assurance, a waste management plan, documentation and record keeping requirements, a safety assessment and an environmental assessment and their criteria, surveillance measures during the implementation phase, physical protection measures as required, and any other requirements established by the regulatory body.

It should be noticed also that if the deferred dismantling strategy has been selected, as is the case in UK, it shall be demonstrated in the decommissioning plan that such an option will be implemented safely and will require minimum active safety systems, radiological monitoring and human intervention and that future requirements for information, technology and funds have been taken into consideration.

There are no formal requirements or arrangements in place that the regulatory body is notified prior to shutting down a facility permanently or terminating the activity.

In the discussion it was noticed that it is expected that a new IAEA General Safety Requirements GSR Part 6 on Decommissioning activities and facilities will be issued. Also ONR informed the Team that guide on LC 35 (decommissioning) is under revision.

Observation: The Team recognised that guidance on decommissioning do not consider some of internationally established requirements related e. g. to frequency of initial decommissioning plan update and review and submission scheme of final decommissioning plan. As it is foreseen that in relative short period of time the oldest nuclear facilities will be shut down and decommissioned in UK the regulatory framework could be reviewed and updated according to latest international recommendations to face this coming situation.

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

(1)

BASIS: WS-R-5 Req. 3.5 states that *“The regulatory body is responsible for the regulation of all phases of decommissioning, from initial planning to termination of the practice or final release of the facility from regulatory control. The regulatory body shall establish the safety standards and requirements for decommissioning, including management of the resulting radioactive waste, and shall carry out activities to ensure that the regulatory requirements are met.”*

FOLLOW-UP MISSION RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

RFF13	Recommendation: ONR should review and update the guidance dealing with decommissioning to ensure that the safety requirements will be in accordance with the latest international safety requirements in this field.
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12.4. SUMMARY

In summary the UK has a good regulatory framework for sustainable management of radioactive sources and requirements set down in the legal and regulatory framework and are globally consistent with IAEA requirements. However some points will need improvement:

- Establishment of a formal mechanism for exchange of information with the database of used RS or disused RS and the register of RAW;
- development and implementation of training for inspectors of ONR and EA to include the full range of duties regarding HASS.

With respect of RAW management and decommissioning there are established memorandums of understanding between different regulatory authorities. Nevertheless the existing legal arrangements of the organization involved in RAW management and decommissioning activities should be revisited for clarifying the roles and responsibilities of such organizations.

National RAW management policy and strategy is well defined for LLW for the whole territory of UK, but for other RAW classes further work is necessary. The regulatory framework for the safe RAW management and decommissioning is established however, there are still some actions to be taken to complement the existing regulatory framework in accordance with international recommendations. For predisposal activities joint guidance combining regulatory requirements of two regulatory authorities was developed. In this frame, requirements were established for the definition of waste streams and its interdependencies.

Despite the fact that the geological disposal programme is in the early stage of the development it should be noticed that actions have already been taken to exchange views and discuss issues between the potential operator and regulators.

13. REGULATORY IMPLICATIONS OF THE TEPCO FUKUSHIMA DAI-ICHI ACCIDENT

13.1. IMMEDIATE ACTION TAKEN BY THE REGULATORY BODY

ONR's Incident Suite was staffed from the first day of the accident and remained active on a 24 hours basis for over two weeks. ONR has not got active responsibility in national off-site emergency preparedness and response but has the duty to provide information and expert advice to the Government and to various governmental organizations. Accordingly, ONR was called to participate in the meetings at the UK Cabinet Office Briefing Room held following the accident and subsequently for about one month, in order to advise UK citizens. The advice provided by ONR pertained to issues directly related to the UK citizens potentially affected by the accident, thus e.g. what road in Japan may or should not be used, or that UK citizens should follow the advice by the Japanese Government and authorities. KI tablets were also delivered from the UK to Japan, although it is not known whether they were actually distributed to UK citizens in Japan.

ONR provided support also to the Government Chief Scientific Advisor and for the Foreign and Commonwealth Office Crisis Team.

In the early phase of the accident ONR took part in international cooperation with US, Canadian and French regulators in order to determine the actual technical status of the Fukushima Dai-ichi power plant units. These consequence and verification calculations have made it possible to ONR to provide realistic information related to the progression of the accident.

ONR set up a dedicated expert team including experts from various technical areas related to the accident (e.g. severe accident management, seismic PSA, electrical engineering, I&C), which team was tasked to advice ONR Chief Inspector and his deputies in compiling reports on the UK implications of the accident. ONR did not have direct experience of severe accident calculations for BWRs and contracted an expert team, including leading US analysts, to review Japanese calculations with the MELCOR and MAAP codes in order to provide confidence in the Japanese severe accident analysis results.

The UK nuclear industry, in line with international tendencies as well as with expectation from ONR, soon after the accident have reviewed the robustness of the UK nuclear power generating installations against the initiating events and their immediate consequences of the accident in Fukushima. The review did not reveal any need for immediate or urgent action and did not indicate the need for shut down of any UK NPP.

An Interim report on the implications of the accident on the UK nuclear industry was released by ONR as early as in mid-May 2011. In compilation of the Interim report various stakeholders had opportunity to contribute with their views and proposals. Although many of the views so obtained lacked technical depth, the fact that a wide range of interested audience expressed its views on the subject has effectively contributed to the practical exercising of the openness and transparency policy of ONR.

The Interim report offered 11 conclusions on the possible implications of the accident for the UK. Thus, among others, the report concluded that:

- no reason was seen for curtailing the operation of UK NPPs;
- no reason was seen for curtailing the operation of UK NPPs;
- no gaps had been revealed in scope and depth of the Safety Assessment Principles for nuclear facilities in the UK;
- no weakness in the UK nuclear licensing regime was revealed;
- no need to change the siting strategies for NPPS;

- the multi-plant site concept can be sustained.

The Interim report also provided altogether 26 recommendations partly for ONR and partly to the nuclear industry. The four recommendations for ONR suggested

- considering the enhancement of open, transparent and trusted communications;
- a formal review of the Safety Assessment Principles;
- considering coverage of severe accidents in emergency exercises; and
- reviewing the regulatory response to potential severe accidents in the UK.

Both ONR and the nuclear industry started the implementation of the recommendations at the time of their publications and this is an on-going process even at the time of the IRRS mission.

When summarizing the steps taken by ONR immediately after the accident, the activity related to international cooperation also needs to be mentioned. ONR was a committed and active partner in every international initiative aimed at summarizing and utilizing the lessons learned from the Fukushima Dai-ichi accident. This included the Fact Finding Mission organized by IAEA (and led by Dr. Mike Weightman, ONR Chief Inspector), various meetings and conferences organized by IAEA and by the European regulatory groups ENSREG and WENRA. Furthermore, on behalf of the UK, ONR participated in the activities related to the European Stress Test (targeted re-evaluation of the safety of nuclear power plants) requested by the European Council and specified by ENSREG. Lessons learned, recommendations and conclusions offered by the Fact Finding mission, by the Japanese Government and by the US NRC Task Force in their reports were also thoroughly studied by ONR and were utilized in their analysis and task setting.

13.2. TECHNICAL AND OTHER ISSUES CONSIDERED IN THE LIGHT OF THE ACCIDENT

As a follow-up of the Interim report, a Final report on the implication of the Japanese earthquake and tsunami for the UK nuclear industry was released in September 2011. This report includes the conclusions and recommendations of the Interim report and offers further ones. The most important novel technical conclusions are:

- the UK approach to identifying the design basis for nuclear facilities is sound for initiating events similar to those in Fukushima;
- the mandatory requirement to perform periodic safety review is a robust means of ensuring adequate facility improvements;
- the accident highlighted the importance of Level 2 PSA for all nuclear facilities.

The Final report identified a number of areas where further improvement was beneficial and formulated 12 further recommendations. Again the majority of these recommendations were addressed to the UK nuclear industry, two of them relate to ONR:

- ONR should support international efforts to improve the process of review and implementation of IAEA and other nuclear safety standards;
- ONR should expand its oversight of nuclear safety-related research.

The recommendations fall into three main groups. The group of general recommendations pertain to international arrangements; Global Nuclear Safety; national emergency response arrangements and openness and transparency. In the second group those recommendations are listed which are relevant to the regulator and which are listed in relation with the Interim and Final reports in details above.

The third group includes recommendations addressed to the UK nuclear industry and are related to specific technical issues like e.g. infrastructure resilience; impact of natural hazards and extreme events; sites and plant layout; fuel pond design; electricity and cooling supplies; etc.

In a third stage of the analysis and task setting ONR and the UK nuclear industry have performed the European Stress Test exercise. Note that the UK was one of the few countries where not only the NPPs were subject to the Stress Test, but also the non-power generating nuclear facilities were investigated. The Stress Test Final report on NPPs was issued in December 2011. This report identifies 19 findings noting that these findings “generally relate to more specific aspects of the recommendations already raised” by the Interim and Final reports. Further 75 findings detail the issues related to non-power generating facilities. The licensees have identified further issues that are formulated as their own considerations and that are to be taken into account in future developments.

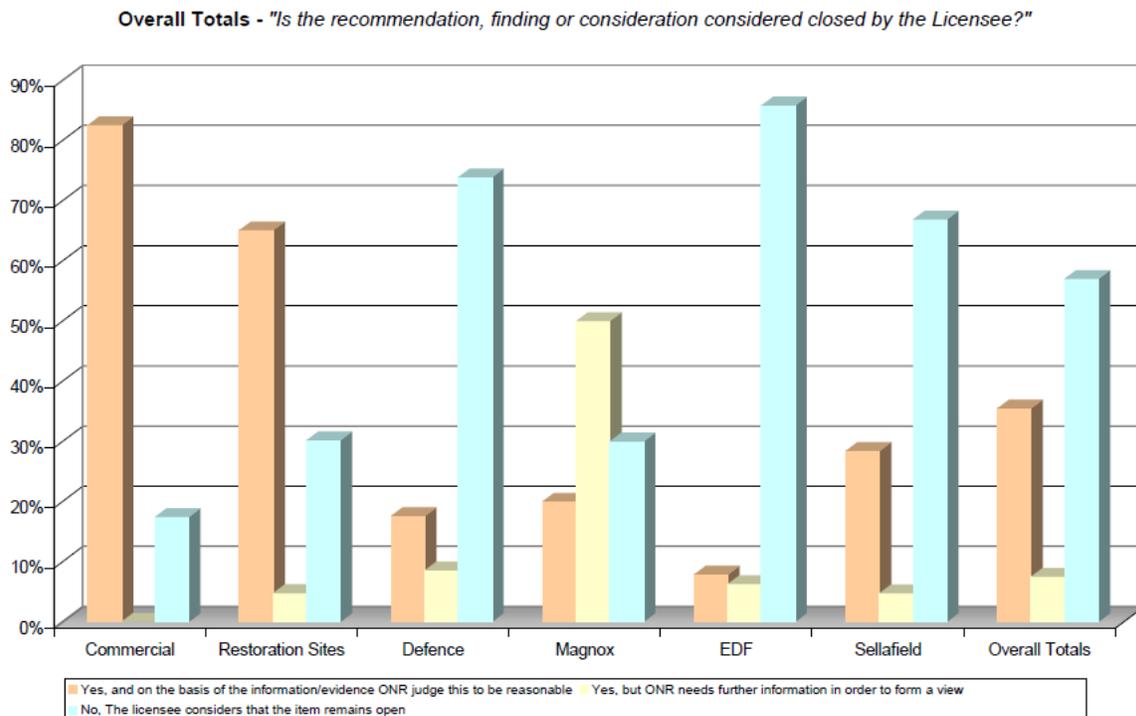


Figure 1

Both the Final report and the Stress Test report required that the licensees provide progress reports by June 2012. Based on these reports ONR prepared a summary on the implementation of the lessons learned from the Japanese earthquake and tsunami, which was issued in October 2012. The report reflects that considerable progress has been made in closure of the recommendations, findings and industry’s considerations. In specific, the licensees consider that 35% of the findings, recommendations or considerations are closed and ONR judges them closed too, 7 % are thought to be closed by the industry but ONR needs further information and 58% of the items are still open. The distribution by licensees is shown in Figure 1 (quoted from the ONR implementation report);

