

INRODUCTION AND GENERAL

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
1	General comment	The style used by UK for the Report (with crossed deleted information and underlined new information) was not user friendly. Also, the printing of Question and Answers form the previous review meeting, now 3 years old, did not add much to the required information. The presentation of “Information requested by the First Review Meeting” was useful.	Comment - no answer required
2	General comment	Before coming to our questions we like to congratulate UK for the excellent report. It is very detailed and comprehensive. We learn a lot from the regulatory system UK has drawn up to ensure the safety of nuclear installations.	Comment - no answer required

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3	General comment	What evaluation and justification processes are required in respect of existing nuclear installations for which modification of function and/or lifetime is proposed? Is this secondary evaluation as rigorous as at the initial application stage?	The justification of modifications, continued operation or new build is done through the process of a safety case submission. In each of these, the standards required of a safety case and their associated independent reviews are the same for any given degree of safety significance as is the degree of scrutiny by NII. All NPPs are subjected to Periodic Safety Reviews that reassess the overall safety case. In addition, specific plant modifications are progressed and assessed using procedures required by the site licence. In both cases safety evaluations are carried out against current safety standards and, in the case of the PSRs, reasonably practicable safety improvements must be made. This has resulted in significant safety upgrading of NPPs. The actual review process is carried out with equal rigor to that carried out initially. However, the developments in NII's Safety Assessment Principles means that safety standards are now significantly higher.
4	General comment	The reports reviewed by France in view of the second peer-review meeting were all examined according to a standard list of issues derived from the obligations of the Convention. If an issue appeared to be covered in an incomplete way by the report of a Contracting Party, this led to a question or comment. However France recognises that the corresponding information may be available in other existing documents.	Comment - no answer required

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5	General comment	<p>The United Kingdom's National Report was very comprehensive and well written. It is a stand-alone document, with references to further, more detailed information. Essentially, it is a second revision of the 1998 report, with additions and deletions shown very clearly.</p> <p>There was an excellent effort put forth to address written and verbal questions from the first Review Meeting of the Contracting Parties of the Convention.</p>	Comment - no answer required
6		To what extent do you use performance indicators to assess the safety performance of a licensed reactor? What indicators are used?	NII is currently working with licensees to establish an agreed set of performance indicators that will be routinely reported to NII as an indication of safety performance. At the same time NII is actively developing its own internal systems for rating individual licensees' performance in respect of regulatory compliance.

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7		How does the regulator use the risk assessment data; for example in planning inspections, developing inspection procedures, developing technical specifications, and evaluating incidents? How does the operator of the facility use the risk data?	Risk assessment data, as presented in safety cases, is a primary source of information that informs inspection planning. Specifically it provides information on which systems should be inspected as a priority, and on which technical specialists should participate in inspection teams. The licensees also make use of risk assessment data in preparation of safety cases and in assessing their own priorities for plant upgrading.
8	Page 248, table 7	<p>Dose information for classified persons is reported in Table 7 as one of the operating data of UK's nuclear installations.</p> <p>More operating data would be appreciated such as plant capacity factor, unscheduled plant shutdown frequency, number of INES events, production and accumulation volume of radioactive waste and spent fuels, etc.</p>	<p>The design capacity of the UK's nuclear power stations is given in Annex 1 – page 187 of our report. Worldwide information is published annually by the World Nuclear Association.</p> <p>Unscheduled plant shutdowns are recorded in documents such as site newsletters. Information relating to the percentage availability of any given reactor is treated as commercially sensitive.</p> <p>British Energy publishes annually a report on Safety, Health and Environmental performance. This can be seen on the British Energy web site http://www.british-energy.com by accessing the 'environment' link on the home page. This report contains data covering a wide range of issues including safety-related events, unplanned reactor shutdowns and radioactive wastes.</p> <p>Data can also be found in BNFL's, Health and Safety Report at http://www.bnfl.com</p> <p>Information on radioactive waste and spent fuels will be dealt with in the</p>

			UK's report for the Joint Convention.
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9	Introduction Paragraph 1.1	It would be useful to present a diagram with all the nuclear organizations of UK and their relations with the various Government Departments.	<i>Please see figure 1 at the end of the table.</i>
10	Introduction Paragraph 1.4	<p>Whether the project for strategy review in energy field is completed? What is the role of nuclear power in this project?</p> <p>At what nuclear facility types the future nuclear power of Great Britain is based?</p>	<p>The UK Cabinet Office Performance and Innovation Unit (PIU) review of energy policy was published on 14 February 2002. The main aim of the review was to set out the objectives of energy policy and to develop a strategy that ensured current policy commitments were consistent with longer-term goals.</p> <p>The review looked at the range of energy supply options including nuclear in an open and inclusive way. It concluded that liberalised and competitive energy markets had been a success in the UK and provide a cornerstone of future energy policy. It recommends that: the policy focus should be establishing new sources of low cost/low carbon energy; keeping options open is essential to avoid technology lock-in; innovation is important in a broad range of energy technologies; a step change in energy efficiency is needed and an expanded role for renewables; and that there are good grounds for keeping the nuclear option open.</p> <p>As a report to Government, it provides recommendations but does not signify a change of policy although it will be an important contribution to policy development and has been welcomed by Government. Government plans to hold a public consultation on the key policy questions brought out by the review and to conclude that process with a White Paper.</p>

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			<p>Nuclear power (from AGR, PWR and Magnox stations) currently provides about a quarter of the UK's electricity supplies as well as playing a role in limiting the UK's greenhouse gas emissions and helping the UK meet its Kyoto targets. It also contributes to the security and diversity of supply in the UK. Existing nuclear stations will continue to contribute to UK energy requirements provided they do so to the high safety and environmental standards currently observed. As with other forms of electricity generation, it is for the market to bring forward specific proposals for new plant. British Energy and BNFL, the UK nuclear generating companies, have said they have no current plans to do so.</p>
11	Introduction Paragraph 1.7	<p>In the report it is stated that recent licensee reorganisations have involved a reduction in persons directly employed by the licensee, but an increase in the use of contractors. Has HSE issued a guideline on which requirements a contractor has to fulfil working on safety related systems? Is it required that a contractor working on such systems has a certified quality management system? Do clear rules and indicators exist to measure the performance of a contractor? We understand from Q13.1 that HSE is not involved in supplier selection or</p>	<p>In the UK, licensees are responsible for ensuring the safety on the licensed site and are required under Licence Condition 17 to have quality assurance arrangements for all matters that might affect safety. Licensees are therefore responsible for ensuring, amongst other things, that its contractors are fitted for the work that they do. HSE has guidance for its inspectors on judging whether licensees and contractors meet their safety responsibilities, and this guidance is available to licensees. It does not specifically prescribe the qualification, quality systems or performance of contractors but it does carry out inspections of the licensees' quality assurance arrangements. For critical components, such inspections may also involve examination of the quality assurance arrangements of suppliers or contractors. However it is always the licensees' responsibility to ensure that these arrangements are adequate.</p>

