



**Office for
Nuclear Regulation**

**Determination of the Off-Site Emergency Planning and Prior
Information Areas for the Imperial College of Science, Technology
and Medicine's Consort Nuclear Licensed Site**

**Radiation (Emergency Preparedness and Public Information)
Regulations 2001**

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EXECUTIVE SUMMARY

Determination of the Off-Site Emergency Planning and Prior Information Areas for the Imperial College of Science, Technology and Medicine's Consort Nuclear Licensed Site: Radiation (Emergency Preparedness and Public Information) Regulations (REPPIR) 2001

The Office for Nuclear Regulation (ONR) is responsible for regulating Great Britain's (GB) nuclear industry in order to protect the health and safety of employees and the public against risks of harm arising from ionising radiations.

ONR's responsibilities also include a legal duty under REPPIR. Where, based on the operator's assessment, ONR concludes that there is a potential for reasonably foreseeable radiation emergencies, as defined in the regulations then ONR determines an off-site emergency planning area (i.e. the area within which, in ONR's opinion, any member of the public is likely to be affected by such radiation emergencies). In these cases, ONR also has a legal duty to determine an area within which prior information is to be distributed to the public. A radiation emergency is defined in REPPIR as an event where a person off-site is likely to receive a radiation dose in excess of the thresholds in REPPIR (typically an effective dose in excess of 5 mSv) in the 12 months following the radiation emergency. It therefore constitutes an important component of the UK's overall emergency response framework.

REPPIR requires operators, in this case Imperial College of Science, Technology and Medicine (hereafter Imperial College), who carry out work involving quantities of radioactive materials at or beyond those specified by REPPIR to undertake a Hazard Identification and Risk Evaluation (HIRE) in relation to their work with ionising radiations. The HIRE assessment must identify all hazards with the potential to cause a radiation accident, and evaluate the nature and magnitude of the risks to employees and other persons (e.g. those who live or work nearby). Where radiation risks to the above persons exist from an identifiable radiation accident, the operator shall then take all reasonably practicable steps to prevent any such accident and limit the consequences of any which does occur. A report of this assessment known as a Report of Assessment (RoA) must be sent to ONR either prior to commencement of the work with ionising radiation, following any relevant material change in this work, or within three years of the last assessment, whichever is the shorter.

The previous determination undertaken by ONR of the Imperial College submissions made under REPPIR concluded that a radiation emergency was not reasonably foreseeable and that, consequently, there was no basis for ONR to determine the REPPIR off-site emergency planning and prior information areas around the Consort Nuclear Licensed Site. In 2015, Imperial College submitted a RoA to fulfil the requirements of REPPIR regulation 5(2).

This ONR Project Assessment Report describes and explains the basis for its re-determination, in accordance with REPPIR, of the requirement for both an off-site emergency planning area and the area within which prior information is to be distributed around the Consort Nuclear Licensed Site. ONR has made an assessment of Imperial College's RoA and supporting information in accordance with its regulatory processes, guidance associated with REPPIR and relevant ONR technical assessment guides. ONR's assessment of Imperial College's technical submission supports Imperial College's conclusion that a radiation emergency from the Consort Nuclear Licensed Site is not reasonably foreseeable. Consequently, regulations 7(1), 9(1) and 16(1) of REPPIR, which relate to operator emergency plans, off-site emergency plans and the consequent need for ONR to specify planning and prior information areas, do not apply.

Accordingly, ONR will notify the Local Authority, in this case Royal Borough of Windsor and Maidenhead, and Imperial College of its decision that there continues to be no requirement under REPPIR for off-site emergency planning or prior information areas for the Consort Nuclear Licensed Site.

