The State Of Security In The Civil Nuclear Industry

And

The Effectiveness Of Security Regulation

April 2003 – March 2004

A Report to the Secretary of State for Trade and Industry

by

The Director of Civil Nuclear Security
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An aerial view of Sellafield
Introduction

1. This is my third annual report on the state of security in the civil nuclear industry and the effectiveness of regulation, since the Office for Civil Nuclear Security (OCNS), which I direct, was established on 1st October 2000. These reports are published, although the subject matter is sensitive, to comply with undertakings made to Parliament.

2. There is understandable concern in the present climate that terrorists might try to sabotage a nuclear facility, or steal material to fabricate a nuclear or radioactive device. There is also a danger that states might try to acquire proliferation-sensitive technology to develop nuclear weapons. To allay such concerns, I aim to demonstrate in these reports that security arrangements taken by the civil nuclear industry in the United Kingdom are comprehensive and effective. I hope to show as well that the security standards applied are regulated by a competent Government authority independent of industry interests, and in other respects consistent with treaty obligations and international agreements.

3. This will also be my last report because I am stepping down in June, after over six years as Director of Civil Nuclear Security, first working for the United Kingdom Atomic Energy Authority (UKAEA) before transferring to the Department of Trade and Industry (DTI). I have included some valedictory observations, as is customary, ranging over the period I have held this post.

4. In writing these reports¹, I have taken account of comments received. Reactions have been generally positive. Earlier reports have been cited in various official and published documents. I have tried to be as informative as possible, without revealing sensitive information capable of being exploited by terrorist groups or breaching confidentiality obligations. My two earlier reports had included some background information about protecting nuclear and radioactive material and sensitive technology. As this is still relevant, I have reproduced the information at Annex A, updated as appropriate. I have added a new Annex B, amplifying previous comments I have made about why security within the civil nuclear industry is subject to regulation by a government authority. I am experienced in both statutory

¹ http://www.dti.gov.uk/energy/nuclear/safety/security.shtml
regulation and arrangements depending on voluntary compliance. I am in no doubt that statutory regulation is necessary to ensure that civil nuclear security requirements in the national interest will not be subordinated to commercial or cost pressures.

The Office For Civil Nuclear Security (OCNS)

5. The DTI’s Office for Civil Nuclear Security (OCNS) regulates security arrangements for the protection of nuclear and radioactive material on civil nuclear sites, nuclear transports and sensitive information, under the Nuclear Industries Security Regulations 2003\(^2\) and related legislation. OCNS was originally the Security Branch of the UKAEA, but its responsibilities have changed over the years, reflecting developments in the industry. What was then called the Directorate of Civil Nuclear Security (DCNSy) was transferred from the UKAEA to the DTI on 1\(^{st}\) October 2000, in response to a recommendation by the Trade and Industry Committee of the House of Commons, after an inquiry into safety and security at the UKAEA’s Dounreay plant in Scotland. It had become untenable that the Government’s security regulator should be legally a component of a nuclear operator subject to regulation, contrary to guidelines issued by the International Atomic Energy Agency (IAEA)\(^3\). At the time of the transfer, the then Minister for Energy announced that DCNSy, in its new guise as OCNS, would function within the Department as an independent unit, with full autonomy in regulatory and operational matters, distinct from the Government’s sponsorship and broader energy policy interests in the civil nuclear industry. As Director of Civil Nuclear Security, I am also publicly accountable for my decisions.

6. OCNS now has 45 posts, with annual expenditure of £2.2 million. An organisation chart is at Annex C: cost and staff schematics at Annex D. Most of our specialists gained their expertise in the security and intelligence agencies, the armed forces or the police, although others with different backgrounds have been recruited to broaden the range of skills available. OCNS headquarters are at Harwell, inside the UKAEA licensed nuclear site south of Oxford, although some members of staff located elsewhere in England and Scotland work from home.

7. Staff numbers have doubled over the past six years, partly in response to the current terrorist threat. However, capabilities had been run down in the years before 1997 when part of the UKAEA, because the nuclear operating companies wanted to determine their own security arrangements. DCNSy had been cut back almost to the point of extinction. I wish to pay credit to my predecessor, Group Captain Brian Anstey, who had fought hard to prevent this happening, ultimately successfully. Credit is due as well to officials in the DTI’s Energy Group who recognised the dangers, accepting my advice to transfer DCNSy to the Department, rebuild capabilities and update our statutory powers. I have known several instances in thirty-three years working in security when resources have been provided or restored only after a serious incident has occurred. Security is vulnerable to short-sighted cost-cutting, because it is usually impossible to demonstrate how many security incidents that might have taken place had been prevented. Although the position is much improved, OCNS needs some further modest reinforcement this year to underpin current capabilities, which I have set in train for the benefit of my successor.

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\(^3\) [http://www.iaea.org/worldatom/Programmes/Protection/inf225rev4/rev4_content.html (4.2.3)](http://www.iaea.org/worldatom/Programmes/Protection/inf225rev4/rev4_content.html (4.2.3))
8. OCNS has no responsibility for safety, safeguards and materials accountancy, for radioactive material held outside licensed sites, or for sites run by the Ministry of Defence (MOD). However, OCNS co-operates with the Health and Safety Executive’s Nuclear Installations Inspectorate (the safety regulator), the DTI’s Safeguards Office and MOD Security. We also liaise closely with the Security Service, the police, counterparts overseas and the IAEA.
Locations Of Civil Nuclear Sites

Legend
1. Dounreay
2. Scottish Universities
3. Hunterston A&B
4. Torness
5. Chapelcross
6. Sellafield
7. Hartlepool
8. Heysham I&II
9. Springfields
10. Capenhurst
11. Wylfa
12. Trawsfynydd
13. Cardiff
14. Hinkley Point A&B
15. Oldbury
16. Berkeley
17. Harwell
18. Amersham
19. Sizewell A&B
20. Bradwell
21. Ascot
22. Dungeness A&B
23. Winfrith
The Civil Nuclear Industry

9. OCNS now regulates security arrangements at 43 civil nuclear sites, from Dounreay at the tip of Caithness to Dungeness on the coast of Kent. These include thirteen nuclear power stations generating electricity for the national grid, one of which (Sizewell B) operates a pressurised water reactor (PWR): the remainder run advanced gas-cooled (AGR) or older Magnox reactors. Other sites include the large Sellafield reprocessing complex in Cumbria, the Springfields fuel fabrication plant, uranium enrichment facilities at Capenhurst and a number of power stations being decommissioned, plus several other ancillary, research and administrative facilities. Regulation has been extended recently to nuclear sites operated by GE Healthcare (Amersham plc), two university sites, several tenant companies located inside licensed sites and, latterly, a plant operated by Centronic Ltd. near Croydon. Seven sites are in Scotland and three in Wales: none in Northern Ireland. The map opposite shows the locations of licensed sites subject to regulation, with a full list at Annex E. Background notes on the nuclear fuel-cycle are at Annex F, describing the process used to generate electricity from mined uranium ore or reprocessed spent nuclear fuel.

10. The nuclear operating companies, including British Nuclear Fuels Ltd. (BNFL), the UKAEA, the Urenco Group and British Energy, take their security responsibilities seriously, both for commercial reasons and in the national interest, but cannot be expected to regulate themselves. The threats to be countered require specialised support from the security and intelligence agencies, other government bodies, the police and the armed services, including Special Forces. To retain public confidence, the Government must also demonstrate that security requirements will not be cut back or undermined by commercial or cost pressures (Annex B). However, the companies subject to regulation are entitled to expect that the security standards and procedures imposed are justifiable, practicable and proportionate. We use the following mission statement to encapsulate these requirements.

To ensure that nuclear and radioactive materials on civil nuclear sites, sensitive nuclear information and those employed in the civil nuclear industry are protected against criminal or malevolent acts that threaten national security, the environment or public safety, and help retain public confidence, without imposing unjustifiable burdens on the companies subject to regulation.

Threat Assessments

11. It is vital, given the potentially serious consequences of any criminal or malevolent activity directed against civil nuclear sites or material, or proliferation-sensitive technology, that security measures are designed to counter realistic threats. Effort must not be wasted on ineffective security precautions. Accurate, timely intelligence is essential. Information on the methods, capabilities and intentions of terrorist groups and other potential adversaries enables security measures to be put in
place, exercised or changed, tailored to anticipate likely methods of attack. Although rarely specific enough to identify in advance when and where attacks might take place, intelligence reporting often does indicate when the threat has increased, to enable contingency measures to be activated in response, such as extra patrols or searching. Intelligence may also indicate when more labour-intensive security measures can be scaled back, to avoid over-extending staff and undermining morale.

12. I am pleased to record that the provision of intelligence has improved markedly over the past six years. When I took over as Director, little intelligence was received, due to DCNSy’s anomalous position within the UKAEA, as well as resource problems inhibiting liaison. To begin with, I had to rely on personal contacts to overcome these difficulties. The transfer to the Department and the provision of additional staff has remedied these deficiencies. We now receive all relevant intelligence, not just about nuclear, radiological and related threats (CBRN), but also providing a broader context. Most reports are sent to OCNS electronically via an encrypted data link. We are consulted by the intelligence agencies about our particular intelligence requirements and our advice is sought about the interpretation to be drawn from raw material. We are also able to provide digests and threat assessments to the operating companies, based on this material, for circulation to Board members, security managers, contractors and members of staff.

13. The decision by the Government, which I mentioned in last year’s report, to establish the Joint Terrorism Analysis Centre (JTAC)\(^4\) has, as expected, substantially enhanced the quality, scope and focus of intelligence reporting on the terrorist threat. JTAC has developed remarkably quickly into a most effective organisation. I am a member of the JTAC Oversight Board and OCNS functions as a participating organisation. As well as receiving intelligence, we provide JTAC with insights into nuclear security issues to aid reporting on these topics. This year, JTAC staff have received briefings from OCNS and attended training courses with managers from the operating companies. Visits to nuclear sites are being arranged. However, to derive full advantage from this link with JTAC, one of our two INFOSEC Inspectors is having to devote much of his time to the work, reading and disseminating material received and liaising with JTAC analysts based in London. For this reason, we aim to recruit a third INFOSEC Inspector to support both functions. Other, larger participating agencies provide teams of analysts to JTAC on secondment.

14. I mentioned in my previous reports the procedures we use to assess medium-term security threats, incorporated in a key planning document known as the Design Basis Threat (DBT). The document is based on the intelligence we receive about the motives, intentions and capabilities of terrorist groups and other potential adversaries. It is designed to provide a definitive statement of the possible scale and methods of attack that could be faced at civil nuclear sites, or when nuclear material is being transported. The DBT also takes account of the availability of countermeasures and contingency arrangements provided by the police, the MOD and other agencies. It makes clear which forms of possible attack the nuclear operating companies are expected to guard against, which types of attack remain the responsibility of the Government and whether, in the latter case, the companies are required to take mitigating or preventative measures.

\(^4\) [http://www.mi5.gov.uk/output/Page65.html](http://www.mi5.gov.uk/output/Page65.html)
15. The DBT provides the basis for the design, implementation and management of security measures by the civil nuclear companies. It is also used by OCNS to develop or revise model security standards and guidance, evaluate site, transport and computer security plans prepared by the operators, and to monitor compliance. The companies subject to regulation have supported this approach because it provides a clear, rational basis for security planning, resource management and quality control. Furthermore, the approach is regarded by the IAEA as best practice and has been adopted by other foreign regulatory authorities. For security reasons, the DBT is classified SECRET and no further details can be published.

Security Standards

16. However, security threats are seldom constant and it is neither effective nor efficient to maintain all available security measures at a constantly high state of vigilance. Sites are required to have in place permanent structural, technical and administrative security defences referred to as baseline measures, as well as guarding, surveillance and access control arrangements capable of being operated and augmented as necessary to respond at all levels of threat.

17. The security standards and procedures specified by OCNS are confidential but reflect published guidance on the Physical Protection of Nuclear Material and Nuclear Facilities issued by the IAEA (INFCIRC/225/Rev4). OCNS has been closely involved over the years with the IAEA and other foreign counterparts in developing the guidance and is the designated UK security authority recommended in these guidelines. The security measures taken at nuclear sites are graduated to reflect the quantities and types of nuclear material held on site, against the categorisation table at Annex G. However, additional measures are taken at some sites and at particularly sensitive or vulnerable facilities within certain sites, either in response to specific threats identified in the DBT document or for other reasons. OCNS has continued to work closely with the National Security Advice Centre (NSAC), part of the Security Service, on the standards and equipment applied within the industry.

18. Throughout the past year, high standards of vigilance have continued to be maintained. I mentioned in my previous report that OCNS had been involved in an exercise led by the Cabinet Office to adapt the government alert state system to reflect the changing nature of the terrorist threat. OCNS had reclassified civil nuclear sites into new risk categories and revised the additional security measures to be taken in each category at different levels of alert. The nuclear power stations had also been brought within the colour-coded system operated by central government and other civil nuclear sites. These new arrangements have worked well, providing useful additional flexibility to reflect local variations in threat levels, whilst enabling stringent security arrangements to be maintained.

http://www.iaea.org/worldatom/Programmes/Protection/inf225rev4/rev4_content.html
http://www.mi5.gov.uk/output/Page134.html#govdepts
Security Vetting

19. Although most individuals working in the civil nuclear industry are reliable and trustworthy, terrorist groups or proliferating states planning attacks might seek to use a disaffected or suborned insider with exploitable access. Attempts by criminals to obtain saleable material or information must also be prevented. In addition, individuals may act irresponsibly for personal reasons, perhaps in ignorance of the possible consequences. For these reasons, OCNS supervises a comprehensive personnel clearance programme (vetting) applied throughout the industry under Regulations 9, 17(3) and 22(3) of the Nuclear Industries Security Regulations 2003.

20. The basis for security vetting for national security purposes had been set out in a statement to Parliament by the then Prime Minister on 15th December 1994. For OCNS, vetting is used as a contributory measure in controlling access to civil nuclear sites and nuclear material, as well as sensitive information. Those nominated for security clearance are informed in advance, the process explained to them and their prior agreement obtained in writing, otherwise vetting does not proceed. However, vetting clearance is a mandatory requirement: those who withhold permission or fail to co-operate will not be employed on work requiring security clearance. As a vetting authority, OCNS has access to intelligence and criminal records. Depending on the level of clearance required, my staff may also undertake credit reference checks and background enquiries, including interviews with supervisors, previous employers and other referees. Occasionally, if doubts persist, checks against local CID or Special Branch records may be undertaken, or enquiries made with individuals known to candidates for security clearance who have not been nominated by them.

21. Comprehensive national guidance on applying vetting criteria forms the basis for the decisions taken on clearance. In considering previous criminal convictions, OCNS is authorised to take account of spent convictions under the Rehabilitation of Offenders Act 1974 (Exceptions) Order 1975, for the purpose of safeguarding national security. We place particular value on individuals being honest about all past convictions, police cautions and any involvement in incidents involving public disorder. However, we recognise that decisions to withhold or withdraw clearance can have serious consequences for those affected. Sites like Sellafield or Dounreay are the major employers in regions with otherwise limited employment prospects. For this reason, care is taken not to disadvantage individuals unreasonably, including those who may have committed offences as juveniles. Convictions for less serious offences may not lead to clearance being refused if individuals have been honest in declaring them and there is reason to believe that they will not re-offend. For similar reasons, we may decide not to withdraw security clearance from employees, if they cooperate fully in resolving doubts arising about their fitness to retain a security clearance, for example by accepting remediation treatment for drug or alcohol abuse, or assistance with debt management organised by their employers.
Vetting Turnover And Performance

22. Over the last twelve months, OCNS has issued 9,121 vetting clearances and 3,346 revalidations, the great majority at the lowest clearance level (BC+PNC), which involves a criminal records check and is used to authorise access to sites. Clearances to the three higher levels (CTC, SC and DV) are needed to permit unescorted access to sensitive facilities, information and nuclear material. A breakdown for the year is provided in the table below (with previous year’s figures shown in brackets):

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<th>Clearance Levels</th>
<th>New Cases</th>
<th>Revalidations</th>
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<tr>
<td>Developed Vetting Clearances (DV)</td>
<td>435</td>
<td>186</td>
</tr>
<tr>
<td>Security Checks (SC)</td>
<td>921</td>
<td>101</td>
</tr>
<tr>
<td>Counter-terrorist Checks (CTC)</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Enhanced Basic Checks (BC+PNC)</td>
<td>7,742</td>
<td>3,059</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>9,121</strong></td>
<td><strong>3,346</strong></td>
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23. The figures above show a substantial increase in higher level clearances and revalidations, following the recruitment of additional staff to address the backlogs at DV and SC reported last year. The number of Enhanced Basic Checks for new cases is down on last year’s figure, partly because the number of outages at nuclear power stations fell slightly for cyclical reasons. Another contributory factor was a reduction in new construction work at Sellafield. Both these causes reduced demand for clearances for previously uncleared contractors’ employees.

24. During the year, clearance was withheld in nine cases and one existing clearance was withdrawn. Sixteen cases are currently subject to local management supervision. Although these numbers may appear small in relation to the scale of checks undertaken, they fall within the range normally experienced.