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		evaluation. But has HSE, besides the general obligation of the licensee, set up some guidance concerning the qualification of contractors working on safety related systems?	
12	Introduction Paragraph 1.7	Whether the reasons of the steam generator pipe damage at power unit 4 of Hunterston-B NPP were established? Whether the planned terms of gas-cooling reactor operation were negatively influenced by this fact?	Hunterston Reactor 4 boiler tubes were affected by erosion/corrosion in the proximity of swage pieces on the water side of the boilers. The effect was detected by leakage, investigated by extensive inspection, confirmed to be substantially limited to a single reactor only and necessary remedial work has since been carried out. Finally, the overall effect on the flow of cooling water through the boilers was minor. This event will therefore, have no bearing on the planned lifetimes of the AGR reactors.
13	Introduction Paragraph 1.29	The increase of the shift duration up to 12 work hours is connected with the risk of personnel mistake augmentation due to his tiredness. Whether the study of this factor is completed, and what are the final decisions?	As the change in shift patterns at Hinkley Point B (from an 8 hour shift to a 12 hour shift) had the obvious potential to safety related tasks, this particular proposed change was "called in" under the licensee's Licence Condition 36 arrangements for detailed review and assessment. A trial was conducted against a wide range of indicators and a detailed study has been completed and assessed. It was concluded that the particular arrangements that were introduced during the trial period, together with the clear and tightly controlled operating constraints and monitoring arrangements, did not result in any observable degradation in operations staff performance at this particular site. There are similar practices elsewhere in the nuclear industry and the experience with such practices has been mixed.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
14	Introduction paragraph 1.34	<p>The electricity trading arrangements and the National Grid Company should ensure that in case of blackouts the nuclear power stations are again provided with off site power as fast as possible. Are there in the privatised market arrangements or obligations for prioritisation of the nuclear power plants in case of blackouts? If yes, what kind of arrangements or/and obligations exist? Does the Gas and Electricity Markets Authority (GEMA) play a role in this context? What is the content of the Memorandum of Understanding between GEMA and HSE?</p>	<p>There are no arrangements to prioritise nuclear power stations because, in the event of a grid blackout, the priority would be to re-establish a stable grid everywhere. All nuclear power stations need to have adequate levels of redundant auxiliary generation (e.g. Diesel generators) for internal supplies in such an event.</p> <p>The purpose of the memorandum of understanding between GEMA and HSE is to provide a forum whereby potential safety issues can be anticipated, discussed and, if necessary addressed by appropriate consultation with all interested parties.</p> <p>A copy of the memorandum of understanding will be made available to the meeting.</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
15	Introduction Paragraph 1.41	<p>The privatisation and the necessary organisational changes consume many person-hours of key-personnel. Many of these key-persons are also responsible for the safety of the plant. <i>The safety case at the Sellafield reprocessing and MOX plant has shown that due to privatisation the top management has had not enough time to spent it in the plant, to handle safety questions.</i> Which arrangements HSE has taken to avoid similar situations in nuclear power plants? Is the management of a nuclear power plant reinforced before a lot of time is spent for reorganisational efforts?</p>	<p>The new licence condition LC 36, on Control of Organisational Change, requires licensees to make and implement adequate arrangements to control organisational changes that may affect safety. NII's guidance states that for its arrangements to be adequate, a licensee must, amongst other things, ensure that changes are analysed and planned so as to avoid such negative impacts on safety.</p> <p>It should be noted that there has not been a privatisation at Sellafield but the requirements of the safety regulator are the same irrespective of ownership.</p>
16	1.50	<p>Baseline: Why the production of the complete baseline will take time? Is there all the information already available in the licensee organization and in the licensing process?</p>	<p>As for most successful businesses, nuclear licensees analyze and plan their staffing requirements. The requirement, arising from LC 36, is for a baseline that is a safety substantiation of the current staffing complement and structure. Substantiation goes beyond a simple description and will inevitably take time. The current structure will have changed since the time of licensing, the need for an up-to-date baseline is intended to address these changes.</p>

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17	1.76 13.15	Is there a public report on the experience in implementing the Business Management System (BMS) at NSD? What has been the experience?	<p>There has not been a public report on the implementation of BMS and there are no plans to issue one.</p> <p>The BMS is a quality-controlled suite of documents that can be accessed by all NII staff through the Intranet. It is a suite of procedures grouped according to our Key Business Activities. It consists of both procedures and guidance. Each document is reviewed at least every three years. It is regularly updated as a result of staff feedback through a controlled continuous improvement process. Frequent audits are also used to improve the BMS.</p> <p>The BMS is a living system that will always be subject to change. At first there was some resistance to the introduction of the BMS. But staff have come to realise that since they are involved in the production of BMS documents it truly reflects the way that we work (5% of staff has been made available for this and other Continuous Improvement activities). New staff in particular, find the BMS invaluable.</p> <p>The decision to produce the BMS required a major resource at the beginning when the bulk of the documentation was produced. A smaller team is now required to maintain the BMS.</p>

ARTICLE 6

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18	6	a. Are closure criteria agreed between the operator and the regulator, or is the program reviewed on a judgement basis? b. How is a reasonable schedule for closure of GIs determined, and how is it enforced? c. Does HSE plan on raising further GIs for AGRs or Sizewell, or are they subsumed in the Periodic Safety Reviews for each station?	Issues which are significant to safety (i.e. those which are in the upper regions of the tolerable risk as set out in HSE's publication on Tolerability of Risk) are expected to be completed by the NII's Decision Date for continued operation. Others will be expected to be completed within an agreed timescale but within 2 years following the Decision Date. Enforcement can be achieved through a range of measures depending on the safety significance; the options include an Improvement Notice (failure to achieve brings a prosecution), withholding a start-up consent after an outage or a Direction to shutdown. A closure decision is essentially judgment based. In most cases such decisions have been taken by the operator when the cost of required safety improvements were not thought to be economically viable. At present, HSE does not intend raising further generic issues.
19	6	BNFL announced on May 2000 a lifetime strategy for its Magnox NPPs. Most of these types of stations began operating in the 1950s and 1960s. <ul style="list-style-type: none"> • What safety and technical measures UK Government have in mind in order to harmonize the increasing safety requirements with the age of these plants ? 	All civil UK reactor plants have to justify to NII that they are safe to operate before NII issues a consent to start up following statutory outages - for Magnox reactors these outages are every two years. In addition periodic safety reviews are carried out every 10 years where the safety of the plant is reviewed against current standards, NII's Safety Assessment Principles (SAPs). All reasonably practicable improvements must be made to move towards current standards. The licensee is required to justify any shortfall and to provide arguments as to why it is not reasonably practicable to meet them.

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		<ul style="list-style-type: none"> How are affected the old Magnox plants by the commercial pressures to cut costs in the open market conditions ? 	<p>Commercial considerations are not allowed to affect the safe operation of our nuclear installations. Future economic operation may be affected but safety is not. It is up to the operator to determine whether it is economically viable to implement required safety modifications. If it chooses not to do so, the plant must be closed down.</p>
20	6	<p>British Energy plc Work Management Project is designed to control all the activities of BE through a uniform computerized system. This system was piloted at Heysham 2 AGR plant and it has the potential to impact on safety through maintenance activities on site, control of plant modifications and management of station safety cases. Could you describe in more details the features of this project?</p>	<p>The task of the Work Management Project for British Energy plc is to introduce common work processes to all of its eight sites (two operated by BEG(UK)L in Scotland and six by BEGL in England). The work processes affected by the project are:</p> <ol style="list-style-type: none"> (1) Engineering Change; (2) Procurement Engineering; (3) Inventory Management; (4) Work Management; (5) Material Safety Data Sheets; (6) Safety Management; (7) Action Tracking; (8) Total Exposure Monitoring; (9) Document Management; (10) System Administration. <p>As well as introducing process improvements, BE has implemented all of the changes through the assistance of modern work management software. Currently BEGL is operating a simplified (reduced number of functions) version of the system at Heysham 2 and Hinkley Point B. Subject to final testing and performance review, BE intends to seek NII's agreement to introduce the full version of the Work Management System to Heysham 2 and Hinkley Point B in June 2002. If this is successful it will gradually introduce the system to the rest of its stations starting in September 2002 with Torness and completing the introduction at its last two NPPs, at Hartlepool and Dungeness B, in March 2003.</p>

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21	6	<p>Following privatisation, the two licensees are embarked on programmes of staff reductions. HSE, the British licensing authority, undertook a safety management audit which resulted in 103 detailed recommendations. What specific actions regarding nuclear safety are planned ?</p>	<p>Following the safety management audit, restrictions were placed on the loss of safety - related posts in British Energy. Some of these restrictions remain pending satisfactory responses from BE on key audit recommendations. BE has been reviewing and revising many of its internal processes and procedures in response to the Audit recommendations and is formally responding to each of the 103 recommendations. NII is aware of a number of positive changes since the Audit but will only 'close out' the recommendations when a satisfactory evidence-based response, demonstrating that the recommendation has been adequately addressed, has been received and assessed.</p>
22	6	<p>Could the United Kingdom explain why the licence lifetime of Wylfa (33 years) is shorter than that for the other plants?</p>	<p>The next 10-year decision date for the Wylfa PSR falls in 2004 when the station will have been operating for 33 years - the 10 year periodicity for Periodic Safety Reviews is a consistent requirement across all commercial UK reactor plant. The apparent anomaly arises from the fact that that the first reviews on the UK's Magnox plant (called Long Term Safety Reviews) were carried out at plant ages of 20-25 years. When successfully completed, these reviews enabled a plant to operate up to a lifetime of 30 years. Wylfa was the first station that was reviewed against the international practice of a ten yearly PSR. This was done at 23 years so the next review will be required at 33 years. There are no term licences in the UK.</p>

