

**DEFENCE NUCLEAR ENVIRONMENT AND SAFETY BOARD****2008 ASSURANCE REPORT<sup>1</sup>****OVERVIEW**

1. My assurance report from the Defence Nuclear Environment and Safety Board (DNESB) covers the calendar year 2008. The DNESB oversees nuclear and radiological safety and environmental protection in the defence nuclear programmes. This report presents a summary compilation of assurance gathered principally by the independent Defence Nuclear Safety Regulator (DNSR) together with comment provided by relevant statutory regulators: the Health and Safety Executive's (HSE's) Nuclear Installations Inspectorate (NII), the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA); its conclusions have been noted by implementers brigaded under Director General Submarines (DGSM), Chief of Materiel (Fleet) and Navy Command.

2. Looking ahead, I consider the maintenance of a sustainable cadre of suitably qualified and experienced staff to be the principal threat to safety performance in the medium term. This encompasses Royal Navy operators, MOD civil servants, and industry partners.

**ASSURANCE ASSESSMENT**

3. DNSR (with input from statutory colleagues) has assessed that those responsible for the Naval Nuclear Propulsion Programme (NNPP) and the Nuclear Weapon Programme (NWP) have maintained an acceptable standard of nuclear and radiological safety for the submarine crews, the workforces, the public and the protection of the environment. The demonstrability of this performance to accepted good practice is sound in some parts of the programme, but continues to need improvement in others. There have been a number of welcome initiatives that promise to resolve some long-standing safety issues in both programmes. Implementers will need to sustain priority for these initiatives over a period of years (in most cases) until they deliver benefits; this will not be easy within defence resources.

4. On the basis of the assurance provided and through dialogue with the dutyholders, I am satisfied that an acceptable standard of nuclear and radiological safety and environmental protection has been maintained in the operation and delivery of the defence nuclear programmes. Behaviours are generally appropriate, and are underpinned by effective systems for safety and environmental protection. But there are a number of issues which present risks to compliance, or to demonstrability of compliance, with SofS's Policy Statement on Safety, Health and Environmental Protection and which the Department should therefore regard as potentially significant risks to its programmes.

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<sup>1</sup> This report is for the Defence Environment and Safety Board (DESB), the Defence Nuclear Safety Committee (DNSC) and the Defence Nuclear Executive Board (DNEB).

**ISSUES & RISKS**

5. Progress has been made in addressing all the key issues presented in the 2007 Report, most of which are challenging and long term issues. Three issues from last year no longer appear<sup>2</sup>; they are being managed as normal business. The eight that remain have been updated to reflect the progress that has been achieved or the way the issue has migrated; the risk rating has been adjusted accordingly. One new issue has been introduced.

6. The nine *Issues* are presented in the table below, in which *Regulatory Risk* is to be interpreted as the risk to:

- a. Protection of the workforce, the public and the environment; or
- b. Compliance with SofS's Policy Statement in respect of relevant legislation, government policy or MOD requirements (as expressed in JSPs); or
- c. The demonstrability of such compliance.

*Current risk* measures the likelihood of regulatory action prior to the *Suggested Strategies and Controls* being implemented. A red (high) *Current Risk* suggests that significant action might be necessary within a year; amber and green risks have commensurately longer realisation periods. Arrows indicate whether the *Current Risk* is assessed to be improving ↑, degrading ↓ or remaining steady →. The level of *Current Risk* is a judgement of significance within the defence nuclear programmes; no attempt has been made to calibrate this against the levels of risk in other safety environments.





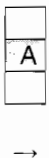
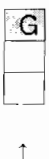
7. None of the issues reflect an immediate safety or environmental concern<sup>3</sup>; they all represent a potential compromise to compliance or the demonstrability of compliance or associated processes. Taken together they pose the risk that it will become increasingly difficult to maintain that the defence nuclear programmes are being managed with due regard for the protection of the workforce, the public and the environment.

Issue	Regulatory Risk	Suggested Strategies & Controls	Owners & Managers	Current Risk
<p><b>1. Adequacy of Resource</b>  <i>2007 Issue 1 modified.</i>                      Lack of adequate resource to safely deliver the defence nuclear programmes.                      (Para 9-15)</p>	<p>Risk to compliance with MOD policy (DESB action) and JSPs 518 &amp; 538.</p>	<p>a. Identify organisational baselines and essential level of resource required to fulfil safety responsibilities, using best practice and regulatory guidance.                      b. Compare with existing level of resource and where necessary seek appropriate additional resource.</p>	<p>DGSM,  <u>Naval Bases &amp; Navy Command</u>                      Managers - Authorisees</p>	<p style="text-align: center;"> <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px; vertical-align: middle;">A</span>                      →                 </p>

<sup>2</sup> Explanations for their removal are provided in the commentary below.