25. I mentioned in my previous report that backlogs had developed, due mainly to a rise in numbers requiring clearance. At their peak, delays at DV had risen to two months against our usual 45-day target, although at Sellafield the backlog reached ten months. At SC and BC+PNC, delays were eleven months and 17 days respectively, against corresponding target times of 30 and 3 days. Backlogs are undesirable because many staff cannot be employed temporarily on less sensitive work and new recruits may have to be escorted while checks are being completed. Nevertheless, it is essential to avoid reducing standards to ameliorate working pressures. The purpose of vetting is easily undermined if sufficient time is not taken to identify problem cases, or to undertake additional checks and interviews where necessary to resolve doubts about individuals’ reliability and trustworthiness. Fortunately, the retention of staff on a temporary basis enabled all backlogs for new cases to be eliminated, (for Sellafield see paragraph 26). Furthermore, the recruitment of additional staff and some streamlining of procedures have also now removed the backlog of revalidation cases.
The DV Backlog At Sellafield

26. I had also mentioned in my previous report that DV clearances at Sellafield were still running six months behind target, due to unexpectedly high, continuing vetting requirements for the new Sellafield MOX plant (SMP). Although an additional Investigating Officer (IO) was recruited during the year to cope with this higher level of demand, the extra capacity created would have been insufficient to remove the backlog with new cases coming forward. To deal with the backlog without recruiting more permanent staff, four suitably qualified, retired police officers were employed under contract from a reputable private security company. The staff employed were cleared to DV and given training by OCNS to interview subjects for clearance and referees. However, to ensure confidentiality, all associated record checks and police enquiries continue to be undertaken by OCNS staff. Furthermore, reports are audited by OCNS vetting staff, who alone are authorised to grant clearance. The employment of these individuals means that all backlog cases will have been actioned by the time this report is published.

Overseas Checks

27. Towards the end of last year, the OCNS Vetting Office assumed responsibility for co-ordinating entry checks for foreign nationals visiting civil nuclear sites, working in conjunction with the Foreign and Commonwealth Office (FCO), the DTI’s Safeguards Office and the MOD. The new procedures have worked well.

28. We operate reciprocal vetting arrangements with our counterparts in Europe, Australia and Canada. However, although numbers are still small, we encounter some difficulty clearing US nationals brought over by BNFL, which holds a majority stake in the Westinghouse Corporation. Although we are hoping to negotiate more reliable reciprocal arrangements with our US counterparts, we have not yet done so due to the devolved system of vetting within the United States and higher priorities.

Appeals

29. I had mentioned in my previous report that, with other vetting authorities, we had established an appeals process, ultimately to the independent Security Vetting Appeals Panel (SVAP) set up by the Cabinet Office. However, this right of appeal is restricted to existing employees. Moreover, the SVAP is not authorised to set aside judgements made by vetting authorities such as OCNS, although its findings may prompt decisions to be reconsidered in particular cases or procedures to be revised.

30. Last year, for the first time, one OCNS case had been referred to the Panel, after the internal route of appeal to me had been exhausted. It is never easy deciding to withhold or revoke security clearance. It is sometimes possible to undertake further enquiries or interviews, but this may not resolve matters. We were reassured, therefore, when the Panel decided that the procedures we had followed had been fair and upheld the decision to withhold clearance. Regrettably, it is sometimes necessary to withhold or revoke clearance to protect national security, even if the circumstances are open to interpretation and the decision might cause hardship for the appellant.
31. This year, no cases had to be submitted to me on appeal or against my decision to the SVAP. However, no conclusions may be drawn from this because appeals are rare. Although we continue to review our procedures to maintain objectivity and fairness, further appeals may be made in future years.

Aftercare

32. Vetting is an essential precaution if individuals are to be entrusted with access to nuclear material or sensitive information and is recommended in the security guidelines issued by the IAEA. However, we cannot read people’s minds or anticipate future behaviour. We know from experience that information on record is sometimes incorrect or incomplete. Although revalidations are undertaken at set intervals, we place the onus on line managers and the companies’ personnel staff to maintain effective staff reporting and assessment procedures, and to intervene, reporting to OCNS as necessary, if individuals with security clearance exhibit indications of unreliability or untrustworthiness. We become concerned if individuals incur substantial debts, exhibit signs of alcoholism or test positive for banned substances, are convicted for criminal offences, or if their behaviour in some other way casts doubt on their continuing fitness to retain security clearance.

33. This continuing oversight is known as Aftercare. We encourage employers to find ways, wherever possible, to help individuals overcome doubts about their fitness to retain security clearance, although it may still be necessary to restrict access or remove clearance altogether. I mentioned in my last report that we had been unable to provide any consistent effort to promote effective aftercare arrangements in the operating companies. By streamlining procedures and recruiting more staff, we have succeeded this year in providing some additional capacity. Six more audits were completed of vetting records and procedures maintained and operated at selected sites.

Staffing Matters

34. We now have a team of nine Investigating Officers, one based in Scotland and the remainder in England. I had mentioned in previous reports that our IOs were all retired police officers with good interviewing skills and experienced in detecting deception. However, we set out this year to broaden the range of skills available by recruiting similarly experienced individuals from other walks of life. Our three newest IOs gained their experience in HR and public relations, fraud investigation, local government and conducting immigration checks. They also happen to be women, complementing what had been an all-male team.

35. We were able this year to provide our IOs with encrypted laptops, connected via dial-up links (to be replaced as soon as possible by broadband connections) to the DTI’s email, word-processing and information-retrieval suite of services. Although vetting questionnaires and interview reports are still produced on paper for legal and administrative reasons, the availability of secure electronic communications is helping to improve briefing and staff communications.
36. I am indebted to all members of the OCNS vetting team for their care and commitment, including those who have left during the past six years. Our IOs have the advantage of working from home. They also get out and about interviewing subjects or checking police records, although each IO drives over 10,000 miles on average a year. However, the staff at Harwell are tied to our vetting records and online data terminals, although all now visit at least one nuclear site every year. The work is unremitting, requiring judgement and attention to detail. Nevertheless, this is the kind of work sometimes disparagingly described as back office. I like to point out that vetting staff (not just those in OCNS) are in the front line combating terrorism. One missed check or misjudgement might make the difference between preserving lives or enabling a terrorist atrocity to take place.

Some Observations On Vetting

37. The vetting system works reasonably effectively, although it is unavoidably intrusive, time-consuming and labour-intensive. We advise foreign agencies that vetting is an essential component in nuclear security arrangements, in line with IAEA guidelines. There has been pressure in recent years to cut back numbers being vetted, but the current terrorist threat has brought about a prudent change of view.

38. It is sometimes claimed that a single government vetting agency could achieve greater efficiency. I doubt this. Our IOs are based close to nuclear sites. OCNS vetting staff are familiar with conditions within the industry, the hazardous nature of nuclear and radioactive material, and the work undertaken. If these close links were ever broken, the discernment of those undertaking interviews and record checks, and the understanding informing the decision-making process, would be lost.

39. The policy and practice of national security vetting gives full regard to the requirements of the Data Protection Act, the Freedom of Information Act, the Human Rights Act, race relations and other relevant legislation. Where appropriate, vetting information is exempt from disclosure. However, we are encountering some reluctance by employers and others interviewed to provide candid references. Despite assurances to the contrary, some worry that their identities might be disclosed on appeal and their organisations sued for defamation. I have drawn the issue to the attention of Cabinet Office officials. I have also suggested that an interdepartmental committee of vetting authorities should be re-established, to provide a forum for a regular exchange of views and the formulation of advice for central government. Companies with sensitive government contracts (List X firms) already have such a body in the Defence Industries Security Association (DISA)7.

Inspections

40. Our eight site inspectors track security policy and practice, and advise on physical and technical security issues. They also review site security plans and undertake physical security inspections or investigations. It is impossible to identify security weaknesses or to monitor compliance with security requirements, without a thorough, comprehensive programme of site inspections, augmented by no-notice spot

7 http://www.thegosc.org/home.htm
checks and investigations, undertaken by security experts familiar with conditions
within the civil nuclear industry (see Annex B). I had mentioned last year that, with
increased numbers, we had been able to assign about five sites to each of our
inspectors, to enable them to get to know their sites, including details about holdings
of nuclear and radioactive material, and key personnel, far better than had been
previously possible.

41. This year, for the first time for many years, we had a sufficient number of
inspectors to undertake a full programme of site inspections, due to the additional
staffing acquired over the past three years mentioned in previous reports. Twelve full
inspections were undertaken at selected sites, led by an inspector responsible for other
sites, usually assisted by the designated site inspector for the site being inspected.
Although we may vary the practice with further experience, we selected this method
to reconcile two opposing objectives. On the one hand, we are aware of the danger
that inspectors risk losing objectivity by identifying too closely with procedures and
personnel on sites for which they are responsible (regulatory capture). On the other
hand, we wish to retain the benefit gained by assigning sites to designated inspectors,
to help them develop effective working links with site managers and become fully
familiar with technical operations and holdings of nuclear and radioactive material. In
addition to programmed inspections, over fifty other shorter inspections and
investigations were carried out in connection with Temporary Security Plans
submitted by the operators, inspections of security improvement works, and ad hoc
inspections during site visits. Nine no-notice spot checks were also carried out.

42. This is further welcome evidence of progress. By 1996, the Inspectorate had
been reduced to the point where it could not sustain a regular programme. Many sites
listed at Annex E were not subject to inspection. We had no designated site
inspectors, or inspectors specialising in Information and Transport Security.
Although there is no automatic correlation between numbers of inspectors and the
effectiveness of security arrangements, OCNS is now far better placed to advise
companies and monitor compliance on the ground.

43. We have also now divided our site inspectors into two teams, each under a
Principal Inspector, to strengthen specialisation and enable the latter to continue to
undertake enough field work themselves to keep in touch. As numbers have
increased, our one Principal Site Inspector found himself having to spend too much
time on administration, undermining his technical grasp. It is difficult in a specialist
organisation preventing highly experienced, senior staff becoming overburdened in
this way. However, in splitting the work, we have ensured that each team has a rough
equivalence of the various types of site subject to inspection (see Annex E), to ensure
adequate cross-fertilisation of ideas and approaches. Both teams will also work
together by exchanging views and inspecting each others’ sites.

Security Plans

44. I have already referred to the new Nuclear Industries Security Regulations,
which came into effect on 22nd March 2003. These new Regulations were made under
Section 77 of the Anti-Terrorism, Crime and Security Act 2001. Hitherto, the

legislative framework administered by OCNS had been outdated and unsatisfactory. It had grown *ad hoc* to reflect the development of the industry since the 1950s, with the result that different parts of the industry were governed by separate, inconsistent regimes. In addition, there were gaps and anomalies. A few of the smaller sites fell outside formal regulation altogether, as did companies transporting nuclear materials, tenant companies operating inside licensed sites, and some premises holding sensitive nuclear information but no nuclear material.

45. The new Regulations carry forward the substance of the previous regulatory regimes. They set requirements for the protection of nuclear material on sites or in transit, against the risks of theft or sabotage, and for the protection of sensitive information, such as site security arrangements. The core requirement is for operating companies to submit a security plan for each site to OCNS for approval, setting out the proposed security arrangements, and to comply with the provisions of the plan once approved. Guidance has been circulated to the companies on how the new Regulations should be interpreted. Detailed technical guidance has also now been issued, following a period for consultation, on the security arrangements companies are expected to apply at nuclear sites, based on previous OCNS security standards.

46. Companies were required to submit security plans for sites under their control by 22\textsuperscript{nd} June 2003. Assistance was given to company managers drawing up plans, particularly those (like the tenant companies at Harwell and Winfrith) that had not been subject to regulation before. I am pleased to record that all met the deadline set. Although several sites already had approved security plans, we required these plans to be updated as well, to improve consistency and incorporate additional or revised security arrangements. Inevitably, most plans needed to be returned after review by OCNS site inspectors, for further revisions to be made. However, twenty-seven plans are nearing approval and most should be approved within the next few months.

47. Neither my inspectors nor the companies’ security managers would have chosen to spend the amount of effort required on such a major exercise. However, I consider that the work involved was necessary. We had found in the past that relying just on generic standards in turn led to requests for derogations or variations to suit local circumstances which were difficult to monitor *ad hoc*. Under the new Security Regulations, approved security plans have become the operative instrument against which compliance is determined and, if required, prosecutions for non-compliance can be brought. For these reasons, I believe that the existence of these plans, specific to individual sites and closely reflecting local circumstances, will prompt greater, long-term commitment by site managers and senior company executives. Moreover, the research involved in drawing up new technical guidance, the incorporation of additional security requirements, the discussions that have taken place and the careful review of plans submitted has ensured that all security arrangements taken at sites have been scrutinised carefully yet again for consistency and effectiveness. As a result, I am satisfied that the industry has reached a high standard of compliance with comprehensive, up-to-date security standards. Furthermore, such a comprehensive security review should not need to be repeated, at least for the foreseeable future. Sites are required under the Regulations to submit either revised or temporary security plans in advance, to cover any changes in circumstances or new construction work.
Post 9/11 Work

48. I had given brief details in my two previous reports on work to strengthen security arrangements at civil nuclear sites following the terrorist attacks in the United States and elsewhere since September 2001. We were already taking stringent security precautions against the threat posed by Irish republican terrorist groups, including stationing armed police at designated sites. Nevertheless, chicanes were put in place in case terrorists tried to use vehicles loaded with explosive to crash through perimeter defences or penetrate undetected into inner areas to detonate explosives. Over the past twelve months, the operating companies have continued extending these additional precautions. Some temporary chicanes have been replaced with permanent, purpose-designed barriers or traffic-management schemes, partly for safety reasons. With the help of OCNS site inspectors, all perimeter defences at sites have been resurveyed and in some instances provided with additional anti-crash features. Strengthened arrangements to search vehicles and personnel have continued.

49. At Sellafield and Dounreay, additional pat-down body searches have been introduced for all personnel, including visitors, whenever access is needed to protected inner areas. Those conducting searches are themselves now protected by armed police (AFOs). No-one is permitted to work unaccompanied on hazardous material, which is monitored at all times by CCTV. The Separation Area at Sellafield does not lend itself to strengthened physical security arrangements. Nevertheless, additional security fencing is being installed by BNFL and the area is also now protected by its own dedicated AFO patrol, in addition to 24-hour mobile patrols by armed officers around the rest of the site and at Drigg.

50. Last year, an important programme was started at Sellafield, in conjunction with the NII’s safety inspectors and the operators’ safety and security specialists, to review security and safety arrangements at Vital Areas. These are areas inside sites containing equipment, systems or devices, the failure of which could have serious consequences. The object of the programme is to understand fully the interaction between security, safety and operational features, in order to gauge the extent to which they might prevent or mitigate a serious radioactive release following a sabotage attack. In several instances, it was possible to demonstrate that duplicate or even triplicate cut-outs and other safety controls, designed to prevent an accidental release, would also function effectively in the event of a sabotage attack. In some cases, however, additional controls are being installed. The programme has now been extended to the generating stations. A review is to be undertaken of security and safety arrangements protecting secondary facilities outside inner security zones, such as reactor coolant systems.

51. Over the past twelve months, OCNS site inspectors have continued working with the NII and the operating companies on additional measures to counter the risk of a large aircraft being deliberately crashed onto a civil nuclear site. Details may not be disclosed for security reasons. However, information has been made public about substantial concrete barriers now being built at two locations around the periphery at Sellafield. As reported previously, other measures have also been taken, including strengthened warning procedures and interdiction by RAF aircraft.
Staffing Matters

52. I am indebted to all members of the Inspectorate, who are handling a truly astonishing amount of work with commendable skill and attention to detail. Average mileage fell slightly last year to 9,133 miles per inspector, due to time spent at headquarters reviewing site security plans. I should like to see three more inspectors recruited to strengthen coverage and resilience.

53. I expect that this further reinforcement will prove sufficient for the foreseeable future, despite an apparent shortfall in comparison with the NII which has dedicated inspectors for each site, with several inspectors deployed at Sellafield and Dounreay. This is because our safety counterparts need more detailed knowledge than we do about operating procedures and systems. We are able to tap this knowledge when necessary, instead of trying to match it.

Chemical And Biological Threats

54. Shortly after the World Trade Center and Pentagon attacks in the United States on 11th September 2001, letters containing anthrax were sent to offices in New York and Florida, and targets in Washington, killing several people. NSAC has continued to provide helpful advice to OCNS and the civil nuclear operating companies about precautions to take in case chemical or biological agents are ever used in the UK.

The Transport Of Nuclear Material

55. OCNS regulates arrangements by carriers for the secure transport of sensitive categories of nuclear material. This Office is the UK’s designated national security authority under the Convention on the Physical Protection of Nuclear Material9 for shipments to and from overseas destinations.

56. The Nuclear Industries Security Regulations 2003 extended direct security regulation for the first time to companies transporting nuclear material within the UK and territorial waters (and for UK registered shipping anywhere in the world). Hitherto, operators had been expected to ensure that their contracts with carriers required the latter to take specified security measures, but this had proved difficult to monitor and enforce. During the past twelve months, twenty-one organisations applied to OCNS for Approved Carrier status by submitting a Transport Security Statement (comparable to a Site Security Plan) under Regulation 14. Most had no previous experience preparing the details required. My two Transport Security Inspectors had to spend time advising applicants on the procedures and standards to follow, including companies based in Belgium, Germany, France and Spain. Eighteen have succeeded to date in gaining Approved Carrier status, as listed at Annex H.