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23	6	Could the United Kingdom give more information on the problem associated with the obsolescence of components of the instrumentation and control system of the old plants? Has it been necessary to replace the system by using a modern technology?	In UK all older plants (those commissioned before 1985) use I&C safety systems based on simple analogue technology. The licensees have been very successful in maintaining these systems to a high standard without the need for whole system replacement with modern technology. A good example is the analogue primary protection systems used on the majority of the UK's gas reactors. This type of system was introduced first in the early sixties and has been maintained largely intact since its introduction. Component and circuit board obsolescence has been confronted and equivalent analogue replacement parts have been designed, justified in safety cases, installed and commissioned.
24	6.17, page 30	It is stated that it is not reasonable to expect that the older designs to be capable of full compliance with the safety standards applied to the more modern designs. What is the viewpoint of the regulatory body regarding lifetime extension and renewal of licensed in case of a vintage designed reactor, and what criteria are used for the decision-making on these matters?	NII's decision as to the acceptability of continued operation is based on its assessment of licensee's periodic reviews of safety cases, which is carried out every 10 years. These reviews are expected to consider ageing, make comparison with modern standards and identify plant improvements to address shortfalls. In reaching its judgments on the licensees' reviews, NII uses its published Safety Assessment Principles and the risk criteria contained within them. In all cases, it is a legal requirement for the licensee to demonstrate that all that is reasonably practicable has been done in the interests of safety.
25	6	In which UK nuclear installations listed in report is recommended the replacement of existing I&C equipment for a new generation as a result of the safety reviews?	From the point of view of the systematic replacement of plant-wide I&C safety systems, the answer is none. The safety reviews that have been undertaken pointed out areas for improvement, particularly on equipment segregation and diversity. Therefore many of the safety reviews recommended enhancements in I&C safety systems and not their complete replacement.

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26	6.17	<p>It is reported that the licensees demonstrate to HSE's satisfaction that an acceptable safety case exists and all reasonably practicable plant improvements have been made.</p> <p>1) How does HSE judge that all reasonably practicable plant improvements have been made?</p> <p>2) Are any cost/benefit analyses made to define reasonably practicable plant improvement?</p>	<p>1. UK legislation requires that the risks are reduced as low as reasonably practicable. Legal precedent defines this state as being when the time, trouble and money to reduce the risk further is grossly disproportionate to the risk reduction it would achieve. In practice most of the decisions are made using "Good Practice" which means that standards, practices, procedures etc are the same or equivalent to those which have been accepted by the regulator elsewhere or in the past. In the latter case we are aware that technology advances and standards evolve and we expect licensees to carry out regular reviews and to upgrade to the latest standards, unless they can show that the cost of doing so is grossly disproportionate to the benefits it would bring. In some cases a cost Benefit Analysis is used as part of the decision making process and, in order for this to work, an estimate of the magnitude of gross disproportion is needed. Although the courts have not established what this value should be, it is generally accepted that the level of gross disproportion will increase as the risk and magnitude of consequences increase. Factors up to 10 have been used by licensees and accepted by the regulator. HSE has its own risk management philosophy, based on Tolerability of Risk (ref 1) in which the risks are categorised as unacceptable, tolerable and broadly acceptable. These categories are not law, but are used to help the regulator decide on a course of action. If the risks are deemed unacceptable in the opinion of the regulator something must be done to improve matters. If the risks are broadly acceptable, although the legal duty remains for the duty holder to do what is reasonably practicable, the regulator will generally focus attention elsewhere (higher risk situations). In the tolerable zone, the regulator will press for improvement or a demonstration that further improvements would be grossly disproportionate.</p>

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			<p>2. Cost benefit analyses have been used to help in determining what a reasonably practicable improvement might be. This involves identifying engineering and/or procedural options for improvement. These are then tested to see the degree of safety benefit they confer, and the associated costs. This information is used together with engineering and operational factors to come to a decision on which option, if any, to implement.</p> <p>Published guidance (ref 1,2,3, &4) for inspectors is available to help them consider reasonable practicability and the content and conduct of a CBA for health and safety issues. NSD specific guidance for NSD inspectors is available in draft - though this is currently being updated.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Reducing risks protecting people. HSE Books 2001 2. Principles and guidelines to assist HSE in its judgments that duty-holders have reduced risk as low as reasonably practicable. Published on the HSE website 13.12.01. http://www.hse.gov.uk/risk/theory/alarp1.htm 3. Assessing compliance with the law in individual cases and the use of good practice. Published on the HSE website 13.12.01. http://www.hse.gov.uk/risk/theory/alarp2.htm 4. Policy and Guidance on reducing risks as low as reasonably practicable in design. Published on the HSE website 13.12.01. http://www.hse.gov.uk/risk/theory/alarp3.htm

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27	6.26	<p>It is reported that HSE has concluded it expects all AGR stations to be able to operate safely for at least 30 years as a result of PSR.</p> <p>1) Does ‘at least 30 years’ mean 30 years from now on?</p> <p>2) Do you have any specific criteria to allow another 30 years of operation?</p>	<p>It means 30 years from start of operation. Any operation beyond this will depend on a satisfactory outcome of Periodic Safety Reviews carried out every 10 years.</p>

ARTICLE 7

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28	7	With the possibility of new nuclear power plants in the U.K. in the next decade, does the U.K. anticipate any significant changes in the licensing framework?	<p>As with other forms of electricity generation in the UK, it is for the market to bring forward proposals for new nuclear plant. Feasibility studies have been announced by BE and BNFL into the potential suitability of two reactor types for the UK – the AECL Candu NG and the Westinghouse AP1000 – to replace existing stations as they close. Both BE and BNFL have also said that they have no current plans to put forward specific proposals for building new NPP.</p> <p>No changes are anticipated to the current licensing framework. It is expected that any application made to the HSE/NII for assessment of a new reactor for licensing in the UK would be judged, as with previous applications, on the quality of the safety case submission made by the applicant.</p>

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29	7	<p>To ensure the safety of nuclear power plants, the licensees as well as the regulator carry out or support research work directed to enhance or at least to maintain the safety level (Article 19.16ff). Does in the legislative and regulatory framework exist an obligation for the licensees to carry out or to promote such research work? Has HSE, due to the legislation, the power and the finances to carry out or to promote regulatory safety research work? That means has the Division 4, Research&Strategy of the NII legislative support for these activities? How are the necessary financial resources determined? What is the amount of these resources? What does in this context mean “a programme of generic safety research agreed between HSE and the industry?</p>	<p>There are no specific legal or regulatory requirements on the licensees to carry out or promote research. However there are licence conditions which research helps the licensees to fulfill. Research is not an end in itself.</p> <ul style="list-style-type: none"> • Under the Health and Safety at Work Act section 11, it is the duty of the Health and Safety Commission to make such arrangements as it considers appropriate for the carrying out of research, the publication of the results of research and the provision of training and information in connection with those purposes, and to encourage research and the provision of training and information in that connection by others. (This duty is delegated to HSE.) Under the Atomic Energy Act section 2, the HSE may recover (from the licensees) expenses incurred wholly or partly in connection with the carrying out of research into nuclear safety at the direction of the Health and Safety Commission. Hence the legislation provides HSE/NSD legislative support for the activities. • The necessary financial resources are determined in the first place by discussion between HSE and the licensees. The programme of research is submitted to a government advisory committee, which advises the HSC, to an internal HSE committee on which the licensees are represented, and finally to the HSC. If the licensees still disagree, they may presumably proceed to judicial review, but this has never happened yet. • In May 2001 the Health and Safety Commission agreed a Coordinated Programme for 2001/2002 comprising a Levy programme (commissioned by HSE) of £1.49 million, with an estimated 42 projects, and programme co-ordinated by an industry