<sup>3</sup> In general in this report the term "safety ..." can be taken to include matters affecting the environment since the measures to achieve protection of both are often similar.

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Issue	Regulatory Risk	Suggested Strategies & Controls	Owners & Managers	Current Risk
<p><b>2. People</b>  <i>2007 Issue 6 updated.</i>                      Measures already in hand may be insufficient to address the present and predicted shortage of NSQEP in the Navy, among MOD civilians and in defence contractors.                      (Para 16-19 &amp; 39)</p>	<p>Risk to the maintenance of an intelligent customer capability, and thus to protection of the workforce &amp; to compliance with JSPs 518 &amp; 538.</p>	<p>a. Continue to implement present initiatives.                      b. Progress the nuclear skills study and act dynamically on its conclusions.</p>	<p><u>DGSM, Naval Bases &amp; Navy Command</u>                       Managers – DGSM/SSD &amp; Navy Command</p>	
<p><b>3. Contracting Strategy</b>  <i>2007 Issue 2 updated.</i>                      The need to ensure that desired safety outcomes and behaviours are maintained or enhanced while performance is commercially incentivised                      (Para 20)</p>	<p>Risk to demonstrable compliance with legislation and MOD requirements</p>	<p>Carry lessons from NPSA &amp; AWE into other commercial strategies especially refits, Future SSBN and Naval Base support.</p>	<p><u>DGSM</u>                       Managers – IPTLs</p>	
<p><b>4. Safety Case Improvement and ALARP Demonstration</b>  <i>2007 Issue 3 updated.</i>                      The development of safety analyses for the plant and weapon approving authorities and the use of these analyses by Authorisees in their safety cases remains inconsistent.                      (Para 21-25)</p>	<p>Risk to demonstrable compliance with legislation (ALARP requirement of Health &amp; Safety at Work Act)</p>	<p>a. Continue the development of integrated (reactor-facility &amp; weapon-facility) safety cases.                      b. Use these safety cases to demonstrate ALARP.</p>	<p><u>DGSM &amp; Naval Bases</u>                       Managers – Authorisees &amp; Approving Authorities</p>	
<p><b>5. Performance measurement</b>  <i>2007 Issue 4 updated.</i>                      Objective performance measurement needs to be developed in accordance with national practice (Para 26)</p>	<p>Risk to compliance with government policy</p>	<p>Conclude development of safety performance indicators and provide data.</p>	<p><u>DGSM, Naval Bases &amp; Navy Command</u>                       Managers – Authorisees &amp; Approving Authorities</p>	
<p><b>6. Control of Work</b>  <i>2007 Issue 5 modified</i>                      Potentially helpful initiatives have been introduced to address root causes in this area but the number of event remains too high.                      (Para 27-29)</p>	<p>Risk to the workforce and public safety and to the environment, in both short and medium term.</p>	<p>a. Maintain current momentum in identifying and implementing best practice at all sites.                      b. Continue the momentum in addressing issues identified in DGSM safety culture symposium.</p>	<p><u>DGSM &amp; Naval Bases</u>                       Managers - Authorisees</p>	
<p><b>7. Co-operation</b>  <i>2007 Issue 7 modified.</i>                      Co-operation between Authorisees and between Authorisees and Approving Authorities needs to be improved &amp; formalised.                      (Para 30)</p>	<p>Risk to compliance with JSPs 518 &amp; 538</p>	<p>a. Develop and agree documented arrangements between Authorisees.                      b. Develop and agree documented arrangements between Authorisees and Approving Authorities.</p>	<p><u>DGSM, Naval Bases &amp; Navy Command</u>                       Managers – Authorisees &amp; Approving</p>	

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Issue	Regulatory Risk	Suggested Strategies & Controls	Owners & Managers	Current Risk
			Authorities	
<p><b>8. Decommissioning &amp; Disposal.</b>  <i>2007 Issue 11 modified.</i>                      There is no approved Decommissioning &amp; Disposal Strategy to implement the agreed Defence Decommissioning Policy. (Para 31-32)</p>	Risk to demonstrably meeting SofS policy, MOD requirements, wider government policy, and international treaty commitments.	a. Continue the development of the DGSM Decommissioning & Disposal Strategy. b. Identify funding to meet the decommissioning liabilities declared in the MOD accounts.	<u>DGSM</u>  Manager – DGSM/SSD	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; text-align: center;">A</div> ↑
<p><b>9. Future Submarine.</b>  <i>New Issue.</i>                      The need for a strong focus during the concept phase on demonstrating that risk has been reduced so far as is reasonably practicable. (Para 22 &amp; 34)</p>	Risk to demonstrably meeting SofS policy and legal requirements, with potential impact on programme.	a. Clarify safety responsibilities. b. Use federated safety case to inform the development of the concept and in due course the design.	<u>DGSM</u>  Manager – DFSM & DNP	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; text-align: center;">A</div> →

