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SUB-CHAPTER 1.4 – COMPLIANCE WITH REGULATIONS

1. INTRODUCTION

The aim of this sub-chapter is to give an overview of the UK regulations to be complied with by the UK EPR design. An overview of the structure of the UK regulations and the associated regulatory framework is provided, followed by an outline of the key relevant UK regulations. The list is not exhaustive but gives a general overview of the basic regulatory requirements. Additional information that is relevant to GDA is given in the appropriate chapters of the submission.

A summary of the French regulatory regime is given in Sub-Chapter 3.8 (section 1 and Table 6) of the PCSR, together with an overview of the French codes and standards (which form part of the French legislative framework) used in the EPR design.

Much of the legislation relating to nuclear installations is underpinned by the ALARP (As Low As Reasonably Practicable) principle, see section 3.1 within this sub-chapter. Compliance with ALARP is covered in Chapter 17 of the PCSR.

One of the requirements of the Generic Design Acceptance (GDA) phase is the demonstration that the Best Available Techniques (BAT) will be used to minimise the arising and impact of waste.

The UK EPR design will comply with all the relevant UK legislation

2. PURPOSE OF THE REGULATIONS

The following two safety-related characteristics are associated with nuclear power plants:

- They are a source of radiation;
- They produce radioactive effluents whose discharge is normally controlled, or exceptionally, uncontrolled in the event of incidents or accidents.

Protection against radiation, the prevention of incidents or accidents and the means to be implemented in order to limit their impact (mitigation) require that technical measures be taken, notably in the design and construction stages.

All of these technical provisions and measures contribute to the safety of the facility and to the limitation of the impact on the environment.

The administrative and technical constraints imposed by UK regulations aim to guarantee the safe operation of the facilities and to reduce their impact on the environment. They cover the design, construction, operation and decommissioning of nuclear units built in the UK.

3. APPLICABLE REGULATIONS

This chapter presents the basic regulatory requirements applicable to an EPR type unit.

- The administrative and technical requirements concerning nuclear installations that deal with both regulations concerning environmentally-classified facilities and construction quality (orders concerning pressure vessels and their ancillaries, rules concerning the quality of structures and the quality of construction).
- Requirements concerning radiation protection and effluent releases.

The applicability of these different regulations to the plant components or systems is outlined below. Details of the applicability of these regulations can be found in the sections describing the related equipment or systems.

Compliance with UK legislation is mandatory. The hierarchy of the UK regulatory structure is as follows:

- UK primary legislation which comprises Acts of Parliament, e.g. the Health and Safety at Work Act, The Nuclear Installations Act (NIA), etc.
- UK secondary (or delegated) legislation, consisting of UK Regulations, which are subordinate legislation authorised by the Acts of Parliament
- The UK Regulations have associated Approved Codes of Practice (ACoP) that provide practical guidance on how to comply with these regulations. Following the guidance provided enables compliance with the law and so the ACoP have a special legal status. In practice, complying with an ACoP can be as important as complying with the related statutory instrument.
- Non-prescriptive documents include the HSE's Safety Assessment Principles (SAPs) and Technical Assessment Guides (TAGs). The SAPs are a set of basic principles and objectives relating to nuclear safety and radioactive waste management, which are used by the HSE, together with the supporting TAGs, to guide decision making in the nuclear licensing process. The SAPs are applied to the assessment of safety cases for nuclear facilities and are used by the NII to make consistent regulatory judgements. Compliance with these is necessary to satisfy the requirements of the related legislation. In the case of the SAPs, this is to comply with the Nuclear Site Licence required under the NIA.

Compliance with the SAPs is summarised in Sub-chapter 17.2 of the PCSR.

- Design codes and standards, where the choice and degree of compliance may be a licensee or designer decision; for instance, not all the principles may be applicable to a certain type of reactor or installation. (Design codes and standards are not addressed here; they are dealt with in Sub-chapter 3.8 of the PCSR).

Overarching the UK legislation, are texts issued by the European Union (EU) or its sub-organisations, notably European Directives and Euratom texts, which must be complied with by member countries.

In each section, the legislation is presented, consistent with the legislative hierarchy, as:

- Primary legislation (mandatory);

- Secondary legislation and associated Approved Codes of Practice (mandatory);
- Safety Assessment Principles (where appropriate).

Section 3.12 of this sub-chapter presents the guidelines issued by international organisations, including the EU, which are either recommendations with no regulatory nature or are used as the basis for changes to British regulations.

The French Safety Authority has issued Basic Safety Rules (Règles Fondamentales de Sûreté or "RFS" in French) and Safety Guides, and latterly Technical Guidelines. Although not compulsory in the United Kingdom, the EPR design complies with the requirements of the Technical Guidelines and where appropriate, the Basic Safety Rules and Guides; they are therefore included, for completeness in Sub-Chapter 1.4 - Table 1.

3.1. REGULATORY FRAMEWORK

The Health and Safety Executive (HSE), the Environment Agency (EA) in England and Wales and the Scottish Environmental Protection Agency (SEPA) regulate compliance with legislation relating to nuclear installations. The HSE is responsible for regulating nuclear safety, including the safe management, conditioning and storage of radioactive waste on nuclear licensed sites. The appropriate environment agency is responsible for regulating the discharges to the environment and disposal of radioactive waste on or from nuclear licensed sites.

3.1.1. The Health and Safety at Work Act 1974

The operators of nuclear facilities in the UK are required to comply with the **Health and Safety at Work (HSW) Act 1974** [Ref], under which employers are responsible for ensuring the safety of their workers and the public from dangers arising from that work.

Under the HSW Act, a general duty is placed on employers to conduct their undertaking in such a way as to ensure, so far as is reasonably practicable, the health and safety at work of both their employees and persons not in their employment who may be affected by their work activities. The ALARP principle, as it is generally known, underpins all health and safety legislation in the UK. It is implicit within the ALARP principle that all risks must be minimised, even though there is a level (the 'broadly acceptable' level) below which regulatory effort will not be devoted to detailed assessment. Compliance with ALARP is covered in Chapter 17 of the PCSR.

The Health and Safety Executive is the enforcing agency for health and safety law. It has the authority to grant a licence to a nuclear installation. The Nuclear Safety Directorate (NSD) exists within the HSE. Its goal is to control health, safety and radioactive waste management on nuclear licensed sites. The Nuclear Installations Inspectorate (NII) forms part of NSD and carries out tasks relating to inspection and assessment.