The recommendations of this report are that ONR:

- Write to the Royal Borough of Windsor and Maidenhead to notify them that there continues to be no requirement for a REPPiR off-site emergency planning area for the Consort Nuclear Licensed Site. This should be copied to Imperial College.
- Write to the Royal Borough of Windsor and Maidenhead to notify them that there remains no requirement under REPPiR for the local authority to prepare an off-site emergency plan in respect of the Consort Nuclear Licensed Site.
- Inform Imperial College that there continues to be no requirement to ensure the appropriate provision of prior information to the public is no longer required under REPPiR. This should be copied to the Royal Borough of Windsor and Maidenhead.
- Inform Imperial College that there continues to be no requirement under REPPiR for an operator's emergency plan.
- Inform, by copy of its letter to the Royal Borough of Windsor and Maidenhead, the Food Standards Agency, Environment Agency and Department of Business, Energy and Industrial Strategy of ONR's decision.

Whilst there remains no requirement for detailed emergency planning under REPPiR in relation to Imperial College, proportionate emergency arrangements for the protection of the public remain in the form of:

- operators have general duties under the Health and Safety at Work Act 1974 to ensure, so far as is reasonably practicable, the safety and welfare of employees and other persons;
- under the provisions of REPPiR, regulation 4(2), operators have a general duty to take all reasonably practicable steps to prevent an identifiable radiation accident and to limit the consequences of any such accident that does occur; and
- operators who hold a nuclear site licence are required, without prejudice to other licence conditions, under LC 11 (emergency arrangements) to make and implement adequate arrangements for dealing with any accident or emergency arising on the site and their effects; and
- to prepare necessary contingency plans as required by regulation 12 of the Ionising Radiations Regulations 1999.

These other duties are not directly affected by ONR's determination, and, where ONR is the enforcing authority, ONR will continue to seek assurance that Imperial College remains compliant with these legal obligations, including any such provision and co-ordination of adequate off site emergency arrangements as these other duties may require.

LIST OF ABBREVIATIONS

CCA	Civil Contingencies Act (2004)
DEPZ	Detailed Emergency Planning Zone (Ref: REPPPIR regulation 9(1))
EURATOM	European Atomic Energy Community
FEPA	Food and Environment Protection Act 1985
FSA	Food Standards Agency
GB	Great Britain
HIRE	Hazard Identification and Risk Evaluation
IAEA	International Atomic Energy Agency
mSv	milliSievert
NIA	Nuclear Installations Act 1965
ONR	Office for Nuclear Regulation
PAR	Project Assessment Report
RA	Reference Accident
REPPPIR	Radiation (Emergency Preparedness and Public Information) Regulations 2001
RoA	Report of Assessment
SAPs	(ONR) Safety Assessment Principles
TAG	(ONR) Technical Assessment Guide

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1 REGULATORY CONTEXT

The UK Energy Act (reference 1) requires the Office for Nuclear Regulation (ONR) to do whatever it considers appropriate for the purposes of protecting persons against risks of harm arising from ionising radiations from GB nuclear sites, including through:

- securing the health, safety and welfare of persons at work on GB nuclear sites; and
- protecting persons, other than persons at work on GB nuclear sites, against risks to health or safety arising out of or in connection with the activities of persons at work on GB nuclear sites.

ONR does this by providing efficient and effective regulation of the nuclear industry, holding it to account on behalf of the public, and, in particular, ensuring that appropriate arrangements are put in place to deal with a nuclear emergency.

ONR's responsibilities include a legal duty, where it is concluded that there is a potential for a reasonably foreseeable radiation emergency (as defined in REPPiR) (reference 2) to determine an off-site emergency planning area. This is the area within which, in ONR's opinion, any member of the public is likely to be affected by such an emergencyⁱ. In these cases, there is also a legal duty under the same regulations, for ONR to determine an area within which prior information is to be distributed to the publicⁱⁱ. A radiation emergency is defined in REPPiR as an event where a person off-site is likely to receive a radiation dose in excess of the thresholds in REPPiR (typically an effective dose in excess of 5 milliSieverts (mSv)) in the 12 months following the radiation emergency. It therefore constitutes an important component of the UK's overall emergency response framework.