57. In my first annual report, I described some of the security arrangements taken to protect shipments of mixed uranium and plutonium oxide fuel (MOX) sent from the UK and France to Japan, in British-flagged vessels operated by PNTL, a BNFL subsidiary. In my last report, I provided details about a third, return shipment from

9 http://www.iaea.org/Publications/Documents/Conventions/cppn.html
Japan to the UK. Although MOX is not an attractive target, either for terrorists or proliferating states and is safe to transport, the production, use and especially the transport of this type of fuel is controversial and all three shipments had attracted adverse publicity. Security arrangements had been reviewed and approved by OCNS, working in conjunction with our regulatory counterparts in France, Japan and the USA. The MOX fuel was conveyed in a specially equipped vessel escorted throughout by a second identical vessel, both operated by PNTL. Both vessels carried deck-mounted naval guns and an armed escort provided by the AEAC. Other less obvious, confidential measures had been taken as well to retain continuous, secure communications throughout the voyage, to counter any attempts to board either vessel, and prevent any unauthorised interference with the MOX cargo. All three shipments were completed successfully, although demonstrations had taken place at various stages, at sea and when leaving or entering port.

58. No MOX shipments to Japan were scheduled to take place during the past twelve months, but further shipments are planned. Work continued as well for the resumption of MOX fuel transports to Switzerland and transports to other destinations in Europe. We understand that commissioning issues at SMP have delayed the manufacture of MOX fuel intended for European customers. When available, MOX will be transported in special High-Security Vehicles (HSV) under armed police escort at all times. Other security measures are also being planned, in conjunction with our regulatory counterparts and the police, to guard against unauthorised interference. For security reasons, dates are not released in advance.

59. The US authorities intend to contract the same specially-equipped PNTL ships to transport plutonium from Los Alamos to Cherbourg, to be moved from there by road to Cogema’s site at Caderache in southern France, where it will be fabricated into MOX test assemblies for return to the USA. This shipment forms part of an agreement between the US and Russian governments for surplus weapons-grade plutonium to be taken out of use by both states. As the PNTL ships to be used are British-flagged vessels, the sea voyage will be regulated by OCNS under NISR 2003. OCNS is in contact with US and French counterparts, as well as PNTL, to ensure that all necessary security arrangements are thoroughly coordinated.

60. This year, there have been sixteen shipments of irradiated fuel from destinations in Germany, Italy, the Netherlands, Sweden and Switzerland. Each had been arranged in conjunction with our European counterparts, the police and the companies involved. In addition, over 1000 transports of less sensitive nuclear materials have been carried out by road, rail and sea within the UK, and to or from overseas destinations, during the past year. This number includes regular movements by train of spent fuel from the nuclear power stations to Sellafield for reprocessing (except from Sizewell B, which stores spent fuel on site). Although the comparable figure last year was 400, this does not represent a sudden increase in scale. The higher figure is a consequence of the requirement in NISR 2003 for all such movements to be reported to OCNS in advance. There were no security incidents.

61. I have decided not to provide an estimate for transport security costs incurred by the companies subject to regulation. The greater number of movements now reported has made it difficult to identify the security component in transport costs.
62. OCNS continues to keep under review all security arrangements for the transport of nuclear material, to ensure that the measures taken are amply robust to counter all possible security threats. In December, OCNS Transport Security Inspectors conducted a no-notice inspection of the security arrangements in place at Willesden Brent Rail Sidings in London. BNFL’s Direct Rail Services (DRS) marshal trains at these sidings carrying spent nuclear fuel in approved fuel flasks from the four nuclear generating stations in the South East, en route to Sellafield. Comprehensive security arrangements had been approved by OCNS to protect spent fuel during marshalling. However, the spot check disclosed that approved guarding arrangements were not being carried out satisfactorily. As a consequence, DRS was instructed to cease marshalling loaded trains at Willesden until the approved security arrangements could be restored, reinforced by a legal Direction to that effect.

63. DRS responded swiftly to rectify matters, appreciating the security and public relations implications, and the operational consequences that a lengthy denial of use at Willesden could have had for the stations affected. The effective supervision of contract guard personnel was restored, enabling the Direction to be withdrawn after one week. This was the first spot-check that OCNS Transport Security Inspectors had undertaken under the new Regulations. While the incident was regrettable, the action taken has had salutary effect. Disciplinary action was taken, including the dismissal of some employees. DRS security arrangements have been brought under BNFL corporate supervision, in line with guidance issued under NISR 2003. Nevertheless, OCNS will continue to monitor security arrangements for nuclear material, for all forms of transport. Further inspections and spot checks will take place at ports, railheads and other transhipment points. To do so, the Transport Security Branch of OCNS should be strengthened by the appointment of a third inspector.

Information Security

64. OCNS regulates arrangements within the civil nuclear industry to protect sensitive information, including investigating any loss or compromise of information. The Government’s protective marking system is applied throughout the industry to classify information with defence, national security or proliferation implications. Companies are also expected to follow government IT security guidelines, with OCNS acting as the industry’s accreditation authority. The documentation the companies submit for approval is analogous to the security plans for civil nuclear sites and the transport of nuclear material mentioned elsewhere in this report.

65. As well as site and transport security inspections and personnel security audits, OCNS inspects regulated companies’ information security arrangements. Last year, this Office carried out five such inspections. Our two INFOSEC Inspectors also evaluated and accredited five more IT systems used by companies to process sensitive information. Although IT specialists employed within the civil nuclear sector are generally highly competent, British Energy staff deserve particular mention this year for excellent work undertaken on the company’s large core data network, recorded in a comprehensive Security Accreditation Document Set. Most companies subject to regulation now follow the BS 7799 standard for information security management systems, with assistance provided or arranged by OCNS, although some further progress needs to be made by companies only recently brought under regulation.
66. Little progress was made last year to follow up the project started with the NII in 2001 to inspect safety-critical IT systems at civil nuclear sites, to guard against unauthorised interference. A methodology had been developed and two pilot inspections undertaken, but both organisations faced other priorities.

67. During the year an agreement was reached with the US Nuclear Regulatory Commission (NRC) on the exchange and protection of sensitive information. A similar agreement is being negotiated with the Canadian authorities. We have also developed revised guidance for companies in the civil nuclear industry contracting for work under EU competition regulations.

68. An inaugural forum was held during the year for company security staff responsible for Information Security, to review industry-wide policies and procedures and promote best practice. Observers attended from the Atomic Weapons Establishment at Aldermaston. It is intended to hold further annual meetings.

69. During the year, four security breaches were reported to OCNS. Four laptops had been stolen in three separate instances, one from a visiting foreign national which was subsequently recovered, one from a parked car and two from an office which had been left unattended. Investigations determined that sensitive UK information had not been stored on these laptops. Nevertheless, because the theft of laptops for resale is widespread in the UK, especially from parked cars, OCNS issued guidance for dissemination to all staff. Last July, an employee working for a contractor at Winfrith had used a sick colleague’s day pass to enter the site. A vigilant member of staff spotted the discrepancy and reported the circumstances to the AEAC, leading to disciplinary action being taken. Misuse of security passes will not be tolerated.

70. Section 79 of the Anti-Terrorism, Crime and Security Act 2001\(^{10}\) introduced a new offence for anyone to make an intentional or reckless disclosure of information that might prejudice the security of nuclear premises or nuclear material. Although the new offence applies to individuals, whether or not they work in the civil nuclear industry, the operating companies are also required to keep such information secure under the new Security Regulations. Revised guidance has been drawn up to assist the companies, other regulatory authorities and government departments involved in deciding which categories of information need protection.

71. OCNS INFOSEC Inspectors continued to attend interdepartmental working groups reviewing IT security policy. OCNS also works closely with the National Infrastructure Security Coordination Centre (NISCC).

Counter-Proliferation

72. Most of the procedures specified by OCNS for the protection of information have a dual purpose, to protect details that could be exploited by terrorist groups, or technology of potential value to countries seeking to develop nuclear weapons, known as proliferation-sensitive technology. The Urenco Group, with plants at Capenhurst in Cheshire, the Netherlands and Germany, develops and operates sensitive centrifuge technology for the enrichment of uranium. Centrifuge components of Urenco design

with supporting documents had been discovered in Iraq in 1991, leading eventually to the prosecution of Karl-Heinz Schaab, who had obtained information through links with Urenco in Germany in the 1980s. The earlier Khan Case, involving the theft of sensitive design information from Urenco in the Netherlands in the 1970s for the Pakistani nuclear programme, provides further illustration of the sensitivity of this technology. Information became public during the year on the supply of derivative technology from Pakistan to Libya, Iran and North Korea (see Annex A).

73. The Khan and Schaab cases occurred many years ago. Security arrangements since then have been kept under close review. OCNS, with our German and Dutch counterparts, constitutes the security authority for Urenco under the terms of the Almelo Treaty. During the course of the year, we have continued to work with Urenco’s own security managers to ensure that stringent precautions are maintained.

74. Work has finished on drafting new Regulations to enable individuals to be prosecuted for the unauthorised disclosure of sensitive uranium enrichment technology (UET). The Regulations should be laid before Parliament within the next few months, following a period for consultation.

75. Urenco is applying to the US Nuclear Regulatory Commission (NRC) for a licence to construct a centrifuge enrichment plant in New Mexico, following procedural delays encountered with an alternative site in Tennessee. Work is well advanced on revising security arrangements to control the transfer of proliferation-sensitive information from the company’s plants in Europe to the United States. OCNS continues to work closely on the project with our German and Dutch counterparts, and with the NRC and the US Department of Energy (DOE).

76. During the year, Urenco set up two subsidiaries to separate the management of R&D and the manufacture and assembly of centrifuges from its uranium enrichment production activities. The French company Areva is seeking to acquire a 50% stake in the first of these subsidiaries, the Enrichment Technology Company (ETC), if agreement can be reached with the three co-signatory states to the Treaty of Almelo on releasing the technology. It will be a prerequisite that security arrangements protecting information under French control will match those already applied by Urenco, to be supervised by French security authorities working in tandem with the existing quadripartite group of UK, Dutch, German and US security authorities.

Security Training And Awareness

77. OCNS distributes training material and sponsors nominees from the civil nuclear companies to attend specialist security courses run by the Security Service, OCNS and other bodies.

Security Management

78. I mentioned in my previous report that a newly-appointed Principal Inspector would assume responsibility for monitoring the effectiveness and resilience of companies’ security management arrangements, which this Office had lacked the
means to supervise effectively. The idea stemmed from discussions with the NII, which takes a close interest in organisational and managerial issues under Licence Condition 36. Our new Inspector supervises compliance with guidelines issued under the Nuclear Industries Security Regulations 2003 covering aspects such as companies’ commitment to security at Board level, the quality, training and accountabilities of company security managers, funding provision, and the involvement of heads of sites and other budget-holders. Besides strengthening oversight in these key areas, the effectiveness of companies’ internal security management arrangements will also inform decisions about the extent to which companies would be permitted to exercise greater autonomy in managing security arrangements, including undertaking security audits and introducing variations in security provision. OCNS and the NII consult under our respective regulations before giving approval for changes to be made.

79. The appointment of the new Principal Inspector proved to be timely. I have already referred to a reorganisation undertaken by the Urenco Group (paragraph 76). The company had not appreciated initially that its subsidiaries would need to comply in full with new OCNS guidelines on security management. We required assurance that Main Board supervision would continue. We were unwilling to accept proposals that UEC security managers would supervise security arrangements within the new ETC subsidiary, due to doubts about workload, authority and budgetary control. We had also advised our Troika counterparts about these concerns. The company responded promptly with revised arrangements satisfying our requirements.

80. A similar set of issues arose during the year with BNFL, which is seeking to reorganise its management structures in anticipation of the formation of the Nuclear Decommissioning Agency (NDA), proposed in the Energy Bill currently before Parliament. We sought assurance that security would continue to be supervised at Main Board level. We were concerned as well about a proposal to divide the company’s Security, Safeguards and International Affairs Division (SSIA) between several levels of management, risking a loss of co-ordination and control. We made clear to BNFL that we expected the SSIA Division’s cohesion and authority to be maintained and extended to all subordinate levels, including transport subsidiaries. I am pleased to report that BNFL promptly submitted revised proposals meeting these requirements, which have been approved subject to further review.

81. I can also report that all companies making up the civil nuclear industry continued to co-operate with OCNS throughout the past twelve months. In the current climate, chief executives, their company directors and other senior managers appear to accept the need for effective security regulation. Heads of sites and middle managers have also cooperated in strengthening security arrangements, even when doing so has caused operational or funding difficulties. I am encouraged by this welcome change in attitude, which was by no means typical when I became Director six years ago. I believe it is now widely accepted within the civil nuclear industry that effective security arrangements are as important as high safety standards.

82. BNFL’s SSIA Division is the largest security organisation within the industry, (with responsibilities as well for safeguards and trade licences). The number of security staff has been increased in recent years and it is an effective, well-run organisation. SSIA Division now routinely submits internal security assessment

11 http://www.parliament.the-stationery-office.co.uk/pa/cm200304/cmbills/093/2004093.htm
reports to OCNS, as well as an annual assurance statement. Although smaller, the security teams employed by the UKAEA, British Energy and Urenco are also competent, as are the security managers in other companies like Nirex and GE Healthcare (Amersham). Until a few years ago, disagreement and prevarication were not uncommon: some company security managers had been expected by their superiors to reduce costs as far as possible. Although there are still disagreements from time to time, co-operation has improved significantly in recent years and is now generally satisfactory. In fact, we value the advice offered by company security staff, many of whom have similar security backgrounds to those in OCNS. Although our statutory powers are necessary to ensure that effective security standards continue to be maintained, they are most useful underpinning internal bids from the companies’ security teams when additional security expenditure is required (Annex B). We held two meetings this year of the Civil Nuclear Security Forum (CNSF) attended by all company security managers, the AEAC and other invited guests.

83. Around 700 security staff are employed by the various companies subject to regulation, undertaking security management, searching, guarding, INFOSEC and related functions. Total staff-related costs last year (excluding OCNS and the UKAEA Constabulary) exceeded £23 million. Over the same period, about £30 million was incurred on security plant, systems and equipment, including upgrades and depreciation, but excluding transport security costs.

The UKAEA Constabulary

84. The main function of the UKAEA Constabulary (AEAC) is to provide an armed response capability at designated civil nuclear sites, although incapacitating weapons are also available (eg. baton rounds). AEAC detachments also provide perimeter and internal patrols, including dog patrols, and control access at all open perimeter gates and at certain sensitive areas inside sites. AEAC officers search personnel, hand-baggage and vehicles (using specially-trained dogs as necessary) and respond to intruder alarms. Unarmed AEAC officers are usually able to deal with minor public order incidents involving anti-nuclear demonstrators without having to wait for assistance from county forces, or risk involvement by armed officers. Because the AEAC may investigate possible criminal activity inside sites (eg. evidence of malicious damage), the evidence discovered can be useful in deciding whether any individuals proved to be implicated should be prosecuted, have their security clearance revoked or face disciplinary proceedings.

85. The AEAC maintains close liaison with police Special Branches and other specialist police units. The Constabulary is tasked by OCNS to provide armed escorts for sensitive nuclear material being transported, in accordance with the Convention on the Physical Protection of Nuclear Material. Although I alone determine the sites to be protected and the security tasks undertaken by the AEAC, the Constabulary’s Chief Constable has operational autonomy, under the oversight of a non-statutory Police Authority. The Chief Constable and the Police Authority publish annual reports.12

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12 [http://www.ukaea.org.uk/ukaeac/reports.htm](http://www.ukaea.org.uk/ukaeac/reports.htm)
86. I have referred to cut-backs in the size of the Constabulary before I took over as Director, and pressure from operating companies to remove the AEAC from Category II and III sites (Annex B). Some held the view that the Constabulary was in some sense distinct from the security measures supervised by DCNSy, although I decided from the outset that the AEAC had to function as an integral component of the security regime within the civil nuclear industry. I took the opportunity as soon as possible to join the Police Authority. I have also prompted action to strengthen the Constabulary’s powers and jurisdiction under the Regulation of Investigatory Powers Act 2000 and the Anti-Terrorism, Crime and Security Act 2001.

87. I had set up the Standing Committee on Police Establishments (SCOPE) shortly after taking over as Director, following a dispute about police numbers at Dounreay. The circumstances were investigated by the House of Commons Trade and Industry Committee which concluded that there had been pressure to reduce numbers at several sites to save costs. SCOPE was created to reassure Ministers, Parliament and the general public that numbers at sites protected by the AEAC would be determined in future by OCNS on security grounds, not by cost or commercial considerations. Over the past five years, police numbers (and supporting civilian staff) have been increased by 30%, excluding a supernumerary complement of police officers established to escort MOX shipments. Relative increases have been made in the number of authorised firearms officers and dog patrols at sites. Staffing at headquarters and at the police training centre have also been strengthened. Some further modest increases have been agreed this year.

88. It is noteworthy that the senior company representatives on the Police Authority have come to accept SCOPE as a useful mechanism for addressing staffing requirements. They adopt a most constructive attitude in considering bids for staff increases. The Constabulary has also been successful in recruiting staff to match rising establishments, at a time when other police forces have been actively recruiting. Forecast total AEAC costs for the current year are £26.9 million.
In my previous reports, I have commented favourably on the professionalism, discipline and commitment displayed by all ranks of the UKAEA Constabulary. Police officers on duty are expected to remain vigilant in all weathers around the clock. The Beat Officer of the Year Award was awarded to another police officer this year by the Chief Constable – an award I had instituted with his agreement to recognize the importance of fixed-point and patrol duties in protecting sites against hostile attack. Authorised firearms officers (AFOs) are well aware that they may be called upon at any time, without warning, to use their weapons and that, after such an event, their actions would be closely scrutinised. AEAC firearms officers are recognised as among the best trained and equipped of any force anywhere in the world. They now exercise annually with DOE counterparts in the United States.