3.1.2. The Nuclear Installations Act 1965 (as amended)

The **Nuclear Installations Act 1965 (as amended) (NIA 65)** [Ref] is a key Act of Parliament with regards to the nuclear industry. Section 1 of the NIA 65, together with regulations made under the powers provided by section 1, prescribes the types of activity that may only be undertaken on a licensed site. Under this Act, apart from certain exceptions, no site may be used for the purpose of installing or operating any nuclear installation unless the HSE has granted a nuclear site licence. Additionally, section 4 of NIA 65 enables the HSE to attach conditions (currently 36) to a licence in the interests of safety or with respect to the handling,

treatment and disposal of nuclear matter, as well as to add, vary or revoke these conditions in order that licences may be tailored to specific circumstances.

Before a site can be licensed, a prospective operator must show that the plant to be used will be safe and that the operator can manage the site and deal with any liabilities remaining when the nuclear installation is finally shut down. The onus is on the applicant to prove the safety of the site and their own viability before HSE will grant a licence.

The HSE perform onsite inspections to ensure that the licensee complies with the licence conditions. It is the responsibility of the licensee to ensure that compliance is achieved. If it is not, the HSE are empowered to issue improvement notices, prohibition notices, to prosecute or withdraw a licence. NIA65 (as amended by the Environment Act 1995 [Ref]) places a requirement on HSE to consult the environment agencies before issuing, amending or varying nuclear site licences, or attaching conditions to them.

3.1.3. The Radioactive Substances Act 1993 (as amended)

The **Radioactive Substances Act 1993 (RSA 93)**, (as amended by the Environment Act 1995) [Ref] provides the framework for the control of radioactive material and any subsequent accumulation and disposal of solid, liquid and gaseous radioactive waste, so as to minimise the impact on the general public and the environment. RSA 93 is regulated in England and Wales by the Environment Agency (EA).

3.2. RADIOLOGICAL PROTECTION REGULATIONS

European directive 96/29/EURATOM of May 13, 1996 on Basic Safety Standards [Ref] deals with the maximum consequences for the public and workers. It sets the maximum individual dose to be complied with for the protection of workers at 100 mSv over five consecutive years (20 mSv/year on average), provided the dose does not exceed 50 mSv during any one year, consistent with recommendation ICRP no. 60 (1990) [Ref]. For members of the public, the effective dose limit is 1 mSv/year; in special circumstances, a higher effective dose may be allowed in a single year, provided that the average over five consecutive years is less than 1 mSv/year.

In the United Kingdom transposition of the directive into domestic law is achieved through the implementation of the following legislation:

Primary legislation:

- **The Radioactive Substances Act 1993 (RSA 93)**, which provides the framework for the control of radioactive material and any subsequent accumulation and disposal of solid, liquid and gaseous radioactive waste, so as to protect the public and the environment.

Secondary legislation:

The following regulations are key legislation applicable to the nuclear industry:

- **Ionising Radiations Regulations 1999 (IRR99)** [Ref] replaced the Ionising Radiations Regulations 1985 (IRR85) (S.I.1985 No 1333) and the Ionising Radiations (Outside Workers) Regulations 1993 (S.I 1993 No 2379);

Approved Code of Practice: Work with ionising radiation. [Ref] Ionising Radiations Regulations 1999. Approved Code of Practice and guidance L121 HSE Books 2000 ISBN 0 7176 1746 7;

The IRR99 and their associated ACoP cover the general radiation protection of workers and the public from work activities involving ionising radiations. They include a general duty to keep exposures as low as reasonably practicable (the ALARP principle and, among other requirements, set limits on such exposure. They implement, in part, the latest Euratom Basic Safety Standards Directive. IRR99 also implement Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers (i.e. persons undertaking activities in controlled areas designated by an employer other than their own) exposed to the risk of ionising radiation during their activities in controlled areas.

- **Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR)**. [Ref] These regulations implement the articles in 96/29/EURATOM on intervention in cases of radiation (radiological) emergency.

For nuclear licensed sites, REPPIR establishes a framework of emergency preparedness measures to ensure that the population local to the site is:

- informed and prepared, in advance, about what to do in the unlikely event of a radiation emergency occurring; and
- provided with information if a radiation emergency actually occurs.

The Regulations place obligations on the licensee to produce an emergency plan for dealing with any reasonably foreseeable radiation emergency, as well as providing prior information to the population around the site. The Regulations also place duties on the local authority in whose area the site is based, to prepare (and if necessary, implement) an off-site emergency plan for dealing with the consequences of any reasonably foreseeable radiation emergency in an area determined by HSE. The local authority is also required to ensure that relevant information is supplied to the affected population in the event that a radiation emergency should occur. REPPIR is enforced by HSE under the HSW Act.

- The Radioactive Substances (Basic Safety Standards) (England and Wales) Direction 2000 [Ref], which directs the Environment Agency to have regard to specified dose constraints. This Direction specifies the maximum dose to members of the public as 0.3 mSv/year from any radioactive source, or 0.5 mSv/year from any single site.

3.3. WASTE MANAGEMENT REGULATIONS

UK waste management practices are based on the following legislation:

3.3.1. Non radiological waste

EC Directive on Integrated Pollution Prevention and Control (96/61/EC) (IPPC) aims to ensure a high level of environmental protection and to prevent and where this is not practicable, to reduce, emissions to acceptable levels. The Directive is implemented in UK law through the following legislation:

Secondary legislation:

- The Pollution Prevention and Control Regulations 2000 (PPC) [Ref];
These regulations cover the disposal and management of all waste by landfill, waste treatment and storage. The regulations require that new facilities obtain a PPC permit prior to commencing operational activities. The permit will implement aspects of other Directives including the Waste Framework Directive (75/442/EEC), Hazardous Waste Directive (91/689/EEC), Waste Oils Directive (75/439/EEC) and PCB Directive (96/59/EC). In the UK, radiological waste is exempt from the PPC regulations and is controlled under the Radioactive Substances Act (section 3.3.2).
- Waste Management Licensing Regulations 1994 [Ref];
In circumstances where the PPC regulations do not apply, the Waste Management Licensing Regulations generally will. These regulations require that a licence is held by operators of sites that keep, treat or store waste.

Note: The Environmental Permitting (England and Wales) Regulations were enacted in December 2007 and came into force in April 2008. The Environmental Permitting Regulations systems combine the Pollution Prevention Control and Waste Management Licensing systems into a common compliance and permitting system.

- Hazardous Waste Regulations 2005 [Ref];
These Regulations implement a procedure controlling the movement and storage of hazardous waste. The regulations identify which wastes are classed as hazardous, including electronic and electrical equipment.

