



Ministry  
of Defence

# DNSR ANNUAL REPORT 2012/2013

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Defence Nuclear Safety Regulator  
An Independent Regulator in Defence

## SECTION 1 – OVERVIEW

1. I am required to provide an Annual Report to the Permanent Under Secretary (PUS) which includes a summary of nuclear and radiological safety and environmental protection performance in the Defence Nuclear Programme<sup>1</sup> (DNP), the identification of issues and an account of the health of regulation undertaken by the Defence Nuclear Safety Regulator (DNSR). DNSR's high-level conclusions on safety performance emerge from its work in regulating elements of the DNP; the statutory regulators (the Office for Nuclear Regulation (ONR), the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA)) provide complementary regulation in the DNP, and their conclusions are integrated, where relevant, in the report. The report supports briefing to the Defence Board on defence safety and environmental protection performance and is provided to Duty Holders in the DNP to make them aware of regulatory conclusions.

2. This report covers the period from 1 January 2012 to 31 March 2013 to align with wider defence safety reporting requirements; it also considers work that is ongoing to support future safety improvements across the DNP. The Government has reaffirmed<sup>2</sup> its commitment to maintain a submarine-based nuclear deterrent and this report is set in the context of high programme loading and the prospect of strategic organisational change at a time of significant pressure on nuclear skilled resource. The Submarine Enterprise (including the Atomic Weapons Establishment (AWE)) is safely delivering: new build infrastructure, facilities and submarines; the Nuclear Warhead Capability Sustainment Programme (NWCSP); and the introduction of the Mk4A warhead modification. Ageing submarines and infrastructure are being safely managed and steady progress has been maintained on key decommissioning and disposal programmes. Defence Equipment and Support (DE&S) Materiel Strategy (Status Change) and Naval Base Transformation are both key developments that will strategically shape the environment for safety delivery across the DNP.

**3. Those responsible for delivering the DNP have maintained an adequate<sup>3</sup> standard of nuclear and radiological safety for the submarine crews, the defence workforce, the public and the protection of the environment.**

4. Eight key issues are raised in this report and, recognising their strategic nature, it is expected that improvement will be delivered over a number of years. The 2 most significant issues continue themes from previous DNSR reporting:

a. The ability of the Department to sustain a sufficient number of nuclear suitably competent personnel is a long standing issue and is again raised as the principal threat to safety in the DNP in the medium term. A number of focussed initiatives continue and there is evidence that the downward trend has been arrested. However, the improved position is marginal and pressure from the civil nuclear market will continue to drive vulnerability in this small and highly skilled group. Safety has not been compromised, but the loss of resilience increases the likelihood of programme delays.

b. Strategic organisational change has the potential to fundamentally re-shape the environment for safety delivery across the DNP. Safety performance is adequate today, but the issue reflects the significant level of Duty Holder attention required to maintain that performance through change, including implementation. Strategic change to organisational arrangements must be assessed for its impact on safety, and suitable MOD Authority agreement is required, prior to implementation.

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<sup>1</sup> Comprising the Naval Nuclear Propulsion Programme and the Nuclear Weapon Programme.

<sup>2</sup> "Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review (SDSR)" dated October 2010.

<sup>3</sup> Adequacy, in this context, means that DNSR has made an evidence-based judgement to the effect that arrangements and management of nuclear safety across the DNP meet the exceptionally high standards required by defence policy and of the nuclear industry.

## Regulation of the Defence Nuclear Programme

5. DNSR regulation of the DNP essentially derives from the fact that it is a defence programme which has exemptions from relevant legislation e.g. the Nuclear Installations Act 1965 (NIA). The primary objective is to ensure that the Secretary of State for Defence's health, safety and environmental protection policy is delivered taking into account the mobility of the Naval Reactor Plant (NRP) and the military operational context. Where Defence has exemptions or dis-applications from health, safety and environmental protection legislation the policy requires the achievement of outcomes that are, *so far as is reasonably practicable*, at least as good as those required by UK legislation. The NIA is not applicable to nuclear activities controlled by the Crown (i.e. MOD) and nuclear submarines ('reactors in a means of transport'). Nuclear weapon design is excluded from licensing by ONR.