**PROGRESS & SUCCESSES**

8. In 2008, those responsible for implementing the nuclear programmes have:
  - a. Safely maintained Continuous At Sea Deterrence (CASD) despite increasing pressures on manpower;
  - b. Safely delivered the required military capability from the Submarine Arm;
  - c. Safely maintained operational outputs from the NWP;
  - d. Continued progress in the development and use of safety case methodologies applicable to all aspects of NNPP work
  - e. Continued to safely progress the manufacture and commissioning of Astute Class submarines, including the installation of ASTUTE's reactor core, while identifying reasonably practical improvements in the design for later submarines of the Class;
  - f. Initiated the development of the concept design for the future SSBN;
  - g. Merged Director Nuclear Weapons (DNW) & Director Strategic Weapon Systems (DSWS) to provide, in Director Strategic Weapons (DSW), a single Approving Authority for the Trident strategic weapon;
  - h. Generally improved compliance with control of change requirements.

## ISSUES AND COMMENTARY

9. **Adequacy of Resource.** In some areas of the defence nuclear programmes there is increasing risk of there being inadequate resource to allow officials to properly fulfil the onerous safety responsibilities that they hold. This is reflected primarily in the number of funded posts in internal MOD organisations, but also in the level of safety related contract funding and in issues such as the holding of safety related spares. Issue 1 last year was entitled “Control of Organisational Change (and Funding)”, and the commentary noted shortcomings in complying with arrangements to achieve this, and further, that there needed to be a robust analysis of the skills and competence that are essential to justify that an organisation can manage its business safely. There has been encouraging progress in the use of control of change processes; notable examples being the change of Authorisee for nuclear weapon transport and the merger of DNW and DSWS to form a single strategic weapon Approving Authority. Compliance is not yet universal, but it is now appropriate for this issue to migrate to the justification of the organisational baseline, and associated resource as presaged last time.

10. Firm control of organisational change, while a necessary discipline, may only establish that the safety capability of an organisation has been maintained without examining whether it is adequate in the first place. Baseline justification seeks to achieve this through a careful analysis of the organisation and in particular its baseline posts<sup>4</sup>: both the number there should be and the competence they should have. Extended beyond the safety discipline, such an analysis ought to be fundamental for any organisation and should underpin its correct funding. It should provide part of the defence against arbitrary reductions in resources which are not uncommon in Government, as noted last year.

11. Robust baselines do not exist universally in the defence nuclear programmes; in general the contractors (Licensees) have performed better in this area than the Department’s internal organisations, not least because of questioning by NII. New guidance<sup>5</sup> was published by NII during 2008 for use by its staff in assessing Licensees’ baselines. DNSR sponsored a workshop in December to improve understanding across the community (both regulator and regulated)<sup>6</sup> and will look for a significant improvement in this aspect of Authorisees’ arrangements over the coming year. Importantly, this will provide analytical evidence of whether Authorisees are adequately resourced to deliver their safety responsibilities: in advance of this analysis it appears to DNSR that under the pressure of efficiency measures, including the Government’s administrative costs regime, some areas are barely resourced to deliver these responsibilities, with a considerable load on a small number of key individuals. This is equally true of operating authorities and other organisations which contribute to the overall delivery of safe activity.

12. Baseline justification is equally required above Authorisee level. In DGSM the re-establishment of the 2\* Chief Strategic Systems Executive (CSSE), and the developing role of the Chief Engineer and Safety Director (CESD) are welcome developments, although DNSR is not aware of a formal control of change process, and there would be benefit from formalisation and promulgation of the CESD’s role. Over this year, there have been evolutionary developments in DE&S, and specifically in the DGSM cluster towards integrated programme management. These have not fundamentally changed the roles of Authorisees, but at times tensions remain between the Authorisees and the

<sup>4</sup> Baseline posts are for those roles that are central to the safe delivery of a programme; those which could lead to an adverse impact if they are not delivered to the right standard.

<sup>5</sup> TAG T/AST/065 available at [http://www.hse.gov.uk/foi/internalops/nsd/tech\\_asst\\_guides/tast065.htm](http://www.hse.gov.uk/foi/internalops/nsd/tech_asst_guides/tast065.htm)

<sup>6</sup> This approach is also well described in a paper presented at the earlier Equipment Safety and Environment Symposium (ESAS08) available at [http://www.esas08.co.uk/pdf\\_papers/Gilbert,%20Steve%20-%20Paper%201.pdf](http://www.esas08.co.uk/pdf_papers/Gilbert,%20Steve%20-%20Paper%201.pdf)

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submarine platform team leaders, who are both the platform project managers and have responsibility for providing safe platforms to the Navy Command Operating Authority.