3.3.2. Radiological Waste

Under NIA65 the HSE are enabled to grant a nuclear site licence and to attach conditions to that licence. All of the conditions can be applied to radioactive waste management and some conditions apply specifically to this. The HSE are therefore able to regulate the storage, conditioning and safe management of radioactive waste through the licensing process. NIA65 (as amended by the Environment Act 1995) places a requirement on HSE to consult the environment agencies before issuing, amending or varying nuclear site licences, or attaching conditions to them.

Primary legislation:

- **The Radioactive Substances Act 1993** (as amended by the Environment Act 1995).

The principal legislation under which the Environment Agency operate is the Environment Act 1995. In accordance with RSA93, the Environment Agency is responsible for granting, varying or revoking authorisations for the disposal of radioactive waste from nuclear licensed sites. The EA have to be satisfied that radioactive waste is disposed of by 'best practical means' to minimise the impact of discharges. The EA also regulate the management of radioactively contaminated land under the Environmental Protection Act 1990 Part IIA.

3.4. ENVIRONMENTAL IMPACT REGULATIONS

EC Environmental Impact Assessment (EIA) Directive 85/337/EEC, as amended by Directive 97/11/EC, sets out a framework on the assessment of the effects of certain public and private projects on the environment. The EIA Directive is implemented in the UK for development projects relevant to the nuclear industry through:

Primary legislation:

- The Town and Country Planning Act (1990) (TCP Act) [Ref], which requires any organisation wishing to construct, extend or operate any type of power generating station in the UK to first obtain planning permission from the relevant local authority.

Secondary legislation:

- Town and Country Planning EIA (England and Wales) Regulations 1999 [Ref];
- Town and Country Planning EIA (England and Wales) (Amended) Regulations 2000 [Ref];
- Town and Country Planning EIA (England and Wales) (Amended) Regulations 2006 [Ref].

The Town and Country Planning Regulations are the main legislative tool governing the preparation of environmental impact assessments. Parts I, II and III of the regulations (1999) set out general provisions, screening provisions and provisions relating to planning applications. Part IV of the regulations sets out the provisions for scoping opinions and the procedure for facilitating the preparation of environmental statements.

EIA provides a useful basis for the assessment of non radiological impacts assessment as developed in Chapter 12 of the PCER.

In addition to these regulations, the Government will conduct a Strategic Siting Assessment and Strategic Environmental Assessment. The conclusions of these processes will be taken into account for the site specific EIA and consenting activities.

Power generation projects, such as new nuclear power stations are also subject to the following legislation:

Primary legislation:

- **The Electricity Act 1989** [Ref] requires that any generating station with a capacity greater than 50 MW must be granted a consent from the Secretary of State for Trade and Industry (for England and Wales) before being constructed, extended or operated.

Secondary legislation:

- The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000 (SI 1927) [Ref].

Under Section 36 of the Electricity Act the applicant must conduct an EIA, the output document of which is called an Environment Statement.

In addition, there are specific regulations relating to decommissioning, which are key legislation applicable to the nuclear industry:

- **The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR) (SI 2892)** [Ref].

These regulations implement the requirement for an environmental impact assessment for the dismantling or decommissioning of nuclear power stations and most nuclear reactors, resulting in the submission to HSE of an Environmental Statement (ES) and an application for consent.

3.5. PRESSURE VESSEL REGULATIONS

The design of the pressure vessel is a key part of the overall safety case for a nuclear power station. Directive 97/23/CE concerning the design and manufacture of pressure vessels was implemented in the United Kingdom through the following legislation:

Secondary legislation:

- Statutory Instruments 2000 No. 128, The Pressure Systems Safety Regulations 2000 (PSSR) [Ref] which requires the use of appropriate codes and standards for the manufacture, operation, maintenance and inspection of the pressure system (including nuclear pressure systems).
- Statutory Instruments 1999/2001, The Pressure Equipment Regulations 1999 (PER) [Ref] which is applicable for the manufacture of equipment for non-nuclear systems.

The EPR design uses the French technical code for mechanical equipment (RCC-M), which was initially based on the US ASME code. This code lays down design and construction rules for pressure vessels, reactor internals and nuclear island pipework and equipment supports. It codifies French industrial practice and benefits from the operating experience from manufacture, inspection and operation of French units. Details of RCC-M and its correspondence to ASME codes are given in Sub-chapter 3.8 of the PCSR.

3.6. QUALITY PROVISION REGULATIONS

Section 4 of The Nuclear Installations Act 1965 enables the HSE to attach conditions to a licence. Condition 17 concerns the Quality Assurance of the design, construction, manufacture, commissioning and operation of installations.

3.7. INCIDENT REPORTING

Secondary legislation:

The following regulations are key legislation (under NIA 65) applicable to the nuclear industry:

- **The Nuclear Installations (Dangerous Occurrences) Regulations 1965** [Ref] require the Licensee to report specified types of Dangerous Occurrences. For nuclear installations these are any:
 - occurrence on a licensed site involving the emission of ionising radiations or the release of radioactive or toxic substances in such circumstances as to cause or be likely to cause the death of, or serious injury to the health of, persons on or outside the site at the time of the occurrence;
 - explosion or outbreak of fire on a licensed site which affects or is likely to affect the safe working or safe condition of the nuclear installation;
 - occurrences involving the breaking open of any outside container in which nuclear matter is being carried; and
 - uncontrolled criticality excursion.

3.8. ELECTRICAL SUPPLY DESIGN

There are two statutory instruments (under the HSW Act), which govern the electrical installation.

Secondary legislation:

- The Electricity at Work Regulations 1989 [Ref].
- The Electricity Safety, Quality and Continuity Regulations 2002 [Ref].

These regulations require that installed electrical equipment should be properly designed and maintained.

3.9. FIRE PROTECTION

The legal requirements for dealing with fire and explosion hazards are embodied in both European Union Directives and UK regulations. EC Council Directive 89/654/EEC of 30/11/1989, Concerning the Minimum Safety and Health Requirements for the Workplace, sets out general fire precautions. The following UK regulations are applicable

Secondary legislation:

- Regulatory Reform (Fire Safety) Order 2005 [Ref].
These Regulations implement the EC Council Directive 89/654/EEC concerning the Minimum Safety and Health Requirements for the Workplace.

- Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) [Ref].
This is the primary legislation applying to the control of substances that can cause fires and explosions in the workplace. DSEAR put into effect requirements from two European Directives: the Chemical Agents Directive (98/24/EC) and the Explosive Atmospheres Directive (99/92/EC).
- The Equipment and Protective Systems (EPS) Intended for Use in Potentially Explosive Atmospheres Regulations 1996 [Ref].
This implements, in Great Britain, Directive 94/9/EC on the approximation of the laws of Members States concerning equipment and protective systems intended for use in potentially explosive atmospheres
- The Control of Major Accident Hazards (Amendment) Regulations 1999 (COMAH) [Ref].
This was introduced in April 1999 to implement the requirements of the EU Directive 'Council Directive on the control of major accident hazards involving dangerous substances (96/82/EC).
- Control of Major Accident Hazards (Amendment) Regulations 2005 (COMAH) [Ref].
Implements Council Directive 96/82/EC, also known as the Seveso II Directive, as amended by Directive 2003/105/EC.

3.10. SITE LAYOUT

A building layout (radiological) must comply with the Ionising Radiations Regulations 1999 (IRR99) (see section 3.2 within this sub-chapter), which includes following the 'ALARP' principle.

Other regulations that may have an effect on plant layout include:

Primary legislation:

- The Anti-Terrorism, Crime and Security Act 2001 [Ref].

Secondary legislation:

- The Nuclear Industries Security Regulations 2003 (NISR) [Ref]. These affect layout in that new plants must be as secure as reasonably practical from terrorist attack.

Several environmental regulations could have an impact on the plant layout such as the Water Resources Act 1991 [Ref].

3.11. HEALTH AND SAFETY

In the UK the basis of health and safety law for nuclear installations is the Health and Safety at Work Act 1974 under which, the following regulations apply:

- Provision and use of Work equipment Regulations 1998 [Ref].
- Lifting Operations and Lifting Equipment Regulations 1998 [Ref].
- The Personal Protective Equipment at Work Regulations 1992 [Ref].

- Management of Health and Safety at Work Regulations 1999 [Ref].

These regulations implement the Council Directive 89/391/EEC of 12 June 1989 on The Introduction of Measures to Encourage Improvements in the Safety and Health of Workers at Work, Luxembourg: 1989. The regulations set out employers duties with regards to any hazard in the workplace

- The Construction (Design and Management) Regulations 2007 [Ref].

These regulations will apply to construction of an EPR in Great Britain even if designed outside the UK. The regulations cover not only construction but design as well with the clear intention of eliminating accidents in construction, operation and decommissioning of the plant.

3.12. INTERNATIONAL TEXTS

International Guidelines (not specific to Europe)

Issued by international organisations, they are generally recommendations, whose application is not mandatory, but to which compulsory national texts may refer. For example, these texts may be ICRP (International Commission for Protection from Radiation) recommendations or IAEA (International Atomic Energy Agency) Basic Safety Rules.

- The ICRP recommendations to which UK texts refer have already been mentioned in the sections dealing with UK regulatory texts (sub-sections 3.1 to 3.11, above). Recommendation ICRP no. 63 (1991) "Principles of intervention for the protection of the public in the event of a radiological risk" [Ref] which indicates the effective dose thresholds beyond which the neighbouring populations must be evacuated.
- Recommendation BSS no. 115 of the IAEA "Protection from ionising radiation and security with respect to radiation sources" [Ref] recommends effective dose thresholds for the implementation of countermeasures (containment, evacuation, etc.) in the event of accidents with radiological consequences for the public.
- The following IAEA codes can also be cited:
 - code 50 C QA [Ref] that deals with Quality Assurance for the safety of nuclear power plants;
 - code 50 C D "The safety of NPP: design" (Revision 1 draft stage) [Ref] that is a design guideline for nuclear power plants.

European Texts

These are texts issued by the European Union or its sub-organisations.

European Directives: they must be applied in the national legislation of each member country within a set deadline, and become compulsory in this form. These European Directives have already been mentioned in the sections dealing with the UK regulatory texts (sub-sections 3.1 to 3.11, above).

Euratom texts: The European Atomic Energy Community (Euratom) has published a Treaty and Directives that essentially concern radiological protection. These directives, which are applied in national legislation, are to be complied with by member countries.

- The Treaty of Rome and standards issued by the Euratom council (April 17, 1957), notably chapter III – articles 31 – 35 – 36 – 37 and 77, 78.
- Directives published in the Official Bulletin of the European Communities, in particular:
EURATOM directives 76/579 of June 1, 1976, 78/659 of July 18, 1978, 79/343, 80/836 of July 15, 1980, modified by directives 84/467 of September 3, 1984 and 90/641/Euratom of December 4, 1990, European directive 96/29 of May 13, 1996.

Decision no. 87/600/Euratom by the Council on December 14, 1987 establishes the Community terms for the rapid exchange of information in the event of a radiological emergency. Switzerland was included in the "Ecurie" (European Community Urgent Radiological Information Exchange) system by Council agreement no. 95/C355/03. These decisions only involve the operator as concerns the speed of event notification (accident or incident, nuclear or otherwise, having or with the risk of having consequences on safety; this obligation of notification, which must be performed immediately to the concerned Ministries is imposed on the operator by Article 5-III of the decree of December 11, 1963 modified, in its text resulting from decree no. 90-78 of January 19, 1990 (regulatory provisions concerning General Operating Rules).

Directive no. 89-618/Euratom of November 27, 1989 additionally determines the measures for informing the population on health protective measures applicable and on the behaviour to adopt in the event of a radiological emergency.

EURATOM directives nos. 87-3954, 89-944, 89-2218, 89-2219 and 90-737 are product marketing standards. They set the limits of the rate of activity beyond which the products can no longer be marketed.

SUB-CHAPTER 1.4 - TABLE 1**Basic Safety Rules, ASN Guides and Technical Guidelines**

Although not compulsory in the UK, the EPR design complies with the requirements of the Basic Safety Rules and Technical Guidelines issued by the French Safety Authority. The Basic Safety Rules ("RFS" in French) have been issued from 1980 onwards. The RFS applicable to PWR power plants are applicable to the EPR design.

In October 2000, the Safety Authority issued the "Technical Guidelines for the design and construction of the next generation of nuclear power plants with pressurised water reactors", called hereafter Technical Guidelines or TG [Ref]. These TG present the opinion of the French Standing Committee for Nuclear Reactors (GPR) concerning the safety philosophy and approach as well as the general safety requirements to be applied.

Some discrepancies exist between the TG and some RFS. Currently there is no official statement (from the Safety Authority) concerning the applicability of those RFS concerned to the EPR design. When there are discrepancies between TG and RFS, the TG prevail.

As mentioned in the introduction of each RFS, if the nuclear plant complies with the RFS, it is considered to comply with the requirement of the regulation. Compliance with regulatory procedures is possible if it is proven that the safety objectives of the RFS are reached by other means.

The existing RFS related to PWR power plants are explained in the following section and whether or not each of them is applicable to EPR is indicated.