6. DNSR operates a non-prescriptive, permissioning regulatory regime and has established a mature system of Authorisation which is analogous to ONR Licensing under the NIA. The regulatory requirements are defined in 36 Authorisation Conditions, akin to ONR's Licence Conditions. DNSR's principal regulatory processes are similar to those employed by statutory regulators and include: inspection; assessment of, for example, safety documentation and emergency response demonstrations; and permissioning of nuclear activities. DNSR has a principal regulatory interface with ONR and effective and efficient regulation is achieved by DNSR and ONR working together to ensure complete and seamless oversight of all DNP activities. DNSR also liaises and works closely with the EA, SEPA and other MOD regulators with common interests.

7. Following the formal establishment of the Defence Safety and Environment Authority (DSEA), revised Departmental safety governance arrangements have matured. This includes the formation of the Defence Nuclear Regulation Stakeholder Committee (DNRSC) and the Defence Environment and Safety Committee (DESC) which, under the chairmanship of the PUS, receives direct reporting of safety performance.

## Naval Nuclear Propulsion Programme

8. Over the 50 year life of the Naval Nuclear Propulsion Programme (NNPP), there has been a steady development in UK Naval Pressurised Water Reactor (PWR) technology with attendant improvements in nuclear safety. DNSR has gained assurance that both PWR 1<sup>4</sup> and PWR 2<sup>5</sup> meet all of the required safety standards. PWR 3<sup>6</sup> will deliver further improvement in NRP design, offering reduced crew, nuclear and platform risk. Furthermore, the increase in reactor core lifetimes arising from continuous development has led to a reduction in the requirement for submarine refuelling with its attendant risk.

9. The UK is committed to an enduring submarine programme which will see 7 Astute Class SSNs progressively enter service over the next decade and the Successor SSBN enter service in the late 2020s. Due to build delays with the Astute Class, there has been a requirement to extend the Trafalgar Class beyond their original design life in order to maintain the SSN flotilla at a fully operational level. Some of the emergent technical issues affecting the Trafalgar Class over the last few years can be directly attributed to the effects of plant ageing. Importantly, the Naval Reactor Plant Authorisee (NRPA) recognises these risks and manages the issues as they arise in order to maintain nuclear safety. The situation is analogous to that observed in the UK civil nuclear sector where Magnox power stations were similarly extended beyond their original design intent, with Wylfa the last remaining operational plant. In both cases DNSR and ONR have gained assurance, through effective regulatory permissioning regimes, that these older nuclear plant remain safe.

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<sup>4</sup> As fitted in Trafalgar Class SSNs.

<sup>5</sup> As fitted in Vanguard Class SSBNs and Astute Class SSNs.

<sup>6</sup> Next Generation Nuclear Propulsion Plant to be fitted in Successor SSBN.

10. The Next Generation Nuclear Propulsion Plant (NGNPP) Project has progressed beyond the Full Concept Definition stage into detailed design. The development of robust technical governance processes and their integration, where relevant, with nuclear safety management arrangements has continued to mature slowly. This has impacted upon concurrence between the emerging NGNPP design and supporting safety substantiation. The NRPA is fully cognisant of this and has introduced Hold Point Control to manage the risk; DNSR supports this proven approach.

11. The NRPA's workload associated with governance of the emerging NGNPP design is rapidly increasing as the Project heads towards Critical Design Review and DNSR welcomes the recent uplift in Project staffing.

12. Shore facilities constructed in the 1980s and 1990s for build and deep maintenance of Vanguard Class submarines remain adequate; however, detailed modifications and enhancements will be necessary to support build and operation of the Successor SSBN.

13. At Clyde, a major investment in the Valiant Jetty will shortly provide a modern SSN berthing facility compliant with relevant good practice for nuclear safety. SSN docking facility upgrades at Devonport will progress during 2013 supported by the parallel development of a modern standard safety case.

## **Nuclear Weapon Programme**

14. The 2006 White Paper on the Future of the UK's Nuclear Deterrent<sup>7</sup> identified that our existing Trident warhead design was expected to last into the 2020s and the programme of investment<sup>8</sup> in sustaining capabilities at AWE would continue ensuring the UK can maintain the existing warhead for as long as necessary. It has since been determined<sup>9</sup> that the current warhead design will not need replacement until at least the late 2030s with any decisions not therefore required in the current Parliament.