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			<p>management committee of £7.2 million (210 projects). 'Generic' is usually interpreted as applying to more than just one particular power station, which often means to all Magnox reactors, all AGR reactors or all PWR reactors (in this case there is only one reactor). The programme is also not normally used to resolve issues directly arising from safety case submissions.</p>
30	7.23	<p>It is reported that RSA was amended by the Environment Act 1995 so that the Environmental Agency (EA) is the regulatory body for authorization in respect of premises in England and Wales and the Scottish Environment Protection Agency (SEPA) is the regulatory body for Scotland.</p> <p>What is the content of the amendment?</p>	<p>The sections of the Environment Act 1995 relating to transfer of functions under RSA93 to the Environment Agency appear at Part I, Chapter I, Section 2 (1) (e) & Section 2 (2) (a). Transfer of functions to SEPA under RSA93 appear at Part 1, Chapter II, Section 21 (1) (e).</p> <p>These functions are broadly similar to those previously carried out by HM Inspectorate of Pollution in England and Wales, and HM Industrial Pollution Inspectorate in Scotland. Both of these former Inspectorates have now been subsumed into the Environment Agencies.</p>

ARTICLE 8

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31	8	<p>One of the most difficult challenges in assessing the safety performance at a nuclear power plant is to recognise the early signs of declining safety performance, before conditions become so serious that regulatory sanctions must be imposed or, worse, a serious incident or accident occurs. In this connection, it is widely known that a good approach is to have senior resident inspectors who can observe the day-to-day operations of the plant.</p> <p>What is the role of resident inspectors in the regulatory framework?</p> <p>What is the size (number) of resident inspectors per reactor or site?</p> <p>What are the major activities of resident inspectors?</p> <p>What are the requirements for the qualification of resident inspectors?</p>	<p>NII appoints as the nominated Site Inspector, a Principal Nuclear Inspector to each operating power station. These inspectors spend around 25% of their available time (about 57 days per year) on site but remain based in NII HQ. Nominated Site Inspectors are supported by other inspectors or specialist inspectors on team inspections on specific topics, on monitoring licensees' responses during annual demonstration emergency exercises and on inspections during statutory outages. Nominated Site Inspectors become familiar with their site and regularly visit the site to gain information and intelligence on its activities, to investigate selected incidents and to inspect for compliance with UK law, particularly for compliance with the conditions attached to the nuclear site licence.</p> <p>The main activities of Site Inspectors relate to the carrying out of planned inspections of activities on site and of the principal safety related systems on the plant. These inspections are used, inter alia, to confirm that the relevant requirements of the site licence are met. Site Inspectors also act as NII's principal 'eyes and ears' on site, report any concerns to colleagues or managers and identify emerging issues that warrant additional regulatory action.</p> <p>Site Inspectors are chosen from the general cadre of NII inspectors and thus possess the same qualifications. In general, appointment to a site inspection post is made after a period of working within NII during which a range of relevant training is undertaken and experience is acquired.</p>

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32	8.14	<p>The report mention in §8.14 (p. 53) that HSE is sponsored by DTLR, however it reports to the Secretary of State for Trade and Industry, which is responsible to Parliament for nuclear safety. In parallel, it is mentioned in the response to Q8.1 (p. 56) that HSE "does not report to the Department of Trade and Industry". Could the United Kingdom clarify the exact relationship between HSE and the ministers of the UK Government as regards independence between regulation and promotion of nuclear energy?</p>	<ol style="list-style-type: none"> 1. HSC and HSE are statutory bodies that were established by the HSW Act 1974. 2. Machinery of Government arrangements establish which Secretary of State (SoS) is responsible to Parliament on a topic where this is not clearly stated by statute. The current Statement of Ministerial Responsibilities for Nuclear Safety stipulates that the Secretary of State for Trade & Industry reports to Parliament on civil nuclear safety matters. She also has other responsibilities in relation to nuclear energy. 3. HSE is resourced by and answers for the bulk of its activities to HSC with an important qualification: HSW Act Section 11(4) precludes HSC from giving any direction to the HSE as to the enforcement action taken in any particular case, except for the purpose of giving effect to directions given to the HSC by the Secretary of State. In turn, HSW Act Section 12 stipulates that the Secretary of State may only give directions relating to the HSC's functions (which do not include enforcement action in a particular case) or which are judged requisite or expedient to give in the interests of the safety of the State. This latter has never been used. 4. The route by which HSC and HSE bid for and receives funding is the sponsorship link between HSC and DTLR referred to in paragraph 8.14. 5. The Secretary of State for Trade and Industry's accountability to Parliament for nuclear safety makes her the authority to whom the HSC would propose any changes in regulations relating to nuclear safety. This is rarely necessary given that HSE has wide ranging regulatory powers to establish, vary and enforce conditions attached to the nuclear site licence, and to issue guidance material. Attaching conditions to the nuclear site licence and providing guidance together are the main means by which HSC's

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
			<p>“regulatory policies” for nuclear safety are developed.</p> <p>6. Taking all these factors into account, HSE’s regulation of nuclear safety is independent of “Government policies supporting or opposing the use of nuclear energy”. (Response to Q8.1)</p> <p>7. The Secretary of State for Trade and Industry, in accounting to Parliament for nuclear safety, needs appropriate information, for example, to answer questions on incidents at nuclear installations. HSW Act Section 11(5) allows Ministers to request such information about the activities of HSE in connection with any matter with which they are concerned. This is the meaning of paragraph 8.14 “the Executive reports to this minister”. The wording in response to Q 8.1 that “HSE does not report to the DTI” is a reference its independence from direction (para 3 above) or influencing through the resourcing route (para 4 above).</p>
33	8.10, page 52	With regards to Article 8.1; paragraph 8.10 on page 52 of the National Report, does the HSE have a Cost Recovery program or fee structure that is flat rate or based upon person-hours, attributed to work for a given licensee?	The Nuclear Installations Act 1965 requires HSE to recover its 'expenses' from nuclear licensees, for its regulatory work in support of its licensing regime. The basis of calculation is the amount of effort directly attributable to individual licensees expressed as a percentage of the total effort expended by HSE staff on nuclear licensing activity. This percentage is then applied to the total costs associated with HSE's nuclear licensing activity including necessary overheads. Thus a licensee consuming 10% of HSE's direct effort will be charged 10% of our expenses.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
34	8.8.7	<p>It is reported that the body commonly referred to as ‘HSE’ is the 4000 or so civil servants who deal with almost all aspects of industrial safety under the authority of the Executive.</p> <p>1) How many people among 4000 civil servants are engaged in nuclear regulatory activities?</p> <p>2) How about the breakdown of the people engaged in nuclear regulatory activities?</p>	<p>The Nuclear Safety Directorate (NSD) is that part of HSE that is responsible for regulating nuclear safety. At present there are 253 staff in NSD of which 162 are inspectors who are qualified and experienced in nuclear safety technology. The remainder are administrative and support staff.</p> <p>NDS’s staff cover a full range of disciplines and expertise. About 30% are involved in site inspections duties but it is policy that there is a rotation of responsibilities. During a career with NSD it would be expected that an inspector will, at various times, work on both site inspection and safety assessment.</p>
35	8.18	<p>It is reported that GEMA has a duty to consult HSC on all electricity safety issues and to take account of the advice offered whether or not in response to such consultation.</p> <p>Could you explain some examples on which GEMA consults HSC and HSC offers advice to GEMA?</p>	<p>HSE and GEMA meet regularly twice each year to provide an opportunity to exchange information. Other than these meetings there has been no need for formal consultations to date. However, the mechanism is in place in case the need arises.</p> <p>GEMA operates under the name of OFGEM – Office of Gas and Electricity Markets</p> <p>(See also the response to question 14 regarding the introduction to the UK report)</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
36	8.20	<p>What is the status of the Health and Safety Commission, how its formation and financial status is realized?</p> <p>What is the status of Consultancy Committee on Nuclear Safety, what is its financial status in its activity?</p>	<p>The mandate and duties of the Health and Safety Commission (HSC) are explained in paragraphs 8.1 and 8.2. HSC is funded by Government through the Department of Transport, Local Government and the Regions (DTLR).</p> <p>The Nuclear Safety Advisory Committee (NuSAC) is described in paragraphs 8.20 to 8.22. It is an independent advisory committee of HSC. Its members receive travel and subsistence expenses for attending meetings, but do not receive other financial benefits for being on the committee.</p>
37	8	<p>The HSE uses technical support organisations (TSO) to support the safety assessment and selected inspection activities. What is the status of the TSO used by HSE and the work relationship with the HSE, with consideration of their independence?</p>	<p>HSE/NII is essentially the regulatory body and the TSO. NII has sufficient a range of expertise to carry out most necessary safety assessments. The majority of NII's staff are employed in assessment duties. On occasions, it is necessary to seek outside support – for example if the volume of work exceeds available resources or very specialist expertise and advice is needed. When this happens, it is the responsibility of the individual NII assessor to contract extra resource from where he/she sees appropriate. A budget is available for this purpose. We do not use a single supplier and, of course, we take care regarding the independence or any other vested interest of any contractor who is selected to provide this service.</p> <p>The responsibility for giving final advice to that part of NII responsible for licensing, rests with the NII assessor. He/she must therefore be able to manage the work of the contractor.</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
38	9.14, 14.13, 14.14 Table 2 Appendices	<p>Please, specify, at what specific stages of the nuclear facility life cycle the licensee submits the Safety Analysis Reports, and what is their difference?</p> <p>Are there the normative documents for regulation of structure and contents of nuclear facilities SAR?</p> <p>Whether the operating organization should receive at the Regulatory Body the separate licensees for concrete NPP siting, its construction and operation?</p>	<p>The stages will depend on the licensees' arrangements but usually divides into pre-construction, pre-commissioning and pre-operation. Periodic Reviews are then required every 10 years. Further safety cases for the major stages of decommissioning will also be expected.</p> <p>No, it is a matter for the licensee. However, NII is about to publish guidance for its inspectors on the qualities, scope and content of safety cases.</p> <p>A licence is granted for a site. Arrangements are required under the licence for the control of safety during construction and commissioning. These usually entail HSE giving its consent at each major stage of construction and commissioning.</p>