AEAC detachments at sites are being equipped with AIRWAVE, an encrypted radio communications system, in phase with its adoption by county forces. Work is progressing on a secure information network. In recent years, BNFL has funded the provision at Sellafield of state-of-the-art firing ranges and dog kennels. The UKAEA is also funding an impressive new Police Command and Control Centre at Dounreay, now nearing completion, with a strengthened inner citadel. My inspectors and I have continued to take part in several AEAC meetings and conferences, as well as security exercises run at sites.

We have also been closely involved this year in drafting provisions included in the current Energy Bill before Parliament to detach the Constabulary from the UKAEA and re-establish it as a stand-alone force, to be known as the Civil Nuclear Constabulary (CNC), under a new, statutory Police Authority. I have supported this proposal from its inception, because the Constabulary should not be administered by one of its funding organisations, with an inbuilt interest in minimising costs. However, it should be noted that the new statutory Police Authority will function within the security regime supervised by OCNS. Although the Constabulary’s police powers are valuable, it exists in lieu of the armed civilian guards or paramilitary forces that other countries use to protect nuclear sites. Consequently, the sites to be protected and the security tasks to be undertaken will continue to be specified by OCNS. SCOPE will also continue in being to determine the police numbers required.

Moreover, we would not wish to see the CNC take on activities diverting resources from its core task protecting nuclear sites and material. OCNS will also continue to take a close interest in supporting functions, such as intelligence assessment, exercises and training. In addition, most meetings of the Authority cannot be held in public because sensitive information needs to be discussed. Members will continue to require security clearance prior to appointment. The Police Authority, as well as the Constabulary, will continue to hold sensitive information. For these reasons, it is intended that OCNS will exercise the broad powers of Direction and objective setting included in the Bill for this purpose.

We have also been involved in discussions on the need for further changes to the Constabulary’s powers, reinforcing provisions included in the Anti-Terrorism, Crime and Security Act 2001. Those earlier changes were important in permitting the AEAC to exercise full police powers within 5 kilometres outside nuclear sites or when escorting nuclear material. Powers of pursuit, arrest and detention beyond these limits

http://www.parliament.the-stationery-office.co.uk/pa/cm200304/cmbills/093/2004093.htm: Chapter3
have been clarified. It has also been proposed in the Bill that CNC officers should have powers of stop and search analogous to those included in the Terrorism Act 2000. If the Bill is approved, what had been only a few years ago a small force of Special Constables with limited jurisdiction will have been transformed into a duly constituted, well-resourced police force with full powers appropriate to its functions.

Security At Nuclear Generating Stations

94. I reported last year that two incursions had been made by anti-nuclear demonstrators into Sizewell B nuclear power station on the Suffolk coast. Action has been taken to enhance deterrence and delay around the station perimeter at Sizewell B and at other sites. Razor wire was installed across the tops of fence lines, at ground level and at certain other points vulnerable to climbing. Electrified fencing has also been installed at selected sites. However, measures like this would not prove effective against armed terrorists, for which other measures are taken. Incursions by demonstrators into nuclear sites are, in my view, irresponsible and unjustified, particularly when the threat of terrorist attack is as high as it is at present. Both incidents diverted effort from work to strengthen counter-terrorist security measures.

95. Sizewell’s security guards had performed very credibly in accordance with contingency arrangements in containing both these incursions until the demonstrators could be removed by local police. I am pleased that one security guard at Sizewell, who had been injured, has been awarded the MBE.

96. A new training course has been developed by BNFL for security guards employed at Magnox stations, in partnership with OCNS and SITO, which we hope will receive national accreditation.

97. For reasons unconnected with the recent Sizewell incursions, I am consulting the operating companies about the best means to strengthen the deployment of armed AEAC police officers at the generating stations, to reinforce the protection already provided by the companies’ unarmed civilian guards. Powers to do so were included in the Anti-Terrorism, Crime and Security Act 2001 and have been exercised. Moreover, contingency arrangements exist for local police forces to provide an off-site armed response in the event of a terrorist attack. However, as an additional precaution in view of the current terrorist threat, I wish to see further arrangements put in place to provide an on-site armed capability. With the agreement of the Police Authority, I have tasked the Chief Constable to establish two mobile patrol groups to provide enhanced cover on an interim basis.
The Nuclear Decommissioning Authority (NDA)

98. Proposals are included in the Energy Bill currently before Parliament to establish a Nuclear Decommissioning Authority (NDA), to assume responsibility for the Government’s interests in discharging public sector civil nuclear liabilities. The NDA, when established, will develop a strategy to drive forward decommissioning and nuclear clean-up safely, securely, cost effectively and with proper regard to the environment. It will be required to do this within the existing regulatory framework. In my first report, this body had been referred to as the Liabilities Management Agency (LMA), but the name has been changed.

99. OCNS has continued to work with officials, in conjunction with the NII, the Environment Agency and SEPA, on ways to establish effective co-operation. We anticipate significant security issues arising if any new companies with limited previous security experience are contracted to manage sites. We have also pointed out that decommissioning involving new construction, an influx of contractors and more material being transported would affect existing security arrangements. To address these issues, which are manageable, we intend to sign a Memorandum of Understanding with the NDA, to ensure prior consultation and agreement on any security matters falling within the terms of the Nuclear Industries Security Regulations 2003, which will not be superseded by provisions in the Bill. Any new companies or consortia taking over the management of sites would be required to implement previously approved site security plans, unless and until revised plans had been agreed. Their capability to do so satisfactorily and to demonstrate effective corporate supervision would be determining factors in awarding contracts. In addition, the NDA itself would become subject to regulation by OCNS in protecting its holdings of sensitive nuclear information.

100. The NDA is expected to have about 230 members of staff. To cope with the significant additional work anticipated, we are proposing to establish a new Principal Inspector post, to ensure that decommissioning security and related issues can be thoroughly researched and effective security standards maintained.

Liaison With The NII

101. Liaison with the Nuclear Installations Inspectorate (NII)\(^{14}\), the safety regulator, has continued to develop, following a Memorandum of Understanding signed in 2001. I have already referred to joint work on Vital Areas, protecting facilities against air attack and safety-critical IT systems. Contact between both Inspectorates is now well established. Because there are more NII inspectors, more deeply involved in systems work than OCNS, we are occasionally told by the former about possible security issues, complementing reports from company security managers and the AEAC. We are learning about each others’ approaches and preoccupations. Newly-appointed OCNS inspectors attend NII training courses. We plan to develop a training module on security regulation to be included in training courses for new NII staff. Our senior management teams meet about twice a year. We consult about issues where our requirements might conflict or if we have interests to pursue in common.

\(^{14}\) http://www.hse.gov.uk/nd/index.htm
102. One such issue is the NDA, discussed in the preceding section. My colleague, the Chief Inspector of Nuclear Installations, and I have agreed that there would be benefit in seconding a NII inspector to OCNS to fill the new post of Principal Inspector (Decommissioning Security) mentioned above, to co-ordinate a joint approach. Doing so would also provide OCNS with much needed in-house technical expertise on nuclear physics and engineering. In return, we would hope to second an OCNS inspector to the NII, to join a new team to co-ordinate work on safety projects with security implications. We have agreed to explore how best this can be achieved.

103. The NII is about five times the size of OCNS. It is sometimes suggested that OCNS should merge with the NII. The idea has merit. Most countries combine nuclear security and safety within a single regulatory authority. The US Nuclear Regulatory Commission (NRC) is the prime example. There are undoubtedly useful synergies to be achieved by even closer co-operation. However, there are drawbacks to a merger. The NII regulates safety at some MOD nuclear facilities operated by contractors, but OCNS has no comparable responsibilities. When consulted prior to the transfer of OCNS to the DTI, the NII’s parent body, the Health and Safety Executive (HSE) also drew attention to difficulties that would arise incorporating the vetting programme within its safety culture. Moreover, maintaining the confidentiality of sensitive intelligence and security information could be challenging, as the HSE aims to publish as much information as possible about its activities.

Representational Activities

104. My Office contributed to several briefs for Ministers and provided advice in response to Parliamentary Questions. I also replied to letters from individuals concerned about nuclear issues, where we could offer reassurance without disclosing sensitive details. I was interviewed by staff members of the Parliamentary Office of Science and Technology (POST), preparing a draft report on the protection of nuclear material for consideration by the Defence Select Committee. However, I do not give interviews to the media, preferring instead to provide briefing material to the DTI’s Communications Directorate, to ensure consistency in response.

105. We continued to participate in discussions between BNFL, the nuclear regulators, some NGOs and experts interested in (or concerned about) nuclear issues. The group, known as the BNFL National Stakeholder Dialogue15, aims to inform the company’s decision-making in terms of its environmental performance. We are always willing to explore better ways of engaging with stakeholders and others to retain public confidence in the civil nuclear industry, even though it can be difficult to avoid being drawn into disclosing security sensitive details.

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Other Professional Activities

106. We continued to take part in interdepartmental groups and professional bodies promoting best practice in protective security. OCNS staff attended several security conferences and exhibitions. We also made contact with the newly-formed Security Industries Authority (SIA)\(^\text{16}\), with a view to co-operating on guard force training.

International Activity

107. OCNS is the United Kingdom’s designated security authority for civil nuclear matters under various treaties, international conventions and agreements. We keep in close touch with our counterparts in the United States, Canada, Australia and Japan. During the year, OCNS staff paid further visits to the United States for bilateral discussions with the US Department of Energy’s National Nuclear Security Administration (NNSA) and the Nuclear Regulatory Commission.

The European Nuclear Security Regulators Association (ENSRA)

108. I mentioned in last year’s report that OCNS is a member of a group of government bodies with responsibilities for civil nuclear security, with counterparts from Belgium, Finland, France, Germany, Spain, Sweden and Switzerland. Meetings are held to exchange information on civil nuclear security issues. Two meetings were held this year, in Berne and Neckerwestheim, organised by our Swiss and German counterparts respectively. Work is well advanced on terms of reference to establish the group on a formal basis, to facilitate confidential exchanges and provide the IAEA and other official bodies with a source of expert advice on the approach taken by members on nuclear security. The group is now called the European Nuclear Security Regulators Association (ENSRA), modelled on a similar group of European nuclear safety authorities, the Western European Nuclear Regulators Association (WENRA).

The IAEA

109. OCNS works closely with the IAEA’s Office of Nuclear Security\(^\text{17}\). In the last twelve months, my staff continued to work with officials in the DTI and our regulatory counterparts overseas in developing proposals to revise the Convention on the Physical Protection of Nuclear Material (CPPNM)\(^\text{18}\). Countries which are party to the Convention are expected to meet defined standards of physical protection for the transport of nuclear material between states, and to co-operate in the recovery and protection of any stolen nuclear material. The Convention also promotes international co-operation in the exchange of information relating to security arrangements for nuclear material being transported across national borders.

\(^\text{16}\) http://www.the-sia.org.uk/  
\(^\text{17}\) http://www-ns.iaea.org/security/  
\(^\text{18}\) http://www.iaea.org/Publications/Documents/Conventions/cppn.html
110. The responsibility for establishing and operating a comprehensive physical protection system for domestic nuclear facilities and nuclear material in domestic use, storage or transport rests entirely with individual states. Nevertheless, OCNS experts have been closely involved with foreign counterparts, working under IAEA auspices, in developing the guidance published by the IAEA entitled The Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.4)\textsuperscript{19}. This document provides a most useful basis for guiding states in designing, implementing and regulating a system of physical protection for nuclear sites and the different categories of nuclear material. As OCNS is one of the authorities closely involved in developing this guidance, our own national standards and procedures follow it closely.

111. My Deputy Director continued to serve on the IAEA Director General’s Advisory Group on Nuclear Security (AdSec), a relatively new body which is developing into an authoritative source of advice on the agency’s nuclear security programmes. AdSec was instrumental this year in securing agreement that the IAEA should develop a separate series of nuclear security documents providing guidance to member States on nuclear security issues.

112. OCNS is one of the main contributory agencies supporting the IAEA’s nuclear security programmes. My Deputy Director was asked once again to lead a mission under the IAEA’s International Physical Protection Advisory Service (IPPAS), this time to Armenia. My Assistant Director led a DBT workshop in South Africa, besides completing work on a new IAEA Tecdoc on the subject. Other members of OCNS have undertaken work for the agency during the year on security requirements for radioactive sources, radioactive waste, Vital Areas, transport and safety-critical IT systems. Work has also been undertaken on revising IPPAS guidelines. OCNS acts as the UK’s point of contact for the IAEA’s illicit trafficking database.

113. I am sometimes asked why OCNS is involved in work of this nature, outside our own national borders. The Government accepts an obligation to assist other states to implement effective nuclear security arrangements, recognising that a major nuclear security incident in another country, especially a nearby country, could have serious repercussions for the UK as well. The Government also accepts that OCNS is best placed to offer the expert advice and assistance required by the IAEA and other member States, drawing on our experience regulating civil nuclear security arrangements within the UK, although we will also involve other UK agencies and companies as required. Moreover, besides helping the IAEA to promote best practice security standards, our involvement helps to underline the UK’s reputation as a responsible member State, maintaining effective national nuclear security arrangements. We also benefit from the interchange of views and ideas with foreign counterparts that takes place at meetings and conferences organised by the IAEA.

\underline{Overseas Assistance}

114. For much the same reasons, OCNS is tasked by the DTI to provide specialist advice and management supervision for nuclear security assistance projects overseas. We have undertaken various projects in recent years in Eastern Europe. We are becoming increasingly involved in Russia. The dangers from terrorism and trafficking

\textsuperscript{19} \url{http://www.iaea.org/worldatom/Programmes/Protection/infcirc225rev4/rev4_content.html}
are serious, but under-funding and obsolete doctrine hampers the maintenance of effective security measures. Helping the countries concerned to improve nuclear security arrangements offers substantial benefits for the UK’s own national security, in terms of both threat reduction and public safety. Funding is provided as part of the Government’s commitment under the G8 Global Partnership programme to address the nuclear, chemical and biological legacies of the Former Soviet Union (FSU)\(^\text{20}\). This programme has an annual budget of £32.5 million per annum and some £2.5 million has been allocated by the DTI for nuclear security projects for 2004 – 05.

115. OCNS continued to collaborate with SKi, NRPA and GAN, our Swedish, Norwegian and Russian counterparts, on security assistance work in Northern Russia. My Assistant Director chaired a conference in Norway of the four nations involved and the IAEA, to review progress and strengthen co-ordination. Security upgrades were completed in two more nuclear icebreakers based at Murmansk, required because these vessels are each powered by two nuclear submarine reactors\(^\text{21}\). The Government had provided 65% of the funding needed. I represented Ministers at the commissioning ceremony held at the AtomFlot port in Murmansk in March. It is worth noting that the security equipment used is manufactured and installed by a Russian contractor to high quality standards at competitive prices. I would not object to equipment of this quality being used to protect civil nuclear sites in the UK.

\[\text{MSCO Icebreaker ARKTICA}\]

116. Although our partners aim to complete work on the rest of the fleet, OCNS will concentrate for the next two years on a project to upgrade security at the port, because the Government is also funding the construction of a new spent fuel store there. OCNS will also assess whether strengthened security arrangements are needed at the former Russian Navy submarine base at Andreeva Bay, where the UK is providing funding with other international donors to make safe and secure some 20,000 spent nuclear fuel assemblies.

117. A workshop was held at Sellafield in March for senior Russian security managers, co-sponsored and funded by the UK and US Governments. Instructors were provided by the US Department of Energy, OCNS, BNFL and the AEAC. Russian managers toured the site and witnessed demonstrations by the Constabulary’s dog handlers, firearms instructors and Special Intervention Teams. They practiced with the Constabulary’s firearms intervention simulator, besides attending seminars on a range of security disciplines. The event was successful. Russian security managers and guard force officers are generally proficient. However, their approach is still based in part on obsolete Soviet doctrine. They can no longer afford to maintain large paramilitary guard force units at sites and lack experience with modern western security systems. Moreover, those attending were plainly impressed, not just by the security arrangements and training facilities they found at Sellafield, but also by the degree of cooperation evident between OCNS, BNFL and the AEAC. Training like this represents excellent value for money. The intention is to hold four courses a year at Sellafield and the Constabulary Training Centre at Summergrove, for security inspectors and managers, and guard force commanders and trainers, from sites throughout Russia.

118. Useful progress was also made this year in taking forward proposals to undertake security assistance projects at other nuclear sites in Russia. A revised interdepartmental strategy has been agreed, which includes the welcome recognition that nuclear safety, decommissioning and clean-up projects might also require associated security work to be undertaken. If not, there is a danger that nuclear and radioactive material might be left in less secure conditions than before. A collaboration agreement was also signed with the Russian Government during the year, paving the way for more security projects to be identified and progressed.

119. We aim to recruit a Russian-speaking security expert to support the OCNS Principal Security Inspector currently supervising security project work in Russia.

Generation IV

120. OCNS took part in two further meetings of the Proliferation Resistance and Physical Protection Evaluation Methodology Expert Group, set up to advise the Generation IV International Forum (GIF)\(^{22}\), which is seeking to develop and assess next-generation reactor designs with improved safety, security and performance characteristics. The project is multi-national. The group is attended by experts from Canada, France, the European Union, the IAEA, Japan, South Korea, the UK and the USA. A report has been drafted on a viable methodology to evaluate proliferation resistance and physical protection in new reactor designs. The group is engaged this year in refining the methodology using an existing reactor design. Although OCNS continues to concentrate on immediate issues, there is professional advantage in reviewing longer-term security fundamentals with foreign experts.