15. Engagement across the weapon design and 4 operational life cycle phases have provided a sound regulatory basis for the continued safe delivery of the Nuclear Weapon Programme (NWP). Key progress includes:

- a. Agreement of the next 5 year priced contract period to enable continued operations at the AWE sites;
- b. Approval of a new safety case to support nuclear weapon transport operations;
- c. International collaboration between UK and France on a new hydrodynamic experimental test facility (covered in Section 3, Para 12);
- d. Revised arrangements for Defence nuclear material transport package approval;
- e. Effective use of robust management of change processes to enable successful establishment of a MOD/Alliance<sup>10</sup> organisation at the Royal Naval Armaments Depot (RNAD) Coulport in January 2013.

16. Whilst progress continues to be made in the delivery of the NWCS, programme slippage has occurred raising the potential for extended operation of current facilities and equipment; DNSR will maintain regulatory oversight jointly with ONR and other regulators.

<sup>7</sup> "The Future of the United Kingdom's Nuclear Deterrent: Defence White Paper 2006 (Cm6994)" dated December 2006.

<sup>8</sup> The Nuclear Warhead Capability Sustainment Programme (NWCS).

<sup>9</sup> "Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review (SDSR)" dated October 2010.

<sup>10</sup> AWE Plc, Babcock and Lockheed Martin UK Strategic Systems Ltd.

17. Notably, safety justification development led by the DE&S Strategic Weapons Project Team (SW PT) in support of the Mk4A warhead modification programme has introduced a revised modern standards approach to the development of the warhead design safety case. DNSR supports the approach and welcomes the through-life safety demonstration benefits that the clarity of facility safety requirements is providing.

18. This progress has been achieved against a backdrop of developing organisational baselines across the programme; these have progressed and are further discussed in Section 2, Issue 2 – Strategic Organisational Change.

## SECTION 2 – KEY ISSUES

1. A summary of key issues across the DNP is provided in tabular form at Annex A; the following paragraphs provide a more detailed commentary

### **Issue 1 – Resource and Nuclear Suitably Qualified & Experienced Personnel (NSQEP)**

2. Overall, this Issue is assessed as Red (Situation Steady); sustained Duty Holder attention is required to ensure maintenance of adequate safety performance. *This continues DNSR 2011 Issue No.1 – Adequacy of Resource & Issue No.2 – People.*

3. The backdrop of reducing personnel numbers in MOD, both armed forces and civilians, remains this year. The DNP is heavily loaded, pressure remains on manpower control totals and there is evidence that SQEP resource is spread thinly in places. Effective action has been taken to address previously recognised delays in routine safety matters; for example, the review and update of configuration control documentation using SQEP contracted support.

4. Safety has not been compromised but there is evidence of difficulties in maintaining action plans where, for example, MOD SQEP resource is required to approve amended documentation for use. Maintenance of an adequately resourced SQEP core capability is key to remaining suitably responsive to varying work demands, enabling individual SQEP development and ensuring an enduring adequate safety performance. Robust organisation baselines that reflect relevant good practice are critical to the understanding and articulation of the core SQEP capability requirement, and are an effective means to support mitigation of this issue.

5. The ability of the Department to sustain a sufficient number of nuclear suitably competent military and civilian personnel is a long standing issue. It is identified as a significant threat to the safe delivery of the DNP and is being actively managed. The developing UK civil nuclear programme is ensuring that nuclear skills are increasingly at a premium in the broad market place. Industry is forecast to increase its recruiting activity and there is evidence that this has begun. The NSQEP threat from civil nuclear is further exacerbated by an ageing demographic within key elements of the Defence nuclear community, both military and civilian.

6. The DNP has deployed a number of initiatives to address the NSQEP issue in the short to medium term. Primarily this has been through the Sustainable Submarine Manning Project in the Royal Navy (RN), the Submarine Training and Education Programme (STEP) and the Defence civilian NSQEP initiative under the direction of Director Submarines (D SM)<sup>11</sup>.

7. The RN has used, and will continue to use for the foreseeable future, pay flexibilities at its disposal to retain key personnel (notably, in the context of the DNP, members of the submarine engineering (ESM) cadres). In general, ESM positions are adequately manned, but there remain specific difficulties in growing and retaining sufficient SQEP at particular ranks.

8. Whilst the required nuclear skills can take between 3 and 10 years to develop, MOD has so far managed the issue despite not being able to compete with civil market salaries. Mechanisms in use to manage the issue include: lateral external entry (approved 3 July 2012); 20 development posts (ring fenced for NSQEP); intake of 15 graduates per annum with a specific nuclear engineering systems anchor<sup>12</sup>; and payment of a small Recruitment and Retention Allowance (£2K per annum) to approved members of the highly skilled civilian

<sup>11</sup> As the Senior Responsible Officer for civilian NSQEP across MOD.