13. The integrated and strategic approach being taken to the Maritime Change Programme is appropriate and welcome. Within this, following the decision to retain 3 Naval Bases, further efficiencies are being sought in the operation of the Naval Bases. In addressing this, the requirements and disciplines of nuclear Authorisation have been well recognised, and DNSR has high confidence in the approach being adopted. As the boundary of contractorisation extends, it remains essential that an appropriate sustainable intelligent customer capability is retained by MOD. Care is also required where posts transferred have secondary roles in support of nuclear activity, especially at sites where nuclear activity is not core business.

14. In Navy Command Transformation has not significantly changed the processes used to control and report NSQEP posts: the system remains robust but may face challenges into the future due to reducing manpower availability (see para 17 below). It will also need to take into account the change of philosophy associated with the transition to the Engineering Technician.

15. An opportunity is emerging to correct an organisational flaw in the framework for regulation of the defence nuclear programmes. The recommendations of the DE&S' Safety Improvement Working Group (subsequently adopted at the direction of 2<sup>nd</sup> PUS as part of the DESB's action plan) have thrown a correcting light on the responsibilities of front-line commands. This aligns with the strengthening of Navy Command's role as the Operating Authority for both surface ships and submarines, required by the Ship Safety Board (in JSP430). At the same time, the formation of DSW (see above) with CSSE separating and his direct staff reducing (to the traditional programme co-ordination role) provides the opportunity for a change of Authorisee for the "at sea" life-cycle phase of the NWP. Furthermore, it has been an observation in previous reports that the two elements of NRPA's authorisation scope (Approving Authority and "at sea" activities) were not being appropriately distinguished. This all points to the potential benefit of Navy Command becoming the Authorisee for submarines outside of authorised or licensed sites (which would include operational berths). But it is important that any such change is properly managed, the demarcation of responsibilities is clearly articulated and Navy Command is suitably resourced to fulfil this responsibility. The opportunity should be taken to clarify the policy and intent for this issue.  
(Issue 1 continues – modified)

16. **People**<sup>7</sup>. Robust baselining will identify the requirement for people, and there will continue to be pressure on funding this requirement. But above this, the challenge in educating, recruiting, training, retaining and sustaining an appropriate cadre of suitably qualified and experienced people, in the Navy, the Civil Service and the defence nuclear industry has been a theme of my reports, and those from the Defence Nuclear Safety Committee for a number of years. It is heartening that the risk that this poses to the delivery of the defence nuclear programmes is now widely recognised, among others by the Defence Nuclear Executive Board, the Navy Board, the Defence Board and the National Audit Office. While a number of measures have been taken by the Department and by industry, with the rapidly developing civil nuclear programme the situation is becoming more difficult and biting sooner than previously anticipated. The commencement of the Defence Nuclear Programme Human Resources (HR) Study is

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<sup>7</sup> It is noted that the DNSC's Principle Recommendation in Apr 08 concerned the same topic; this Issue complements that recommendation.



warmly supported, but it will be essential that its conclusions are acted on dynamically. In light of this, the current risk has been increased to Red, which implies that significant regulatory action might be necessary within a year. In practice it is more likely that the need for such action will be averted by dutyholders taking action to delay or cancel activities, rather than seeking regulatory agreement to proceed with insufficient people.

17. People remain the top Navy Command risk to delivery of the submarine programme. A series of special recruiting and retention measures are mitigating any direct impact on submarine activity but the situation remains critical over the medium term. As the Navy Command top risk it is being actively managed and the current impact is considered to be a potential loss of availability of SSNs - not any direct reduction in safety compliance.

18. The underbearing of 14% of MOD civilian NSQEP posts has grown from around 10% in 2007: this is partially due to an increasing requirement. The programmes initiated in recent years to recruit and train graduates and (advanced modern) apprentices are beginning to bear fruit (with encouraging quality of graduates), but it will take many years to provide the numbers at the management levels that are most under threat. Despite the increasing scope of work that is transferred to industry, it is absolutely essential that MOD retains an intelligent customer capability for its nuclear programmes, embedded in a sustainable cadre of competent Crown Servants. While uniformed nuclear operators have a key role to play, it is important that their skills are complemented by deep expertise in design, safety analysis, support and regulation.