\(^{22}\) [http://gif.inel.gov/](http://gif.inel.gov/)
The Radioactive Substances Act 1993

121. Currently, regulation is focussed on the types of nuclear material that present significant security risks, following internationally agreed categorisations for such materials (see Annex G). We have been considering whether there was a case for extending the Nuclear Industries Security Regulations 2003 to lower-risk nuclear materials used for research, industrial and medical purposes outside nuclear sites, such as natural and depleted uranium, as well as very small quantities of enriched uranium and plutonium, and separated americium and neptunium. However, basic provisions to this effect are already included in the Radioactive Substances Act 1993 (RSA)\textsuperscript{23}. We aim during the coming year to amend NISR 2003 to enable OCNS staff to assist the Environment Agency and SEPA, which administer the RSA, to ensure that due account is taken of security concerns for all categories of nuclear material.

Security Of Radioactive Materials

122. There are concerns that a terrorist group might use stolen radioactive material in an improvised radiation dispersal device (RDD). There is widespread recognition that security standards need to be strengthened world-wide because many sealed sources are misplaced or stolen every year.

123. OCNS is not responsible for the security of radioactive material held outside licensed nuclear sites, such as radiation sources used in hospitals, research facilities and industry, or when sources are being transported. Nevertheless, we have been taking part in an interdepartmental study to recommend how best to strengthen security arrangements within the UK, in line with a revised IAEA Code of Conduct\textsuperscript{24}. Our experience in OCNS is that statutory regulation by a competent security authority provides the most reliable means of ensuring that effective security standards will be observed (see Annex B).

Resource Management And Administration

124. I have already touched on the extent to which DCNSy (the predecessor organisation to OCNS) had been run down in the years before 1996, when part of the UKAEA. It has taken the years since then to recruit and train the extra staff needed to rebuild capabilities. In doing so, we have received welcome support from senior policy officials in the DTI who understood why this was necessary, especially following the emergence of the current terrorist threat.

125. I have also mentioned the benefits gained of improved coverage, specialisation and continuity, but there are others as well. We have been able to improve training, because it is now easier to release staff from normal duties. Average age has fallen to 47.5 which helps reduce turnover. We now have nine women officers at middle-management level, as opposed to only one when I arrived, although none as yet in the Senior Management Group. We have started to recruit graduate trainees and facilitate some progression from administrative grades into the more senior, specialised security

\textsuperscript{23} http://www.hmso.gov.uk/acts/acts1993/Ukpga_19930012_en_1.htm#end
posts. Besides improving morale and retention, this also reduces reliance on imported expertise, at a time when the recruitment of experienced security professionals is subject to strong competitive pressures. Nevertheless, we have also managed to recruit a broader range of skills from external sources. A temporary drawback, however, is that 45% of staff currently have less than four years service with OCNS.

126. An unexpected benefit from the transfer to the DTI has been the quality of the Department’s IT systems. However, DTI systems are limited to information classified RESTRICTED and below. We expect to be connected in the coming year to a system in use in some Departments and agencies accredited to CONFIDENTIAL.

127. Progress has been made in resolving disparities in pay and conditions between members of staff recruited on DTI terms and longer-serving staff still legally entitled to UKAEA terms. To overcome the difficulty, a revised package has been offered to all OCNS staff. Reserved rights would apply where specific UKAEA terms differ. The new package would not affect special pay enhancements previously negotiated.

128. I have noted that a further modest increase in staffing is needed. However, officials wish to set up an interdepartmental panel to scrutinise these proposals. While I agree that external scrutiny is desirable, care will be needed to ensure that funding and sponsorship considerations do not overbear security requirements, at a time when other security organisations are being reinforced in response to the terrorist threat. Furthermore, I hope this scrutiny process can be completed quickly, bearing in mind that it can take six months or more to recruit from external sources.

129. OCNS is supported directly by its own finance, HR, contracts and administrative staff, unlike most mainstream policy branches within the DTI that have these services provided centrally. This is partly because OCNS is unusual in recovering the bulk of its costs from charges levied on companies subject to regulation, which needs to be supervised by finance staff familiar with the companies and procedures involved. Our office accommodation at Harwell is leased from the UKAEA, in turn requiring contracts for utilities and other services which have to be administered locally. Besides running our own local recruitment, training and aftercare programmes, our HR manager supervises health and safety arrangements protecting OCNS staff who are classified radiation workers. Our archivist manages OCNS records which are classified and, in the case of vetting records, subject to Data Protection requirements. We are, in fact, almost entirely self-supporting, except for legal advice, IT and policy support provided by the DTI. I regard this as a further useful guarantee that OCNS is able to function as an independent regulatory authority, distinct from mainstream energy policy and administration considerations.

130. The lease on the Harwell building is due to expire within two years and we are being asked to vacate by the UKAEA. Doing so suits because the building has become too small to accommodate growing staff numbers and does not lend itself to modern flexible working practices exploiting IT. We are taking the opportunity to review our future accommodation requirements, which could include setting up an outstation to cover civil nuclear sites in the north of England and Scotland.
Funding

131. OCNS costs during the year amounted to £2.2 million, excluding support provided centrally by the Department for IT and legal advice. OCNS costs recovered by charges levied on the operating companies are treated as ring-fenced. Last year, the proportion was 91%, because the Department makes a nominal contribution (currently £198,000) towards costs incurred in our support work for the IAEA (although some costs are funded by the IAEA), or when this Office provides security advice unrelated to domestic civil nuclear security regulation.

132. In July, a new accounting regime was introduced with Treasury agreement, known as Net Administration Cost Control, designed for units like OCNS which recover most of their operating costs by charges levied for services. This change should also help underpin the role of OCNS as an autonomous regulatory authority. The new regime enables the Department to authorise necessary increases in resources, for example for additional staff, without the need to seek additional funding from the Treasury or find offsetting savings, providing additional receipts recovered from increased charges levied on the companies subject to regulation offset any additional costs. The change is welcome, since it restores the funding position of OCNS when part of the UKAEA. In the interim, the DTI has faced problems funding the additional staff needed by OCNS in responding to the heightened terrorist threat.

133. Work has been completed on a new Fees Order under which OCNS would continue to recover costs by levying charges pro rata on the companies subject to regulation. However, a heavy legislative workload within the DTI policy branch supporting OCNS has meant that the process of implementing this Order has been delayed. Charges have continued to be levied after obtaining the agreement of the companies to continue paying on a voluntary basis. It is intended to undertake the necessary consultation for the new Fees Order over the next few months, with a view to laying a Statutory Instrument after Parliament’s summer recess. However, new charging arrangements have already been trialled with the industry in the interim, which should aid understanding as consultation proceeds.

The OCNS Advisory Board

134. An OCNS Advisory Board was established at the time OCNS was transferred to the DTI in 2000, attended by DTI officials and representatives from the Security Service and the NII. There is also one member from the civil nuclear industry. Two meetings of the Board were held during the year, providing useful advice on a range of issues, including the annual Work Plan and this report. Discussions are taking place on broadening the composition of the Board to include more industry representatives. I should also like to see an external member appointed, possibly with an academic background in risk or security management.
Executive Agency Status

135. Before the transfer to the DTI, it had been intended to establish OCNS as an Executive Agency, to underpin our rôle as an independent regulator. However, this decision was changed at a late stage to avoid the administrative effort entailed. One consequence was the difficulty subsequently experienced in having ex-UKAEA staff and those recruited since the transfer on different terms and conditions (paragraph 127). Another was that OCNS had to be switched to a Gross Running Cost regime, complicating resource allocation (paragraph 132).

136. Although both problems now appear to be resolved, I consider that greater formal independence is still desirable. Although senior officials have never sought to challenge my regulatory autonomy, legal advisers have confirmed that this has no statutory or administrative basis. An issue might arise at some stage where nuclear security and energy policy interests conflict. Although Ministers did announce that OCNS would function within the DTI as an independent unit, some NGOs have also questioned how we can be fully autonomous within mainstream policy structures.

137. The UK is unusual in the degree to which regulatory responsibilities for the civil nuclear industry are dispersed between several government departments and agencies. Most countries have only one or two regulatory authorities combining responsibility for nuclear safety, security, safeguards, transport, environmental issues and radioactive materials which, in the UK, involves several different bodies. Those of us involved co-operate closely but I would expect useful efficiency gains to flow from a greater concentration. While there is no immediate driver for reform, I have recommended that the position should be reviewed.

Conclusions

138. I can confirm that stringent security precautions are being taken to protect nuclear and radioactive materials on civil nuclear sites, nuclear transports, sensitive information, and those employed in the civil nuclear industry within the UK. There is still work to be completed. I expect there will be always be refinements and changes needed. Nevertheless, security arrangements applied within the nuclear companies and bodies regulated by OCNS are comprehensive, well-managed and effective.

139. A great deal of work has been completed over the past few years rebuilding capabilities to enable OCNS to regulate effectively, at a time when the terrorist threat has never been more serious. Some more staff are needed and the influx of new staff has had some temporary impact on experience, but within manageable bounds.

140. Apart from the reinforcements we have managed to achieve in OCNS and the UKAEA Constabulary, both of which were essential, I am most pleased about the welcome change in attitude that has taken place within the civil nuclear companies subject to regulation. The civil nuclear industry is often criticised by commentators, sometimes unfairly. I have been impressed by the professionalism and integrity of most of the people I have met. The security staff employed within the industry are professional, committed and dependable. The main advantage of the new Security Regulations has been that they have removed much of the pressure hitherto faced by
security managers to cut costs. It has become accepted that high security and safety standards are equally important, superseding companies’ business objectives. Nevertheless, site visits, no-notice spot checks and security inspections provide the only really effective means to monitor compliance and put right any defects identified.

141. I expect the NDA to have a rapid, far-reaching impact once the Energy Bill is passed. Care will be needed in deciding how best to accelerate decommissioning whilst maintaining effective security controls.

142. I believe it is recognised that OCNS makes a valuable, cost-effective contribution towards supporting the IAEA and foreign states needing assistance to implement effective nuclear security arrangements. By reducing the danger of a serious nuclear incident taking place in another country, this activity also helps preserves national security and public safety within the UK.

143. I consider it is desirable to entrench the independence of OCNS. Remaining an autonomous unit within the DTI’s mainstream policy and administrative structures does not appear to be a viable long-term solution.

144. Over the past six years, I have developed a high regard for all members of staff working for the Office for Civil Nuclear Security. I could not have wished for better support. I am sure they will continue to work as well for my successor.

M. J. Buckland-Smith
Director of Civil Nuclear Security
May 2004
Background Notes On Civil Nuclear Security

1. The term *Security* is used in this report to describe standards, systems and procedures to counter deliberate, criminal or malicious attempts to sabotage nuclear facilities, steal nuclear or radioactive material, or obtain sensitive information without authority. The subject is sometimes referred to as *Protective Security* or *Physical Protection*, especially in international discussions and documents. This is because, in translation, security can have several meanings, covering concepts as diverse as reliability and safety (eg. German *Sicherheit* and French *Sûreté*).

2. Security or Physical Protection has been a preoccupation for the civil nuclear industry since its emergence from the nuclear weapons programme in the 1950s. The earliest security cases concerned the investigation of spies, such as Klaus Fuchs and Nunn May, convicted of passing atomic secrets to the former Soviet Union (FSU). Espionage is still a concern although, with the end of the Cold War, the main threat is posed by countries attempting to circumvent export controls to acquire proliferation-sensitive technology to further their own nuclear weapons programmes. The proliferation threat is often overlooked by commentators, but the dangers are real, as illustrated by the KHAN and SCHAAB cases in the Netherlands and Germany in the 1970s and 1980s, which enabled Pakistan, Libya, Iraq, Iran and North Korea to acquire sensitive uranium-enrichment technology (UET).

3. However, since the late 1960s, the focus of public concern has become the threat that terrorists might try to sabotage a nuclear facility, or steal fissile material to fabricate an improvised nuclear device (IND). Public concerns are often misconceived. There have been no terrorist attacks against any nuclear facilities in the United Kingdom and no known examples of malicious activity that could have caused a nuclear explosion or a serious release of radioactivity. Moreover, improvising a viable nuclear device would almost certainly fall outside the capabilities of current terrorist groups. Nevertheless, these dangers cannot be discounted. A successful sabotage attack on a nuclear facility could cause widespread radioactive contamination and loss of life. It is essential, therefore, that stringent security precautions are taken by the civil nuclear industry, well above normal commercial standards, on the basis of specialist intelligence and advice available only to the Government and subject to strict Government supervision – see Annex B.

4. In recent years, concerns have also grown that terrorist groups might use stolen radioactive material in an improvised radiation dispersal device (RDD). Unlike fissile material, other radioactive materials cannot produce a nuclear explosion. Nevertheless, radioactive material could be dispersed by conventional explosives or concealed unshielded in a public place, such as a railway station or a busy shopping mall. People in range not immediately affected would have cause for concern about the long-term carcinogenic implications for themselves and their families. OCNS is not responsible for the security of radioactive material held at sites other than those listed at Annex E, such as radiation sources used in hospitals, research laboratories and the construction industry, or when sources are being transported.
5. Maintaining an effective security regime against the threats of terrorism and proliferation is not straightforward. Those contemplating attacks usually have the advantage of surprise, selecting the time, method and location best suited to their purposes. They could also possibly circumvent security arrangements if they could learn about the measures being taken in advance from disaffected or suborned insiders, covert surveillance or any exploitable information made publicly available. Most nuclear facilities are large industrial complexes that cannot operate without substantial numbers of workers and regular deliveries of supplies, complicating effective controls on access. The amount and sensitivity of nuclear material varies between sites, new construction and maintenance work sometimes involving large numbers of contractors have to be catered for, and some sites need to attract tenant organisations. In addition, nuclear material has to be transported for a variety of reasons, usually within the country by road or rail and abroad by sea or, in certain limited circumstances, by air. Furthermore, for business reasons and to meet various statutory requirements, a considerable amount of information about sites and about nuclear technology has to be made publicly available.

6. Fortunately, those responsible for security have several countervailing advantages. In general, they know their sites and the locations of hazardous material far better than potential adversaries. They can put in place a serious of interlocking physical, technical and procedural security controls which attackers have to force through or circumvent in turn, leading to delay and detection. If necessary, overwhelming armed force can be brought to bear. Sensitive nuclear sites and nuclear transports are protected by armed police trained to use a variety of weapons.

7. However, security is not just about physical barriers and armed police. It helps that most sites are located within tight-knit local communities: workers and their families and the local police are encouraged to report strangers behaving suspiciously. OCNS maintains close links with the security and intelligence services, the police and foreign counterparts, to ensure that prompt action can be taken in the event of advance warning of any hostile activity. Frequent, random security patrols, both inside and outside sites, on foot, in vehicles, and with trained police dogs, are a valuable deterrent. Staff, visitors and vehicles are subject to search or may be scanned electronically. Members of staff, especially those with access to sensitive material and information, are security-screened (vetted) and briefed regularly about security threats. Safety-critical computer control systems inside sites are protected against hacking and other forms of interference. All these measures in combination provide defence in depth, to deter or counter any form of ground-based attack assessed as falling within the capabilities of terrorist groups and others posing a threat, and to reassure workers inside sites that they are not at risk. Other measures are taken to protect civil nuclear sites from attack from the air or sea.

8. A relatively new development in nuclear security stems in part from the closer co-operation that has developed over the last few years between OCNS and the NII, the UK nuclear safety regulator. Work on the protection of Vital Areas and safety-critical IT systems has been undertaken jointly, as have studies into the impact effects of large aircraft on structures. In a separate development, OCNS is working with GIF partners in developing methodologies to assess how best to incorporate security measures into new reactor designs to optimise effectiveness. Although still relatively new, both developments represent a departure from the conventional approach, where security is usually treated as a self-contained set of measures applied to existing
structures and systems. However, OCNS security inspectors are having to become more familiar with underlying scientific, engineering and safety principles.

9. Many individuals hold genuine concerns about the safety and security of nuclear power and are entitled to express their views or to demonstrate outside nuclear sites. Sometimes, however, demonstrators try to bypass security arrangements, exposing themselves and others to risk. Moreover, no practicable, cost-effective combination of perimeter fencing and other obstacles can prevent large numbers of demonstrators breaching outer barriers. The purpose of perimeter barriers is not to keep intruders outside sites, but to detect intrusions taking place and afford time for contingency arrangements to be activated. The objective, therefore, is to contain intruders at or within outer perimeters of sites. Inner security arrangements are designed to counter the most serious threats (eg. the deployment of armed police).

10. For security reasons, it is recognised by the IAEA and member States that the responsibility for the establishment, implementation and maintenance of civil nuclear security arrangements must remain the sole, sovereign responsibility of a country’s national government. This is because intelligence material and details about particularly sensitive security measures cannot be disclosed either to international or supranational bodies. For the same reasons, it can be difficult providing details to adjoining states seeking reassurance that security measures being taken are effective. It is also recognised that sensitive details about security arrangements should not be made public, in case they could be exploited by terrorists and others intending to mount attacks. Where this danger conflicts with statutory requirements on disclosure, it may be necessary to invoke exemptions in legislation to safeguard national security.
The Need For Civil Nuclear Security Regulation

1. The argument is sometimes advanced that nuclear companies should be trusted to implement security measures without government regulation: that reputable companies would not place the safety of their staff, their own business interests, or the national interest at risk by failing to do so. They also point out that other potentially hazardous and vulnerable industrial sectors, such as chemicals and petrochemicals, are not subject to government regulation on security.