<sup>12</sup> On the DE&S Graduate Scheme.

nuclear community. In year, the programme has delivered a number of developments to support effective management of the MOD nuclear community, including issue of a new single MOD civilian nuclear competence framework<sup>13</sup>; unifying the previous NP and NW frameworks. The framework reflects best practice and supports a suitably flexible workforce across NP and NW disciplines.

9. The SQEP threat extends to the DNP's industrial partners where specialist engineering skills recruitment and retention is recognised as a key challenge to meet future programme demands. Vulnerabilities exist in core skills areas, including safety, propulsion, power and naval architects. The MOD has strengthened its collaborative arrangements with its submarine enterprise partners through the STEP. MOD has accepted an invitation to sit on the Nuclear Industry Council, formalising previous engagements with Cogent (Sector Skills Council for Nuclear) and the National Skills Academy (Nuclear). This should support development of a strategic and holistic approach to nuclear skills and training across both Defence and the civil sector, building on existing relationships.

10. Nevertheless, the evident pressure from the civil nuclear market will continue and will drive vulnerability in this small but highly skilled MOD group. The difficulties in maintaining a sustainable community of suitable nuclear competent staff has been, and is again, raised by DNSR as the principal threat to safety in the DNP in the medium term. The loss of SQEP resilience is of concern and increases the likelihood of programme impact. The initiatives in place have the potential to mitigate these issues, but an enduring priority will be needed for these issues to be adequately addressed. Greater Defence recognition of the financial bounty placed on the nuclear skill set by a resurgent civil nuclear sector, and wider freedoms to recruit appropriate ex-military skills, would provide increased assurance of the MOD's ability to maintain the required resourcing and manage the nuclear skills vulnerability in support of the DNP. Consideration of alignment of remuneration for nuclear skills with other Government departments, for example the Department for Work and Pensions (DWP) / Health and Safety Executive (HSE), would seem appropriate.

11. **Summary.** The ability of the Department to sustain a sufficient number of nuclear suitably competent personnel is a long standing issue and is again raised as the principal threat to safety in the DNP in the medium term. A number of focussed initiatives continue and there is evidence that the downward trend has been arrested. However, the improved position is marginal and pressure from the civil nuclear market will continue to drive vulnerability in this small and highly skilled group. Safety has not been compromised, but the loss of resilience increases the likelihood of programme delays. Recognising the strategic nature of this issue it is expected that improvement will be delivered over a number of years.

## Issue 2 – Strategic Organisational Change

12. Overall, this issue is assessed as Red (Situation Steady); significant and sustained Duty Holder attention is required to ensure maintenance of adequate safety performance and the rating reflects the potential impact if changes are ill-conceived or implemented. *This continues DNSR 2011 Issue No.1 – Adequacy of Resource & Issue No.3 – Front Line Responsibilities.*

13. This report is set in the context of strategic organisational change which has the potential to fundamentally re-shape the environment for safety delivery across the DNP. DE&S Materiel Strategy and Naval Base Transformation are both strategic developments that have potential for significant programme impact if safety delivery is affected and there are aspects that need skilled consideration; in particular, in relation to any retained MOD organisation in a possible DE&S Government Owned, Contractor Operated (GOCO) organisation (an option in DE&S Materiel Strategy). DNSR has a key regulatory role in how nuclear safety is to be sustainably delivered in any new organisational construct, and how

<sup>13</sup> MOD Nuclear Competence Framework, Version 1.0 dated July 2012.

unique nuclear equipment is to be approved safe and fit for use in-service by the Crown. There are 6 MOD Authorisees; all are hosted in DE&S and authorised for specific nuclear activities. Three Submarine Enterprise partners are authorised for defence nuclear activities. As the controlling mind for these activities, Authorisees need to be in effective day-to-day control and must understand the implications sufficiently to fulfil their legal responsibility to ensure that the associated risk is ALARP.

14. It is Departmental safety policy<sup>14</sup> that, before being introduced, change to organisational arrangements is to be properly assessed for its impact on safety and is to be suitably managed. Furthermore, good safety management requires senior managers to ensure that safety performance will be improved or at least maintained by the change. In the defence nuclear arena this is reflected in the key requirement<sup>15</sup> to control any organisational change that may affect safety, which includes the need to provide and maintain adequate financial and human resources to ensure safe operation.