This report sets out ONR's assessment and regulatory decision for the continued basis that there is no requirement for off-site emergency planning and prior information areas for the Imperial College Consort Nuclear Licensed Site, in accordance with the requirements of REPPiR regulations 9(1) and 16(1) respectively (reference 2).

2 BACKGROUND

The UK nuclear regulatory system requires that every licensee (i.e. nuclear site license holder) demonstrate to the regulator that it fully understands the hazards and risks associated with its operations and controls them appropriately. The regulator (in this case ONR) assesses the safety and security of the design and operation of nuclear plant to ensure that licensees' provisions are robust, and that any risks are reduced so far as is reasonably practicable.

In relation to emergency planning, REPPiR requires operators, in this case Imperial College, to undertake a Hazard Identification and Risk Evaluation (HIRE) of all hazards arising from their work with the potential to cause a radiation accident on their site. These assessments shall be sufficient to demonstrate that all such hazards have been identified and the nature and magnitude of the risks to employees and other persons arising from those hazards have been evaluated. Where the assessment shows that a risk exists from an identifiable radiation accident, the operator shall take all reasonably practicable steps to prevent any such accident and limit the consequences of any such accident which does occur. REPPiR also requires that operators submit a Report of the Assessment (RoA) of their HIRE to ONR prior to commencement of work, following any material change, and at least every three years, whichever is the shorter.

ⁱ ONR has historically used the term detailed emergency planning zone (DEPZ) to refer to the area it defined under REPPiR regulation 9 as requiring an off-site emergency plan. (The term is still used this way in some ONR guidance.) As the term is not used within REPPiR itself (although referred to in the related guidance), and to ensure legal clarity and avoid misunderstanding amongst stakeholders, this report refers to the 'REPPiR off-site emergency planning area' under regulation 9 rather than to 'detailed emergency planning zone' or 'DEPZ'.

ⁱⁱ This is sometimes, and has historically been, referred to as the Public Information Zone (PIZ) under regulation 16, but for the same reason as given above is not used in this report. This report refers to the 'REPPiR prior information area'.

Where, based on the operator's technical assessments, ONR concludes that it is reasonably foreseeable that a radiation emergency (as defined in REPPIR) could arise, REPPIR requires ONR to determine areas within which, in its opinion, persons (including any member of the public) are likely to be affected by such emergencies. This then defines the area for which local authorities are required to prepare an adequate off site emergency plan (regulation 9(1)) and for which operators are required to provide specified prior information (regulation 16(1)) to members of the public without them having to request it and also make that information publicly available.

ONR is of the opinion that the extent of areas for local authority detailed off-site planning and for the provision of prior information by the operator to the public should usually be the same. This is a reflection of the fact that the factors considered by ONR, over and above the operator's technical assessment, for determination of these areas are the same. As a consequence, and for simplicity, where the term 'REPPIR off-site emergency planning area' is used in this report, it should be assumed to refer equally to the off-site emergency planning and prior information areas.

The off-site emergency plan, in cases where one is required, should include urgent countermeasures in order to reduce radiation doses to members of the public, such as sheltering, evacuation, administering stable iodine tablets (in the case of operating nuclear reactors), and other protection measures that are relevant, reasonably practicable, and proportionate to the radiological risk.

The previous RoA, submitted in 2012, was based upon the Consort Reactor remaining operational. The Report of Assessment for these operations concluded that there were no reasonably foreseeable radiation emergencies associated with Consort's operation and hence an off-site emergency plan was not required (reference 3).

In October 2015, Imperial College submitted an RoA (reference 4) to fulfil the requirements of REPPIR regulation 5(2) which reflected the status of the Consort Reactor at that time.