Evaluation of the implementation status was repeated in May 2013 when the respective ratios were 48% (closed), 5% (closed but needs information) and 47% (open). According to the schedule, all significant recommendations should be completed by the end of 2014. Some of them may take longer (e.g. some analyses may suggest further plant improvements). In 2015 ONR intends to publish further information on the results of the implementation.

Turning to the technical issues addressed to ONR, the most important recommendation was given by the Interim report when requiring the formal review of the Safety Assessment Principles (SAPs). The ONR review has shown that there are no essential gaps in the SAPs, yet based on experience gathered during the six years application minor amendments – mainly related to coverage of severe accidents – need to be performed. The IRRS Team was made acquainted with an example of the methodology of reviewing the SAPs. The example demonstrated that the changes are mostly clarifying or enhancing exactness. E.g. application of the single failure criterion for Category A safety systems was clarified in one of the added parts, some others enhance the principles related to severe accident management taking into account the implications of the Fukushima Dai-ichi accident. A further example is the revision of the requirements for fuel pumps, secondary sources of power supply and the capacity to be considered in the radioactive waste storage facilities. More on the characteristics of and changes to the SAPs as well as on specific technical issues considered are given below in the Module-wise sections.

In the field of emergency preparedness and response ONR decided to take steps in order to enhance its capability to provide a sustained response to a prolonged emergency. A number of exercises that were moved to this direction have already been held, a nuclear emergency exercise programme for fixed nuclear installations within the UK has been prepared that will test the prolonged delivery and sustainability of the on-site, the off-site and central government responses.

The third area where ONR was expected to take steps is the review of its oversight of nuclear safety and security-related research. A so-called ONR Research Index is published to cover ONR's research requirements to be satisfied by the licensees.

The implementation report concluded that all relevant stakeholders have shown an appropriate level of commitment and there is clear evidence that they are making adequate progress, although further efforts are needed to complete all tasks. ONR will press for the industry to complete the important tasks, will deliver appropriate oversight and will continue to report to the Government on the progress. ONR is determined to use its enforcement power should it become necessary to reach the goals set by the recommendations, findings and by the National Action Plan.

CONCLUSION [1]

The IRRS Team considers that ONR has exercised considerable efforts in order to collect information on the circumstances of the Fukushima Dai-ichi accident, to draw conclusions on the lessons learned and to initiate steps in order to enhance nuclear safety in the UK. The IRRS Team recognises that these efforts have led to valuable results and are expected to reach their goals. The IRRS Team notes that ONR's assessment did not identify important gaps or noncompliances in the UK nuclear safety regulatory regime.

13.3. PLANS FOR UPCOMING ACTIONS TO FURTHER ADDRESS THE REGULATORY IMPLICATIONS OF THE ACCIDENT

In December 2012 a National Action Plan was prepared in order to summarize the UK position in addressing the Stress Test findings. This document evaluates the status of the Stress Test findings and the related actions on one hand, and where appropriate, provides the planned completion time of each individual stress test finding, European peer review conclusions, and for each individual item from ENSREG's compilation of recommendations and suggestions. ONR shall continuously follow and evaluate the progress made by its licensees in complying with the recommendations and findings set by the various reports.

As for the regulatory implications, the new version of SAPs shall be published in early 2014. As a follow-up to that the respective Technical Assessment Guidelines shall be revised to reflect the changes in the principles.

CONCLUSION [2]

The IRRS Team concludes that the immediate and short term assessment of the implications of the Fukushima Dai-ichi accident have covered all important issues and identified the respective recommendations. Thus no important new task remained to be performed in a longer time frame.

13.4. CONCLUSIONS BY REVIEWED AREAS

Module 1: Responsibilities and Functions of the Government

The IRRS Team discussed the responsibilities and functions of the UK government with ONR, and reviewed legal documents concerning ONR's regulatory authority, as well as other departments of government. The UK has an appropriate governmental, legal, and regulatory framework in place for the regulation of nuclear installations, including under emergency/accident situations. Provisions have been made for coordination among all the departments of government, as well as the license holders for nuclear installations, in case of emergencies or accidents. License holders are required to ensure their employees have appropriate dosimetry in case of accident conditions.

CONCLUSION [3]

The IRRS Team considers that the UK Government has an appropriate governmental, legal, and regulatory framework in place to deal with emergencies or accident conditions.

Module 3: Responsibilities and Functions of the Regulatory Body

The IRRS Team reviewed documentation and discussed with ONR its responsibilities and authorities in the event of an emergency or accident situation. As an independent body that is responsible for regulating nuclear safety, ONR has sufficient legal powers to take timely regulatory action in case of an emergency or accident. ONR has adequate tools to communicate with a license holder during an emergency. Providing information concerning the release of radiation and the potential effect on the public is the license holder's responsibility. ONR is responsible for monitoring the information and confirming the license holder provides the proper information on public protection.

CONCLUSION [4]

The IRRS Team considers that ONR, as an independent regulatory body, has the appropriate legal authority and responsibility to take timely regulatory action during in emergency or accident condition.

Module 4: Management System of the Regulatory Body

The ONR Management System is still under development. However, it is the intent that, when complete, it be continuously assessed and improved so that the implications of any future incident or accident are appropriately addressed.

The Management System, when complete, will also ensure a long-term and balanced management commitment to provide sufficient resources and competence, to promote safety culture, to promote

transparency and openness and to develop and maintain open and constructive relations with regulators in neighbouring countries.

CONCLUSION [5]

The IRRS Team considers that the necessary actions related to the management system have been recognised, the regulatory body is committed to act as necessary and the necessary further actions have been initiated.

Module 5: Authorization

ONR is not involved in the strategic decisions relating to the siting of new nuclear sites; however the conditions of issuing a licence or permission for starting nuclear activities at a site are well specified (mainly in the Standard Licence Conditions). When issuing a new site licence, the main considerations are the suitability of the site for the proposed activities; the management arrangements put in place to comply with the site licence conditions; the safety report for the design; and the organisational capabilities of the requesting organization to lead and manage for safety effectively. ONR has recently issued the document Licensing Nuclear Installations, which specifies the process that ONR follows when considering whether to grant a nuclear site licence, and includes the steps that a licence applicant would need to follow to apply for and obtain a licence, including the expected safety submissions.

With respect to external hazards, ONR's TAG 013 and the related Safety Assessment Principles (SAPs) are judged to be sufficiently robust in the light of the Fukushima accident. UK has and continues to adopt a $10^{-4}/y$ threshold for design basis external hazards assessments. External hazards assessments are part of the licensing process. A systematic approach to identifying a comprehensive set of postulated initiating events is required to meet existing assessment guidance. No specific revision of approaches and guidance in this area is considered to be needed. The post-Fukushima review of the SAPs also concluded that no new requirement should be added with respect to the internal hazards, interactions, extra power supply and heat removal capabilities, as well as with respect to the spent fuel handling.

The "design extension conditions" are part of the UK's assessment process and these have been looked at for NPPs. However, in the course of the European stress tests, it is recognized that this is an area that can be improved upon. ONR is in the process of updating SAPs to provide more comprehensive guidance in regard to severe accident assessments and will be re-issuing the supporting Technical Assessment Guide on severe accidents in due course.

There are no explicit requirements in the UK for supplementary control room, though means have to be ensured to shut down and keep cooled a reactor even if the main control room is unserviceable. The new designs operating or planned to be built are supplied with back-up control room.

CONCLUSION [6]

The IRRS Team considers that the existing status of the authorization process is appropriate, however, as the regulatory body participated in the ENSREG stress tests, further actions to improve safety have been initiated in the area of design extension conditions.

Module 6: Review and Assessment

UK licensees have conducted detailed reassessments of safety (including safety margins) in light of the Fukushima accident, namely in response to ONR's Weightman Reports and the ENSREG Stress Tests. The report of regulatory review, along with the details of licensee's individual submissions is available on ONR's Fukushima web page.

Taking into account that the UK is relatively benign in terms of the demands from external hazards, the ONR's TAG 013 and the related SAPs are judged to be sufficiently robust in the light of the Fukushima accident. With regard to the seismic hazards, Probabilistic Seismic Hazard Assessment (PSHA) methods were used in the UK to take account of instrumental, historic and pre-historic data. Similar evaluation from the point of view of tsunami, tidal and storm surge hazard yielded the conclusion that the UK reactor sites are acceptably safe from flooding, with improvement work on-going to reduce these risks still further.

With regards to heat removal from the reactor and from the fuel store as well as regarding to the confinement of radioactive materials in accident states, ONR is in the process of updating SAPs to provide more comprehensive guidance for severe accident assessments. In addition, the detailed internal guide for reviewing severe accident analyses is under review. These activities are within the framework of the action plan initiated upon the European stress test and there is on-going work to address potential improvements in these areas.

The existing SAPs contain sufficiently systematic approaches to identifying a comprehensive set of postulated initiating events with the potential for serious consequences. ONR's review of the SAPs did not lead to any changes in this respect.

The "design extension conditions" for NPPs were already part of ONR's existing assessment process. However, reflecting the stress tests, it was recognized that this area can be improved upon and ONR is in the process of updating the SAPs.

The importance of common cause failure (CCF) is recognized in ONR's SAPs. However, improvements at the sites to improve robustness in light of Fukushima have been identified and are being implemented.