15. Although DNSR does not have a role to formally approve strategic change in Defence above Authorisee level, suitable regulatory engagement early in the process is an effective safeguard to manage the risk of unintended safety management and regulatory impact. Against this background, senior managers are encouraged to seek assessment of the safety impact of strategic organisational change and consider stratagems for gaining suitable MOD authority acceptance (e.g. via the DESC) prior to implementation. There is evidence that suitable regulatory engagement has begun.

16. DE&S Materiel Strategy considerations recognise the need for talented people in MOD engineering and that DE&S has almost no freedom to recruit, retain or motivate staff to get the skills it needs. It has the potential to provide those freedoms to enable human resource management that is coherent with programme commitments and the support drawn from industry. Nevertheless, the strategy for any retained MOD organisation, specifically including NSQEP personnel, needs to be determined. In the context of ensuring holistic organisational sustainability, the impact of a DE&S GOCO on retained MOD specialist skills and any retained nuclear specialist organisation needs due consideration. Specialist skills retained in MOD would be subject to traditional civil service management constraints.

17. Both Naval Base Commander (NBC) Clyde and NBC Devonport are Authorised by DNSR for the conduct of specified nuclear activities. Naval Base Transformation has the potential to affect the lines of authority, control of activities and management of nuclear safety at both sites. Recognising the scale, pace and potential implications of transformation, DNSR has promoted effective early regulatory engagement. DNSR will be involved (as an empowered observer) through 2013 as the nuclear safety management model for the Naval Bases develops. Authorisee submissions will be subject to normal control of organisational change scrutiny and regulatory approval (AC 36).

18. At a more tactical level, Authorisee management of change processes have matured and are being effectively used. In the period, establishment of a strategic MOD/Alliance at RNAD Coulport was a significant organisational change that was effectively enabled by robust Authorisee change processes; a good example of early regulatory engagement. The approach supported comprehensive regulatory (including external regulators) oversight and assessment, culminating in successful vesting in January 2013. DNSR concurs with the Authorisee's review that the MOD/Alliance organisation represents a minimal MOD presence to retain the current Authorised regulatory regime. The sustainability of the retained MOD organisation is likely to need continued attention if the approach is to endure.

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<sup>14</sup> JSP 815 Part 2 – Safety, Health, Environmental Protection & Sustainable Development in Defence: A Policy Statement by the Secretary of State for Defence.

<sup>15</sup> Authorisation Condition 36 (AC 36) – Organisational Capability.



19. Robust baselines which justify the roles and resource needed to safely deliver outputs are an essential precursor to any organisational change process and to the demonstration of resourcing requirement and adequacy. The identification of core roles that must be undertaken by the MOD Authorisee is of clear importance through strategic change. The Nuclear Industry Code of Practice<sup>16</sup> provides good guidance on organisational baselines and has regulatory support.

20. Progress on baselines continues to be made across the DNP, notably AWE's organisational baseline approach is being recognised by ONR as industry best practice. A company wide operating model change to a matrix management structure draws on this work and is providing the driver to bring development on the Design Authority (DA) baseline to a conclusion. SW PT has recently produced a draft comprehensive nuclear capability baseline which, together with the DA baseline, should provide an improved description of the Nuclear Weapons Approving and Design Authorities (NWADA) baseline. The NRPA has also continued to make progress in addressing shortfalls in this area, which allowed DNSR to close its extant Regulatory Direction in March 2012.

21. DNSR acknowledges that the co-operative behaviours enabled through the Submarine Enterprise Performance Programme (SEPP) is beginning to deliver beneficial safety effects and welcomes the formal establishment of the Submarine Enterprise Safety Directors' Forum (ESDF). Together with ONR, DNSR anticipates valuable routine engagement with this influential group in the manner of regulatory working with the industry wide Safety Directors' Forum (SDF).