3 SCOPE

The assessment described in this report sets out the basis for, and conclusions of, the re-determination of the REPPIR off-site emergency planning and prior information area relating to the Consort Nuclear Licensed Site. This has been undertaken in accordance with the guidance on REPPIR (reference 5) and the relevant ONR supporting Technical Assessment Guide (TAG) (reference 6), which incorporates ONR's principles for determination of REPPIR areas, and related guidance, as revised in 2013.

ONR's principles recognise the learning that has emerged from global events such as occurred at Fukushima (reference 7), and the subsequent need to review the scope of off-site emergency planning. They also reflect ONR's commitment to maintaining high standards of nuclear safety by regulation at nuclear installations, and its continual efforts to seek improvements to standards and to the consistency and transparency of its decision making.

Provisions for the implementation of food restrictions are not relevant to the process of determining the REPPIR off-site emergency planning area on the basis that they are provided separately (Food and Environment Protection Act 1985 (FEPA) (reference 8) and are under the legal jurisdiction of the Food Standards Agency (FSA). These provisions are therefore addressed by separate legislation other than REPPIR, may be exercised in a broader range of circumstances (i.e. not restricted to a radiological event), and are subject to existing planned implementation arrangements made by the FSA. They are therefore out with the scope of this report.

4 METHODOLOGY

4.1 THE ONR PROCESS FOR DETERMINING A REPPIR OFF-SITE EMERGENCY PLANNING AREA

This process requires that ONR:

- A. Conduct an initial independent technical assessment of the information provided by the licensee in their RoA seeking and using additional information as appropriate; and
- B. Where the potential for a REPPIR defined reasonably foreseeable radiation emergency exists, establish and consider any other relevant practical and strategic factors relating to the planning and practical implementation of measures to restrict public exposure so far as reasonably practicable (e.g. urgent countermeasures) for those persons who are likely to be affected by a radiation emergency.

Step A requires ONR to assess the operator's identification and characterisation of the likelihood, nature and magnitude of the radiation related risks that may result from a radiation accident. ONR also assess the operator's assessment of whether there is the potential for a radiation emergency to occur that is reasonably foreseeable. If this potential exists ONR will then consider the likely extent of any area within which the dose criteria contained within Schedule 1 of REPPIR may be met or exceeded. This indicates the minimum distance for further consideration in Step B, and is usually presented in the operator's report of assessment as a circle with a specified radius centred at the source of the potential accident.

Step B applies additional pragmatic, population (including vulnerable groups), geographic and practical factors to the ONR determination and requires dialogue with the relevant local authority. The nature of these factors is set out in detail in the relevant ONR TAG (reference 6). Whilst the determined REPPIR off-site emergency planning area, as a result of considering these additional factors, need not be circular, it cannot be smaller than that arising from the technical assessment under Step A.

4.2 BASIS OF ASSESSMENT

The REPPIR off-site emergency planning area must, as a minimum, include all of the area around the site within which any person could receive an effective dose in excess of 5 mSv in the year following a radiation emergency that is reasonably foreseeable (or other dose criteria defined in REPPIR Schedule 1). When assessing the extent of exposure, REPPIR requires that operators, in this case Imperial College, assess the potential doses to members of the public from all exposure routes and, for this purpose, must disregard any health protection countermeasures that may be implemented by the local authority, emergency services or the exposed persons themselves, during the first 24 hours immediately following the event.

The Imperial College Report of Assessment (reference 4) provides a description of the remaining plant containing radioactive substances on the site (which exceed the levels specific in Schedule 2 of REPPIR). The remaining radioactivity inventory on site includes a number of sealed radioactive sources. Other inventories include small activated samples and activated materials associated with the reactor's structure.

ONR undertook a review and assessment of the Imperial College REPPIR submission (reference 4) to ensure that it is appropriate in response to REPPIR requirements and to provide an up to date assessment for the REPPIR off-site emergency planning and prior information areas determination to be undertaken (reference 9). This forms the basis of the 'Step A' (see section 4.1) assessment described in this report.