The SAPs cover in a satisfactory manner the potential harmful interactions of systems important to safety; however, as noted above, the position is not so strong for beyond the design basis events, where better guidance is currently under development.

The SAPs require the means for cooling the reactor core to be justified and demonstrated to meet deterministic and probabilistic criteria, which are considered robust. However, additional back-up electrical power and cooling water supplies have been/ are being implemented at all NPP sites to further enhance safety. The SAPs also cover the heat removal and transfer to the ultimate heat sink in a sufficiently robust manner. In these areas ONR is also contributing to the review of WENRA reference levels.

The expectations for emergency power supplies at NPPs are summarized in the Essential Services section of SAPs. Notably, it requires that power supply systems be designed so that the simultaneous loss of both normal and back-up services will not lead to unacceptable consequences. As it has been referred above, on-site improvements to essential services were identified by licensees own assessment as well as ONR's recommendations and the outcomes are being implemented.

Concerning the expectations for fuel handling and storage safety the post-Fukushima review of the SAPs considered whether explicit guidance was needed for this area and concluded that the existing generic guidance remains adequate.

CONCLUSION [7]

The IRRS Team considers that the existing status of review and assessment is appropriate, nevertheless, the regulatory body plans to improve its Safety Assessment Principles in the area of design extension conditions, including for severe accidents.

Module 7: Inspection

An extensive programme to enhance the inspection programme of ONR to improve its ability to detect precursor events was on-going prior to Fukushima. In 2006, ONR published principles on Leadership and Management for Safety (L&MfS) that are, in part, based on this international learning. Since the publication of this document draft guidance on L&MfS (T/AST/078) has been developed that utilises the international learning and identifies potential precursors. The guidance is still in trial use pending agreement within ONR on the next phase involving wider roll-out and how best to assimilate the feedback from inspectors. A decision was taken last year to defer the next phase until the reorganisation of ONR had been completed.

Implementation of the lessons learned from Fukushima is described in the implementation report (c.f. Section 13.2). Targeted inspections to review related plant and procedural modifications are part of ONR's inspection programme.

All recommendations and findings of the ONR reports in response to the Fukushima accident – including reactor heat removal and radioactive material containment – are subject to regulatory inspection to ensure implementation. Mechanical, electrical and human factors aspects are inspected to ensure that appropriate modifications are made. These include on-site and off-site arrangements for ensuring heat removal to the ultimate heat sink and power supply in emergency conditions.

ONR has an on-going inspection program to ensure the robustness of fuel handling and storage systems.

The arrangements between licensee's HQ and the sites are also being inspected and these are considered to be adequate. At EDF sites the Site Director and during emergencies, the Site Emergency Controller, are accountable for and have the authority to ensure the safety operation of the plant. ONR's inspections extend to the observation of Level 1 exercises as well.

CONCLUSION [8]

The IRRS Team considers that the existing inspection practice of ONR is appropriate from the point of view of implications of Fukushima Dai-ichi accident.

Module 8: Enforcement

Currently part of the Health and Safety Executive (HSE), ONR applies its Enforcement Management Model which is based on HSE's Enforcement Policy Statement (EPS) when considering the use of enforcement tools. This includes the application of grading, according to the potential consequences by requiring carrying out proportionate, targeted, consistent and transparent enforcement. The term 'enforcement' has a wide meaning and applies to all dealings between the enforcing authority and those on whom the law places duties. ONR has a range of tools at its disposal when seeking to secure compliance with the law and to ensure a proportionate response.

ONR would follow the same process for an issue, which lead to identify unforeseen radiation risk (like in Fukushima) as for any other issue. ONR would apply a four step approach:

- Determine the risk gap – The gap between where the Licensee should be, with respect to the law, and where the licensee is, if relevant standards and good practices were followed.
- Identify what action to take, if any. – The action would be in accordance with the enforcement policy statement and enforcement management model.
- Liaise with the Licensee to obtain a forward action plan – The plan would detail the corrective actions taken to remedy the risk gap that aligned with the principles of ALARP and the required timescales.

- Periodically review the forward action plan and inspect the implementation of corrective actions to ensure that any issues or unforeseen radiation risks are adequately addressed.

CONCLUSION [9]

The IRRS Team considers that the existing status of ONR enforcement practice is appropriate to cope with the implications of Fukushima Dai-ichi accident.

Module 9: Regulations and Guides

The Safety Assessment Principles are in the process of being revised as a result of Fukushima and taking into account other developments such as new or updated IAEA Requirements or Guides or other, recent standards. Once these have been published, the Technical Assessment Guides (TAGs) will be brought into line with them. They will also take account of the revised WENRA Reference Levels that are being developed.

Among the changes are that there will be more emphasis in the TAGs on severe accidents and enhanced guidance on external hazards and emergency response.

CONCLUSION [10]

The IRRS Team considers that the necessary actions to revise regulations and guides have been initiated, while the regulatory body also participated in a “stress test”-type exercise.

Module 10: Emergency Preparedness and Response

The implications for the UK nuclear industry from the Fukushima accident (including the EPR conditions in the UK) were promptly addressed after the accident and have initiated a series of activities in the EPR area including emergency exercises, where the resilience of emergency conditions of nuclear facilities presenting high level of hazards have been thoroughly examined.

The Interim report by the ONR Chief Inspector to the Government (Japanese earthquake and tsunami: Report on Implications for the UK Nuclear Industry, ONR Chief Inspector Report) recognized the need for a review of the arrangements for response to potential severe accidents in the UK. It also addressed the implications for the UK public contingency planning for widespread emergencies and a need for a review of the national nuclear emergency arrangements on dealing with the prolonged severe nuclear emergency event. A complex summary of recommendations has been given in the Interim and Final Fukushima Report.

Partial or full scale emergency situations, not limited to RFA (“reasonable foreseen accident”) have been planned and verified or envisaged as subjects of emergency exercises, based on a range of accident scenarios including severe accidents, including radiation events combined with conventional emergency. The actions planned on the basis of lessons learned are being implemented and the nuclear related aspects of the processes are reviewed by ONR as also discussed in sections 13.2 and 13.3.

CONCLUSION [11]

The IRRS Team concludes that ONR responded promptly and in accordance with its regulatory authority functions. Appropriate actions have been taken to improve the existing arrangement and to verify the resilience of the EPR arrangements with regard to severe accidents at UK nuclear facilities. Further assessment should be performed to verify effectiveness of the current development and to identify possible additional needs to implement the lessons learned from the

CONCLUSION [11]

TEPCO Fukushima Dai-ichi accident.

Module 12: Supervision of non-NPP facilities and activities – Waste Management Facilities

The IRRS Team notices that the results of the Fukushima stress test were taken into consideration in the check list to be performed in the inspection to the Berkeley facility. The licensee presented a report of the status of the measures agreed in the action plan to be addressed.

The Team was informed that in September 2011 an ILW Hazard Workshop was organized in the facility. This considered plant and structural integrity, operational resilience and plant monitoring and control and reviewed all hazards and consequences in the event of an extreme natural hazard with a view to identify simple enhancements. The output was a list of 41 proposed enhancements for consideration by the site. Eleven of these actions were subsequently deemed to cover generic issues and have been prepared centrally. All 41 statements of action were approved and 37 of them were already closed. Some of the improvements which have been/are being implemented follow:

- Removal of and securing a number of potentially buoyant items to prevent possible impact damage to radiological storage facilities or blockage of access routes;
- Improvements to the advice provided in the Emergency Handbook of actions to take in the event of a Vault fire;
- Review of the Site's arrangements for early warning of extreme events;
- Production of (beyond design basis) Accident Management Guidelines;
- The procurement and introduction of two satellite phones to improve resilience of communications;
- The procurement and the introduction of two R3M radiation monitoring cones, and;
- The provision of a Beyond Design Accident Container.

When actions will be completed the Site Director will sign to agree all works completed.

The Team noticed in the site that some of the lessons learned from Fukushima accident were already considered in the design of the facility as for example a several accidents induced by an external Potential Initiating Event (PIE), as is the case with flooding, which was considered in the safety assessment to take place once in 10^4 years. Measures to reduce the potential consequences of a flooding were in place well before the Fukushima accident and reviewed after that.

CONCLUSION [12]

The IRRS Team considers that the existing status is appropriate. The necessary actions have been recognized and included in a plan, which is under implementation and permanent control by the licensee and the ONR. The regulatory body is committed to act as necessary. The actions taken by the regulatory body were exemplary because they decided to extend the test case to all the facilities under their jurisdiction including those that have no nuclear fuel on-site or are not operational.

IRRS UK FOLLOW UP TEAM



APPENDIX I – LIST OF PARTICIPANTS

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APPENDIX III – SITE VISITS

SITE VISITS	
1.	Sellafield
2.	Berkeley

APPENDIX IV – LIST OF COUNTERPARTS

	IRRS EXPERTS	ONR Lead Counterpart	ONR Support Staff
1.	LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES		
	SKEEN, David LUND, Ingemar	Teresa Quinn/David Senior	John Price Barbara Woods Simon Thornhill
2.	GLOBAL NUCLEAR SAFETY REGIME		
	SKEEN, David LUND, Ingemar	Steve Griffiths/David Senior	-
3.	RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY		
	SKEEN, David LUND, Ingemar	Mark Bassett	-
4.	MANAGEMENT SYSTEM OF THE REGULATORY BODY		
	WEBSTER, Philip	Mike Finnerty/David Senior	John Smith Christine Alcock
5.	AUTHORIZATION		
	ADORJÁN, Ferenc	Craig Reiersen/David Senior	Kulvinder McDonald Mina Golshan
6.	REVIEW AND ASSESSMENT		
	ADORJÁN, Ferenc	Anthony Hart/Andy Hall	-
7.	INSPECTION		
	ADORJÁN, Ferenc	Graeme Thomas/Andy Lindley	Matthew Cowen Steve Saunders Paul Harvey

	IRRS EXPERTS	ONR Lead Counterpart	ONR Support Staff
8.	ENFORCEMENT		
	ADORJÁN, Ferenc	Graeme Thomas/Andy Lindley	Matthew Cowen Steve Saunders Paul Harvey
9.	REGULATIONS AND GUIDES		
	WEBSTER, Philip	Geoff Grint/David Senior	-
10.	EMERGENCY PREPAREDNESS AND RESPONSE		
	JANKO, Karol	Steve Griffiths/Donald Urquhart David Senior	Paul Dicks Anna Mayor Tim Randles Gareth Thomas
11.	ADDITIONAL AREAS		
	GUILLAUD, Pascal BREAS, Gerard	Charles Temple David Senior	Susan McCready-Shea Jim Stewart Clive Ingram
12.	SUPERVISION OF NON-NPP FACILITIES AND ACTIVITIES		
	TRIPAULO, Ruslana LIETAVA, Peter JOVA SED, Luis HUTRI, Kaisa-Leena	Frans Boydon Derek Lacey	Mick Bacon Bill Turner Nina Barnes Mark Tearle Simon Morgan Elaine Nattress
13.	REGULATORY IMPLICATIONS OF THE TEPCO FUKUSHIMA DAI-ICI ACCIDENT		
	LUX, Ivan and IRRS Team	Geoff Grint/Andy Hall	as required

**APPENDIX V - RECOMMENDATIONS (R) AND SUGGESTIONS (S) FROM THE PREVIOUS IRRS MISSIONS THAT
REMAIN OPEN**

AREA	R: Recommendations S: Suggestions	Recommendations or Suggestions
3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	SF2	<u>Suggestion:</u> ND should institute a programme for the reconstitution of an advisory committee on nuclear safety.