A summary of the applicability of the RFS to EPR is given in Sub-Chapter 1.4 - Table 2.

RFS NO. I.2.A (05/08/1980)

Consideration of risks associated with aeroplane crash (*Prise en compte des risques liés aux chutes d'avions*).

Main discrepancies and/or purposes:

The RFS requires an assessment of the frequency of damage to the three main safety functions, for two types of airplanes (Cessna 210 and Learjet 23) of the general aircraft traffic. Protection is considered as acceptable if the frequency is lower than a determined value, which is a probabilistic objective.

The Technical Guidelines require a deterministic approach, based on load-time diagrams C1 and C2 representing the crash of a military airplane. The Reactor Building, the Fuel Building and some auxiliary buildings shall be designed against these load cases.

Conclusion:

The objective of RFS no. I.2.a is applicable to EPR. Nevertheless, the method to be applied to verify that this objective is reached will be different (the method given in the TG is more demanding than the method given in the RFS).

RFS NO. I.2.B (05/08/1980)

Protection against missiles generated by the turbine or the main alternator (*Prise en compte des risques d'émission de projectiles par suite de l'éclatement des groupes turbo-alternateurs*).

Main discrepancies and/or purposes:

The RFS requires:

- design and supervision provisions against ruptures of the low pressure part of the turbine;
- to assess when a missile occurs the probability of causing unacceptable consequences;
- to install appropriate protections if this probability is significantly higher than 10^{-2} .

The requirements of the TG (section F.1.2.5) are less detailed but express the same idea.

Conclusion:

RFS no. I.2.b is applicable to EPR.

RFS NO. 2001-01 (16/05/01) (REVISION OF RFS NO.I.2.C (1981)) [REF]

Determining seismic risk for the safety of nuclear plants (*Détermination du risque sismique pour la sûreté des installations*).

Main discrepancies and/or purposes:

The RFS explains how to determine the maximum historically likely earthquake (in French, SMHV) and the safety increased earthquake (in French, SMS, also called SSE or Safe Shutdown earthquake) for a given site, and how to use them for the design of the plant.

The TGs (section F.2.2.1) allow use for a given site either site specific or standardised spectra, without explaining how to determine the site specific spectra. In any case, the designer has to prove that the used spectra are bounded by the site specific ones.

There are no discrepancies between the RFS and the TG.

Conclusion:

RFS no. 2001-01 is applicable to EPR.

RFS NO. I.2.D (07/05/1982) [REF]

Protection against risks associated to the industrial environment and the roads (*Prise en compte des risques liés à l'environnement industriel et aux voies de communication*).

Main discrepancies and/or purposes:

The RFS defines a probabilistic objective and requires consideration of a reference explosion pressure wave with the following parameters: triangular shape, maximum value 0.05 bar,

duration 0.3 s.

The TG require to consider a reference explosion pressure wave with the following parameters:

- triangular shape, maximum value 0.1 bar, duration 0.3 s.

Conclusion:

The objective of the RFS no. I.2.d is applicable to EPR. Nevertheless, the method to be applied to verify that this objective is reached will be different (the method given in the TG is more demanding than the method given in the RFS).

RFS NO. I.2.E (12/04/1984) [REF]

Protection against external flooding (*Prise en compte du risque d'inondation d'origine externe*).

Main discrepancies and/or purposes:

The RFS explains how to calculate the CMS, i.e. the overestimated safety level of the flooding used to design the plant. For the time being, it is foreseen to revise the present RFS in order to take into account the feedback experience (Le Blayais).

The TGs do not express anything about the CMS.

Conclusion:

RFS no. I.2.e (12/04/1984) is applicable to EPR. Its revision, if any, will also be applicable.

N.B. The Blayais feedback is used in the design of the CMS.

RFS NO. I.3.A (05/08/1980)

Use of the Single Failure Criterion in the safety analyses (*Utilisation du critère de défaillance unique dans les analyses de sûreté*).

Main discrepancies and/or purposes:

The RFS and the TG (C.2.1 and G.3) are practically consistent about the Single Failure Criterion (SFC). Only light differences may be noticed:

- TG section G.3 §7 defines clearly how to treat spurious failures in the I&C;
- for the possible exceptions to the active single failures (SF), both RFS and the TG mention the check valves (failure to open) but the TG limit this exception to the accumulators;
- another exception in the TG is the failure to close of the MSIV in case of SGTR; this exception is not mentioned in the RFS;
- for the passive SF, the TG require sensitivity studies to show that no cliff-edge effect would rise if some parameters are exceeded (< 24h, > 200l/min).

Conclusion:

Although some light differences between RFS 1.3.a and TG must be taken into account, **the principle of the RFS 1.3.a is applicable to EPR.**

RFS NO. I.3.B (08/06/1984)

Seismic instrumentation (*Instrumentation sismique*).

Main discrepancies and/or purposes:

The RFS requires that in case of earthquake, seismic instrumentation gives alarms and indicate immediately the level seen by the plant, allowing the operator to take appropriate measures.

The TGs do not express anything about this subject.

Conclusion:

RFS no. I.3.b is applicable to EPR.

RFS NO. I.3.C (01/08/1985)

Geological and geotechnical studies of a site; characteristics of the soil and behaviour of the ground (*Etudes géologiques et géotechniques du site; détermination des caractéristiques des sols et études du comportement des terrains*).

Main discrepancies and/or purposes:

The RFS requires that the characteristics of the soil and the behaviour of the ground are determined according to methods specified in the RFS.

The TGs do not express anything about this subject.

Conclusion:

RFS no. I.3.c is applicable to EPR.

RFS NO. II.2.2.A RÉVISION 1 (31/12/1985)

Design of the containment sprinkling system (*Conception du système d'aspersion de l'enceinte*).

Main discrepancies and/or purposes:

The RFS considers as obvious the necessity of such a system and specifies the requirements for its design.

The TGs do not express anything about this subject and no such system exists for EPR.

Conclusion:

RFS no. II.2.2.a révision 1 serves no purpose for EPR.

RFS NO. II.3.8 (08/06/1990)

Construction and operation of the main secondary system (*Construction et exploitation du circuit secondaire principal*).

Main discrepancies and/or purposes:

The RFS gives rules for the construction and operation of the main secondary system. In 1999 a new regulation was issued, dealing with both topics:

“Règles techniques relatives à la construction des CPP et CSP”, approved on 05/10/99, “Arrêté du 10/11/99 relatif à la surveillance en exploitation des CPP et CSP”.

The RFS is thus no longer valid, independently from the TG.

Conclusion:

RFS no. II.3.8 is not applicable to EPR.