ARTICLE 10

Question Number	CNS Article and National report reference	COMMENT/QUESTION	
39	10	<p>The Report mentions that developing a good of safety culture in all areas is of highest importance.</p> <ul style="list-style-type: none"> • What methods for measuring the level of safety culture do you use? • What organizations perform this “measuring” activity and to what nuclear related activity groups is applied? 	<p>Safety culture is a combination of a number of factors which are enumerated in INSAG-4, for example, and include knowledge and competence, communication and commitment. Within the UK, the NII evaluates these factors through the routine site inspection programmes carried out by site inspectors as part of establishing how licensees are managing safety. NII seeks to gain confidence that a licensee’s safety culture is appropriate and that it is consistent with current best practice. There is extensive examination and promotion of the factors that make up safety culture which contribute towards a positive safety culture. The UK Health and Safety Executive (HSE) has developed a safety climate tool which may be used for measuring safety culture within an organisation, and this is intended for use by the duty holder (licensee) rather than the regulator. This is a generic tool and is not specifically for nuclear operators, and although it has been used by a number of nuclear sites, this has been relatively limited to date. Further details of this can be found on the HSE web site.</p>
40	10	<p>Responsibility for safety should be allocated to the senior managers within the NPP operating organization. How do these managers demonstrate their commitment to safety as an overriding priority to the regulator, especially in the case of an open market?</p>	<p>There is a legal requirement within the UK under the Health and Safety at Work Act that companies must develop and implement a formal safety policy. NII, through its inspections, assessments and other interventions, checks that this is reflected in an NPP’s documentation and that senior management provide the resources and means to achieve the safety policy. NPPs are required to develop and implement fully documented safety management systems that reflect the top tier policy on safety.</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
41	10	Different types of safety reviews and indicators are used in the United Kingdom: are these indicators thought to allow an early identification of possibly declining safety in order to take the appropriate countermeasures?	The UK continues to be involved in International activities on developing appropriate indicators for measuring licensees' safety performance and regulatory effectiveness. This work is being fed into discussions with licensees on developing a comprehensive suite of safety indicators. Together with the results of inspections, assessments and reviews of incidents and events, these can provide early identification of safety problems.
42	10.12	<p>Whether the specialized and subcontract organizations should receive the respective licenses on the right of different services realization for operation organizations at the Regulatory Body?</p> <p>How does the operating organization realize the monitoring for the quality of equipment and items important for safety, supplied by the subcontract organizations?</p> <p>Is there, in GB, the independent expert organization engagement practice for different NPP's document evaluation providing background of the safety (for example, Safety Analysis Reports) before their submission to the Regulatory Body?</p>	<p>NII puts no restrictions on the contractors a licensee uses, the licensee is responsible for ensuring that the contractors are fitted for the work they do:</p> <ul style="list-style-type: none"> a) Thus NII does not licence contractors to do work; b) NII does not prescribe ways of monitoring contractors; licensees are responsible for doing this. (See also the response to Switzerland, submission 1 regarding the introduction to the UK report.) c) Licensees are also responsible for obtaining appropriate independent evaluation of important analyses (such as the SAR) before the submission of such documents to NII. Licensees are free to utilize advice from vendor organizations or other consultants to help in the preparation and/or evaluation of SARs before their submission to NII, but ultimately must possess sufficient in-house knowledge to judge the quality of such advice.

ARTICLE 11

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
43	Introduction, 11 and 12	Is the change in shift patterns in Hinkley point B (from an 8 hours shift to a 12 hours shift) not harmful for an optimal execution of safety related tasks, such as testing or maintenance of safety related components? Are similar practises known in the nuclear industry? If so, what are the experiences in that case?	As the change in shift patterns at Hinkley Point B (from an 8 hour shift to a 12 hour shift) might well have proved harmful for the execution of safety related tasks, this particular proposed change was "called in" under the licensee's Licence Condition 36 arrangements for detailed review and assessment. A trial was conducted against a wide range of indicators and a detailed study has been completed and assessed. It was concluded that the particular arrangements that were introduced during the trial period, together with the clear and tightly controlled operating constraints and monitoring arrangements, did not result in any observable degradation in operations staff performance at this particular site. There are similar practices elsewhere in the nuclear industry and the experience with such practices is mixed.
44	Introduction, 11 and 19	The staff reductions are prominent and occur in a rather short period of time. What kind of measures have been taken to compensate for the losses in skill and knowledge/experience and to avoid loss of safety culture (social unrest due to forced dismissals, if any)?	The new licence condition LC 36, on Control of Organisational Change, requires licensees to make and implement adequate arrangements to control organisational changes that may affect safety. Licensees have to develop ways of protecting their safety culture and monitoring for any loss of morale or staff. NII's Inspectors seek evidence of this and make their conclusions on whether there has been any degradation. (see also the response to question 15 regarding the introduction to the UK report.)

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
45	11.4	In Article 11.4 it is stated that the nuclear operator must demonstrate to the satisfaction of HSE that they have in place adequate resources, that means enough money for normal safe operation and of making any necessary safety improvements. In an open electricity market the operator will try to reduce the budget, also for normal operational expenses. Has HSE given a limit below which it would not allow the further operation of the plant, because it is then deemed to be no more a safe operation?	No, the HSE has not set a financial limit below which it would not allow the further operation of the plant. HSE is not a financial regulator and it relies upon the Department of Trade and Industry, which is the sponsor of the industry in the UK (see para 1.1. of the UK report), to monitor the financial well being of nuclear operators. In addition HSE's ongoing monitoring of each nuclear licensee's operational and safety performance informs regulatory judgments about its capability to continue to operate safely. If HSE concluded that safety was compromised by a lack of resources it could invoke its general power, under licence condition 31, to Direct the nuclear licensee to cease operations.
46	11.11.7 11.11.9	Financing waste management and decommissioning: Since there is no disposal route for ILW and HLW in the UK, how can the costs be estimated? How is the basis? Which values have been used?	BNFL, UKAEA and BE produce annual reports and accounts in which they estimate their decommissioning and waste management liabilities. These reports are published on their web sites, which are referenced in the UK's report. The estimates produced are based on the latest detailed technical knowledge available, which will be revised as knowledge and circumstances change. Government policy is the basis for determining the future cost of waste management and decommissioning. Licensees make their plans based on this policy.