APPENDIX VI – RECOMMENDATIONS (RFF), SUGGESTIONS (SFF) AND GOOD PRACTICES (GPFF)

AREA	R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES	SFF1	Suggestion: ONR should ensure sufficient resources with the appropriate skillsets are available to provide regulatory oversight of the GDF project.
2. GLOBAL NUCLEAR SAFETY REGIME	-	-
3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	SFF2	Suggestion: ONR should consider developing a timetable with milestones for when all of the previously separate organizations will be fully integrated within ONR.
	SFF3	Suggestion: ONR should follow through to publish the revised communications strategy document when it is completed.
	SFF4	Suggestion: ONR should develop a process to administer refresher training for Inspectors once they have been re-Warranted and to take appropriate action should an Inspector fail to take or fail to pass such training within the prescribed period.
	SFF5	Suggestion: ONR should continue to assess whether it has the necessary human resources to fulfil its statutory obligations.
	SFF6	Suggestion: ONR should review its training programme and revise as necessary to include the full range of duties regarding radioactive sources
	SFF7	Suggestion: As part of its communication strategy, ONR is encouraged to promote the establishment of an appropriate means of informing and consulting interested parties and the public about the possible radiation risks associated with facilities and activities, associated with GDF, and about the processes and decisions of the regulatory body.

AREA	R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
4. MANAGEMENT SYSTEM OF THE REGULATORY BODY	RFF1	Recommendation: The management system should be completed and fully implemented as quickly as possible. This should include all the requirements for managing the organization, in particular those mentioned in the earlier Recommendations and Suggestions that have been closed.
	SFF8	Suggestion: A high-level timeline should be prepared to affirm Senior Management’s determination to complete the preparation of the Management System by showing the steps involved, such as: <ul style="list-style-type: none"> - Issuing the Management System Manual - Approving the Policy Framework - Issuing the Policy Document - Populating HOW2 with the existing processes - Reconciling and updating HOW2 to make the processes consistent The Management System may then be used to support the goal of continuous improvement, such as by performing audits/evaluations of HOW2 usage.
	SFF9	Suggestion: Changes should be made to relevant parts of the management system to indicate that one of its purposes is to promote and support a strong safety culture.
5. AUTHORIZATION	SFF10	Suggestion: ONR should complete its first full review of the Standard Licence Conditions as scheduled.
	GPFF1	Good Practice: Systematic engagement with a prospective licensee in the area of organisational governance, structures, competencies and resources, based on documented regulatory requirements and expectations, is considered a good practice that contributes to successful implementation of the licensing process. The regulatory review and assessment is based on technical assessment guides guiding the regulatory body’s staff interactions with an applicant and supporting a

AREA	R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		consistent regulatory approach. This approach fostered a constructive relationship based on trust and mutual recognition of the other party's roles, responsibilities and expectations.
6. REVIEW AND ASSESSMENT	GPFF2	Good Practice: The elaboration of detailed ONR guidelines and their application in the practices of ONR on the application of Graded Approach and the principles for regulatory assessment.
7. INSPECTION	-	-
8. ENFORCEMENT	-	-
9. REGULATIONS AND GUIDES	-	-
10. EMERGENCY PREPAREDNESS AND RESPONSE	GPFF3	Good Practice: The development of a method based on the use of comparative emergency capability maps for estimation of the level of on-site and off-site emergency readiness enables an early identification of gaps, performing a benchmarking and facilitates further development in the area of EPR.
11. ADDITIONAL AREAS	GPFF4	Good Practice: The HSE website provides access to a large range of information on radiation protection, available to employers and workers, including Radiation Protection News.
	RFF2	Recommendation: HSE and ONR should ensure that the allocation of responsibilities is documented when employees are engaged in work involving radiation sources that are not under the control of their employer.
	RFF3	Recommendation: HSE and ONR should ensure that the regulatory framework contains specific requirements addressing:

AREA	R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		<ul style="list-style-type: none"> • consideration of the new dose limits for the lens of the eye, • explicit prohibition concerning the occupational exposure of persons under the age of 16 years, • maintenance of records for training provided to all employees in the non-nuclear sector who are engaged in work with ionising radiation.
	RFF4	<p>Recommendation: HSE and ONR should define and ensure the implementation of arrangements concerning the assessment of doses received by workers who regularly work in supervised areas, the recording of their occupational exposure and their need for health surveillance.</p>
	RFF5	<p>Recommendation: The government should ensure that the operational limits and conditions are based on the latest international standards in GSR Part 3.</p>
12. SUPERVISION OF NON-NPP FACILITIES AND ACTIVITIES	RFF6	<p>Recommendation: The interaction between ONR and other regulatory bodies (RBs) should be agreed to and better documented for implementation of effective cooperation in regulating radioactive sources (legislation, authorization, regulatory functions relevant to emergency exposure situations, registration of RS, inspection and enforcement)</p>
	SFF11	<p>Suggestion: ONR should complete development and implementation of training to include the full range of duties regarding radioactive sources</p>
	RFF7	<p>Recommendation: The Government together with devolved Administrations should continue to implement policy and develop strategies as necessary, specifying steps and responsibilities, for all radioactive waste streams in the UK.</p>
	SFF12	<p>Suggestion: ONR in collaboration with other relevant regulatory authorities should consider ensuring the coordination of regulatory responsibilities dealing with licensing and permitting/authorisation of</p>

AREA	R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		Low Level Waste disposal facilities such that all safety aspects are comprehensively considered and so that both short and long-term aspects are taken into account.
	GPF5	Good Practice: The establishment of a working group to exchange views between regulators and potential operators on the future GDF is a good practice.
	RFF8	Recommendation: Regulatory authorities should review their Guidance on Requirements for Authorisation (GRA) to consider a need for passive institutional control of the site of a near surface disposal facility. The responsible legal body should be defined and the process of any transfer of regulatory responsibilities should be established.
	RFF9	Recommendation: ONR should further develop their assessment capabilities to be able to review the whole safety case and safety assessment of RAW management facilities.
	RFF10	Recommendation: ONR should review the criteria in the use of the Enforcement Management Model to ensure compliance with regulatory requirements in relation to RAW management activities.
	RFF11	Recommendation: Considering that the legal arrangements are in place ONR should review the implementation of the present legal arrangements and ensure that all organizations involved in decommissioning activities and in the management of the radioactive waste, responsible for safety, are held accountable for their responsibilities and that their activities are coordinated.
	GPF6	Good Practice: The use of Radioactive Waste Management Case for every single waste stream contributes to the demonstration that the interdependences among the various steps in the predisposal management of RAW are considered in a comprehensive way.

AREA	R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
	RFF12	Recommendation: The ONR should review its approach to authorising decommissioning plans.
	RFF13	Recommendation: ONR should review and update the guidance dealing with decommissioning to ensure that the safety requirements will be in accordance with the latest international safety requirements in this field.
13. REGULATORY IMPLICATIONS OF THE TEPCO FUKUSHIMA DAI-ICI ACCIDENT	-	-

**APPENDIX VII – CONCLUSIONS ON THE REGULATORY IMPLICATIONS OF THE TEPCO
FUKUSHIMA DAI-ICHI ACCIDENT**

AREA	NO.	CONCLUSION
IMMEDIATE ACTION TAKEN BY THE REGULATORY BODY	C 1	The IRRS Team considers that ONR has exercised considerable efforts in order to collect information on the circumstances of the Fukushima Dai-ichi accident, to draw conclusions on the lessons learned and to initiate steps in order to enhance nuclear safety in the UK. The IRRS Team recognises that these efforts have led to valuable results and are expected to reach their goals. The IRRS Team notices that ONR did not identify important gaps or noncompliances in the UK nuclear safety regulatory regime.
PLANS FOR UPCOMING ACTIONS TO FURTHER ADDRESS THE REGULATORY IMPLICATIONS OF THE ACCIDENT	C 2	The IRRS Team concludes that the immediate and short term assessment of the implications of the Fukushima Dai-ichi accident have covered all important issues and identified the respective recommendations. Thus no important new task remained to be performed in a longer time frame.
1. RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT	C 3	The IRRS Team considers that the UK Government has an appropriate governmental, legal, and regulatory framework in place to deal with emergencies or accident conditions.
3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	C 4	The IRRS Team considers that ONR, as an independent regulatory body, has the appropriate legal authority and responsibility to take timely regulatory action during in emergency or accident condition.
4. MANAGMENT SYSTEM OF THE REGULATRY BODY	C 5	The IRRS Team considers that the necessary actions related to the management system have been recognised, the regulatory body is committed to act as necessary and the necessary further actions have been initiated.

AREA	NO.	CONCLUSION
5. AUTHORIZATION	C 6	The IRRS Team considers that the existing status of the authorization process is appropriate, however, as the regulatory body participated in the ENSREG stress tests, further actions to improve safety have been initiated in the area of design extension conditions.
6. REVIEW AND ASSESSMENT	C 7	The IRRS Team considers that the existing status of review and assessment is appropriate, nevertheless, the regulatory body plans to improve its Safety Assessment Principles in the area of design extension conditions, including for severe accidents.
7. INSPECTION	C 8	The IRRS Team considers that the existing inspection practice of ONR is appropriate from the point of view of implication of Fukushima Dai-ichi accident.
8. ENFORCEMENT	C 9	The IRRS Team considers that the existing status of ONR enforcement practice is appropriate to cope with the implications of Fukushima Dai-ichi accident.
9. REGULATIONS AND GUIDES	C 10	The IRRS Team considers that the necessary actions to revise regulations and guides have been initiated, while the regulatory body also participated in a “stress test”-type exercise.
10. REGULATIONS AND GUIDES	C 11	The IRRS Team concludes that ONR responded promptly and in accordance with its regulatory authority functions. Appropriate actions have been taken to improve the existing arrangement and to verify the resilience of the EPR arrangements with regard to severe accidents at UK nuclear facilities. Further assessment should be performed to verify effectiveness of the current development and identifying possible additional needs to implement the lessons learned from the TEPCO Fukushima Dai-ichi accident.