19. By contrast, at present defence contractors generally have less difficulty at present in recruiting and retaining high quality staff, although there are areas of difficulty in more practical areas, such as commissioning.

(Issue 2 continues (2007 Issue 6))

20. **Contracting Strategy.** The employment of appropriate commercial strategies in influencing appropriate safety behaviour and performance is an enduring theme of these reports, although it is now assessed as GREEN. The Nuclear Propulsion Sustainability and Availability (NPSA) contract with Rolls-Royce has proved positive in this area, and arrangements with AWE (to be carried forward from April 2008) have adopted the right approach. Similarly the MOD/Babcock Future Nuclear Facilities (FNF) partnering agreement allowed very high levels of commercial and technical risk to be managed in the successful removal of the Devonport 80t refuelling crane. It is important that similar principles are adopted for other activities including submarine upkeep: the agreed Maritime Support Principle that contracting for performance is to be adopted where practical is thus welcome. This issue will be closed when such revised contracting strategies result in appropriately changed safety behaviour. The Submarine Enterprise Collaborative Agreement (SECA) is also a welcome initiative, and should provide the platform on which improvements can be based.

(Issue 3 continues (2007 Issue 2))

21. **Safety Case Improvement and ALARP Demonstration.** There has been steady progress in this area, but (as planned) the significant benefits that will result remain in the future programme. DNSR welcomes the importance placed on the development of the integrated Core H through life safety case and the [REDACTED] for naval reactor plant, which is using relevant good practice and is meeting its revised schedule with advance information being made available to support specific operations on site. The methodology and processes for using the eventual output and incorporating it into site safety cases have been identified. Similarly, safety analyses for nuclear weapon activities at Coulport were delivered by DNW & AWE to Clyde who will now integrate this to

produce revised safety cases; sustaining or developing this approach for the warhead modification (Mk4A) will require early decisions with possible resource implications.

22. The key regulatory requirement is to reduce the risk of all activities until the risk is as low as is reasonably practical (ALARP). This requires potential improvements to be assessed and implemented unless the associated cost or sacrifice is grossly disproportionate to the benefit. Cost is a legitimate factor for consideration, but affordability is not. There have been a number of weaknesses in the approach to this in the defence nuclear programmes: there is sometimes excessive focus on a probabilistic demonstration of meeting the Basic Safety Objective; there is sometimes too much attention paid to complex analysis demonstrating that an improvement is not required; and frequently an "ALARP assessment" is used to justify not implementing an improvement, often on cost grounds. Furthermore, it is clear that the standard of performance that is achievable for a new plant or design is likely to be significantly higher than that achievable by modification to an existing plant or design. As such the provision of new plant or facilities designed against modern standards may represent the ALARP solution.

23. The development by DGSM of a Deterrence Coherence Safety Review, which compares and contrasts the approaches taken in demonstrating ALARP against the many hazards, is encouraging. Similarly the principles of the model for the federated safety case being developed for the future SSBN (discussed later in this report) will need to be considered for existing submarines.

24. The continuing development of the UK wide staged improvement programme and particularly the associated development of consistent through life management plans (TLMP) for each site supporting the nuclear propulsion programme is encouraging and should allow better targeting of new investment. In Clyde the implementation of a periodic review of safety (PRS) of the radioactive effluent disposal facility (REDF) and study of best practicable means (BPM) for management of radioactive waste, resulting in significant refurbishment and plant replacement in the existing facility, is addressing a long-standing area of weakness. In Devonport the safe removal of the 80t refuelling crane was a major milestone in hazard reduction.

25. It is heartening that in both the weapon and propulsion programmes the underlying research programmes are now well established, funded, and under sound governance.  
(Issue 4 continues (2007 issue 3))

26. **Performance Measurement.** Not only is it recognised good practice, but the Government continues to emphasise the need for objective measurement of a range of publicly delivered or regulated services including nuclear safety performance. The nuclear industry Safety Directors Forum (SDF) is working closely with HSE/ND and DNSR in the developing use of the published safety performance indicator (SPI) framework: good progress is being made. In the defence sector reporting is in a pilot phase. The framework is generally agreed, all Licensees are sharing SPI data against some of the applicable strategic indicators, and Authorisees are developing data coherent with the DGSM safety performance model. The key now is to move this from a project into a process, engaging NII and DNSR inspectors in discussing data with operators and building a review of performance trends into the regulatory review process.  
(Issue 5 continues (2007 issue 4))

27. **Control of Work.** The effective control of potentially hazardous activities at the point they are conducted has featured (at amber risk) in recent reports; formal regulatory action had been taken by HSE/NII at Devonport, Barrow, AWE (on criticality control) and the



Rolls-Royce Core Factory (following a glovebox event). There has been an increase in the number of events reported associated with failure to follow authorised procedures. And there have been a number of unauthorised discharges of radioactive material to the environment which have also resulted from failings in control of work (CoW), although the quantity of material discharged has been within limits and had negligible environmental impact.