4.3 STANDARDS AND CRITERIA

4.3.1 ACTS, REGULATIONS AND GUIDANCE

The relevant standards and criteria considered within this assessment are those contained within REPPIR (reference 2) and its associated guidance (reference 5). REPPIR are regulations created under the Health and Safety at Work Act 1974 and implements the articles on intervention in cases of radiation emergencies contained in the European Council Directive 96/29/EURATOM (European Atomic Energy Committee) - Basic Safety Standards for the Protection of the Health of Workers and Members of the Public against the Dangers from Ionising Radiation (reference 10).

4.3.2 SAFETY ASSESSMENT PRINCIPLES & LICENCE CONDITIONS

ONR's Safety Assessment Principles (SAPs) provide inspectors with a guiding framework for making consistent regulatory judgements on nuclear safety cases. Although the SAPs are not directly relevant to the assessment of REPPIR submissions, cognisance has been taken of SAP: AM.1 in particular (reference 11).

4.3.3 TECHNICAL ASSESSMENT GUIDES

The SAPs are supported by a suite of internal Technical Assessment Guides (TAG), of which the following is relevant to this assessment:

- The technical assessment of REPPIR submissions and the determination of detailed emergency planning zones, ONR NS-TAST-GD-082 Revision 2, 2013 (reference 6). This TAG incorporates ONR's principles for the determination of REPPIR off-site emergency planning areas, and related guidance, as revised in 2013.

4.3.4 NATIONAL AND INTERNATIONAL STANDARDS AND GUIDANCE

The following national guidance has also been considered and, where appropriate, has informed this assessment:

- A guide to the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (reference 5).

ONR also notes the relevance of the following international standards and guidance:

- IAEA Safety Standard Series – Preparedness and Response for a Nuclear or Radiological Emergency GSR Part 7 (reference 12).
- IAEA Safety Standards – Arrangements for Preparedness for a Nuclear or Radiological Emergency GS-G-2.1 (reference 13).

5 ASSESSMENT OF TECHNICAL SUBMISSIONS

In accordance with REPPIR regulation 5, Imperial College undertook a review of their HIRE in 2015 and identified and assessed all hazards on site with the potential to cause a radiation accident. A RoA was submitted to ONR to reflect this review (reference 4).

A summary of Imperial College's submission and ONR's technical assessment of it (reference 9) are detailed in sections 5.1 and 5.2 respectively.

5.1 IMPERIAL COLLEGE REPORT OF ASSESSMENT

The Consort Reactor was shut down in December 2012. The uranium fuel was removed from the site in July 2014 and there is no intention to refuel the reactor. The result is a significant

reduction in the radioactive inventory on the site since the previous RoA was submitted in 2012.

Imperial College identifies the bounding fault for the Consort Nuclear Licensed Site as the accidental cropping of a radioactive source during the size reduction of the oscillator tube containing the source. The tube requires size reduction in order for it to be placed within a waste package.

The dose assessment is based on a release of Americium and Beryllium powder. The powder is inhaled and results in a dose of 4.36 μ Sv to a member of the public.

The RoA concludes that a radiation emergency is not reasonably foreseeable at the Consort Nuclear Licensed Site.

5.2 ONR TECHNICAL ASSESSMENT

The RoA, together with its supporting documents, have been reviewed and reported on by an ONR specialist assessor (reference 9).

ONR's assessment confirms that the Operator has undertaken an assessment of their extant safety case to identify all potential faults that could give rise to a radiation accident. It is noted that the bounding fault identified within the RoA of the accidental cropping of a radioactive source during the size reduction of the oscillator tube containing the source can no longer be realised. This is as a result of the fact that the oscillator tube has now been decommissioned and the decommissioned components transferred off-site for disposal (reference 14, 15).