2. There is some validity in these arguments. Civil nuclear operators in the UK are highly responsible - well aware that their sites, staff, tenants and the nuclear and radioactive materials for which they are responsible could be targets for attack. They also recognise that any publicised accounts about lax security arrangements could undermine public confidence, with potentially damaging business implications. Security measures against the threats of terrorism and proliferation cannot be implemented effectively without the intelligence material and specialised security support available only from the Government. Nevertheless, some industrial sectors are given this kind of support on a voluntary basis, such as the oil and gas industries.

3. Nevertheless, there are good reasons why the Government has taken the additional step of regulating security within the civil nuclear industry on a statutory basis, in accordance with IAEA guidelines. A sabotage attack on a nuclear site could have devastating consequences, not just in terms of deaths and casualties sustained at the time, but for years afterwards due to abnormally high radiation levels possibly causing increased cancer rates and birth defects. Although not caused by a terrorist attack, many people have died so far as a result of the Chernobyl disaster in 1986 in the Ukraine and many others have had to be evacuated. The theft of nuclear material or proliferation-sensitive information could also have grave consequences. Civil nuclear operations are generally managed to very high safety standards by responsible professionals, but deliberate attacks to cause serious harm must be avoided. Government security regulation is necessary to reassure the public that security arrangements will not be subordinated to business or cost considerations.

4. Moreover, this did happen before OCNS became established as a regulatory authority, as described in previous reports. During the years when the PIRA threat was at its height, the operating companies involved succeeded in reducing police numbers below safe levels. They were pressing to remove the AEAC altogether, including authorised firearms officers, from Category II and III sites. Left unchecked, this pressure might in time have also undermined the armed response capabilities at the two Category I sites at Sellafield and Dounreay. Furthermore, prevarication and delay was often encountered during those earlier years in implementing other security measures. The Government’s decision to place security regulation on an up-to-date statutory basis, with powers of access and prosecution for non-compliance, is the main reason why this pattern of behaviour is now rarely encountered, although the current serious terrorist threat is a contributory factor.
5. To understand why this is so, it should be appreciated that decision-making in large organisations is inevitably complex. As responsibility is devolved downwards, middle managers are often confronted by demanding business objectives and tight budgetary constraints which may be difficult to reconcile, but against which annual pay awards and future career progression is evaluated. Resource managers setting business objectives and budgets are themselves assessed against demanding targets, but are not necessarily aware of higher-level, strategic considerations. Even when faced with such complexity, few set out to disregard sound security advice. What tends to happen is that projects without a high priority linked directly to some key business objective are simply held over for a time or left under-resourced, in competition with higher-priority company objectives. The primary benefit in placing security on a statutory basis has been that compliance has been elevated above all commercial objectives, on a par with safety. Moreover, most managers welcome this: there can be no arguments about commercial priorities possibly threatening effective security compliance. An important secondary benefit has been that the statutory basis for vetting within the civil nuclear industry and the protection of sensitive information from unauthorised disclosure has also been strengthened.

6. However, statutory regulation is insufficient by itself. Experience suggests that standards may fall if inspectors cannot visit sites at least at six-monthly intervals and more frequently in the case of larger, more complex facilities, or those undergoing some form of change, such as new construction or decommissioning. Inspectors cannot hope to appreciate what is going on, let alone build co-operative working relationships, unless they can do so. The capacity to conduct unannounced spot-checks is also essential, to ensure compliance with approved site and transport security plans, and security accreditation documents for computer systems. Furthermore, inspectors need to understand more than just the nature of security threats and the range of possible countermeasures. They also need a working knowledge of the hazards involved in processing, storing and transporting nuclear and radioactive material. Without this knowledge, they would have difficulty establishing credibility in dealings with the managers, scientists and engineers employed in the industry. In addition, they would lack both the knowledge and confidence to adapt model security measures to suit local operational, technological and commercial considerations, in circumstances where this would be justified. Even with statutory powers of access and enforcement, it is this additional capability which offers the most reliable assurance that comprehensive and effective security measures will be maintained, in co-operation with professional staff employed by the operating companies. These points need emphasising. It is sometimes supposed that security arrangements can be monitored by semi-trained security staff simply checking against predetermined standards, but this can only offer limited assurance.

7. Moreover, security regulation is not confined to the civil nuclear industry. The transport sector has been regulated by the Directorate of Transport Security (TRANSEC) since the Lockerbie disaster in 1988. However, it is obviously better to introduce regulation before attacks occur. For this reason, security arrangements for pathogens and toxins are now subject to regulation by NaCTSO under provisions in the Anti-Terrorism, Crime and Security Act 2001. It is expected that security arrangements for radioactive sources held outside licensed nuclear sites will also be made subject to regulation, in line with a new Code Of Conduct issued by the IAEA. OCNS is co-operating with NaCTSO and others in developing appropriate standards.
OCNS Staffing And Costs 2003-04

OCNS Staffing (Costs)

Corporate Management 7%
Finance & Management Services 16%
Information Security 5%
Transport Security 5%
Site Security 19%
Guarding, Policing & Security Management 2%
Personnel Security 46%
Corporate Management 18%
Finance & Management Services 13%
Information Security 7%
Transport Security 7%
Site Security 24%
Guarding, Policing & Security Management 3%
Personnel Security 28%

OCNS Staffing (Numbers)

UKAEA 20%
Urenco & UCL 5%
Others (21) 4%
British Energy 11%
Magnox 7%
BNFL 45%
DTI 6%
GE Healthcare 2%

OCNS Cost Recovery
Sites Covered By The Nuclear Industries Security Regulations 2003

Licensed Fuel Cycle Sites

1. Capenhurst (Category III) near Chester is divided into two adjacent licensed sites. The plant managed by BNFL was used originally to enrich uranium using the gaseous diffusion method but ceased operation in 1982. BNFL intends to remove all remaining Category III material from the site by March 2006.

2. Urenco (Capenhurst) Ltd shares the Capenhurst site with BNFL. The Urenco group, a British, German and Dutch joint venture set up under the Treaty of Almelo, undertakes uranium enrichment using centrifuge technology at plants in all three countries. At Capenhurst, the first commercial centrifuge demonstration plant was operational from 1976 until closed in 1991. A second larger plant began operation in 1982 and additional capacity has been provided in stages, with the most recent plant becoming operational in 1997. ET(UK), a subsidiary of Urenco’s Enrichment Technology Company, is also based at Capenhurst (paragraph 45).

3. Dounreay (Category I) is a UKAEA site on the north coast of Scotland, near Thurso. The site has a range of facilities including the Fuel Cycle Area (FCA), which is used to store and process plutonium and uranium. There are a number of facilities within the FCA, including laboratories and plant for recycling, the Cementation Plant and the Waste Receipt Assay Characterisation and Super Compaction Facility (WRACS). Dounreay is being decommissioned, with a planned closure date of 2047. Decommissioning work includes the Dounreay Fast Reactor (DFR), which ceased operation in 1977 and the Prototype Fast Reactor (PFR) shut down in 1994. An adjacent site is managed by Rolls Royce on behalf of the MOD.

4. Drigg (Category II). Operated by BNFL, the site is located a few miles south of Sellafield. The site is used mainly to store LLW but also holds some ILW in the form of plutonium contaminated material (PCM). Work is underway to remove all PCM to Sellafield by 2006.

5. Harwell is the UKAEA’s headquarters site south of Oxford, which also houses the headquarters offices of OCNS. Although the birthplace of the civil nuclear industry in the UK, Harwell’s three research reactors closed in 1990. The site has a Category II store containing spent nuclear fuel and PCM. Harwell is run nowadays by the UKAEA as a science and technology business park. Tenant companies subject to the Nuclear Industries Security Regulations 2003 are listed separately at paragraphs 33 - 39. Several other tenant companies operating inside the licensed site are not subject to security regulation, along with organisations bordering the site, including the National Radiological Protection Board (NRPB), UK Nirex Ltd., the Medical Research Council (MRC) and the Rutherford-Appleton Laboratory (RAL). Under separate arrangements endorsed by OCNS, the AEAC patrols around buildings occupied by these organisations, to provide mutual protection and support.
6. Sellafield (Category I) on the Cumbrian coast south of Whitehaven is operated by BNFL. This is the largest licensed civil nuclear site in the UK. Nuclear facilities include the Sellafield MOX Plant (SMP), the Magnox and Thermal Oxide Reprocessing (THORP) plants, as well as waste compaction and vitrification plants. Spent fuel is transported to Sellafield for reprocessing as part of the fuel cycle process described at Annex F. Over 120 tonnes of plutonium are stored at Sellafield. The site also contains the first Magnox nuclear reactor, known as Calder Hall, which ceased generation in March 2003 and the Windscale Piles (see paragraph 8).

7. Springfields (Category III), located near Preston in Lancashire, has been operating since 1946. Run by BNFL, the site manufactures reactor fuel for both AGR and Magnox reactors. It has in the past also fabricated fuel for the PWR at Sizewell B and still retains this capability. AGR fuel is made from UO$_2$ powder converted into pellets and stacked inside stainless steel tubes. Magnox fuel consists of a solid uranium metal rod encased in a machined magnesium alloy tube assembly. The PWR fuel for Sizewell B is also made from UO$_2$ pellets, encased in zirconium alloy tubes.

8. Windscale (Category III) is a separate licensed site at Sellafield run by the UKAEA. Two early reactors known as Piles 1 and 2, and the Windscale AGR, ceased operation in 1957 and 1981 respectively. Pile 2 is in a state of long term care and maintenance and other minor facilities are in the process of being decommissioned, or leased to tenants, including a Post Irradiation Examination (PIE) facility.

9. Winfrith (Category III), near Wool in Dorset, is also run by the UKAEA. The site was used originally to operate various prototype reactors, including the Dragon reactor and the Steam Generating Heavy Water Reactor (SGHWR), which are being decommissioned. Holdings at Winfrith are scheduled to fall below Category III in 2004 as remaining material is moved to Harwell. Winfrith is also being operated as a business park: tenants subject to regulation are listed at paragraph 40 et seq.

Operating Nuclear Power Station Sites (7 AGR, 5 Magnox and 1 PWR)

10. Chapelcross (Category III), near Annan in Dumfriesshire. Commissioned in 1959 and operated by BNFL, this station has four Magnox reactors generating 168 MW. It is due to cease operating in 2005 and to be de-fuelled in 2007.

11. Dungeness A (Category III), near Romney March in Kent. Commissioned in 1965 and operated by BNFL, the station has two Magnox reactors generating 450 MW. It is due to cease operating in 2006 and to be de-fuelled in 2009.

12. Dungeness B (Category III), next to Dungeness A. Commissioned in 1983 and operated by British Energy (BE), the station has two Advanced Gas-Cooled reactors (AGR) generating 1110 MW.

13. Hartlepool (Category III), on the coast near Middlesborough. Commissioned in 1983 and operated by BE, this station has two AGRs generating 1150 MW.

14. Heysham 1 (Category III), on the coast near Lancaster. Commissioned in 1983 and operated by BE, this station has two AGRs generating 1210 MW.
15. Heysham 2 (Category III), next to Heysham 1. Commissioned in 1988 and also operated by BE, this station has two AGRs generating 1250 MW.

16. Hinkley Point B (Category III), near Bridgwater, Somerset. Commissioned in 1976 and operated by BE, the station has two AGRs generating 1250 MW. The Magnox Hinkley Point A station ceased operating in 2001.

17. Hunterston B (Category III), near Largs on the Ayrshire coast. Commissioned in 1976 and operated by BE, this station has two AGRs generating 1190 MW. The Magnox Hunterston A station ceased operating in 1990.

18. Oldbury (Category III), on the River Severn about twelve miles from Bristol. Commissioned in 1968 and operated by BNFL, Oldbury has two Magnox reactors generating 434 MW. It is due to cease operating in 2008 and to be de-fuelled in 2010.

19. Sizewell A (Category III), on the Suffolk coast near Aldeburgh. Commissioned in 1966 and operated by BNFL, this station has two Magnox reactors generating 420 MW. It is due to cease operating in 2006 and to be de-fuelled in 2009.

20. Sizewell B (Category III), near Aldeburgh, on the Suffolk coast. Commissioned in 1995 and operated by BE, this station has the one Pressurised Water Reactor (PWR) in the UK, generating 1188 MW.

21. Torness (Category III) on the coast near Dunbar, East Lothian. Commissioned in 1988 and operated by BE, Torness has two AGRs generating 1220 MW.

22. Wylfa (Category III) on Anglesey. Commissioned in 1971 and operated by BNFL, the station has two Magnox reactors generating 980 MW. It is due to cease operating in 2010 and to be de-fuelled in 2012.

Decommissioning Nuclear Power Station Sites

23. Bradwell (Category III) is operated by BNFL near Maldon in Essex. Bradwell ceased generation in March 2002. The fuel is due to be removed by 2005.

24. Calder Hall (Category III) is operated by BNFL at the Sellafield site in Cumbria. This was the first commercial nuclear reactor station in the UK, commissioned in 1956. The last of the four Calder Hall Magnox reactors ceased power generation in March 2003. All four reactors are due to be de-fuelled by 2007.

25. Hinkley Point A (Category III) on the coast near Bridgwater in Somerset is operated by BNFL. A Magnox station commissioned in 1965, which ceased operating in 2001, it is due to be de-fuelled in 2005.
26. GE Healthcare (formerly Amersham plc) specialises in medical diagnostics and life science research. The Grove Centre at Amersham (Category III) produces medical diagnostic and predictive imaging products. The company’s Maynard Centre at Cardiff (Category IV) undertakes disease research and new drug development. Some of this work involves radioactive materials, predominantly of low energy and short half-life. GE Healthcare also operates two separately licensed facilities at Harwell (paragraph 35). OCD, a tenant company currently subject to regulation, is also based at the Maynard Centre at Cardiff (paragraph 44).

27. London University’s Imperial College of Science, Technology and Medicine operates a Consort II reactor at Ascot in Berkshire, with a thermal rating of 100 KW (Category III). It is used for teaching and research in nuclear science and technology and provides an irradiation service to Imperial College and other organisations.

28. Berkeley is 25 miles north of Bristol on the River Severn, near Oldbury. This Magnox station ceased operating in 1989 and has been de-fuelled, with some ILW and LLW remaining (Category IV). Berkeley accommodates a PIE facility holding Category III irradiated fuel and the headquarters of BNFL’s Magnox Division.

29. ICI operated a TRIGA research reactor at Billingham in Cleveland until 1996. However, this has been decommissioned and the fuel removed to Dounreay. Other irradiated assemblies and waste have been removed to Sellafield for conditioning and disposal. The site is scheduled to be de-licensed in the near future.

30. The Scottish Universities Environmental Research Centre (SUERC) lies within the Scottish Enterprise Technology Park (formerly the National Engineering Laboratory) at Birniehill, East Kilbride. An Argonaut research reactor was used for research and teaching between 1963 and 1995 by a consortium of Scottish universities. The reactor and associated facilities have now been decommissioned, demolished and removed from the site, which will be de-licensed in due course. The Centre holds a number of radioactive sources for calibration purposes (Category IV).

31. The Hunterston ‘A’ BNFL Magnox station shares a common perimeter with the Hunterston ‘B’ AGR station in Ayrshire. The former ceased power generation in 1990 and decommissioning commenced in 1996. The site is currently disposing of redundant plant and equipment. No nuclear fuel elements remain there but the site still holds some ILW (Category IV). Planning permission has been granted for the building of a new store for this material.

32. Trawsfynydd is a few miles north of Dolgellau in North Wales. It was the only nuclear power station not built on the coast. This Magnox station ceased operating in 1993 and has been de-fuelled. Some ILW and LLW (Category IV) remains on site.
33. AEA Technology stores radioactive sources (Category IV) for clients.

34. Canberra Harwell holds Category III material to calibrate radiological protection instruments, and developing and calibrating nuclear material assay systems.

35. GE Healthcare (formerly Amersham plc) operates two facilities, one of which reconditions radioactive sources and stores radioactive waste (Category III). The other is being decommissioned (Category IV).

36. NNC Ltd stores nuclear and radioactive materials (Category IV) used for testing and calibrating radiological instrumentation.

37. REVISS Services (UK) Ltd distributes irradiated material from their premises at Harwell, including Cobalt 60, Caesium 137 and Americium 241.

38. RWE Nukem holds nuclear and radioactive material (Category IV) for calibrating radiation protection instruments.

39. Scientifics Ltd also holds Category IV material, for instrument calibration and for spiking samples to assess recovery.

40. AEAT Technology holds LEU, HEU and natural and depleted uranium (Category IV), as well as various radioactive sources. The Company’s Waste Management Technology Department provides a low-level radioactive waste management service to the nuclear and non-nuclear industries.

41. Canberra Harwell has a single neutron source at Winfrith (Category IV). The company provides instrumentation and related services for radiological protection, nuclear material assay, reactor protection systems and other industrial applications.

42. NNC Ltd. holds sealed and open radioactive reference sources (Category IV). The company undertake contracts for the Environment Agency for the measurement of radioactivity in low-level waste and environmental standards.

43. RWE Nukem holds sealed radioactive sources (Category IV). Company staff are also decommissioning the Active Handling and Decontamination Facility at Winfrith and provide a care and maintenance service for the Dragon and SGHWR reactor facilities.