22. **Summary. Strategic organisational change has the potential to fundamentally re-shape the environment for safety delivery across the DNP. Safety performance is adequate today, but the issue reflects the significant level of Duty Holder attention required to maintain that performance through change, including implementation. Strategic change to organisational arrangements must be assessed for its impact on safety, and suitable MOD Authority agreement is required, prior to implementation.**

### Issue 3 – Ageing Plant, Facilities and Infrastructure

23. Overall this Issue is assessed as Amber (Situation Steady); Duty Holder attention is required to ensure maintenance of adequate safety performance. *This is a new Issue for 2012/13.*

24. The phasing out of PWR1 plant has been slower than intended due to the delayed entry into service of the Astute Class. As a result, the Trafalgar Class are operating at the right hand end of their "bathtub" reliability curves and the effect has been seen in a number of emergent technical issues over the last few years. Importantly, the NRPA continues to effectively manage these issues as they arise in order to maintain nuclear safety. The Vanguard Class is likely to exhibit plant ageing effects as a result of the SDSR decision to extend their life (to the late 2020s and early 2030s) and re-profile the Successor SSBN build programme. The Vanguard Class Plant Lifetime Extension (VPLEX) Project is planning to address predicted and potential effects in a suitable and sufficient manner; DNSR will remain engaged.

25. DNSR welcomes the reinvigoration of the UK Safety Improvement Programme (SIP) to manage a holistic approach to infrastructure investment across the NNPP through the Submarine Enterprise Infrastructure Forum (SEIF). The SEIF operates under the auspices of the SEPP and the Submarine Enterprise co-operative arrangements. The importance of that co-operation, to enable the SEIF to manage a suitably prioritised plan that provides the best programme safety benefit, is recognised. A targeted infrastructure development and refurbishment programme is planned over the next decade to support Successor SSBN.

<sup>16</sup> Nuclear Industry Code of Practice – Nuclear Baseline and the Management of Organisational Change, First Edition dated October 2010.

26. An extensive programme of facility replacement and upgrade is well advanced at AWE; this will deliver modern standards facilities. The programme is challenging and slippage has the potential to require existing facilities to operate beyond their design life. There is considerable experience and parallels in this area and safety review will be required to justify further operation. Facilities that are already nearing the end of their design life are subject to a comprehensive programme of ongoing Examination, Inspection, Maintenance and Testing (EIMT). In some areas, inspection programmes have not been as comprehensive as regulators would expect. As an example, corrosion in the structural supports of a building was not identified as early as would be expected which resulted in ONR issuing a Safety Improvement Notice. AWE has subsequently provided assurance that this issue does not affect similar facilities. Both ONR and DNSR will continue to seek assurance that AWE is implementing adequate EIMT regimes for all plant and facilities.

27. Although key infrastructure developments are being delivered, for example the Valiant Jetty at HMNB Clyde, and more are planned, this issue is raised because of the continued Duty Holder commitment and attention needed to continue to adequately manage ageing issues in support of the enduring programme.

28. **Summary.** A number of emergent Trafalgar Class technical issues can be directly attributed to the effects of plant ageing. Importantly, the NRPA continues to effectively manage these issues as they arise in order to maintain nuclear safety. It is anticipated that plant ageing effects will be seen in the Vanguard Class following the SDSR decision to extend their life and planning is in place to address predicted and potential effects. A targeted infrastructure development and refurbishment programme is planned to support Successor SSBN, while an extensive programme of facility replacement and upgrade is already well advanced at AWE. Duty Holder commitment and attention is required to safely manage ageing plant, facilities and infrastructure across the DNP.

#### **Issue 4 – Safety Case Improvement and Safety Management Arrangements**

29. Overall this Issue is assessed as Amber (Situation Improving); Duty Holder attention is required to ensure maintenance of adequate safety performance. *This continues DNSR 2011 Issue No.4 – Safety Case Improvement & Issue No.5 – ALARP Demonstration.*

30. Safety Case Improvement. The new generation of safety cases which are being produced are providing an overall improvement in understanding of safety issues and how these should be managed, e.g. the objective of the NRP Through Life Safety Case (TLSC) campaign is to address the key challenges posed by the application of safety case modern methods, tools and techniques. Broad commitment and effort to upgrade safety cases has continued, however the quality of safety demonstration in some areas does not often meet the expectations of modern standards (although many safety cases pre-date these methodologies). The lack of availability of qualified safety case authors to support the programme is delaying the resolution of this issue, but the continued drive for robust safety justification remains vital.

31. Generally, safety case improvement is being delivered in the NWP. The development and use of the “Safety Case on a Page” methodology by AWE as part of an initiative to improve the front-line awareness of the most significant hazards and their controls is regarded as good practice. The methodology is being adopted at HMNB Clyde and wider sharing across the DNP is encouraged. The approach provides a readily digestible safety case summary, enhances awareness and understanding of engineering and process controls, and motivates operational staff to consider how their day-to-day actions directly affect safety. In the NNPP the work to consolidate the number of safety cases and supporting data is on programme to deliver in 2015.