ARTICLE 12

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
47	Page 83, 12.27	The paragraph 3 describes that each licensee is striving to achieve a more open approach to event reporting, for example, by encouraging the reporting of abnormal conditions or near-miss events. What are the main features of utility’s open approaches mentioned above?	<p>The Health and Safety Policy of British Energy's two UK nuclear generating companies states that the Board of the Company will "Promote a culture of co-operation and open communication in which every opportunity is taken to learn from actual and potential failures of the Health and Safety arrangements and no unfair blame is placed on individuals." and states the expectation that all staff will "Report any incident affecting health or safety, or any matter that may affect health or safety". (This updated policy will appear in the 2001/02 Safety, Health & Environment report on the Company website http://www.british-energy.com - due to be published in July). When seeking the highest possible standards of safety, it is important for every abnormality and discrepancy to be reported, however small. In other circumstances, such discrepancies might be contributors to an injury or untoward event threatening safety. British Energy stresses to all staff the importance of reporting abnormal events. However minor, all such events need to be recorded and investigated so that lessons can be learned and shared with other stations and operators. The health of this reporting process is scrutinised as part of normal management accountability, monitored by the independent internal Health, Safety & Environment Division and performance indicators are reported to each meeting of the Board's Safety, Health & Environment Committee.</p> <p>BNFL follows a very similar approach.</p>
48	12	What procedures have been developed to incorporate systematic root cause analysis of human-induced events into the event reporting system of UK NPPs?	The UK Licensees use HPES (Human Performance Enhancement System) developed by the Institute of Nuclear Power Operators (INPO). This has been introduced fairly recently, and the regulator is working closely with the licensees to ensure a consistent and accurate analysis of all incidents, and to check that lessons learned are fed back into the industry.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
			<p>HPES should identify human induced events, if used properly. Our procedures stem from Licence Condition 7 that requires the licensee to “<i>make and implement adequate arrangements for notification, recording, investigation and reporting of such incidents occurring on the site:....</i>”</p>
49	12	<p>How do the licensees assess the level of safety culture achieved at their facilities?</p>	<p>The regulator, NII, evaluates the factors that contribute to safety culture through the routine site inspection programmes carried out by site inspectors as part of establishing how licensees are managing safety. This extensive examination and promotion of the factors that make up safety culture contribute towards a positive safety culture within the licensees’ organisations that is then continued through self-regulation by the licensees. The UK Health and Safety Executive (HSE) has developed a safety climate tool which may be used for measuring safety culture within an organisation, and this is intended for use by the duty holder (licensee) rather than the regulator. This is a generic tool and is not specifically for nuclear operators, and although it has been used by a number of nuclear sites this has been relatively limited to date. Further details of this can be seen on the HSE web site.</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
50	Page 84 12.37	What is the basis for the definition of the scope of the human factor assessment to be performed for a given safety case?	NII sets out its expectations for human factors assessment in its published Safety Assessment Principles (SAPs). The SAPs seek to ensure that human actions which have the potential to impact upon nuclear safety are systematically identified and analysed in the safety case. This analysis should take account of areas such as job design and task analysis, user-interface design, procedures, safety culture and safety management. The analysis should include both a qualitative and a quantitative treatment of human reliability. NII carries out assessment of the licensees' safety cases to ensure that the treatment of human factors is appropriate, and that the design and operation of plant and equipment reflect the findings of the human factors analysis. Several licensees have developed their own internal guidance on the treatment of human factors within safety cases, and NII has been involved in scrutinising this guidance to make sure that it is suitable and represents modern standards and practice.

ARTICLE 13

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
51	13	Does a QA system exist for suppliers and contract firms, and who audits them?	Within the UK there exists a highly developed and formalised scheme whereby many customers, including NPPs, require suppliers and contractors wishing to supply goods and services to meet national/international standards on QA. Compliance with these standards, mainly ISO 9000 series, is audited at a number of levels including independent third party bodies such as LRQA and BSI. For safety significant items the customer, appropriate regulator and others will also carry out some auditing function. The quality systems operated by suppliers and contractors are designed to complement those operated by the NPPs.
52	Page 91 13.13	What is the frequency and scope of programmed inspection performed by HSE inspectors?	QA inspection by NII forms part of a wider inspection of licence compliance arrangements. The wider programme focuses on safety related systems and procedures and is carried out predominantly during routine visits by site inspectors and others. The programme is designed to cover the whole site and all licence conditions within a maximum cycle of 3 years. Specific QA inspections are arranged periodically, but QA aspects are frequently a part of other inspections.
53	Page 92 13.14	Does HSE perform regulatory inspection to verify that the suppliers conform to LC17? Refer to the Question 13.1 to the first national report which said “HSE are not involved in supplier selection or evaluation since this is clearly the work of the licencees.”	HSE is not involved in the selection or evaluation of suppliers. This is the responsibility of the licensees. However, as part of NII’s inspections of the licensees’ quality assurance arrangements, the process of supplier selection is inspected to ensure that only suitable and experienced companies are employed. The NII has established a programme of regulatory inspections of licensees’ arrangements under Licence Condition 17 (QA). This is carried out on a 2-3 yearly cycle with topic specific inspections/audits being carried out in the interim in support of the ongoing regulatory inspection programme.

ARTICLE 14

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
54	14	How is guaranteed that the staff who monitor safety are not influenced by production needs?	<p>Issues of safety significance should be referred by the licensee to a site Nuclear Safety Committee which is required to have some independent members. NII also expects any significant submission to have independent nuclear safety assessment and for the licensee to have within its structure staff who monitor safety performance who are independent of the operational management chain.</p> <p>HSE/NII inspection staff are entirely independent of licensees and carry out their inspection duties to procedures, practices and standards defined by the regulator, not the licensee. Numerous examples exist where the results of inspection activities by HSE/NII have resulted in action being required by licensees which have had adverse effects on electricity production in the form of delays to operation or reduced power output.</p> <p>HSE/NII also <u>expects</u> licensees to employ their own safety inspection specialists whose responsibilities include the provision of advice to operators on safety matters. Such advice can at times be compelling, and can if necessary be given to a director responsible for safety and independent of any production function. HSE/NII staff liaise closely with their counterparts within licensee organisations and specifically comment on the effectiveness of the licensees' internal safety regulation process.</p>

ARTICLE 15

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
55	Page 114, 15	<p>What is the authority and what are the responsibilities of the Radiation Protection Adviser? What is arranged concerning his/hers independence of the daily operation?</p>	<p>The authority of Radiation Protection Advisers (RPAs) stems primarily from the Ionising Radiations Regulations 1999 (IRR99) that place legal obligations on Nuclear Site Licensees to consult suitable RPAs on matters specified in the IRR99. The IRR99 require RPAs to be formally appointed and meet criteria of competence specified by the Health and Safety Executive (HSE). HSE has provided a detailed and robust framework for this purpose. It should be noted that IRR 99 replaced similar regulations that had been in force since the end of 1985.</p> <p>All Nuclear Site Licensees have detailed documented managerial arrangements for the control of plant and operations, and conditions in the Nuclear Site Licence empower HSE to prohibit proposed changes to these arrangements should it be necessary. HSE has published authoritative guidance on the management of safety including the role of health and safety advisers. This guidance calls for provision of authoritative and independent advice, and Licensees adhere to this in respect of RPAs.</p>
56	15	<p>Is the effect of releases from nuclear facilities under normal operation evaluated as regard the exposure to critical groups of population in their vicinity? If so, specify the models used and how they reflect changes of the actual weather situation throughout the year.</p>	<p>Yes, doses to critical groups of the population arising from radioactive waste discharged from UK nuclear facilities are assessed annually based on monitoring data. The monitoring data will naturally take account of variation in weather throughout the year. The results are published in the Environment Agency's "Radioactivity in the Environment" report series and the Food Standard Agency's and the Scottish Environment Protection Agency's annual report "Radioactivity in Food and the Environment".</p>