Other tenant companies subject to the Nuclear Industries Security Regulation 2003

44. Ortho-Clinical Diagnostics (OCD) is located at GE Healthcare’s Maynard Centre at Cardiff. The company has C14 radioactive sources (Category IV) for precision calibration in the manufacture of pharmaceutical and analytical equipment.
45. Enrichment Technology (UK) Ltd is a subsidiary of the Enrichment Technology Company. The company uses Category IV quantities of depleted UF6 to test equipment involved with the enrichment process.

Non-licensed sites holding Category I – III nuclear material subject to regulation

46. The Electro-Optic and Radiation Detection Divisions of Centronic Ltd. (Category III) are based on a site just outside Croydon. The company manufactures radiation detection equipment for clients in the UK and Canada.

Non-licensed sites holding sensitive nuclear information subject to regulation

47. Barnwood, on the outskirts of Gloucester, houses various British Energy engineering, marketing and administrative offices.

48. Culham, located near Abingdon, south of Oxford and operated by the UKAEA, accommodates the headquarters of the UKAEA Constabulary (AEAC), as well as UKAEA administrative offices. Co-located on the site is the experimental Joint European Torus (JET), managed by the UKAEA on behalf of the European Fusion Development Agency (EFDA).

49. BNFL Group headquarters relocated during the year to new premises at Daresbury, near Warrington in Cheshire.

50. The headquarters of the Urenco Group and one of its subsidiaries, the Urenco Enrichment Company Ltd (UEC), are at Marlow in Buckinghamshire. The registered address of another subsidiary, the Enrichment Technology Company Ltd (ETC) is also at Marlow.

51. UK Nirex Ltd., outside the site boundary fence at Harwell, was established to provide publicly acceptable, long-term options for the management of radioactive material. The company carries out research, sets standards, gives advice on waste packaging, and maintains an inventory of radioactive waste.

52. British Energy’s Group headquarters is currently located at Peel Park, East Kilbride, near Glasgow, although there are plans to move the headquarters to another location in Scotland, as yet undecided. It also is planned to move some engineering and other posts from Peel Park to Barnwood in Gloucestershire and to another, as yet undecided, location in Scotland.

53. BNFL has retained its previous headquarters offices in Risley near Warrington for use by various departments, including engineering drawing offices and NSTS, the company’s research and development arm.

54. The UKAEA also maintains a small outstation at Risley dealing mainly with safety cases and other safety-related matters.

55. Summergrove, near Sellafield, accommodates the AEAC Training Centre.
A Brief Outline Of The Nuclear Fuel Cycle

1. Currently, there are over 440 nuclear power reactors in operation in over thirty countries worldwide. In many cases they supply a substantial proportion of national electricity requirements.

Reactor Types

2. The majority of the world’s power reactors are of the light water type (LWR), where ordinary water acts as both moderator, slowing down neutrons to efficient speeds for nuclear fission to occur, and coolant, transferring heat from the nuclear reaction to steam generators for producing electricity.

3. Because ordinary water is an inefficient moderator, LWRs must be operated on enriched uranium, that is, uranium in which the proportion of the fissile isotope U-235 has been increased from the level in natural uranium (0.71%) usually to between 3% and 5%. Some reactor types can be operated on natural uranium, by using more efficient moderators, such as heavy water, which has a proportion of the heavier hydrogen isotope deuterium, and graphite. Typical examples of this type of reactor are the Canadian CANDU, which is moderated and cooled by heavy water, and gas-cooled graphite-moderated reactors such as the Magnox reactors operated in the UK.

Fuel Cycle Stages

4. Following mining and milling of uranium and production of uranium ore concentrates (yellowcake), the stages of the light water fuel cycle are (Fig x):

- Conversion: natural uranium is formed into a gaseous compound, uranium hexafluoride (UF₆), prior to enrichment.

- Enrichment: a process by which the proportion of the U-235 content is increased. The main technologies in use are gaseous diffusion and centrifuge. The product is described as low enriched uranium (LEU), typically containing between 3% and 5% U-235.

- Fabrication: manufacture of LEU into uranium oxide fuel pellets, which are assembled into fuel rods and then fuel elements for use in a reactor.

- Reactors: a power reactor uses the heat from a controlled nuclear chain reaction to drive a turbine to generate electricity. Typically, the turbine is driven by steam. In the case of pressurised water reactors as well as liquid metal-cooled reactors and some gas-cooled reactors, steam for the turbines is produced in a secondary circuit. There are some high-temperature gas-cooled reactors where the generating turbine is gas-driven.
In a typical LWR, fuel elements are used over 3 - 4 operating cycles each of 12 to 18 months (i.e. the reactor might be unloaded every 12 months, with a third of the core being replaced each time).

Reprocessing: spent fuel is dissolved for the separation of highly radioactive fission products, and for the recovery of plutonium and uranium. Uranium can be re-enriched for further reactor use. Plutonium is mixed with uranium to produce MOX (mixed oxide) fuel and used both in LWRs and potentially in fast neutron reactors.

Partly because depressed uranium prices are impacting on the economics of reprocessing, a number of countries have committed to, or are considering, the once-through cycle, where spent fuel will be disposed of without reprocessing.

Civil Nuclear Fuel Cycle-Outline
Military Fuel Cycle

5. There are five acknowledged nuclear-weapon states (the US, Russia, the UK, France and China) and three ‘threshold’ states, two of which have conducted nuclear explosive tests (India and Pakistan) and one which is suspected of having a nuclear weapon capability (Israel). In all cases, the military nuclear programs developed ahead of civil power programs. In addition, North Korea has recently claimed to have nuclear weapons. Military programs involve the production of special grades of nuclear material, substantially different to the material used in civil programs.

6. Nuclear weapons are based on the following nuclear materials:

Plutonium

7. Plutonium is formed through the irradiation of uranium in a reactor. The uranium-238 isotope absorbs a neutron, leading to the formation of plutonium-239. Longer irradiation times lead to the formation of higher plutonium isotopes, Pu-240, Pu-241 and Pu-242.

8. Weapons-grade plutonium predominantly comprises the isotope Pu-239 and contains no more than 7% of the isotope Pu-240. Pu-240 (and the higher isotope Pu-242) are undesirable for weapons purposes because their rate of spontaneous fission causes pre-initiation (a premature chain reaction). By contrast, ‘reactor-grade’ plutonium from the normal operation of a LWR contains high levels of Pu-240, typically around 25%.

9. Because of the need to minimise the Pu-240 content, weapons-grade plutonium is produced in dedicated plutonium production reactors, usually natural uranium-fuelled, graphite-moderated, where irradiated fuel can be removed after short irradiation times (i.e. at low burn-up levels).

Uranium

10. Weapons-grade uranium is very highly enriched, to 90% or more U-235. This compares with normal civil enrichment levels of around 3–5% U-235. High enrichment levels are produced in enrichment plants specially designed and operated for this purpose.

This description of the fuel cycle has been reproduced by kind permission of the Director General of the Australian Safeguards and Non-Proliferation Office (ASNO) and is taken from the ASNO Annual Report 2001 – 02.
### Categories Of Nuclear Material

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I/II</td>
</tr>
<tr>
<td></td>
<td>III</td>
</tr>
<tr>
<td>1. Plutonium (other than Plutonium with an isotopic concentration</td>
<td>More than 500 grammes</td>
</tr>
<tr>
<td>exceeding 80% in Plutonium-238) which is not irradiated</td>
<td>500 grammes or less, but more</td>
</tr>
<tr>
<td></td>
<td>than 15 grammes</td>
</tr>
<tr>
<td>2. Uranium-233 which is not</td>
<td>More than 500 grammes</td>
</tr>
<tr>
<td>irradiated</td>
<td>500 grammes or less, but more</td>
</tr>
<tr>
<td></td>
<td>than 15 grammes</td>
</tr>
<tr>
<td>3. Previously separated Neptunium-237 which is not irradiated</td>
<td>More than 1 kilogramme</td>
</tr>
<tr>
<td></td>
<td>1 kilogramme or less, but more</td>
</tr>
<tr>
<td></td>
<td>than 15 grammes</td>
</tr>
<tr>
<td>4. Previously separated Americium-241, previously separated</td>
<td>More than 1 kilogramme</td>
</tr>
<tr>
<td>Americium-242 or previously separated Americium-243, which are</td>
<td>1 kilogramme or less, but more</td>
</tr>
<tr>
<td>not irradiated</td>
<td>than 15 grammes</td>
</tr>
<tr>
<td>5. Uranium-235 in enriched Uranium containing 20% or more of Uranium-235</td>
<td>More than 1 kilogramme</td>
</tr>
<tr>
<td>which is not irradiated</td>
<td>1 kilogramme or less, but more</td>
</tr>
<tr>
<td></td>
<td>than 15 grammes</td>
</tr>
<tr>
<td>6. Uranium-235 in enriched Uranium containing 10% or more, but less than</td>
<td>10 kilogrammes or more</td>
</tr>
<tr>
<td>20%, of Uranium-235, which is not irradiated</td>
<td>Less than 10 kilogrammes, but</td>
</tr>
<tr>
<td></td>
<td>more than 1 kilogramme</td>
</tr>
<tr>
<td>7. Uranium-235 in enriched uranium containing less than 10% but more</td>
<td>10 kilogrammes or more</td>
</tr>
<tr>
<td>than 0.711% of Uranium-235, which is not irradiated</td>
<td></td>
</tr>
<tr>
<td>8. Irradiated reactor fuel being used, stored or transported within the</td>
<td>Any quantity</td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
</tr>
<tr>
<td>9. Irradiated reactor fuel being transported outside the United Kingdom</td>
<td>Any quantity</td>
</tr>
<tr>
<td>other than such fuel which, prior to being irradiated, was Uranium</td>
<td></td>
</tr>
<tr>
<td>enriched so as to contain 10% or more, but less than 20%, of Uranium-235</td>
<td></td>
</tr>
<tr>
<td>10. Irradiated reactor fuel being transported outside the United Kingdom</td>
<td>Any quantity</td>
</tr>
<tr>
<td>which, prior to being irradiated, was Uranium enriched so as to contain</td>
<td></td>
</tr>
<tr>
<td>10% or more, but less than 20%, of uranium-235</td>
<td></td>
</tr>
<tr>
<td>11. Other irradiated nuclear material</td>
<td>Any quantity</td>
</tr>
</tbody>
</table>

#### Notes

1. This table is used for material being transported and to identify premises other than licensed civil nuclear sites subject to the Nuclear Industries Security Regulations 2003.
2. Enriched Uranium is uranium enriched so as to contain more than 0.711% of Uranium-235.
3. The terms Irradiated and previously separated have the meanings given in Regulation 3(2).
Annex H

Transport Companies And Subsidiaries Granted Approved Carrier Status
Under The Nuclear Industries Security Regulations 2003

Rail Class A
Direct Rail Services (DRS), a BNFL subsidiary

Road Class A
BNFL International Transport
United Kingdom Atomic Energy Authority (UKAEA)

Road Class B
BNFL Chapelcross
BNFL Environmental Services (Berkeley)
BNFL Environmental Services (Capenhurst)
BNFL Magnox Electric
BNFL Sellafield
British Energy Generation (UK) Ltd
C M Downton (Haulage Contractors) Ltd
Express Truck SA (Spain)
Nuclear Cargo + Services GmbH (Germany)
Nuclear Material Supply (NMS), a BNFL Westinghouse subsidiary at Springfields
R Barker & Sons (Transport) Ltd
RSB Logistic Projektspedition GmbH (Germany)
W H Bowker Ltd

Sea Class A
BNFL International Transport
Pacific Nuclear Transport Ltd (PNTL), a BNFL subsidiary

Sea Class B
Stena Line Ltd

Notes
1. These companies submitted Transport Security Statements in 2003 and have been granted Approved Carrier status under Regulation 13 of the Nuclear Industries Security Regulations.
2. Class A carriers are approved to transport Cat I-III material; Class B may only transport Category III (see Annex G).
### Glossary Of Abbreviations, Acronyms And Definitions

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/11</td>
<td>A reference to terrorist attacks on 11th September 2001 when two hijacked aircraft were crashed into the World Trade Center in New York. A third aircraft was crashed into the Pentagon in Washington and a fourth by passengers preventing the aircraft reaching its intended target. Over two thousand people were killed or injured. These attacks illustrate the threat posed by extremist Islamist terrorist groups willing to cause massive loss of life, unconstrained by humanitarian considerations.</td>
</tr>
<tr>
<td>Advanced Gas-Cooled Reactor</td>
<td>A graphite-moderated nuclear power reactor in which heat is transferred from the core by carbon dioxide. Unlike earlier Magnox reactors, AGRs use slightly enriched UO₂ as fuel, clad in stainless steel tubes.</td>
</tr>
<tr>
<td>AEAC</td>
<td>Atomic Energy Authority Constabulary</td>
</tr>
<tr>
<td>AFO</td>
<td>Authorised Firearms Officer</td>
</tr>
<tr>
<td>AGR</td>
<td>See Advanced Gas-Cooled Reactor.</td>
</tr>
<tr>
<td>Al Qaeda</td>
<td>Properly <em>al Qa'ida</em>, an Islamic terrorist group responsible for the terrorist attacks on the World Trade Center and the Pentagon in Washington on 11th September 2001 as well as attacks in other countries. Al Qaeda has links with (or influences) several other extreme Islamist terrorist groups.</td>
</tr>
<tr>
<td>Americium</td>
<td>A man-made radioactive material produced in very small amounts from plutonium, for use in smoke alarms and other applications.</td>
</tr>
<tr>
<td>Anthrax</td>
<td>An acute infectious disease found in cattle and other animals that can also be fatal for humans. Anthrax can also be used as an agent by terrorists to kill human beings.</td>
</tr>
<tr>
<td>Areva</td>
<td>The trading name of the Société des Participations du Commissariat à l’Énergie Atomique, the holding company for Cogema and other French nuclear companies.</td>
</tr>
<tr>
<td>ARV</td>
<td>Armed Response Vehicle</td>
</tr>
<tr>
<td>ASNO</td>
<td>Australian Safeguards and Non-Proliferation Office</td>
</tr>
<tr>
<td>BC</td>
<td>A basic check to confirm a person’s identity.</td>
</tr>
<tr>
<td>BC + PNC</td>
<td>Basic Check plus PNC Criminal Records Check.</td>
</tr>
<tr>
<td>BE</td>
<td>British Energy plc</td>
</tr>
<tr>
<td>Becquerel</td>
<td>The Becquerel has now replaced the Curie as the standard measure of radioactivity. One Becquerel is equal to one disintegration or nuclear transformation per second.</td>
</tr>
<tr>
<td>BNFL</td>
<td>British Nuclear Fuels Limited</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>BTP</td>
<td>British Transport Police</td>
</tr>
<tr>
<td>Cask</td>
<td>A shielded container used to transport radioactive materials.</td>
</tr>
<tr>
<td>CBRN</td>
<td>Chemical, Biological, Radiological and Nuclear</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed-circuit Television</td>
</tr>
<tr>
<td>CEGB</td>
<td>The Central Electricity Generating Board, which had built and used to run nuclear power stations in England and Wales.</td>
</tr>
<tr>
<td>CID</td>
<td>Local police Criminal Investigations Departments</td>
</tr>
<tr>
<td>Classified</td>
<td>Classified information, more correctly referred to as <em>protectively marked</em> information, is sensitive information given a government-defined label, to indicate the degree of protection required to avoid disclosure to unauthorised individuals. The usual markings are RESTRICTED, CONFIDENTIAL, SECRET and TOP SECRET, although various other markings and codewords may also be used. Within the civil nuclear industry, classified information may be proliferation-sensitive or provide exploitable details about safety and security arrangements.</td>
</tr>
<tr>
<td>CNC</td>
<td>Civil Nuclear Constabulary, the new name proposed for the UKAEA Constabulary (AEAC) in the Energy Bill currently before Parliament.</td>
</tr>
<tr>
<td>Cogema</td>
<td>The French civil nuclear operating company.</td>
</tr>
<tr>
<td>Contamination</td>
<td>The accidental or unwanted deposition of radioactive material on structures, areas, people and other objects.</td>
</tr>
<tr>
<td>CPPNM</td>
<td>The Convention on the Physical Protection of Nuclear Material, an international agreement on the security measures to be adopted by ratifying states when transporting nuclear material across national boundaries.</td>
</tr>
<tr>
<td>CTC</td>
<td>Counter-terrorist Check</td>
</tr>
<tr>
<td>Counter-Proliferation</td>
<td>Security arrangements to prevent certain foreign states illicitly acquiring sensitive information and technology, or nuclear material, to help them develop nuclear weapons.</td>
</tr>
<tr>
<td>DBT</td>
<td>Design Basis Threat</td>
</tr>
<tr>
<td>DCNSy</td>
<td>The UKAEA’s Directorate of Civil Nuclear Security, the predecessor organisation to OCNS.</td>
</tr>
<tr>
<td>Decommissioning</td>
<td>The process involved in shutting down or ceasing to operate a nuclear facility safely and securely, followed by phased reductions in holdings of nuclear and radioactive material, and residual radioactivity, to enable the site and any facilities remaining to be used safely for other purposes.</td>
</tr>
<tr>
<td>Decontamination</td>
<td>The reduction or removal of unwanted radioactive material from a contaminated structure, area, person or object.</td>
</tr>
<tr>
<td>Delicensed</td>
<td>A site is <em>delicensed</em> when, following decommissioning, its operating licence is rescinded by the NII.</td>
</tr>
</tbody>
</table>
Fissile

Only a few naturally occurring substances, known as fissile material, are easily fissionable (capable of sustaining a fission chain reaction). These include Uranium-235 and Thorium.