32. The Nuclear Weapon Approving & Design Authority (NWADA) have developed the concept of "Authorisee Safety Functions (ASFs)" which assist integration of the design safety case for the weapon with the safety cases for supporting facilities. The clarity that ASFs provide is facilitating improved cooperation between Duty Holders throughout the weapon lifecycle and application of the concept may be of benefit in other aspects of the DNP.

33. ALARP. A fundamental requirement of UK safety legislation is that a Duty Holder shall reduce risks to the workforce and the public (who may be affected by an activity) *so far as is reasonably practicable* (SFAIRP aka ALARP). DNSR will continue to seek improvements in the written demonstration of ALARP across the DNP. The retrospective justification of pre-existing decisions (often as a result of the design maturing in advance of safety demonstration) remains in some areas e.g. the Valiant Jetty at HMNB Clyde, where the design matured and was implemented in advance of the safety case. NGNPP design development needs to be cautious of this to ensure that future optioneering decisions are based on sound ALARP considerations; DNSR will continue to proactively engage in this area.

34. In the design phase, the maintenance of a staged safety demonstration programme suitably aligned with a staged design development programme is vital to mitigate the risk associated with demonstrating adequate equipment safety performance and possible late regulatory challenge. Authorisees are expected to adopt a safety informed approach to design to ensure that safety risk reduction options are considered, maintain early engagement in programmes to gain assurance that ALARP considerations are being suitably prioritised in design development and that so called "reverse ALARP" arguments will not be presented late in design and construction programmes.

35. Periodic Review of Safety. Further development to establish and apply robust Periodic Review of Safety (PRS) processes remains a vital objective across the DNP, particularly in the light of proposed plant and facility life extensions. The timely and rigorous close out of identified actions arising from PRS is a specific area for attention. Appropriate categorisation of the issues according to safety significance and application of the ALARP process are elements for consideration to support effective close out. Valuable lessons (e.g. those identified during the recent PRS at HMNB Devonport) and areas of good practice (e.g. those applied during the recent PRS at the Naval Reactor Test Establishment (NRTE) Vulcan) are being generated as PRS processes are implemented. There will be considerable benefit in sharing these across the wider DNP.

36. Internal Challenge. Effective internal Authorisee challenge is a vital factor in ensuring nuclear safety. However, the robustness of internal challenge arrangements is variable across the DNP. DNSR consider that improved internal challenge arrangements have an important role in addressing many of the issues associated with the development of safety cases and ALARP consideration. This issue extends across the spectrum of safety management arrangements and effective management will be fundamental to support Strategic Organisational Change.

37. Summary. **In general, safety case improvement is being delivered; however, the quality and timely delivery of safety cases needs continued attention. Sustained focus on a safety informed approach to design is key to ensuring the sound application of the ALARP requirement. The robust application of PRS processes, that reflect relevant good practice, remains a vital objective. Internal Authorisee challenge arrangements are currently variable and have a major role in improving: safety cases; ALARP demonstration; and PRS application. Overall, Duty Holder attention is required to ensure maintenance of adequate safety performance.**

## Issue 5 – Quality of Product (incorporating Control of Work)

38. Overall this Issue is assessed as Amber (Situation Steady); Duty Holder attention is required to ensure maintenance of adequate safety performance. *This incorporates DNSR 2011 Issue No.6 – Control of Work.*

39. The delayed entry into service of the Astute Class is due to a range of factors, including build quality control issues (mainly associated with the platform rather than the NRP), and technical SQEP challenges. DNSR notes that BAE Systems (BAES) Maritime-Submarines Ltd. is implementing a wide ranging improvement programme at its Barrow shipyard, including resource capability and materials management. DNSR will continue to monitor build quality, working with the NRPA and MOD customer (project) organisations which have substantial build monitoring resource on site. Specifically, DNSR will maintain its scrutiny of supervision of operations and application of processes.

40. A 'right first time' quality product is essential to support the delivery, as well as safety, of the DNP; in particular, the NRP for Successor SSBN. DNSR's regulatory scope does not extend directly to the NRP supply chain and DNSR will seek to work with the NRPA and Rolls-Royce Submarines to gain suitable regulatory oversight in this area.