ARTICLE 16

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
57	16	Could the United Kingdom give more information on the rationale for selecting the design basis accident taken into account in the definition on the emergency planning and used to determine the size of the emergency-planning zone?	The detailed emergency planning zone is an area around the nuclear installation where arrangements to protect the public are planned in detail. This is based on the release of radiation from an accident which can be reasonably foreseen taking account of the most significant design basis accident derived from the safety case for each site. This is derived using safety analysis techniques to identify a spectrum of accidents, the one which gives rise to the most significant off site consequences is used for planning purposes. This information, taken together with the countermeasures guidance provided by NRPB on sheltering, taking of stable iodine tablets and evacuation which are described in section 16.9 of the UK CNS Report, provides the basis of the DEPZ. Detailed actions are not predefined for beyond design basis accident either within or without the DEPZ because it is not practicable to make detailed plans against very uncertain and improbable events. Instead, existing plans are capable of being extended to deal with a larger than foreseen accident, based on civil emergency contingency arrangements. This approach was endorsed by the reports of the independent Inspectors for the Sizewell B and Hinkley Point C Public enquiries into the planning applications for these two plants.
58	16	Is the emergency planning zone in the vicinity of nuclear power plants specified as a special area with predefined actions for a severe (beyond design basis) accident? If so, what criteria are used to define this emergency planning zone?.	
59	16	The size of the Detailed Emergency Planning Zone (DEPZ) in the UK appears smaller than in some other countries. What is the basis for establishing the size of DEPZ? ”?	

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
60	16	In particular, could the United Kingdom detail the accident taken into account for the PWR Sizewell B, which does not require actions beyond the site boundary? Does this accident involve core melting?	A design base accident at Sizewell B, such as loss of coolant accident or steam generator tube failure, would not necessitate countermeasures beyond the site boundary and would not involve core melting. However, the emergency plans cover events where the effects are confined within the site boundary and also those events where, as a matter of prudence, there may be a need to consider countermeasures to protect the public outside the site boundary. At Sizewell, the emergency planning zones are largely based on the adjacent Sizewell A, a Magnox Station.
61	Page 136, 16	In case of an emergency situation HSE inspectors have the regulatory powers to direct the licensee if they feel the situation warrants it. Who has the responsibility for the associated actions? Is it still the operator or will it be taken over by HSE?	In the event of an emergency HSE would set up its Response Centre to manage the inspection, review and monitoring of the operator's response. This would ensure appropriate actions were taken by the operator to restore the plant to a safe state and minimise the risk to the public. If the operator actions were considered inappropriate, HSE could use its regulatory powers to Direct the operator to respond in an appropriate way. The operator would still be responsible for implementation of all actions on the site.
62	16	At which intervals are Level 1 exercises being performed? Are those the same for all nuclear installations?	Level 1 emergency exercises are carried out annually at each nuclear licensed site. The exercises are witnessed by NII.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
63	16.5	<p>It is reported that licensees will also have to comply with additional requirements on the public availability of certain information.</p> <p>What kind of information is required to be made available to the public by the additional requirements?</p>	<p>Statutory Instrument 2001 No. 2975, the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR), came into force on 20 September 2001 and are enforced by HSE. The text of the regulations can be found on HSE's web site at: http://www.hse.gov.uk/radiation/ionising/reppir.htm</p> <p>If you wish to purchase a copy of REPPIR., the website is linked to the Stationary Office Ltd.</p> <p>Regulation 16 covers prior information to the public and Schedule 9 lists prior information to be supplied and made publicly available.</p> <p>Regulation 17 states the duty on the local authority to supply information to the public in a radiation emergency.</p>

ARTICLE 17

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
64	17.4	<p>a. Is the content of the assessment of the environmental impact decided upon by the Environment Agency or the Scottish Environment Protection Agency, or the HSE?</p> <p>b. Is there some sort of public input into the scope of the assessment?</p> <p>c. Who reviews the submitted assessment?</p>	<p>Statutory Instrument 2000 No. 1927, The Electricity Works (Environmental Impact Assessment) England and Wales Regulations 2000 apply to Nuclear Power Stations for construction, extension or operation in England and Wales. They came into force on 1 September 2000 and implement European Directive 85/337/EEC as amended by Directive 97/11/RC. A copy of the regulations can be obtained from The Stationary Office Limited.</p> <p>The content of the assessment is explained in the regulations. The Secretary of State for Trade and Industry has to satisfy herself in every case that adequate information has been included in the environmental statement that the regulations require from a developer.</p> <p>Yes, there is public input into the scope of the assessment. Also, the Secretary of State takes representations and views from the Local Planning Authority, consultative bodies and the public together with the contents of the environment statement before coming to a decision on whether or not to give consent to the proposed development.</p> <p>Similar requirements apply in Scotland.</p>
65	17	<p>While deciding the siting and/or construction of nuclear facilities, are the acceptance criteria for exposure to members of the critical group of population at emergencies (up to design basis accident) identical to dose limits for members of the public at normal operation? If different, provide specification</p>	<p>A new plant would need to satisfy the criteria the dose limits for the general public for normal operation as specified in the NII Safety assessment principles. However, for the worst-case design base accident, an individual dose of up to 100mSv is permitted. The licensee would however be expected to invoke the emergency plan would come into action that may involve sheltering or evacuation in order to limit doses to very much lower levels. These are set out in paragraph 16.9 of the report. Any new plant would be expected to be designed to give doses to the critical group in normal operation of a few tens of microSieverts at the most.</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
66	Page 146 17.7	Comment: It is interesting that already in 1955 UK considered that its plant design was “inherently safe”. Was the term used at that time in the same way that it is used now a day?	It is our understanding that there is not yet an internationally agreed technical definition of “inherently safe”. In our report we quoted directly from the 1955 White Paper. It is doubtful if such wording would be used today in relation to current designs of power reacts in use around the world.
67	17.8	Reference is made to criteria for siting of a nuclear power plant. Do the criteria in respect of populations refer only to UK populations? What consideration is made of the citizens of neighbouring countries, and of impacts on shared environments?	<p>Because of the geography of the Great Britain, neighbouring countries’ populations are very unlikely to fall within the siting criteria described in paragraph 17.8.</p> <p>Euratom Article 37 and Council Directive 97/11/EC are relevant here. Article 37 refers to implementation of any plans for the disposal of radioactive waste that are liable to result in the contamination of the water, soil or airspace of another Member State. The article covers operation of nuclear reactors. An Environmental Impact Assessment (EIA) is required for a wide range of nuclear activities including proposed new nuclear projects. Article 1 of Council Directive 97/11/EC, amending Directive 85/337/EEC, states “Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment.....are made subject to a requirement for development consent and assessment with regard to their effects.”</p> <p>The answer above on Environmental Impact Assessments related to paragraph 17.4 is also relevant here, as is the information contained in Article 16 on emergency arrangements.</p>