AREA	NO.	CONCLUSION
12. SUPERVISION OF NON-NPP FACILITIES AND ACTIVITIES – WASTE MANAGEMENT FACILITIES	C 12	<p>The IRRS Team considers that the existing status is appropriate. The necessary actions have been recognized and included in a plan, which is under implementation and permanent control by the licensee and the ONR. The regulatory body is committed to act as necessary. The actions taken by the regulatory body were exemplary because they decided to extend the test case to all the facilities under their jurisdiction including those that have no nuclear fuel on-site or are not operational.</p>

APPENDIX VIII – ONR REFERENCE MATERIAL USED FOR THE REVIEW

[1]	IRRS Questions and Answers:
	<ul style="list-style-type: none"> - <i>Module 1: Legislative and Governmental Responsibilities</i> - <i>Module 2: Global Nuclear Safety Regime</i> - <i>Module 3: Responsibilities and functions of the Regulatory Body</i> - <i>Module 4: Management System of the Regulatory Body</i> - <i>Module 5: Authorization</i> - <i>Module 6: Review and Assessment</i> - <i>Module 7: Inspection</i> - <i>Module 8: Enforcement</i> - <i>Module 9: Regulations and Guides</i> - <i>Module 10: Emergency Preparedness and Response</i> - <i>Module 11a: Occupational Radiation Protection</i> - <i>Module 11b: Control of Discharge, Materials for Clearance and Chronic Exposures; Environmental Monitoring for Public Radiation Protection</i> - <i>Module 12a: Radiation Sources Applications</i> - <i>Module 12b: Waste Management Facilities</i> - <i>Module 12c: Decommissioning Activities</i> - <i>Module 13: Regulatory Implications of the Tepco Fukushima Dai-Ichi Accident</i>
[2]	General Items
	<ol style="list-style-type: none"> 1. <i>2013 IRRS Mission - General Items - Web links</i> 2. <i>2013 IRRS Mission - Policy Area Write ups - Openness and Transparency.DOC</i> 3. <i>2013 IRRS Mission - Policy Area Write ups - Programme working and ONRs operating model.DOC</i> 4. <i>2013 IRRS Mission - Update - Establishing ONR as an independent public corporation.DOC</i> 5. <i>UK IRRS Report - 2013 Self-Assessment and follow up on 2006 and 2009 findings - Annex A - Output from UK Prep meeting.DOC</i> 6. <i>UK IRRS Report - 2013 Self-Assessment and follow up on 2006 and 2009 findings - Annex B - UK 2013 Self Assessment.DOC</i> 7. <i>UK IRRS Report - 2013 Self-Assessment and follow up on 2006 and 2009 findings - Annex C - Follow up on previous findings.DOC</i> 8. <i>UK IRRS Report - 2013 Self-Assessment and follow up on 2006 and 2009 findings report - 16 July 2013.DOC</i>
[3]	New Build
	2013 Information
	<ol style="list-style-type: none"> 1. <i>2013 IRRS Mission - New Build Module - Web links</i>
	Follow Up From 2006 and 2009 Missions

2. *2013 IRRS Mission - Module 11 - New Build - Close out reports*

[4] Module 1

2013 Information

3. *2013 IRRS Mission - Module 1 Synopsis - UK Nuclear Safety Related Legal Overview*
4. *2013 IRRS Mission - Policy Area Write ups - Establishing ONR as an independent public corporation.DOC*
5. *Dept for Business Enterprise and Regulatory Reform - Regulators Compliance Code.PDF*
6. *Supporting information - Health and Safety at Work Act 1974.PDF*
7. *Supporting information - Statutory instrument 2001 2975 - Emergency Preparedness and Public Information Regs 2001.PDF*
8. *Supporting Information - BERR Regulators Compliance Code.PDF*
9. *Supporting information - Radiation Protection Council Directive 96-29 EURATOM.PDF*
10. *Supporting information - Statutory instrument 1999 3232 The Ionising Radiations Regulations 1999.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 1 - Close out reports*
2. *A1.4 - Supporting documentation - Analysis of Energy Bill 2012-13 - GSR Part 1.DOC A1.4 -*
3. *R1 - S4 - A1.1 - Supporting Information - Board paper - Appeals process.DOC*

Legislation

1. *Health and Safety at Work Act 1974*
2. *Nuclear Installations Act 1965.mht Nuclear Installations Act 1965*
3. *Radiation Protection Council Directive 96-29 EURATOM.PDF*
4. *Statutory instrument 1999 3232 The Ionising Radiations Regulations 1999.PDF*
5. *Supporting information - Statutory instrument 1999 3232 The Ionising Radiations Regulations 1999.PDF*
6. *The Radiation Emergency Preparedness and Public Information Regulations 2001.PDF*

[5] Module 2

2013 Information

1. *2013 IRRS Mission - Module 2 - Web links*
2. *Fifth National Report - Convention on Nuclear Safety.pdf*
3. *Fourth National Report to the Joint Convention.pdf*
4. *NATIONAL REPORT TO THE SECOND EXTRAORDINARY MEETING OF THE CONVENTION ON NUCLEAR SAFETY.pdf*
5. *Radiation Protection Council Directive 96-29 EURATOM.PDF*
6. *The Role of the UK International Nuclear and Radiological Event Scale National Officer.PDF*

7. *The Role of the UK National Coordinators for International Operating Experience Report Systems.PDF*

[6] Module 3

2013 Information

1. *2013 IRRS Mission - Module 3 Synopsis - Regulatory System - Safety at UK Civil Nuclear Sites*
2. *2013 IRRS Mission - Policy Area Write ups - Programme working and ONRs operating model.DOC*
3. *IRRS 2013 - Supporting information - Module 1 - Legal - Health and Safety at Work Act 1974.PDF*
4. *IRRS 2013 - Supporting information - Module 4 - Management System - organogram ONR structure.PDF*
5. *IRRS 2013 - Supporting information - Module 4 - Management System - ONR annual plan 2013 - 2014.PDF*
6. *IRRS 2013 - Supporting information - module 4 - Management System - ONR Board organogram.PDF*
7. *IRRS 2013 - Supporting information module 4 - Management System - copy of ONR strategy.PDF*
8. *IRRS 2013 Supporting Information - Module 3 - Role of the Regulator - BERR Regulators Compliance Code.PDF*
9. *Statutory instrument 1999 3232 The Ionising Radiations Regulations 1999.PDF*

2013 Self-Assessment

1. *2013 IRRS Mission - Module 3 - Operating Model - Self Assessment report*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 3 - Close out reports*
2. *A2.1 - RSG Paper - re Land use Planning.DOC*
3. *A3.3 - ONR OD Database - April 2012.XLS*
4. *A3.3 - ONR Resilience data by discipline.XLS*
5. *A3.3 - ONR Resilience Project presentation - March 2013.PPT*
6. *A3.3 - ONR Resource Strategy - December 2012.DOC*
7. *A3.3 - ONR Workforce Overview.XLS*

[7] Module 4

2013 Information

1. *2013 IRRS Mission - Supporting Evidence - Module 4 - Management Systems - HOW2 Landing Page Structure*
2. *IRRS 2013 - Supporting information - Module 4 - Management System - organogram ONR structure.PDF*
3. *IRRS 2013 - Supporting information - Module 4 - Management System - ONR annual plan 2013 - 2014.PDF*
4. *IRRS 2013 - Supporting information - module 4 - Management System - ONR Board organogram.PDF*
5. *IRRS 2013 - Supporting information module 4 - Management System - copy of ONR strategy.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 4 - Close out reports*
2. *Supporting evidence - R12 - HOW2 Landing page.PDF*
3. *Supporting evidence - RF1 - ONR Annual Plan 2013-14.PDF*
4. *Supporting Evidence - RF1 - ONR Operating Plan - 2013-14.PDF*
5. *Supporting evidence - RF1 - ONR strategy - January 2012.PDF*
6. *Supporting evidence - S12 - A8.4 - HOW2 Landing page.PDF*
7. *Supporting evidence - S13 - HOW2 Landing page.PDF*
8. *Supporting evidence - S14 + A8.5 - HOW2 Business Assurance Audit process.PDF*
9. *Supporting Evidence - SF6 - CPMO Summary of priority and resourcing of ONR Operating Plan 2013-14.DOC*
10. *Supporting evident - RF5 - RF6 - Programme Strategy - Regulatory Policy, Strategy and Assurance.DOC*

[8] Module 5

2013 Information

1. *2013 IRRS Mission - Module 5 - Web links*
2. *IRRS 2013 - Supporting information - module 5 licensing - Licence condition handbook.PDF*
3. *IRRS 2013 - Supporting information Module 5 - Licensing - licensing nuclear installations.PDF*
4. *IRRS 2013 Supporting Information - Module 9 Standards and Guides- Licensing Procedure Public Body Notification.PDF*
5. *Module 9 Standards and Guides - The Delicensing Process for Existing Licensed Nuclear Site.PDF*
6. *Module 9 Standards and Guides- The Processing of Licence Applications for New Nuclear Sites.PDF*
7. *Supporting Evidence - Module 5 - Nuclear Site Licence No 48E - Urenco - Capenhurst Works - November 2012.pdf*
8. *Supporting Evidence - Module 5 - Nuclear Site Licence No 62C - EDF Generation Ltd - Hinkley Point B - November 2012.pdf*
9. *Supporting Evidence - Module 5 - Nuclear Site Licence No 95A - Magnox Ltd - Hinkley Point A Site - October 2012.pdf*
10. *Supporting Evidence - Module 5 - Nuclear Site Licence No 97 - NNB GenCo Ltd - Hinkley Point C - December 2012.pdf*
11. *The Processing of Applications for Replacement Licences for Existing Licensed Nuclear Sites.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 5 - Close out reports*
2. *Supporting documentation - A4.2 - ONR internal guidance on licensing of nuclear installations.PDF*
3. *Supporting Evidence - A4.5.1 - RSG paper - Proposed approach to reviewing standard licence conditions.DOC*
4. *Supporting evidence - A4.4 - A4.5 - Flexible permissioning document re derived powers reference NS-*