28. Much has been done, continuing the efforts noted in the previous report, with a result at Barrow of lower re-work rates in AMBUSH and ARTFUL. Significant progress has been made on CoW in ASTUTE which has made commissioning of the NRP possible. It has been facilitated by realistic programming by the BAES project team, such that current activities are proceeding within programme limits (earliest – latest dates)<sup>8</sup>. Correction of bad safety behaviours will require renewed vigilance from management, and this has been recognised at both Barrow and Devonport Dockyard with a long term drive toward improving safety culture<sup>9</sup>. The initiatives will take time to deliver a wholesale improvement and there are continuing CoW incidents at both these sites, for example [REDACTED].

Similarly, at HMNB Clyde, there has been a noticeable improvement following regulatory initiatives of 2 years ago, and both the extension of the permissioning regime in the vessel support and NW programmes, and the injury and incident free safety culture improvement programme are welcome. But there are continuing CoW failures although none of these has to date had a significant effect on the adequacy of submarine repair. It is appropriate that this issue should remain amber.

29. More widely it is encouraging that the vital importance of developing safety leadership, culture and behaviour is being increasingly recognised across the programmes. It is essential that momentum is maintained in addressing the issues identified in the DGSM Safety Culture Symposium in late 2007. These had much in common with issues identified at the HSE major conference “Leading from the Top”, in April 2008, which was well attended by senior leaders in the defence nuclear programmes.

(Issue 6 continues (2007 issue 5)).

30. **Co-operation.** Encouraging progress has been made in documenting formal arrangements for co-operation between Authorisees/Licensees across whose geographical boundaries submarine reactors and nuclear weapons pass (eg. a weapons convoy arriving at Coulport). The other aspect of co-operation in the defence nuclear programmes is between Authorisees and the approving authorities. Documented arrangements in the NWP will be inspected during the accreditation of the NW Approving and Design Authorities (due to complete in March 2009); in the NNPP the findings of earlier inspections are being worked out. The revised JSPs 518 & 538 capture and clarify the requirements for co-operation as Further Authorisation Condition 1.

(Issue 7 continues)

31. **Decommissioning and Disposal.** In response to the Departmental Policy endorsed in 2006, DGSM has developed a Decommissioning and Disposal Strategy, issued in draft in September. This has adopted an approach similar to that of the Nuclear Decommissioning Authority; when mature it should be able to provide the essential high-level context for the quinquennial strategies required of each Licensee and Authorisee in

<sup>8</sup> Same realistic programming approach, taking account of resource limitations, needs to be applied to boats 2 & 3

<sup>9</sup> There is management recognition that this will also improve project delivery.

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the programmes. DNSR is co-ordinating with the statutory regulators (HSE/NII, EA & SEPA) a review of the draft Strategy document to inform revisions planned as part of a wider consultation prior to formal publication. The key challenge in this area remains the allocation and sustainment of the funding to meet the better defined liabilities.

32. A new sense of momentum has been injected into the task of disposing of laid-up submarines this year (the former ISOLUS project renamed the Submarine Dismantling Project (SDP)). The aim to advance the funding profile for this work and enable it to happen earlier, [REDACTED] are welcomed. There are many hurdles yet ahead, including the decision on whether to dismantle the reactor compartment, but a more positive approach could now play well into the public climate.

(Issue 8 continues (2007 Issue 11))

**33. Astute Class.** There has been significant progress with the Astute class in this reporting year, reflected in the annual joint compliance review. Generally there is good learning from experience in the manufacturing processes, with significant process improvement being implemented in successive submarines. In ASTUTE a recovery repair following the TG incident has been successfully effected, and the reactor core has been successfully loaded. This took much longer than anticipated, partly due to the discovery of a manufacturing problem. Commissioning lessons are being reflected in organisational changes and will be fed into the planning for future boats. The increased focus by NRPA on gaining confidence in the “as-built” condition and on issues such as maintenance is helpful. Second launch was achieved within its planning window, without deferring work.