RFS NO. II.4.1.A (15/05/2000)

Software of the safety-classified electrical systems (*Logiciels des systèmes électriques classés de sûreté*).

Main discrepancies and/or purposes:

The RFS gives principles and requirements applicable to the design, production, installation and operation of software for safety systems.

Although the requirements of this RFS refer to the 1E classified safety systems, which do not exist in EPR (see RFS no. IV.2.b), and are not formally applicable to EPR, this RFS is nevertheless considered applicable to EPR safety systems.

Conclusion:

RFS no. II.4.1.a is formally not applicable to EPR. Nevertheless, this RFS is considered applicable and its requirements are taken into account in the relevant codes (ETC-I, RCC-E).

RFS NO. IV.1.A (21/12/1984)

Classification of mechanical components, electrical systems, civil works (*Classement des matériels mécaniques, systèmes électriques, structures et ouvrages de génie civil*).

Main discrepancies and/or purposes:

The RFS defines what is meant by “safety-classified” for all equipment or structures, relating to the integrity of the RCPB, the safe shutdown of the reactor and the prevention of accidents and limitation of their radiological consequences. Then the RFS explains how to determine the safety class for each category of equipment or structure: mechanical, electrical, civil works.

The TGs (B.2.1) define a safety classification on a notably different basis: e.g. classification of functions, definition of a controlled state and a safe shutdown state, barrier classification...

Without entering more deeply in details, we can consider that both approaches of classification are not comparable.

Conclusion:

RFS no. IV.1.a is not applicable to EPR.

RFS NO. IV.2.A (21/12/1984)

Requirements for the design of mechanical components which are safety-classified, pressure retaining and of levels 2 and 3 (*Exigences à prendre en compte dans la conception des matériels mécaniques classés de sûreté, véhiculant ou contenant un fluide sous pression et classés de niveaux 2 et 3*).

Main discrepancies and/or purposes:

The "classification levels 2 and 3" make no sense according to the TG.

Conclusion:

RFS no. IV.2.a is not applicable to EPR.

RFS NO. IV.2.B (31/07/1985)

Requirements for the design, qualification, use and operation of safety-classified electrical equipment (*Exigences à prendre en compte dans la conception, la qualification, la mise en œuvre et l'exploitation des matériels électriques appartenant aux systèmes électriques classés de sûreté*).

Main discrepancies and/or purposes:

The RFS gives a list of requirements concerning the safety classification of electrical materials (1E or not 1E), in terms of design, qualification, installation, operation and periodic tests.

The Technical Guidelines (B.2.1) contain similar requirements which apply to the systems or the materials classified on the basis of RFS IV.1.a. The result is obviously different.

However, this RFS is considered applicable to EPR safety systems on the same basis as RFS II.4.1.a.

Concerning the requirements of this RFS presented to paragraph 3 of the RFS (seismic classification, redundancy, independence and continuity of the electrical supply, qualification and periodic tests), they are applicable to classified materials F1A. The requirements of paragraph 3.2.2 of the RFS are applicable to classified materials F1B.

However, for the qualification, only the principles are applicable. The practical methods of qualification retained for EPR are evolving compared to the operating plant. In particular, the qualification profiles K1, K2 and K3 are not proposed as such for the qualification of materials for EPR in accident conditions.

The step of qualification retained for the EPR (presented to chapter 3.6) is based on a more

precise definition of what is necessary (use of environmental conditions) and on the use of methods of qualification (RCC-E, KTA, IEEE in particular).

Conclusion

The RFS IV.2.b is applicable in these principles to the EPR.

RFS NO. V.1.A (18/01/1982)

Activity released from the fuel in the accident studies (*Détermination de l'activité relâchée hors du combustible à prendre en compte dans les études de sûreté relatives aux accidents*).

Main discrepancies and/or purposes:

The RFS defines the source terms to be taken into account in the accident studies for the three types of accidents: "conventional", resulting from multiple failures, or "extreme". A source term is defined by a fraction of the core inventory (fission products). For example the source term level 1 concerns the "conventional" accidents and contains 50% of the rare gases, 50% of the halogens and 50% of the alcalins.

This RFS is no longer applied and lower percentages are now used in accident studies for the existing plants, basically ten times lower than the above values. This RFS can be considered as obsolete.

The TGs do not express anything about this subject.

Conclusion:

RFS no. V.1.a is not applicable to EPR.

RFS NO. V.1.B (10/06/1982)

Meteorological measurement means (*Moyens de mesures météorologiques*)

Main discrepancies and/or purposes:

The RFS gives a list of measurements to be done on or near the plant site: the measured values are used in normal operation or during accidents to evaluate the transfer of the radiological releases into the environment.

The TGs do not express anything about this subject.

Conclusion:

RFS no. V.1.b is applicable to EPR.

RFS NO. V.2.B (30/07/1981)

General rules for civil works (*Règles générales applicables à la réalisation des ouvrages de génie civil*).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the EDF document entitled "Recueil des règles relatives au génie civil (RCC-G)" dated 01/01/1981.

For the EPR, the safety Authority accepted that a new document be used, entitled "EPR Technical Code for Civil works (ETC-C)".

Conclusion:

RFS no. V.2.b serves no purpose for EPR.

RFS NO. V.2.C RÉVISION 1 (12/09/1986)

General rules for mechanical components (*Règles générales applicables à la réalisation des matériels mécaniques*).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the AFCEN document entitled "Recueil des règles de conception et de construction applicables aux matériels mécaniques (RCC M)" issued in 1983 and revised in 1984.

For the EPR, the Safety Authority accepted that a new document be used, entitled "RCC-M-EPR version".

Conclusion:

RFS no. V.2.c serves no purpose for EPR.

RFS NO. V.2.D RÉVISION 1 (23/09/1986)

General rules for electrical equipment (*Règles générales applicables à la réalisation des matériels électriques*).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the AFCEN document entitled "Recueil des règles de conception et de construction des matériels électriques des îlots nucléaires (RCC E)" dated 1981 and revised in 1982 and 1984.

For the EPR the safety Authority accepted that a new document be used, entitled "RCC-E-EPR version".

Conclusion:

RFS no. V.2.d revision 1 serves no purpose for EPR.

RFS NO. V.2.E REVISION 2 (14/12/90)

General rules for fuel assemblies (*Règles générales applicables à la réalisation des assemblages combustibles*).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the AFCEN document entitled "*Recueil des règles de conception et de construction applicables aux assemblages combustibles des centrales nucléaires REP (RCC C)*" dated September 1989.

The TGs do not require anything in contradiction with the RCC-C.

Conclusion:

RFS no. V.2.e revision 2 is applicable to EPR.