As part of the assessment ONR's specialist assessor also considered external hazards as identified in the Consort decommissioning safety case. The operator had concluded that the worst case radiation dose to a member of the public results from the direct shine from exposure to activated control rods following a seismic event. However, the control rods have now been removed from the site as part of the decommissioning project. None of the other external hazards such as aircraft impacts and extreme weather conditions were judged to be likely causes of a radiation emergency. The remaining radiation accidents identified relate to spillage or exposure to legacy items within the laboratories or stores and these also could not result in a radiation emergency.

In addition to this, the ONR security inspector confirmed that there are no reasonably foreseeable security events which could give an off-site radiological consequence greater than that of a process based event (reference 16).

On-going decommissioning of the CONSORT reactor has resulted in a change to the bounding radiation accident, however, it is the ONR specialist assessor's opinion that the consequences of any radiation accident that could occur are less than that identified for the bounding fault in the original RoA submission (reference 14). Accordingly, it is not reasonably foreseeable that a fault at the Consort Nuclear Licensed Site could lead to a radiation emergency as defined by REPPiR.

As a result of these findings, in particular, the absence of the need for a local authority off-site emergency plan under REPPiR, it is my opinion that Step B of ONR's determination process (relating to the application of other practical and strategic factors to a planning area) is not required.

5.3 CONCLUSION OF TECHNICAL ASSESSMENT

ONR is satisfied that a radiation emergency as defined in REPPiR is not reasonably foreseeable at the Consort Nuclear Licensed Site. The doses associated with such emergencies are accepted as falling significantly below the threshold of applicability of regulations 7, 9 and 16 of REPPiR (which relate to the requirement for an operator's

emergency plan, the determination of an off-site planning area by ONR, the preparation by the local authority of a corresponding off-site emergency plan and the provision of prior information by the operator.)

There is no basis for ONR to determine REPPIR off-site emergency planning and prior information areas for the Consort Nuclear Licensed Site, in accordance with the requirements of REPPIR regulations 9(1) and 16(1) respectively.

As a result of the absence of the need for a local authority off-site emergency plan under REPPIR, Step B of ONR's determination process (relating to the application of other practical and strategic factors to a planning area) is not required.

6 CONCLUSIONS

This report describes ONR's assessment of the Imperial College RoA for the Consort Nuclear Licensed Site and the consequential requirements, if any, for REPPIR off-site emergency planning and the provision of prior information to members of the public.

The conclusions of this report are as follows:

- ONR is satisfied that the technical submission made by Imperial College demonstrates that members of the public are not likely to be exposed to effective doses at or in excess of 5 mSv in the year following a reasonably foreseeable radiation emergency (or other relevant dose value in Schedule 1 of REPPIR), from the Consort Nuclear Licensed Site, and
- There continues to be no requirement under REPPIR regulations 7(1), 9(1) and 16(1) for an operator's emergency plan, the identification of off-site planning and prior information areas by ONR, the preparation of a local authority off-site emergency plan, or for the provision by the operator of prior information to the public in respect of its Consort Nuclear Licensed Site.

Although this review confirms that there remains no requirement for detailed emergency planning under REPPIR in relation to the Consort nuclear licensed site, proportionate emergency arrangements for the protection of the public nonetheless remain, in particular:

- operators have general duties under the Health and Safety at Work etc. Act 1974 to ensure, so far as is reasonably practicable, the health, safety and welfare of employees and the health and safety of other persons;
- under the provisions of REPPIR, regulation 4(2), operators have a general duty to take all reasonably practicable steps to prevent an identifiable radiation accident and to limit the consequences of any such accident that occurs; and
- operators who hold a nuclear site licence are required, under licence condition 11 (emergency arrangements) to make and implement adequate arrangements for dealing with any accident or emergency arising on the site and their effects; and
- to prepare appropriate contingency plans as required by regulation 12 of the Ionising Radiations Regulations 1999.

Where it is the enforcing authority, ONR will continue to regulate Imperial College and ensure that it remains compliant with these legal obligations.