2013 Information

1. *2013 IRRS Mission - Module 6 - Web links*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 6 - Close out reports*
2. *2013 IRRS Mission - Supporting documentation to 2006 + 2009 - Module 6 - Web links.DOC*
3. *Safety assessment principles for nuclear facilities.PDF*
4. *Supporting documentation - A5.1 - HOW2 process - Generic Design Assessment - Effective regulation.PPT*
5. *Supporting Evidence - R10 - A5.6 - INS-011 – Incident Notification and Reporting Process - January 2012.DOC*
6. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 01-09 - Common Traits of Major Accidents.DOC*
7. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 02-09 - Biodiesel in Fuel Oil for Diesel Engines.DOC*
8. *Supporting Evidence - R11 - A5.7 - Regulatory Intelligence - OELG Presentation.PPT*
9. *Supporting Evidence - R11 - A5.7 - UK Events reported to IEAE - IRS and FINAS.XLS*
10. *Supporting evidence - A5.1 - New nuclear power stations Generic Design Assessment - Guidance to requestion parties.PDF*
11. *Supporting Evidence - A5.1 - S9 - Task 5 - Advice to Licensees on Regulatory Decisions.VMBX*
12. *Supporting Evidence - A5.8 - A5.9 - HOW2 Process for Nuclear Safety Permissioning.PPT*
13. *Supporting Evidence - R10 - A5.6 - ONR Guidance - Notifying and reporting incidents and Events to ONR.DOC*
14. *Supporting Evidence - R10 - A5.6 - ONR Guidance - ONR Incident Notification Form.DOC*
15. *Supporting Evidence - R10 - A5.6 - ONR Guide - LC7 Incidents on the Site and Other Reporting and OE Processes.DOC*
16. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 01-10 - Chalk River - Lessons for NII and Licensees.DOC*
17. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 01-12 - Contributors to poor plant maintenance.DOC*
18. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 02-12 - Concealed Services - Hidden Problems.DOC*
19. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 03-09 - Regulatory Lessons.DOC*
20. *Supporting Evidence - R10 - A5.6 - ONR OpEx Advice Note - 03-10 - Nimrod - Lessons Learned for Safety Cases.DOC*
21. *Supporting Evidence - R10 - A5.6 - Reacting to Emergent Work - Principles derived from the boiler closure unit.DOC*

22. *Supporting Evidence - R10 - A5.6 - Regulatory Intelligence Sub-Programme - Operating Plan.DOC*
23. *Supporting Evidence - R10 - A5.6 - Regulatory Intelligence Sub-Programme - Operational Experience.DOC*
24. *Supporting Evidence - R10 - A5.6 - Regulatory Intelligence Sub-Programme - Operational Strategy 2012-15.DOC*
25. *Supporting Evidence - R10 - A5.6 - Regulatory Intelligence Sub-Programme - Resource Summary.XLS*
26. *Supporting Evidence - R11 - A5.7 - Guidance ONR Inspection and Use of Licensee SPIs.DOC*
27. *Supporting Evidence - R11 - A5.7 - TAG - Guidance for Inspectors for interaction with Licensees.DOC*
28. *Supporting evidence - S9 - A5.4 - HOW2 Process – Nuclear Safety Permissioning - PAR for release in public domain.PPT*
29. *Supporting evidence - S9 - A5.4 - HOW2 Process – Nuclear Safety Permissioning.PPT*
30. *Supporting Evidence - S9 - Task 5 - Advice to Licensees on Regulatory Decisions.VMBX*
31. *Technical Assessment Guide ns-tast-gd-005 - Guidance on ALARP*

[10] Module 7 + 8

2013 Information

1. *2013 IRRS Mission - Module 7-8 - Web links*
2. *Copy of Sellafield Decommissioning Facilities Inspection Plan.XLS*
3. *Copy of Sellafield Infrastructure Facilities Inspection Plan.XLS*
4. *Copy of Sellafield Spent Fuel Facilities Inspection Plan.XLS*
5. *Copy of Sellafield Waste and Effluent Facilities Inspection Plan.XLS*
6. *Licence Condition 20 Modification to Design of Plant Under Construction.PDF*
7. *Magnox IIS plans 2013-14 for Oldbury and Berkeley version 3 - July 2013.doc*
8. *ONR Inspection and Use of Licensee Safety Performance Indicators.PDF*
9. *ONR Sellafield Programme intervention strategy document.doc*
10. *Technical Information Guide NS-INSP-GD-014 - Licence Condition 14 Safety Documentation.PDF*
11. *Technical Inspection Guide - Licence Condition 22 Modification or Experiment on Existing Plant.PDF*
12. *Technical Inspection Guide - Licence Condition 28 Examination - Inspection - Maintenance and Testing EMIT.PDF*
13. *Technical Inspection Guide - Licence Condition 4 Restrictions on Nuclear Matter on the Site.PDF*
14. *Technical Inspection Guide INSP-GD-007- Licence Condition 7 Incidents on the Site and Other Reporting and OE Processes.PDF*
15. *Technical Inspection Guide NS-INSP-GD-005 - Licence Condition 5 Consignment of Nuclear Matter.PDF*
16. *Technical Inspection Guide NS-INSP-GD-008 - Licence Condition 8 Warning Notices.PDF*
17. *Technical Inspection Guide NS-INSP-GD-009 - Licence Condition 9 Instructions to persons on site.PDF*

18. *Technical Inspection Guide NS-INSP-GD-011 - Licence Condition 11 Emergency Arrangements.PDF*
19. *Technical Inspection Guide NS-INSP-GD-013 Licence Condition 13 - Nuclear Safety Committee.PDF*
20. *Technical Inspection Guide NS-INSP-GD-016 - Licence Condition 16 Site Plans + Designs and Specifications.PDF*
21. *Technical Inspection Guide NS-INSP-GD-018 - Licence Condition 18 Radiological Protection.PDF*
22. *Technical Inspection Guide NS-INSP-GD-020 - Licence Condition 3 Restrictions on Dealing with Site Lease Arrangements.PDF*
23. *Technical Inspection Guide NS-INSP-GD-021 Licence Condition 21 Commissioning.PDF*
24. *Technical Inspection Guide NS-INSP-GD-023 - Licence Condition 23 Operating Rules.PDF*
25. *Technical Inspection Guide NS-INSP-GD-024 - Licence Condition 24 Operating Instructions.PDF*
26. *Technical Inspection Guide NS-INSP-GD-025 - Licence Condition 25 Operational Records.PDF*
27. *Technical Inspection Guide NS-INSP-GD-026 - Licence Condition 26 Control and Supervision of Operations.PDF*
28. *Technical Inspection Guide NS-INSP-GD-027 - Licence Condition 27 Safety Mechanisms - Devices and Circuits.PDF*
29. *Technical Inspection Guide NS-INSP-GD-030 - Licence Condition 30 Periodic Shutdown.PDF*
30. *Technical Inspection Guide NS-INSP-GD-031 - Licence Condition 31 Shutdown of Specified Operations.PDF*
31. *Technical Inspection Guide NS-INSP-GD-032 - Licence Condition 32 Accumulation of Radioactive Wastes*
32. *Technical Inspection Guide NS-INSP-GD-033 - Licence Condition 33 Disposal of Radioactive Waste.PDF*
33. *Technical Licence Condition 34 - Leakage and Escape of Radioactive Material and Radioactive Waste.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Modules 7+8 - Close out reports*
2. *Supporting Evidence - AFI6.5 - Demonstration of Response to Abnormal Events.DOC*
3. *Supporting Evidence - AFI6.9 - Demonstration of Current Site Inspection Training Arrangements.DOC*
4. *Supporting Evidence - A6.10 - Regulatory Intelligence Sub-Programme - Operating Plan.DOC*
5. *Supporting Evidence - A6.10 - Regulatory Intelligence Sub-Programme - Operational Strategy.DOC*
6. *Supporting Evidence - AFI6.1 - Demonstration of the Role of Sampling - 5 April 2013.DOC*
7. *Supporting Evidence - AFI6.2 - HOW2 Technical Inspection Guides home page.PPT*
8. *Supporting Evidence - AFI6.3 - Demonstration of Accessible Safety Cases.DOC*
9. *Supporting Evidence - AFI6.4 - Demonstration of Unannounced Inspections Guidance - 5 April 2013.DOC*
10. *Supporting Evidence - AFI6.4 - A 6.10 - INS-008 - Intervention Planning.PDF*

11. *Supporting Evidence - AFI6.4 - A6.10 - G-INS-008 - Guidance for Intervention Planning.PDF*
12. *Supporting Evidence - AFI6.6 - Demonstration of guidance on the management of regulatory issues.DOC*
13. *Supporting Evidence - AFI6.7 - Demonstration of Enhanced Arrangements .DOC*
14. *Supporting Evidence - AFI6.8 - Guidance on Organisational Aspects and Working Arrangements .DOC*
15. *Supporting Evidence - RF2 Recommendation - Demonstration of Limited Warrant to Full Warrant Process.DOC*
16. *Supporting Evidence - RF3 - Demonstration of Enhanced Arrangements Are Communicated To The Licensee.DOC*
17. *Supporting Evidence - RF4 - Recommendation - CNRP Strategy.DOC Supporting Evidence - RF4 - Recommendation - CNRP Strategy*
18. *Supporting Evidence - RF4 - Recommendation - ONR Prioritisation Framework - 13-14 Operating Plan.XLS*
19. *Supporting Evidence - RF4 - Recommendation - Operating Reactors Sub-Programme Strategy.DOC*
20. *Supporting Evidence - RF6 - RF4 - Summary of prioritisation and resourcing of ONR Operating Plan 13-14.DOC*
21. *Supporting Evidence - SF5 - Guidance on the management of regulatory issues.DOC*

[11] Module 9

2013 Information

1. *2013 IRRS Mission - Module 9 - Web links*
2. *IRRS 2013 Supporting Information - Module 9 Standards and Guides- Licensing Procedure Public Body Notification.PDF*
3. *Module 9 Standards and Guides - Incidence notification and reporting process.PDF*
4. *Module 9 Standards and Guides - ONR Guidance Notifying and Reporting Incidents and Events to ONR.PDF*
5. *Module 9 Standards and Guides - ONR Inspection and Use of Licensee Safety Performance Indicators .PDF*
6. *Module 9 Standards and Guides - The Delicensing Process for Existing Licensed Nuclear Site.PDF*
7. *Module 9 Standards and Guides - The Processing of Applications for Replacement Licences for Existing Licensed Nuclear Sites.PDF*
8. *Module 9 Standards and Guides - The Role of the UK International Nuclear and Radiological Event Scale National Officer.PDF*
9. *Module 9 Standards and Guides- The Processing of Licence Applications for New Nuclear Sites.PDF*
10. *The Role of the UK National Coordinators for International Operating Experience Report Systems.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 9 - Close out reports*
2. *2013 IRRS Mission - Supporting documentation to 2006 + 2009 - Module 9 web links.DOC*

3. *Supporting Evidence - A7.3 - AST-004 - Risk and Issues Management in ONR - Issue 4.PDF*
4. *Supporting Evidence - A7.3 - IMT-017 - Using TRIM in Nuclear Directorate - Business Rules - Issue 1.DOC*
5. *Supporting Evidence - A7.4 - TAGs front sheet on HOW2.PPT*
6. *Supporting Evidence - A7.5 - T-INS-22 - LC22 - Modificaiton or Experiment on Existing Plant.DOC*
7. *Supporting evidence - A7.6 - Updated T-INS-007 - LC7 Reporting Incidents on the Site.PDF*