RFS NO. V.2.F (28/12/1982)

General rules for protection against fire (*Règles générales relatives à la protection contre l'incendie*).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the EDF document entitled "*Recueil des règles relatives à la protection contre l'incendie (RCC I)*" dated May 1982.

For the EPR the safety Authority accepted that a new document be used, entitled "EPR Technical Code for Fire protection (ETC-F)".

Conclusion:

RFS no. V.2.f serves no purpose for EPR.

ASN/GUIDE/2/01 (25/05/2006)(REVISION OF RFS NO. V.2.G (31/12/1985)) [REF]

Considering the risk of an earthquake when designing civil engineering structures of nuclear installations, excluding long term storage of radioactive waste (*Prise en compte du risque sismique à la conception des ouvrages de génie civil d'installations nucléaires de base à l'exception des stockages à long terme des déchets radioactifs*).

Main discrepancies and/or purposes:

The ASN Guide defines: the design principles and requirements for civil engineering structures considering seismic activity risk, design for earthquake movements, properties of materials, modelling principles for seismic analysis, methods for determining stress, the use of stresses calculated for the verification of civil works, the documentation to be presented.

The TGs do not express anything about this subject.

Conclusion:

ASN Guide 2/01 is applicable to EPR.

RFS NO. V.2.H (04/06/1986)

General rules for civil works (*Règles générales applicables à la réalisation des ouvrages de*

génie civil).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the AFCEN document entitled "*Recueil des règles relatives au génie civil (RCC G)*" dated October 1985.

It has the same subject as the RFS no. V.2.b and can be considered as a revision of the latter.

Conclusion:

For the same reason as for RFS no. V.2.b, **RFS no. V.2.h serves no purpose for EPR.**

RFS NO. V.2.J (21/11/1988)

General rules for the protection against fire (*Règles générales relatives à la protection contre l'incendie*).

Main discrepancies and/or purposes:

The purpose of the RFS is to accept the EDF document entitled "*Recueil des règles relatives à la protection contre l'incendie (RCC I)*" dated October 1987.

It has the same subject as the RFS no. V.2.f and can be considered as a revision of the latter.

Conclusion:

For the same reason as for RFS no. V.2.f, **RFS no. V.2.j serves no purpose for EPR.**

RFS NO. RFS 2002-01 (26/12/2002)

Use of the probabilistic studies for the safety of the basic nuclear facilities, with the following associated text.

This rule specifies the methods acceptable for the development of the probabilistic safety assessment (PSA) and the applications of the PSA for the pressurised water reactors of the French nuclear program in operation or for future operation, taking into account national and international experience. The Technical Guidelines (C.2.2) are less detailed.

Conclusion

The RFS 2002-01 is applicable to the EPR.

A summary of the applicability of the RFS to EPR is given in Sub-chapter 1.4 - Table 2.

SUB-CHAPTER 1.4 - TABLE 2

Summary Table of Applicability of RFS to EPR

RFS	PURPOSE	Applicability
I.2.a	Incorporation of risks arising from airplane crashes	A + TG
I.2.b	Incorporation of risks of missiles...of turbine generator	A
2001-01	Determination of seismic risk	A
I.2.d	Incorporation of risks arising from industrial environment	A + TG
I.2.e	Incorporation of external flooding risk	A
I.3.a	Use of SFC in safety analyses	A + TG
I.3.b	Earthquake Instrumentation	A
I.3.c	Site geological and geotechnical studies	A
II.2.2.a	Design of the containment spray system	NP
II.3.8	Design and operation of the main secondary system	NA
II.4.1.a	Software of the safety-classified electrical systems	NA
IV.1.a	Classification of mechanical, electrical and Civil Works equipment	NA
IV.2.a	Requirements for design of 2 and 3 classified and pressure-retaining mechanical equipment	NA
IV.2.b	Requirements for the design, qualification, deployment and operation of safety-classified electrical hardware	A
V.1.a	Determination of the activity released from the fuel	NA
V.1.b	Meteorological measuring instruments	A
V.2.b	Acceptance of the use of RCC G dated 01/01/1981	NP
V.2.c	Acceptance of the use of RCC M dated 07/1984	NP
V.2.d rev1	Acceptance of the use of RCC E dated 06/1984	NP
V.2.e rev2	Acceptance of the use of RCC C dated 09/1989	A
V.2.f	Acceptance of the use of RCC I dated 05/1982	NP
V.2.g	Seismic calculations of Civil Works structures	NA
V.2.h	Acceptance of the use of RCC G dated 10/1985	NP
V.2.j	Acceptance of the use of RCC I dated 10/1987	NP
2002-01	Probabilistic studies for the safety of the basic nuclear facilities	A

A = applicable to EPR

A + TG = the objective or the principle of the BSR are applicable, but the method may be different, according to TG.

NA = not applicable to EPR: see explanations in the text above

NP = No Purpose

SUB-CHAPTER 1.4 – REFERENCES

External references are identified within this sub-chapter by the text **[Ref]** at the appropriate point within the sub-chapter. These references are listed here under the heading of the section or sub-section in which they are quoted.

3. APPLICABLE REGULATIONS

3.1. REGULATORY FRAMEWORK

3.1.1. The Health and Safety at Work Act 1974

[Ref] Health and Safety at Work etc Act, 1974. ISBN 978-010215683-6. The Stationery Office Ltd. (E)

3.1.2. The Nuclear Installations Act 1965 (as amended)

[Ref] The Nuclear Installations Act 1965 (as amended). ISBN 0-10-850216-3. The Stationery Office Ltd. (E)

[Ref] Environment Act 1995. ISBN 978-010542595-3. The Stationery Office Ltd. (E)

3.1.3. The Radioactive Substances Act 1993 (as amended)

[Ref] The Radioactive Substances Act 1993. ISBN 0-10-541293-7. The Stationery Office Ltd. (E)

3.2. RADIOLOGICAL PROTECTION REGULATIONS

[Ref] 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 ionizing radiation. Official Journal of the European Communities, L159, Vol. 39. June 1996. (E)

[Ref] 1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60. Ann. ICRP 21 (1-3). 1991. (E)

Secondary legislation:

[Ref] The Ionising Radiations Regulations 1999. Statutory Instrument 1999 No. 3232. ISBN 0-11-085614-7. The Stationery Office Ltd. (E)

[Ref] Approved Code of Practice: Work with ionising radiation. Ionising Radiations Regulations 1999. Approved Code of Practice and guidance L121 HSE Books 2000 ISBN 0-71-761746-7. (E)

[Ref] The Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPPIR). Statutory Instrument 2001 No. 2975. ISBN 0-11-029908-6.HM Stationery Office. The Stationery Office Ltd. (E)