7 RECOMMENDATIONS

As a result of the conclusions of this report, the recommendations are that ONR:

- Recommendation 1: Write to the Royal Borough of Windsor and Maidenhead to notify them that there continues to be no requirement for a REPPiR off-site emergency planning area for the Consort Nuclear Licensed Site. This should be copied to Imperial College.
- Recommendation 2: Write to the Royal Borough of Windsor and Maidenhead to notify them that there remains no requirement under REPPiR for the local authority to prepare an off-site emergency plan in respect of the Consort Nuclear Licensed Site.
- Recommendation 3: Inform Imperial College that there continues to be no requirement to ensure the appropriate provision of prior information to the public is no longer required under REPPiR. This should be copied to the Royal Borough of Windsor and Maidenhead.
- Recommendation 4: Inform Imperial College that there continues to be no requirement under REPPiR for an operator's emergency plan.
- Recommendation 5: Inform, by copy of its letter to the Royal Borough of Windsor and Maidenhead, the Food Standards Agency, Environment Agency and Department of Business, Energy and Industrial Strategy of ONR's decision.

8 REFERENCES

- 1 The Energy Act 2013, Chapter 32.
Part 3, Chapter 1, 'The ONR purposes', paragraph 68(1).
Part 3, Chapter 4, 'Function of the ONR', paragraph 78, 'Principal function'.
The Stationery Office. December 2013. IBN 978-0-10-543213-5
- 2 Radiation (Emergency Preparedness and Public Information) Regulations 2001.
- 3 3 Yearly Reassessment of the Application of the Radiation (Emergency Preparedness and Public Information) Regulations 2001 to the Imperial College Reactor Centre (Consort Nuclear Licensed Site) & HIRE Report, Ref: ICRC SD 655 Issue 1 October 2012.
- 4 3 Yearly Reassessment of the Application of the Radiation (Emergency Preparedness and Public Information) Regulations 2001 to the Imperial College Reactor Centre (Consort Nuclear Licensed Site) & HIRE Report. October 2015.
- 5 A guide to the Radiation (Emergency Preparedness and Public Information) Regulations 2001. L126. 2002. <http://www.gov.uk/pubns/priced/l126.pdf>
- 6 The technical assessment of REPIR submissions and the determination of detailed emergency planning zones, ONR NS-TAST-GD-082 Revision 2 2013. www.onr.org.uk/depz-onr-principles
- 7 Koichi Tanigawa et al. Loss of life after evacuation: lessons learned from the Fukushima accident. Lancet: Volume 379 Issue 9819 889-891, 10 March 2012
- 8 Food and Environment Protection Act 1985
- 9 ONR-DFW-AR-16-026 Assessment of Imperial College 2015 REPIR Submission
- 10 Council Directive 96/29 Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation. Official Journal of the European Communities (1996) 39, No L159, 1-114 ISBN 0 11 915263 0
- 11 ONR Safety Assessment Principles for Nuclear Facilities, 2014 Edition, Revision 0. AM.1 Accident management and emergency preparedness.
- 12 IAEA Safety Standards Series (General Safety Requirements) No GSR Part 7 dated November 2015. Preparedness and Response for a Nuclear or Radiological Emergency. ISBN 978-92-0-105715-0.
http://www-pub.iaea.org/MTCD/Publications/PDF/P_1708_web.pdf
- 13 IAEA Safety Standards – Safety Guide No GS-G-2.1 2007. Arrangements for Preparedness for a Nuclear or Radiological Emergency. ISBN 92-0-109306 3. http://www-pub.iaea.org/mtcd/publications/pdf/pub1265_web.pdf
- 14 ONR File Note: Amendments to the ONR Technical Assessment of the Imperial College 2015 REPIR submission for the Consort Reactor Centre, 16 November 2016.
- 15 Email from Imperial College to ONR re: Imperial College Project Assessment Report for Review. 3 January 2017.
- 16 ONR internal email regarding the Security Statement for the Report of Assessment for the Imperial College HIRE. 30 March 2016.