[12] Module 10

2013 Information

1. *2013 IRRS Mission - Module 10 - Web links*
2. *2013 IRRS Mission - Module 10 Synopsis - Emergency Preparedness at a UK Nuclear Installation.DOC*
3. *Module 9 Standards and Guides - Incidence notification and reporting process.PDF*
4. *ONR Guidance Notifying and Reporting Incidents and Events to ONR.PDF*
5. *Statutory instrument 2001 2975 The Radiation Emergency Preparedness and Public Information Regulations 2001.PDF*
6. *The Role of the UK International Nuclear and Radiological Event Scale National Officer.PDF*
7. *The Role of the UK National Coordinators for International Operating Experience Report Systems.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 10 - Close out reports*
2. *2013 IRRS Mission - Supporting documentation to 2006 + 2009 - Module 10 web links.DOC*
3. *Supporting Evidence - A9.16 + RF7 - RCIS GTA Aide Support Guidance.DOC*
4. *Supporting Evidence - A9.19 - Model of Engagement between ONR - REFIT and BEU when ONR use the RCIS.DOC*
5. *Supporting Evidence - A9.7 - HSE Enforcement Management Model.PDF*
6. *Supporting Evidence - RF8 + SF10 + SF13 and A9.8 - TAG82 - Draft Tech Assessment of REPPIR Submission.DOC*
7. *Supporting Evidence - A9.1 - T-INS-011 - LC11 - Emergency Arrangements.DOC*
8. *Supporting Evidence - A9.10 - Communications Officer Guidance.DOC*
9. *Supporting Evidence - A9.10 - Communications Plan 2012-2013.DOC*
10. *Supporting Evidence - A9.10 - Task Group 2 - Communications function in exercises - Terms of reference.DOC*
11. *Supporting Evidence - A9.13 - ONR Emergency Evaluation Training - Emergency Exercises and ONRs Role.PPT*
12. *Supporting Evidence - A9.13 - ONR Emergency Evaluation Training - Guidance on Evaluation.PPT*
13. *Supporting Evidence - A9.13 - ONR Emergency Evaluation Training - Site Inspector Feedback.PPT*
14. *Supporting Evidence - A9.13 - ONR Emergency Evaluation Training - What is a good scenario.PPT*
15. *Supporting Evidence - A9.13 - ONR Training - Emergency Evaluation Training - Joining*

Instructions.DOC

16. *Supporting Evidence - A9.13 + A9.15 - Strategy for ONR Regulation of Emergency Preparedness and Response.DOC*
17. *Supporting Evidence - A9.14 - Supporting Information - EPR Scope Document.DOC*
18. *Supporting Evidence - A9.15 - 2013 Emergency Exercises - Roles and Responsibilities.XLS*
19. *Supporting Evidence - A9.15 - 2013 Emergency Exercises at Civil or MOD sites - Team sheet template.DOC*
20. *Supporting Evidence - A9.16 + R7 - RCIS Deputy Director Guidance.DOC*
21. *Supporting Evidence - A9.16 + RF7 - RCIS Director Guidance - January 2013.DOC*
22. *Supporting Evidence - A9.16 + RF7 - RCIS Inspector 1 Guidance.DOC*
23. *Supporting Evidence - A9.16 + RF7 - RCIS Inspector 2 Guidance.DOC*
24. *Supporting Evidence - A9.16 + RF7 - Telecomms Officer Guidance.DOC*
25. *Supporting Evidence - A9.16 + RF7 + A9.13 - CESC Inspector Guidance.DOC*
26. *Supporting Evidence - A9.16 + RF7 + A9.13 - RCIS CNS Inspector Guidance.DOC*
27. *Supporting Evidence - A9.16 + RF7 + A9.13 - RCIS Health Physicist Guidance.DOC*
28. *Supporting Evidence - A9.16 + RF7 + A9.13 - Rolling Brief Officer Guidance.DOC*
29. *Supporting Evidence - A9.16 + RF7 + A9.13- Telecomms Officer Guidance.DOC*
30. *Supporting Evidence - A9.17 - ONR Business Continuity Plan.DOC*
31. *Supporting Evidence - A9.18 - BSS-HRM-030 - ONR Training and development framework*
32. *Supporting Evidence - A9.19 + A9.19.1 - Checklist for Testing of Equipment in the RCIS.DOC*
33. *Supporting Evidence - A9.19 + A9.19.1 - RCIS Business Support Rota duties - 2013-14.DOC*
34. *Supporting Evidence - A9.4 - Radioactive Materials Transport Programme Guidance.DOC*
35. *Supporting Evidence - A9.4 - RSG paper - Proposal for Major Changes to ONRs Emergency Arrangements.DOC*
36. *Supporting Evidence - A9.5 + A9.6 - INES Event Rating Form.DOC*
37. *Supporting Evidence - A9.5 + A9.6 - Review of Events notified to ONR - Licensee or Operator form.DOC*
38. *Supporting Evidence - A9.5 + A9.6 - UKINO and RIMNET flowchart - Version 2.PNG*
39. *Supporting Evidence - A9.7 - HOW2 - Licence Instruments process.PPT*
40. *Supporting Evidence - RF7 - ONR Command and Control training course data.VMBX*
41. *Supporting Evidence - RF7 - ONR Command and Control training course for Business Support.PPT*
42. *Supporting Evidence - RF8 + SF10 + SF13 and A9.8 - HOW2 - REPPIR Assessment and DEPZ.PPT*
43. *Supporting Evidence - S9 - ONR RSG Paper - Proposal for major changes to ONR s Emergency Response Arrangements.DOC*
44. *Supporting Evidence - S9 - Typical Duty Roster for Emergency Response.DOC*

45. *Supporting Evidence - SF11 - eMail Confirmation of DECC lead for international notification.VMBX*
46. *Supporting Evidence - SF11 - eMail re DECC lead for international notification.VMBX*
47. *Supporting Evidence - SF12 - eMail re PHE review of its ERLs inc wider radiation preparedness.VMBX*
48. *Supporting Information - A9.9 - HOW2 Process - Assessment of REPPIR dose levels for intervention personnel.PPT*

[13] Module 11a + b, 12 a-c

2013 Information

1. *2013 IRRS Mission - Radiation Protection Module - Web links*
2. *2013 IRRS Mission - Radiation Protection Synopsis - Protection and Safety Optimisation.DOC*
3. *Radiation Protection Council Directive 96-29 EURATOM.PDF*
4. *Statutory Instrument 1999 3232 The Ionising Radiations Regulations 1999.PDF*
5. *Statutory instrument 2001 2975 The Radiation Emergency Preparedness and Public Information Regulations 2001.PDF*
6. *Technical Inspection Guide NS-INSP-GD-018 - Licence Condition 18 Radiological Protection.PDF*
7. *Technical Inspection Guide NS-INSP-GD-053 - Criticality Safety.PDF*
8. *The Regulation of Conventional Health and Safety on UK Nuclear Sites.PDF*

2013 Self-Assessment

1. *2013 IRRS Mission - Radiation Protection Module - Self Assessment report*
2. *Support - Requirements for approval of dosimetry services under the IRR 1999.PDF*
3. *Support – Air-fed suits in nuclear decommissioning.PDF*
4. *Support – Change room design operation and maintenance - code of practice.PDF*
5. *Support - FIT testing of Respiratory Protective Equipment.PDF*
6. *Support - Guide to Radiation - Emergency Preparedness and Public Info Regs 2001.PDF*
7. *Support - Health and Safety at Work Act 1974.PDF*
8. *Support - HSE Info sheet - Industrial Radiography - Managing radiation risks.PDF*
9. *Support - Management of health and safety at work Regulations 1999.PDF*
10. *Support - Personal Protective Equipment 2002.PDF*
11. *Support - Respiratory protective equipment at work A practical guide.PDF*
12. *Support - Safety Reps - Safety Committee Regulations 1977.PDF*
13. *Support - Statutory instrument 1999 3232 The IRR99.PDF*
14. *Support - Statutory instrument 2001 - Radiation Emergency Preparedness and Public Information Regs.PDF*
15. *Support - The Health and Safety - Safety Signs and Signals - Regulations 1996.PDF*
16. *Support - The Management of Health-Safety at Work Regulations 1999.PDF Support - The Nuclear*

Installations Act 1965.PDF

17. Support - The Personal Protective Equipment at Work Regulations 1992.PDF

[14] Module 11b

2013 Information

1. 2013 IRRS Mission - Waste Management and Decommissioning module - Supporting documentation web links

2013 Self-Assessment

- 1. 2013 IRRS Mission - Waste Management and Decommissioning Module - Self Assessment report*
- 2. IRRS 2013 - Licensing nuclear installations.PDF*
- 3. IRRS 2013 - Licence condition handbook.PDF*
- 4. IRRS 2013 - ONR annual plan 2013 - 2014.PDF*
- 5. IRRS 2013 - ONR Board organogram.PDF*
- 6. IRRS 2013 - ONR strategy.PDF*
- 7. IRRS 2013 - Organogram ONR structure.PDF*
- 8. IRRS 2013 - QID 15 - SA Supporting information - Licence Condition 14 Safety Documentation.PDF*
- 9. IRRS 2013 - QID 15 - SA Supporting information - Licence Condition 21 Commissioning.PDF*
- 10. IRRS 2013 - QID 15 - SA Supporting information- Licence Condition 23 Operating Rules.PDF*
- 11. IRRS 2013 - QID 2 - Radiation Protection Council Directive 96-29 EURATOM.PDF*
- 12. IRRS 2013 - QID 2 - Radioactive Substances Act 1993.PDF*
- 13. IRRS 2013 - QID 3 - The Environmental Permitting Regulations 2011.PDF*
- 14. IRRS 2013 - QID 34 - SA Supporting information - License Condition 17 - Management systems .PDF*
- 15. IRRS 2013 - QID 5 - Guidance on scope re radioactive substances legislation.PDF*
- 16. IRRS 2013 - QID 5 - Justification Decision re Generation of Electricity.PDF*
- 17. IRRS 2013 - QID 5 - SA Supporting information - Licence condition handbook.PDF*
- 18. IRRS 2013 - QID 5 - SA Supporting information - License Condition 23 - Operating Rules.PDF*
- 19. IRRS 2013 - QID 6 - SA Supporting information - Overview and glossary.PDF*
- 20. IRRS 2013 - QID 6 - SA Supporting information - Pt 3a Waste Minimisation.PDF*
- 21. IRRS 2013 - QID 6 - SA Supporting information - Regulatory Process.PDF*
- 22. IRRS 2013 - QID 6 - SA Supporting information - Storage of Radioactive Waste.PDF*
- 23. IRRS 2013 - QID 6 - SA Supporting information - Technical Assessment Guide 005 - re ALARP.PDF*
- 24. IRRS 2013 - SQID 33.1 - SA supporting Information - License Condition 15 - Periodic Review .PDF*
- 25. Managing Radwaste Safely - Framework for Implementing Geological Disposal.PDF*
- 26. MRWS Implementing Geological Disposal 3rd Annual report.PDF*
- 27. Policy for the Long Term Management of Solid Low level Radaste in the UK.PDF*