Fission

Nuclear fission involves splitting an atom into two or more fractions. A fission reaction is achieved by bombarding fissile material with neutrons. This causes the nuclei to split, emitting extra neutrons and starting a chain-reaction, resulting in a great deal of energy in the form of heat and radiation. Although fission is the process used in an atomic bomb, in a nuclear power reactor the heat energy created is controlled and sustained to generate electricity. Material used in a fission reaction becomes highly radioactive, requiring very careful handling under safe conditions.

Fusion

Nuclear fusion, unlike fission, involves fusing the nuclei of two heavy isotopes of hydrogen – Deuterium and Tritium. A fusion
reaction requires very high temperatures (over 100 million degrees Celsius), capable of separating electrons from their nuclei and the plasma created has to be contained with an electromagnetic field. However, the material needed can be cheaply extracted from water, the process is inherently safe and no lasting radioactivity is caused. Experiments have been conducted for many years in the US, the UK, Russia and elsewhere to find out how to make fusion reactions self-sustaining, producing more energy than the power needed to start and maintain the reaction.

G8 The group of seven richest countries (G7) and Russia.
GAN GOZATOMNADZOR, the Russian nuclear security and safety authority.
Gendarmerie A French term used by security experts to describe paramilitary forces such as armed border guards and other special police units.
Generation The total net amount of electrical energy produced by a generating station.
GIF The Generation IV International Forum initiated by the DOE to develop next-generation reactor designs with improved safety, security and performance characteristics. The forum is multi-national, currently involving ten countries, including Canada, France, Japan, South Korea, the UK and the USA.
HEU High Enriched Uranium, enriched to 20% or more in U-235
HEX Uranium Hexafluoride (UF₆)
High Level Waste High Level Waste consists mainly of the liquid waste produced from the reprocessing of nuclear fuels.
HLW High Level Waste
HMIC Her Majesty’s Inspectorate of Constabulary
HR Human Resources or Personnel Management
HSE The Health and Safety Executive
HSV High Security Vehicle
IAEA International Atomic Energy Agency
ILW Intermediate Level Waste consists mainly of material that has been irradiated in a nuclear reactor.
IND Improvised Nuclear Device
INFCIRC An IAEA Information Circular.
Information Security The branch of security protecting information, including documents, images, magnetic media and information processed by computer, or held or transmitted in electronic, digital form.
INFOSEC Information Security
INMM Institute of Nuclear Materials Management
Insider Threat  
The danger that personnel with authorised access to sensitive nuclear sites, material and information might attempt to cause damage, possibly in ignorance of the possible consequences, or because they had been pressured to co-operate by a terrorist group, other criminals or a foreign intelligence service.

IO  
OCNS Investigating Officer

Inspection  
A pre-programmed, routine audit of an operator’s security arrangements, as specified in an approved site or transport security plan, based on OCNS model security standards.

Inspector  
A member of OCNS authorised to enter civil nuclear sites and other nuclear premises to conduct inspections or investigations under the Nuclear Industries Security Regulations 2003.

Investigation  
An enquiry to determine the causes of a breach in security arrangements; a police investigation into criminal activity; or a special investigation into particular security issues.

Investigating Officer  
A member of OCNS authorised to undertake background enquiries and interview referees in connection with candidates for DV clearance.

IPPAS  
International Physical Protection Advisory Service

IRR  
Ionising Radiations Regulations 1999

IRSN  
Institut de Radioprotection et de Sûreté Nucléaire

Isotope  
Forms of the same type of chemical element, with the same number of protons but different numbers of neutrons.

ITSOF  
Information Technology Security Officers Forum

JET  
Joint European Torus – see the entry on Fusion.

JTAC  
Joint Terrorism Analysis Centre

LEU  
Low Enriched Uranium, with less than 20% U-235.

Licence Condition 36  
A condition under the Health and Safety at Work Act 1974 requiring companies to obtain NII approval before changing the organisation and management of regulated activities.

Licensed  
Operating civil nuclear sites in the UK have to be licensed by the NII under the terms of the Health and Safety at Work Act 1974 and related legislation, with conditions covering the design, construction, operation and maintenance of nuclear installations.

LLW  
See Low Level Waste.

LMA  
Obsolete term for the NDA.

Lockerbie  
In 1988, a bomb exploded on a Pan American flight over the Scottish town of Lockerbie, killing 270 people all told. The attack had been carried out by Libyan intelligence agents.

Low Level Waste  
Low Level Waste consists of items like protective clothing and laboratory equipment contaminated with radioactive material.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ltd</td>
<td>Limited. A company with limited legal liability.</td>
</tr>
<tr>
<td>LWR</td>
<td>Light Water Reactor - see Annex E.</td>
</tr>
<tr>
<td>Magnox Reactor</td>
<td>First generation, graphite-moderated, gas-cooled light-water nuclear power reactors, still in service in the UK but in the process of being decommissioned. Magnox fuel consists of a solid uranium metal rod encased in a machined magnesium alloy tube assembly. See Annexes D and E.</td>
</tr>
<tr>
<td>Materials Protection</td>
<td>Security arrangements protecting nuclear and radioactive material, as opposed to personnel or sensitive information.</td>
</tr>
<tr>
<td>Metric Ton</td>
<td>See Tonne.</td>
</tr>
<tr>
<td>MI5</td>
<td>See Security Service.</td>
</tr>
<tr>
<td>MOD</td>
<td>Ministry of Defence</td>
</tr>
<tr>
<td>MOX</td>
<td>Mixed Oxide fuel, consisting of a mixture of uranium and plutonium oxides.</td>
</tr>
<tr>
<td>MRC</td>
<td>The Medical Research Council</td>
</tr>
<tr>
<td>MW</td>
<td>Megawatt, one million watts.</td>
</tr>
<tr>
<td>NaCTSO</td>
<td>National Counter-Terrorist Security Organisation, a specialist police organisation co-located with the Security Service in the National Security Advice Centre. NaCTSO co-ordinates a nationwide network of specialist police advisors known as Counter Terrorist Security Advisors (CTSAs) who offer help on counter terrorism security.</td>
</tr>
<tr>
<td>NDA</td>
<td>Nuclear Decommissioning Authority</td>
</tr>
<tr>
<td>Neptunium</td>
<td>A man-made radioactive metal extracted in small amounts from spent uranium reactor fuel.</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-government Organisations, used in the context of bodies like Greenpeace and CORE concerned about nuclear issues.</td>
</tr>
<tr>
<td>NII</td>
<td>HSE’s Nuclear Installations Inspectorate.</td>
</tr>
<tr>
<td>Nirex</td>
<td>UK Nirex Ltd was set up by the nuclear industry with Government endorsement to examine long-term options for the management of radioactive material. The company also provides advice about waste packaging and information about radioactive waste held or stored in the UK.</td>
</tr>
<tr>
<td>NISCC</td>
<td>The National Infrastructure Security Coordination Centre, an interdepartmental organisation co-located with the Security Service co-ordinating security measures against electronic attack.</td>
</tr>
<tr>
<td>NISR 2003</td>
<td>The Nuclear Industries Security Regulations 2003, derived from provisions included in the Anti-Terrorism, Crime and Security Act 2001, under which civil nuclear security arrangements within the UK are made subject to regulation by OCNS.</td>
</tr>
<tr>
<td>NNSA</td>
<td>The DOE’s National Nuclear Security Administration.</td>
</tr>
</tbody>
</table>
NRC US Nuclear Regulatory Commission
NRPA Statens Strålevern, the Norwegian Radiation Protection Authority.
NRPD National Radiation Protection Board
NSAC National Security Advice Centre, part of the Security Service, responsible for producing security advice for government and businesses.
NSTS Nuclear Sciences and Technology Services, BNFL’s research and development division.
Nuclear The term is widely used and has several shades of meaning but is intended in the context of this report to refer to material and processes capable of generating a nuclear chain reaction, a nuclear explosion or radioactivity.
OCNS DTT’s Office for Civil Nuclear Security
ORM Other Radioactive Material
Outage A pre-planned period when a nuclear power reactor is shut down for routine inspection and maintenance inside the reactor vessel and systems difficult to access safely when the reactor is operating, due to high radiation levels.
PCM Plutonium Contaminated Material (See ILW)
PFR Prototype Fast Reactor
Physical Protection A term used internationally to denote security arrangements to protect personnel, material or information. It came into use because, in many languages, security has several meanings, covering concepts such as assurance and safety.
Physical Security Used to describe security plant and equipment, such as locks, barriers, CCTV, access control and intruder detection systems.
PIE Post Irradiation Examination
PIRA The Provisional Irish Republican Army – a terrorist group.
Plc Publicly listed company, a legal definition for companies with limited liability or incorporated in law.
Plutonium A man-made, radioactive metal extracted from spent nuclear (uranium) fuel. Plutonium can also be used as a nuclear fuel and in nuclear weapons.
PNC Police National Computer
PNTL Pacific Nuclear Transport Limited, a BNFL subsidiary shipping nuclear and radioactive materials, with minority shareholdings held by Cogema and the Japanese nuclear power utilities.
POST Parliamentary Office of Science and Technology
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressurised Water Reactor</td>
<td>A nuclear reactor in which heat is transferred from the core to a heat exchanger via water kept under high pressure but without boiling the water.</td>
</tr>
<tr>
<td>Proliferation</td>
<td>Attempts by foreign governments to get information, technology and nuclear material illicitly to help develop nuclear weapons.</td>
</tr>
<tr>
<td>Protectively marked</td>
<td>See Classified.</td>
</tr>
<tr>
<td>PSDB</td>
<td>Police Scientific and Development Branch</td>
</tr>
<tr>
<td>PSWG</td>
<td>Physical Security Working Group</td>
</tr>
<tr>
<td>PuO₂</td>
<td>Plutonium Dioxide</td>
</tr>
<tr>
<td>PWR</td>
<td>See Pressurised Water Reactor.</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>The property of certain types of material to emit energy in the form of charged particles or gamma radiation. Some material is naturally radioactive, like Uranium and Radon gas. However, material used in nuclear reactors produces harmful emissions until decay processes result in safer levels, which can take thousands of years, depending on the material.</td>
</tr>
<tr>
<td>Radiology/Radiological</td>
<td>The branch of science dealing with the medical uses of x-rays and other forms of ionising radiation. However, the term radiological is also used loosely to refer to the misuse of radioactive material.</td>
</tr>
<tr>
<td>RAF</td>
<td>Royal Air Force</td>
</tr>
<tr>
<td>RAL</td>
<td>Rutherford-Appleton Laboratory</td>
</tr>
<tr>
<td>RDD</td>
<td>Radiation Dispersal Device</td>
</tr>
<tr>
<td>Regulation</td>
<td>Used in this report to describe the supervision of specified private-sector activities, such as security or safety, by a Government authority with statutory powers of access and prosecution for non-compliance.</td>
</tr>
<tr>
<td>Reprocessing</td>
<td>See Annex E.</td>
</tr>
<tr>
<td>Research Reactor</td>
<td>A nuclear reactor used for research, training and testing, and sometimes for the production of radioisotopes.</td>
</tr>
<tr>
<td>RIRA</td>
<td>The Real Irish Republican Army – a terrorist group.</td>
</tr>
<tr>
<td>RPII</td>
<td>The Radiological Protection Institute of Ireland</td>
</tr>
<tr>
<td>RSA</td>
<td>Radioactive Substances Act 1993</td>
</tr>
<tr>
<td>RSMF</td>
<td>The Risk and Security Management Forum</td>
</tr>
<tr>
<td>Safety</td>
<td>A term which, in the nuclear context, is used to refer to standards, procedures and equipment designed to reduce or mitigate the risk of an accidental nuclear explosion or release of radiation.</td>
</tr>
<tr>
<td>SC</td>
<td>Security Check</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Security</td>
<td>A term used in this report to describe standards, systems and procedures to counter deliberate, criminal or malicious attempts to sabotage nuclear facilities, steal nuclear or radioactive material or obtain sensitive information without authorisation – see also Safety and Physical Protection.</td>
</tr>
<tr>
<td>Security Service</td>
<td>The UK’s defensive security intelligence agency (MI5).</td>
</tr>
<tr>
<td>SEPA</td>
<td>The Scottish Environment Protection Agency</td>
</tr>
<tr>
<td>SGHWR</td>
<td>The Steam Generating Heavy Water Reactor at Winfrith</td>
</tr>
<tr>
<td>SIA</td>
<td>The Security Industries Authority</td>
</tr>
<tr>
<td>SITO</td>
<td>The Security Industries Training Organisation</td>
</tr>
<tr>
<td>SKi</td>
<td>The Stätnens Karnkraftinspektion, the Swedish Nuclear Power Inspectorate.</td>
</tr>
<tr>
<td>SMAC</td>
<td>Special Materials Accounts Committee</td>
</tr>
<tr>
<td>SMP</td>
<td>The Sellafield MOX Plant</td>
</tr>
<tr>
<td>SO</td>
<td>The Official Committee on Security</td>
</tr>
<tr>
<td>Special Branch</td>
<td>Police units tasked by the Security Service to collect intelligence on individuals and organisations possibly posing a threat to national security.</td>
</tr>
<tr>
<td>Spent Nuclear Fuel</td>
<td>Reactor fuel that will no longer sustain a chain reaction after constant use. Spent fuel is often misleadingly referred to as Waste, but can be reprocessed into fresh fuel, because it still contains about 96% Uranium, 1% Plutonium and only around 3% radioactive waste – See Annex E.</td>
</tr>
<tr>
<td>Spot Check</td>
<td>A no-notice, limited security inspection to monitor compliance with an approved site or transport security plan.</td>
</tr>
<tr>
<td>SSIA</td>
<td>BNFL’s Security, Safeguards and International Affairs Division.</td>
</tr>
<tr>
<td>SVAP</td>
<td>Cabinet Office Security Vetting Appeals Panel</td>
</tr>
<tr>
<td>Tecdoc</td>
<td>An IAEA series of technical documents.</td>
</tr>
<tr>
<td>THORP</td>
<td>The Sellafield Thermal Oxide Reprocessing Plant</td>
</tr>
<tr>
<td>Tonne</td>
<td>A metric ton, equal approximately to 2,200 pounds.</td>
</tr>
<tr>
<td>TRANSEC</td>
<td>The Department of Transport’s Directorate of Transport Security, set up after the Lockerbie air disaster in 1988.</td>
</tr>
<tr>
<td>Troika</td>
<td>The governments of Germany, the Netherlands and the United Kingdom, operating under the Treaty of Almelo.</td>
</tr>
<tr>
<td>UCL</td>
<td>Urenco (Capenhurst) Limited</td>
</tr>
<tr>
<td>UET</td>
<td>Uranium Enrichment Technology</td>
</tr>
<tr>
<td>UK</td>
<td>The United Kingdom of Great Britain and Northern Ireland</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>UKAEA</td>
<td>The United Kingdom Atomic Energy Authority.</td>
</tr>
<tr>
<td>UKAEAC</td>
<td>The UKAEA Constabulary, also abbreviated as AEAC.</td>
</tr>
<tr>
<td>UO₂</td>
<td>Uranium Dioxide</td>
</tr>
<tr>
<td>Uranium</td>
<td>A naturally occurring, radioactive metal, about 99% Uranium-238 and 1% Uranium-235. Only the latter form is capable of sustaining a chain reaction. Uranium is mined in Australia, Canada, parts of Africa, Russia and the USA.</td>
</tr>
<tr>
<td>Uranium Hexafluoride</td>
<td>UF₆ - See Annex E.</td>
</tr>
<tr>
<td>Urenco Ltd</td>
<td>The Uranium Enrichment Company</td>
</tr>
<tr>
<td>UEC</td>
<td>The Urenco Enrichment Company, a subsidiary producing enriched uranium using the centrifuge enrichment technology developed by Urenco.</td>
</tr>
<tr>
<td>USA</td>
<td>The United States of America</td>
</tr>
<tr>
<td>Vetting</td>
<td>Security screening to assess the reliability and trustworthiness of personnel needing sensitive access. Vetting involves a graduated series of checks and background enquiries, depending on the access required to sites, material and information.</td>
</tr>
<tr>
<td>Vital Areas</td>
<td>Areas inside nuclear sites containing equipment, systems or devices, the failure of which could directly or indirectly lead to unacceptable radiological consequences.</td>
</tr>
<tr>
<td>WAGR</td>
<td>Windscale Advanced Gas-Cooled Reactor</td>
</tr>
<tr>
<td>Waste</td>
<td>Categorised as High, Intermediate or Low, depending on the amount of radiation emitted. See Annex E.</td>
</tr>
<tr>
<td>Watt</td>
<td>The electrical unit of power.</td>
</tr>
<tr>
<td>WENRA</td>
<td>The Western European Nuclear Regulators Association, an association of the heads of nuclear safety authorities from European countries with nuclear power plants.</td>
</tr>
<tr>
<td>WRACS</td>
<td>The Dounreay Waste Receipt Assay Characterisation and Super Compaction Facility</td>
</tr>
<tr>
<td>XNP</td>
<td>DTI’s Export Control and Non-Proliferation Directorate.</td>
</tr>
<tr>
<td>Yellow Cake</td>
<td>Concentrated, crude Uranium Oxide (about 60% UO₂).</td>
</tr>
</tbody>
</table>

This glossary is not exhaustive. Only abbreviations and acronyms mentioned in this series of reports have been included, as well as definitions intended to aid understanding. The language used has been kept as simple and non-technical as possible for the benefit of lay readers.