ARTICLE 18

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
68	18	The report indicates that there are "guidelines for dealing with severe accidents and the provision of instrumentation and other equipment where necessary": could the United Kingdom provide some examples of "other equipment"?	<p>The Severe Accident Guidelines (written by the licensees) are specific to reactor type and consider what might occur beyond the design basis accident, and what measures would be necessary to address them, e.g. for the Magnox reactors the guidelines consider differing sizes of breach in the reactor gas circuit, and the techniques required to seal these breaches, i.e. for a gas duct neoprene inflatable seals are available to provide gas tight containment where it is not possible to close the isolation valves. Similarly the guidelines address what techniques and materials (and where they can be sourced) for example to convert the bioshield into a containment. They also cover more mundane provisions such as the use of hoses to provide tertiary feed and shutdown capability.</p> <p>There are also installed provisions such as the alternative indication centers which have dedicated hardwired instrumentation (seismically qualified) which would continue to function beyond a design basis accident, and the boron dust injection systems on magnox reactors.</p>
69	Introduction 18 and 19	Were the problems causing several Magnox reactors being out of service for a prolonged time related to aging? If so, were these problems not foreseeable?	There is a range of reasons why several of the Magnox reactors were out of service. Some of these related for example to the identification of original defects while others were because of age related issues. The most important safety related ageing issues on Magnox are associated with the integrity of the non -replaceable components such as the steel pressure vessels and the graphite moderator. Both of these items are now reviewed annually, which enable safety problems to be predicted in good time. The establishing of ageing management systems was one of the outcomes of the first PSRs.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
70	18	What are the technical arguments leading to the conclusion that although the design criteria of Magnox plants and older AGRs do not fully meet modern standards and expectations, there is increased confidence that these plants have met and will meet required safety performance?	All civil UK reactor plants have to justify to NII that they are safe to operate before NII issues a consent to start up following statutory outages - for Magnox reactors these outages are every two years. In addition, periodic safety reviews are carried out every 10 years where the safety of the plant is reviewed against the current standards. The first stage of the assessment process requires the plant to pass a minimum acceptable level of safety but we would then expect the licensee to enhance this by implementing reasonably practicable improvements to bring safety levels as near as possible to those that would be required for a new plant.
71	18	Is the probability and acceptability of a particular scenario used as prerequisite to determine the design basis accident? If so, what probabilities are considered.	HSE has its own risk management philosophy, based on Tolerability of Risk (ref 1) in which the risks are categorised as unacceptable, tolerable and broadly acceptable. The licensing of Nuclear Reactors is based on trying to achieve no more than a certain level of risk from the operation of the plant. This is done by considering the contribution to that risk from a series of faults that range from frequent to infrequent scenarios. The infrequent faults used in estimating offsite risk will include beyond design basis events. The Design Basis Fault is an initiating fault that is the most severe infrequent fault that the plant can just tolerate without any large-scale fuel failure. This varies according to the design of the reactor. For Magnox Reactors the frequency of the Design Basis Fault has to be shown to be less than 10 ⁻⁴ to 10 ⁻⁵ per reactor yr. The level that we judge as acceptable is where the total frequency of core melt from all faults is less than 10 ⁻⁶ /yr. The assumption is that this could be made up of ten significant faults that could lead to large scale core melt and the target for each of these then becomes less than 10 ⁻⁷ /yr for each of these faults. The contribution to the overall core melt frequency is made up of the initiating frequency of the fault combined with the failure probability of engineered safety systems to control and contain the resulting transient.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
72	18.3, 18.9, 18.11	Which kind of severe accidents have been identified and which scenarios are the worst with respect to fuel element integrity and containment function? Is core destruction considered as a possible scenario requiring the implementation of mitigation measures to cool a degraded core and to prevent large releases?	A whole range of faults is considered in the safety case ranging from frequent faults to infrequent beyond design basis faults. The main contribution to risk to the surrounding population results from core melt that is considered in the risk assessment. Measures are in place to assist operators to try to avoid a reactor fault developing into a severe accident, if the fault develops outside Emergency Operating Instructions. These are known as System Based Emergency Response Guidelines. If the fault progresses to fuel melt there is guidance on each plant to assist the management of a severe fault. These are known as Severe Accident Guidelines and include advice as to what material should be used to shutdown and hold down the core reactivity and what materials could be considered to limit offsite releases.

ARTICLE 19

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
73	19	What kind of root cause analysis techniques are used by the UK licensees and their effectiveness?	The UK Licensees use HPES (Human Performance Enhancement System) developed by the Institute of Nuclear Power Operators (INPO). This has been introduced fairly recently, and the regulator is working closely with the licensees to ensure a consistent and accurate analysis of all incidents, and to check that lessons learned are fed back into the industry.
74	19 (iii), 19.9, 19.11	Has HSE developed specific guides or rules on the contents and format of procedures for maintenance, tests and inspections which could be used as a basis for approval of the licensee’s arrangements and schedules related to these items?	The UK regulatory system sets safety goals in the licence conditions that the licensees must achieve. However it does not specify how these goals are to be achieved. This is the responsibility of the licensee. It is the licensees’ responsibility to demonstrate to the regulatory authority that the compliance arrangements are adequate and that the licensee is complying with its own arrangements. The goals for maintenance testing and inspection are set out in licence condition 28.
75	19(v), 19.13, 19.14	Is there sufficient engineering and technical support from the NPP vendor, equipment suppliers, outside contractors for plants built to earlier standards in the areas of operation, maintenance, surveillance?	At present there is adequate support for the plants that were built to older standards. Where obsolete equipment cannot be replaced directly (for example some of the I&C), alternative equipment must be evaluated using established procedures for plant modifications and will need the approval of the Regulatory Authority. The availability of adequate technical support is constantly kept under review by the regulator.

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
765	19(viii), 19.27-.29, 19.5, 19.7	The database on incident evaluation is in the responsibility of the industry. How can HSE assure that the incident assessment and information distribution are sufficient and proper actions are taken as a consequence of specific incidents which occurred in the UK or abroad?	HSE/NII receives and distributes internally information on incidents occurring on UK licensed sites and on reported incidents (from various sources) on foreign sites. Depending on the significance of such events, inspectors check that licensees are aware of the events and the lessons learned from them, and that the potential impact of similar or related events have been properly considered for UK sites and that any necessary or desirable changes are made or lessons appropriately applied as appropriate.
77	Page 169 19.22 19.24	Please provide some statistics about the number of events reported by UK nuclear power plants. What has been the recent trend in the number and severity of the events reported?	<p>During the calendar year 2001, we considered 251 events to be of sufficient importance to circulate within the operational division responsible for the affected site. Of these only 14 events were circulated across all operating Divisions of the Inspectorate and 3 met the Ministerial Reporting Criteria (See answer to Q 19.4 for ministerial reporting criteria). This compares with 403, 23 and 5 respectively for 2000, and 357, 36 and 12 for 1999.</p> <p>There has been a steady downward trend in the number of incidents meeting the Ministerial Reporting Criteria, and of these 2 were reported at INES level 2 in 1998, 6 in 1999, none in 2000, and 1 in 2001.</p>

Question Number	CNS Article and National report reference	COMMENT/QUESTION	ANSWERS
78	19.35	<p>In Article 19.35 it is stated that spent PWR fuel is stored at the nuclear installation in the form discharged from the reactor. Is it foreseen to reprocess the spent fuel? If not, what are the reasons for this decision?</p>	<p>The fuel is presently stored at the nuclear reactor in a medium term storage facility. Decisions as to whether the fuel is reprocessed or stored in the longer term have not been taken at this time.</p>
79	19.38	<p>It is reported that the conditions on limit setting require operators to use Best Practicable Means (BPM) to minimize the volume of waste produced and the activity of waste discharged, and to minimize the radiological impacts of discharges.</p> <p>Could you explain Best Practicable Means?</p>	<p>Definition of BPM can be found in the Government White Paper Cm 2919 and is as follows: “Within a particular radioactive waste management option, BPM is that level of management and engineering control that minimises, as far as practicable, the release of radioactivity to the environment whilst taking into account a wider range of factors, including cost-effectiveness, technological status, operational safety, and social and environmental factors.”</p>
80	19.39	<p>It is reported that the UK has consulted on, and is due to publish during 2001, a Strategy for Radioactive Discharges to cover the period 2001 to 2020.</p> <p>Could you explain the Strategy for Radioactive Discharges covering the period 2001 to 2020?</p>	<p>The strategy for radioactive discharges has not yet been published, but is expected to be addressed in the UK’s national report for the Joint Convention.</p>

GLOSSARY OF ACRONYMS (See Figure 1)

BNFL	British Nuclear Fuels Plc
DEFRA	Department for Environment, Food and Rural Affairs
DOH	Department of Health
DTI	Department of Trade and Industry
DTLR	Department of Transport, Local Government and the Regions
EA	Environment Agency
HSC	Health and Safety Commission
HSE	Health and Safety Executive
IRAC	Ionising Radiation's Advisory Committee
NAW	National Assembly for Wales
NRPB	National Radiological Protection Board
NSD	Nuclear Safety Directorate
NuSAC	Nuclear Safety Advisory Committee
RWMAC	Radioactive Waste Management Advisory Committee
SE	Scottish Executive
SEPA	Scottish Environmental Protection Agency
SPD	Safety Policy Directorate

Figure 1-Nuclear Safety: Policy, Advice, Regulation & Operation in the UK