**34. Future SSBN.** Following the Government’s decision to maintain the nuclear deterrent capability, the Future SSBN project is now more than halfway through a very challenging 2 year concept phase, due to complete with the Initial Gate decision in Sep 09. There is, rightly, a very strong focus on meeting time and cost targets: this must be matched by an equal focus on safety and environmental performance, demonstrating that all risk has been reduced so far as is reasonably practical. (Key decisions made during this phase, not least the type of nuclear propulsion plant to be used, will impact the safety performance of the nuclear deterrent into the second half of this century.) It is essential that safety responsibilities are clearly documented and agreed, coherent with those for the rest of the submarine flotilla, and maintained through the project. The development of a safety framework for a federated safety case addressing all hazards (and particularly the relationship between nuclear safety and submarine safety) is a huge step forward and strongly commended. It is now important that this is used to inform the development of the concept and in due course the design. DNSR is engaged and has identified that regulatory agreement to moving into the design phase will be informed by regulatory review of the preliminary safety reports for the propulsion plant and the submarine platform, and a safety strategy paper for the utilisation of support facilities in the Clyde Naval Base.

(Issue 9 new)

**35. Emergency Response.** Reports of assessment of the Hazard Identification and Risk Evaluation (HIRE) were submitted to regulators on time for the 2008 REPIR<sup>10</sup> round. DNSR assessment of the submissions has been completed in conjunction with NII and has agreed the adoption of a reference accident approach, and in turn allowed the

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<sup>10</sup> The Radiation (Emergency Preparedness and Public Information) Regulations, which require an assessment of whether a radiation emergency is reasonably foreseeable, and if so, the determination of the required detailed emergency planning zone.

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DNSR Safety Improvement Notice (issued in 2005) to be closed. The analysis concludes that the reasonably foreseeable radiation emergency in the propulsion programme is dominated by gamma-shine. Operators' plans will now need revision. The outcome also potentially changes emergency actions for the general public; the NII will make the determination of the detailed emergency planning zone which may also change. All parties are aware that careful presentation of the revisions with local authorities and the public will be required if the benefits of the new approach are to be realised.

(2007 Issue 7 closed)

36. 18 nuclear accident response demonstration exercises were conducted in 2008; the 2008 Grade A exercise (SENATOR) was postponed until February 2009 to allow for an important security exercise. Inadequate emergency plans at the Scottish operational berths of Loch Ewe and Broadford Bay<sup>11</sup> caused DNSR to suspend permission for their use. Other than this, and notwithstanding some specific difficulties, emergency response has been demonstrated as being generally maintained at an acceptable level.

37. **Warhead Modification.** Some delays are being experienced in the warhead modification project which are symptomatic of the proximity of the UK introduction programme to the completion of US development and production. Similarly, not all safety evidence is yet available, and thus project decisions (for example about [REDACTED]) are necessarily being based on assumptions. Sound thinking has gone into the technical issues, and while the newly authorised community tackles some process issues for the first time, the outcomes are sensibly judged.

(2007 Issue 9 closed)

38. **Nuclear Transport.** Changes in the management arrangements for nuclear weapon transport, including the transfer of Authorisee title to (now) DSW were satisfactorily handled and have preserved management functions essential for safety under direct control of the Authorisee. There is a clear plan covering the future of special nuclear material transport in the NWP which will deliver in 2009. (Director Nuclear Propulsion (DNP) retains the responsibility for the transport of new and used reactor fuel.)

(2007 Issue 10 closed)

## REGULATORY ACTIVITY

39. **Organisation and resources.** DNSR is hosted in the DE&S TLB within the DG Safety & Engineering cluster. A DNSR Through-Life Management Plan has been produced and endorsed by me and DGS&E. This facilitates DNSR's independence, establishing me, on behalf of 2<sup>nd</sup> PUS, as DNSR's single customer (and source of delegated regulatory authority), and it secures DNSR's resources provided by DE&S (DGS&E). DNSR's professional strength remains at 20 posts: there has been considerable churn this year, with a further 2 experienced inspectors leaving to join British Energy, and a total of 6 new inspectors joining. This has resulted in a high internal training and development load. I judge that while the level of regulatory experience has inevitably reduced, the necessary level of competence has been maintained. The essential support from Serco RSD and DSTL has been maintained, although with the reality of cost inflation in the nuclear industry being significantly greater than the allowance in defence programme management, this has resulted in a progressive reduction in the manhours deployed, and thus the complement of RSD staff dedicated to supporting DNSR. Furthermore, against an expanding defence nuclear programme, DNSR's

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<sup>11</sup> Broadford Bay was subsequently closed (no longer required) by Navy Command.

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resource remains unchanged. Enhancements proposed to address this during 2008 have been unsuccessful and I consider it essential that this is addressed in 2009. It is an IAEA safety requirement that nuclear regulatory bodies shall have adequate staffing and financial resources.<sup>12</sup>

40. **Activity Summary.** In regulating the defence nuclear programmes and seeking assurance about safety DNSR has:

- a. permissioned 20 significant nuclear activities;
- b. reviewed at least 103 documented safety submissions;
- c. conducted 113 planned inspections (many jointly with NII) and 11 reactive inspections and investigations in response to unplanned events;
- d. assessed 17 emergency response exercises including 3 re-demonstrations;
- e. agreed the removal of 1 Safety Improvement Notice; 1 SIN remains outstanding from 2006 (in respect of the air transport of highly enriched uranium loads).