28. *QI6 6 Support - RWM Part 2 Radioactive waste management cases.PDF*
29. *QID 15 Support - Licence Condition 16 Site Plans - Designs - Specifications.PDF*
30. *QID 15 Support - Licence Condition 16 Site Plans - Designs and Specifications.PDF*
31. *QID 15 Support - Licence Condition 20 Mod to Design of Plant Under Construction*
32. *QID 15 Support - Licence Condition 22 Mod or Experiment on Existing Plant.PDF*
33. *QID 15 Support - Licence Condition 28 Maintenance and Testing EMIT.PDF*
34. *QID 17 Support - Licence Condition 14 - Safety Documentation.PDF*
35. *QID 31 Support - Licence Condition 4 - Restrictions on Nuclear Matter on the Site.PDF*
36. *QID 33 Support - Safety Assessment Principles for Nuclear Plants.PDF*
37. *QID 6 Support - Review of processes contributing to radwastes in the UK.PDF*
38. *QID 6 Support - RWM Part 3d Managing info relating to Radwaste.PDF*
39. *QID 6 Support - Conditioning and disposability.PDF*
40. *QID 6 Support - Fundamentals of the management of Radioactive Waste.PDF*
41. *QID 6 Support - Overview and glossary.PDF*
42. *QID 6 Support - Review of processes contributing to Radwaste in the UK.PDF*
43. *QID 6 Support - RWM Part 2 Radwaste management cases.PDF*
44. *QID 6 Support - RWM Part 3a Waste Minimisation etc.PDF*
45. *QID 6 Support - RWM Pt1 The Regulatory Process.PDF*
46. *QID 6 Support - Storage of Radioactive Waste.PDF QID 6 Support - Storage of Radioactive Waste*
47. *QID V1 - SA Supporting - 2010 UK Radioactive Waste Inventory Main Report.PDF*
48. *QID V1 - SA Supporting - 2010 UK Radioactive Waste Inventory Summary of the 2010 Inventory.PDF*
49. *QID V1 - SA Supporting - Joint Convention re spent fuel management.PDF*
50. *Scotland s Higher Activity Radioactive Waste Policy 2011.PDF*
51. *SQID 23.1 Support - Licence Condition 11 - Emergency Arrangements.PDF*
52. *SQID 23.2 Support - License Condition 19 - Construction of installation of new plant.PDF*
53. *Statement re IAEA dissemination of Managing Radwaste Safety White Paper.VMBX*
54. *Support - Assessment of Prospective Public Doses re Authorised Discharges.PDF*
55. *Support - Guidance on ALARP.PDF*
56. *Support - Incidence notification and reporting process.PDF*
57. *Support - Licensing Procedure Public Body Notification.PDF*
58. *Support - ONR Guidance Notifying and Reporting Incidents and Events to ONR.PDF*
59. *Support - ONR Inspection and Use of Licensee Safety Performance Indicators .PDF*
60. *Support - Processing Applications for Replacement Licences - Existing Licensed Nuclear Sites.PDF*
61. *Support - Role of UK International Nuclear Radiological Event Scale National Officer*

62. *Support - Safety assessment principles for nuclear facilities.PDF*
63. *Support - The Processing of Licence Applications for New Nuclear Sites.PDF*
64. *Support SQID 13.1 - License Condition 19 - Construction of installation of new plant.PDF*
65. *Support -The Delicensing Process for Existing Licensed Nuclear Site.PDF*
66. *Supporting Documentation web links.DOC*
67. *Supporting info - QID 6 - Conditioning and disposability.PDF*
68. *Supporting info - QID 6 - Fundamentals of the management of Radioactive Waste.PDF*
69. *Supporting info - QID 6 - National Occupational Standards Development Research Report 2008.PDF*
70. *Supporting info - QID 6 - RWM Part 3d Managing info - records relating to radioactive waste.PDF*
71. *The 2010 UK Radwaste Inventory - summary of information for international reporting.PDF*

Follow Up From 2006 and 2009 Missions

1. *2013 IRRS Mission - Module 11 - RadWaste Mgmt - Close out reports*
2. *Support to A11.2 - Plan on a Page.PDF*
3. *Support to A11.5 - Decomm Training.DOC*
4. *Support to A11.5 - RadWaste Training.DOC*
5. *Supporting Evidence - A11.2 - SAPs.PDF*
6. *Supporting Evidence - A11.3 - TAG 005 Guide_ALARP.DOC*
7. *Supporting Evidence - A11.3 + A11.6 - TAG 026 - Decommissioning.DOC*
8. *Supporting Evidence - A11.4 - MoU NDA_HSE.PDF*

[15] Module 12a, b, c

2013 Information

1. *2013 IRRS Mission - Safety and Security of Radioactive Sources Module - Web links*
2. *Radiation Sources - SI 2005 no. 2686 Atomic Energy and Radioactive Substances.*

2013 Self-Assessment

1. *2013 IRRS Mission - Radioactive Sources Module - Self Assessment report*
2. *Guidance Related to Radioactive Sources.doc*
3. *Support - Council Regulation EURATOM No 1493 - 93 - Shipments of rad substances.PDF*
4. *Support - Health-Safety - Consultation with Employees Regs 1996.PDF*
5. *Support - Industrial Radiography - Managing Radiation Risks.PDF*
6. *Support - Managing RadWaste Safely A Framework for Implementing Geological Disposal.PDF*
7. *Support - Market Standards Accreditation of Services - Accreditation Regulations 2009.PDF*
8. *Support - Requirement for Approval of Dosimetry Services - IRR 99 - External radiations.PDF*
9. *Support - Safety Assessment Principles for Nuclear Facilities - 2006 Edition.PDF*
10. *Support - The Air Navigation Order 2009.PDF*

11. *Support - The Children and Young Persons Act 1933.PDF*
12. *Support - The Employment Protection Consolidation Act 1978.PDF*
13. *Support - The Environmental Permitting England-Wales Regs 2010.PDF*
14. *Support - NPL Guide 29 - examination testing-calibration of installed rad prot instruments.PDF*

[16] Module 13

2013 Information

1. *2013 IRRS Mission - Fukushima Module - Web links*
2. *Generic Design Assessment Progress Report - Reporting period 1 April 2012 to 30 June 2012.PDF*
3. *Generic Design Assessment Progress Report - Reporting period 1 Jan 2012 to 31 March 2012.PDF*
4. *Generic Design Assessment Progress Report - Reporting period 1 July 2012 to 30 Sept 2012.PDF*
5. *Guidance on the management of GDA outcomes.PDF Guidance on the management of GDA outcomes*

2013 Self-Assessment

1. *2013 IRRS Mission - Fukushima Module - Self Assessment report*
2. *BERR - Regulators Compliance Code.PDF*
3. *Civil Contingencies Act 2004.pdf*
4. *Council Directive 2009_71_Euratom.pdf*
5. *Health and Safety at Work Act 1974.PDF*
6. *INS007 Revision 2 - Site Annual Review Meetings - April 2013.DOC*
7. *ONR Business Assurance Governance Presentation - May 2012.PPT*
8. *ONR Regulatory Policy Strategy and Assurance programme strategy.DOC*
9. *PMO Prioritisation and resourcing of Operating Plan.doc*
10. *Radiation Emergency Preparedness and Public Information Regulations 2001.PDF*
11. *Statutory instrument 1999 3232 - Ionising Radiations Regulations 1999.PDF*
12. *TAST003 - Issue 6 - Safety Systems.pdf*
13. *TAST013 - Issue 4 - External Hazards.PDF The Nuclear Installations Act 1965.PDF*

APPENDIX IX – IAEA REFERENCE MATERIAL USED FOR THE REVIEW

1. **IAEA SAFETY STANDARDS SERIES No. SF-1** - Fundamental Safety Principles
2. **IAEA SAFETY STANDARDS SERIES No. GSR PART 1** - Governmental, Legal and Regulatory Framework for Safety
3. **IAEA SAFETY STANDARDS SERIES No. GS-R-2** - Preparedness and Response for a Nuclear or Radiological Emergency
4. **IAEA SAFETY STANDARDS SERIES No. GS-R-3** - The Management System for Facilities and Activities
5. **IAEA SAFETY STANDARDS SERIES No. NS-R-1** – Safety of Nuclear Power Plants: Design
6. **IAEA SAFETY STANDARDS SERIES No. NS-R-2** – Safety of Nuclear Power Plants: Operation
7. **IAEA SAFETY STANDARDS SERIES No. NS-R-4** - Safety of Research Reactors
8. **IAEA SAFETY STANDARDS SERIES No. GS-G-1.1** - Organization and Staffing of the Regulatory Body for Nuclear Facilities
9. **IAEA SAFETY STANDARDS SERIES No. GS-G-1.2** - Review and Assessment of Nuclear Facilities by the Regulatory Body
10. **IAEA SAFETY STANDARDS SERIES No. GS-G-1.3** - Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body
11. **IAEA SAFETY STANDARDS SERIES No. GS-G-1.4** - Documentation for Use in Regulatory Nuclear Facilities
12. **IAEA SAFETY STANDARDS SERIES No. GS-G-2.1** - Arrangements for Preparedness for a Nuclear or Radiological Emergency
13. **IAEA SAFETY STANDARDS SERIES No. GS-G-3.1** - Application of the Management System for Facilities and Activities
14. **IAEA SAFETY STANDARDS SERIES No. GS-G-3.2** - The Management System for Technical Services in Radiation Safety
15. **IAEA SAFETY STANDARDS SERIES No. RS-G-1.3** - Assessment of Occupational Exposure Due to External Sources of Radiation
16. **IAEA SAFETY STANDARDS SERIES No. RS-G-1.4** - Building Competence in Radiation Protection and the Safe Use of Radiation Sources
17. **IAEA SAFETY STANDARDS SERIES No. RS-G-1.8** – Environmental and Source Monitoring for purposes of Radiation Protection
18. **IAEA SAFETY STANDARDS SERIES No. NS-G-2.10** - Periodic Safety Review of Nuclear Power Plants Safety Guide

19. **IAEA SAFETY STANDARDS SERIES No. NS-G-211** - A System for the Feedback of Experience from Events in Nuclear Installations Safety Guide
20. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Convention on Early Notification of a Nuclear Accident (1986) and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1987), Legal Series No. 14, Vienna (1987).
21. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Generic Assessment Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA, Vienna (1997).

APPENDIX X – ORGANIZATIONAL CHART



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ONR Structure