[Ref] Radioactive Substances (Basic Safety Standards) (England and Wales) Direction 2000. Defra, UK. (E)

3.3. WASTE MANAGEMENT REGULATIONS

3.3.1. Non radiological waste

Secondary legislation:

[Ref] The Pollution Prevention and Control Regulations 2000 (PPC). ISBN 978-011099621-9. The Stationery Office Ltd. (E)

[Ref] Waste Management Licensing Regulations 1994. ISBN 978-011044056-9. The Stationery Office Ltd. (E)

[Ref] Hazardous Waste Regulations 2005. ISBN 978-011072685-4. The Stationery Office Ltd. (E)

3.4. ENVIRONMENTAL IMPACT REGULATIONS

Primary legislation:

[Ref] The Town and Country Planning Act (1990) (TCP Act). ISBN 978-010540890-1. The Stationery Office Ltd. (E)

Secondary legislation:

[Ref] Town and Country Planning EIA (England and Wales) Regulations 1999. ISBN 0-11-080474-0. The Stationery Office Ltd. (E)

[Ref] Town and Country Planning EIA (England and Wales) (Amended) Regulations 2000. ISBN 0-11-018690-7. The Stationery Office Ltd. (E)

[Ref] Town and Country Planning EIA (England and Wales) (Amended) Regulations 2006. ISBN 0-11-075471-9. The Stationery Office Ltd. (E)

Primary legislation:

[Ref] The Electricity Act 1989 ISBN 978-010542989-0. The Stationery Office Ltd. (E)

Secondary legislation:

[Ref] The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000 (SI 1927). ISBN 978-011099675-2. The Stationery Office Ltd. (E)

[Ref] The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR) (SI 2892). ISBN 978-011085395-6. The Stationery Office Ltd. (E)

3.5. PRESSURE VESSEL REGULATIONS

Secondary legislation:

[Ref] The Pressure Systems Safety Regulations 2000 (PSSR). Statutory Instruments 2000 No. 1281, ISBN 0-11-085836-0. The Stationery Office Ltd. (E)

[Ref] The Pressure Equipment Regulations 1999 (PER). Statutory Instruments 1999/2001, ISBN 978-011082790-2. The Stationery Office Ltd. (E)

3.7. INCIDENT REPORTING

Secondary legislation:

[Ref] The Nuclear Installations (Dangerous Occurrences) Regulations 1965. Statutory Instruments 1965 No.1824. The Stationery Office Ltd. (E)

3.8. ELECTRICAL SUPPLY DESIGN

Secondary legislation:

[Ref] The Electricity at Work Regulations 1989. ISBN 9780110966359. The Stationery Office Ltd. (E)

[Ref] The Electricity Safety, Quality and Continuity Regulations 2002. ISBN 0-11-042920-6. The Stationery Office Ltd. (E)

3.9. FIRE PROTECTION

Secondary legislation:

[Ref] Regulatory Reform (Fire Safety) Order 2005. ISBN 0-11-072945-5. The Stationery Office Ltd. (E)

[Ref] Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR). ISBN 0-11-042957-5. The Stationery Office Ltd. (E)

[Ref] The Equipment and Protective Systems (EPS) Intended for Use in Potentially Explosive Atmospheres Regulations 1996. ISBN 978-011053999-7. The Stationery Office Ltd. (E)

[Ref] The Control of Major Accident Hazards (Amendment) Regulations 1999 (COMAH). ISBN 978-011082192-4. The Stationery Office Ltd. (E)

[Ref] Control of Major Accident Hazards (Amendment) Regulations 2005 (COMAH). ISBN 0-110-72766-5. The Stationery Office Ltd. (E)

3.10. SITE LAYOUT

Primary legislation:

[Ref] The Anti-Terrorism, Crime and Security Act 2001 4. ISBN 978-010542401-7. The Stationery Office Ltd. (E)

Secondary legislation:

[Ref] The Nuclear Industries Security Regulations 2003 (NISR). ISBN 0-11-045397-2. The Stationery Office Ltd. (E)

[Ref] Water Resources Act 1991. ISBN 978-010545791-6. The Stationery Office Ltd. (E)

3.11. HEALTH AND SAFETY

[Ref] Provision and Use of Work equipment Regulations 1998 (PUWER). ISBN 0-11-079599-7. The Stationery Office Ltd. (E)

[Ref] Lifting Operations and Lifting Equipment Regulations 1998. ISBN 0-11-079598-9. The Stationery Office Ltd. (E)

[Ref] The Personal Protective Equipment at Work Regulations 1992. ISBN 0-11-025832-0. The Stationery Office Ltd. (E)

[Ref] Management of Health and Safety at Work Regulations 1999. ISBN 0-11-085625-2. The Stationery Office Ltd. (E)

[Ref] The Construction (Design And Management) Regulations 2007. ISBN 978-011075789-6. The Stationery Office Ltd. (E)

3.12. INTERNATIONAL TEXTS

International Guidelines (not specific to Europe)

[Ref] ICRP. Principles for intervention for protection of the public in a radiological emergency. ICRP Publication 63, Annals of the ICRP 22 (4). 1993. (E)

[Ref] IAEA. International Basic Safety Standards for protection from ionising radiation and security with respect to radiation sources. Safety series No 115. ISBN 92-0-104295-7. IAEA Vienna, 1996. (E)

[Ref] IAEA. Quality Assurance for Safety in Nuclear Power Plants and other Nuclear Installations, Code and Safety Guides Q1–Q14. Safety Series No. 50-C/SG-Q, IAEA, Vienna (1996). (E)

[Ref] Safety of Nuclear Power Plants: Design (Requirements for Design). ISSN 1020-525X IAEA Safety Standards Series N° NS-R-1. IAEA. 2000. (E)

SUB-CHAPTER 1.4 - TABLE 1

- [Ref]** "Technical Guidelines for the design and construction of the next generation of nuclear pressurized water plant units" adopted during plenary meetings of the GPR and German experts on the 19 and 26 October 2000. (E)
- [Ref]** Basic Safety Rule - Fundamental safety rule n°2001-01 concerning basic nuclear installations. RFS-GB-2001-01. ASN. (E)
- [Ref]** Basic Safety Rule – Rule 1.2.d. Protection against risks associated to the industrial environment and the roads. May 1982. (E)
- [Ref]** Basic Safety Rule – Rule 1.2.e. Protection against external flooding. April 1984. (E)
- [Ref]** ASN Guide 2/01. Considering the risk of an earthquake when designing civil engineering structures of nuclear installations, excluding long term storage of radioactive waste. May 2006. (E)