41. **Joint Regulation.** In almost all parts of the nuclear programmes a tiered structure of regulatory interface meetings has been adopted; these engage all relevant regulators with the Licensee/Authorisee and, where appropriate, the MOD branch contracting for the programme. The practice of joint regulation has been further developed during 2008. In particular:

- a. Integrated intervention strategies and plans, leading to joint inspection and assessment activity, for the defence licensed sites have been further developed with NII, although better consistency across the different areas is desirable. The joint regulatory assessment of the REPIIR submissions, with DNSR actively supporting the HSE/ND's statutory role, is an example of developing good practice.
- b. The dialogue with statutory environment regulators has ensured that clarity exists at the boundary of DNSR's environmental requirement<sup>13</sup>. Much needed new momentum is being injected to conclude the MOD/SEPA agreement and its radiological annex.
- c. DNSR's development as the defence Competent Authority for transport packages has proceeded with assistance from the DfT's Dangerous Goods Division (DfT/DGD).
- d. The DOSG Ordnance Safety Review Panel (OSRP) (in which DNSR participated) granted a CS(OME)<sup>14</sup> for the Trident All-up round (less warhead); the former CSSM<sup>15</sup> for Trident was replaced by a CSE<sup>16</sup> granted by Naval Authority (Explosives).
- e. There is a developing dialogue between DNSR and relevant Naval Authorities.

<sup>12</sup> IAEA GS-R-1 - Organization and Staffing of the Regulatory Body for Nuclear Facilities

<sup>13</sup> Newly expressed as FAC3 in JSPs 518 & 538.

<sup>14</sup> Certificate of Safety (Ordnance Munitions and Explosives) under JSP520 requirements for inherent safety

<sup>15</sup> Certificate of Safety Shipborne Munition

<sup>16</sup> Certificate of Safety, Explosives under JSP430 ship safety requirements

- f. DNSR's understanding of security drivers for the defence nuclear programmes has improved through dialogue with MOD's security regulatory community. This included a joint workshop, attendance at security exercises and briefings.

42. **Regulatory Nuclear Interface Protocol.** A protocol has been adopted between the regulators and dutyholders across all the UK nuclear programmes, which sets out ways of working and a shared vision statement, "to enable the safe, secure, effective use and control of nuclear technology and material for the overall benefit of society". In particular it establishes a set of effective values and behaviours for all parties, and measures performance against them. The protocol was signed at a ceremony in April, by HM Chief Inspector of Nuclear Installations, and the DNESB Chairman, and by the Chief Executives of all principal nuclear dutyholders, including DGSM.

43. **Regulatory Policy.** Revised versions of JSP 518 (Regulation of the Naval Nuclear Propulsion Programme) at Issue 3 and JSP 538 (Regulation of the Nuclear Weapons Programme) at Issue 2 were published in December.

44. DSW and AWE have provided briefings to DNSR staff at the commencement of the concept phase for the successor warhead.

#### **PRIORITIES FOR 2009**

45. I consider that in 2009 those responsible for implementing the nuclear programmes should respond to all the Issues identified earlier in this report. In a year of continuing uncertainty of resources, both finance and people, the keys to this are:

- a. To formulate robust organisational baselines essential to justify and defend the skills and resources required to deliver the nuclear programmes safely, to maintain graduate and apprentice recruitment and training and to deliver a report and recommendations on the wider picture for SQEP (Issues 1 & 2);
- b. To continue to develop safety analyses for reactor and weapon which can inform robust safety cases and improve the demonstrability that risk is ALARP, for both current and future programmes (Issue 4);
- c. To consult more widely and publish an improved version of the Decommissioning and Disposal Strategy (Issue 8);
- d. To clarify the safety management arrangements for the Future SSBN project and justify the choice of reactor design appropriate for the whole life of the project (Issue 9).

46. In 2009, in addition to routine regulatory activity, DNSR should:

- a. Finalise accreditation of the Nuclear Warhead Approving and Design Authority;
- b. Influence the new programmes, particularly in the concept and assessment phases;
- c. Train the users of the updated issues of JSPs 518 and 538;

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- d. Renew the bid for modest additional resources appropriate to regulation of the new programmes, and invoke me and 2<sup>nd</sup> PUS in support;
- e. Improve transparency by publishing more material about its activities.

*Signed by*

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