41. Quality delivery within the supply chain is vital and, under the auspices of SEPP, the Submarine Enterprise have progressed a number of initiatives to address this. These include: establishment of common quality clauses for supply chain contracts; a coherent approach to supply chain auditing using a pan-enterprise audit team; and delivery of a Submarine Enterprise Quality Strategy.

42. Similar supply chain problems have been experienced in the facility new build aspects of the NWCSP, where failures to achieve the necessary high quality standards during the original fabrication or installation process have resulted in avoidable programme delays.

43. A number of 'control of work' issues have arisen during the reporting period; this remains an area of regulatory focus. DNSR supports the continued high level of Duty Holder attention that is afforded to control of work across the DNP. In particular, the recognition that full resolution, including adequate Design Authority engagement, is essential to support Successor SSBN build.

44. Furthermore, DNSR welcomes the continued implementation of a number of safety culture initiatives. These include: the second cycle of Submarine Enterprise Safety Culture Peer Reviews; the NRPA's new Event Reporting System; and the planned 2013 Submarine Safety Symposium.

45. **Summary.** A 'right first time' quality product is essential to support the delivery, as well as safety, of the DNP. Various initiatives have been progressed to address quality delivery within the supply chain. A number of 'control of work' issues have arisen during the reporting period and continued Duty Holder attention is required in this area.

## Issue 6 – Transport and Package Approval

46. Overall this issue is assessed as Amber (Situation Improving); Duty Holder attention is required to ensure maintenance of adequate safety performance. *This is a new Issue for 2012/13.*

47. The DNSR competent authority role for DNP transport packaging has continued to develop. The good progress that has been achieved in bringing the extant and legacy packaging approval process under appropriate management arrangements, including periodic review, has limited the opportunities to fully deliver the planned inspection

programmes. Opportunities to maintain the overall intervention strategy will be further limited in the short term following the recent loss of a fully trained Inspector.

48. Whilst DNSR's intent is to maintain the necessary approvals, clear prioritisation, and coordination across the DNP, of the packing and container requirements to support the operational programme will be needed from the user community to ensure that the potential for delays are suitably mitigated, recognising DNSR's resource limitations.

49. The regulatory support for the approval of new package designs is significantly greater than that required once the design has been accepted into service. Early regulatory engagement in respect to the associated development programmes and similar prioritisation and coordination across the DNP will be required in the longer term. Developments in the approval methodology for new packages will continue to shift the emphasis from full scale testing to computer modelling with the associated requirement for DNSR to develop the associated knowledge.

50. **Summary. Progress in developing the management arrangements for packaging approvals, including periodic review, has been good. Early regulatory engagement, with approval requirements prioritised across the DNP, is essential in the long term to ensure maintenance and establishment of extant and new approvals, respectively.**

## Issue 7 – Nuclear Liabilities

51. This Issue is assessed as Green (Situation Steady); there has been steady and determined progress in addressing decommissioning and disposal issues. Safety performance is considered adequate. *This continues DNSR 2011 Issue No.8 – Nuclear Liabilities.*

52. The Submarine Dismantling Project successfully concluded public consultation on proposals for submarine dismantling, which included local and national consultation events; the approach and supporting documentation was well received. In March 2013, the MOD published its response to the public consultation and announced decisions on the project. The decision has been taken to demonstrate the initial dismantling process by removing all radioactive waste from a submarine at Rosyth. Subject to the successful conclusion of this demonstration, it is intended that the dismantling of remaining submarines will be carried out at both Rosyth and Devonport. Separately, the project to defuel nuclear submarines using modern standards approaches has gained momentum with the majority of enabling contracts now in place.

53. Current reactor core testing at NRTE Vulcan is scheduled to complete in 2015 and there are no plans for PWR3 prototyping at the site. Options for decommissioning the Vulcan site are being considered under the Vulcan Defuel and Decommissioning (VDAD) programme. Approval has been given to assess the decommissioning options and, importantly, the Nuclear Decommissioning Authority (NDA) is actively supporting these elements of the VDAD programme. The benefit of suitably engaging NDA's SQEP capabilities has been recognised in the options, including NDA acting as an agent for MOD and as the intelligent customer. Such an approach might usefully be used to manage some of MOD's other nuclear liabilities.

54. The essential relationships between the MOD, NDA and Department of Energy and Climate Change continue to be effective over a number of projects. Activity is underway across the range of themes in MOD's Nuclear Liabilities Management Strategy<sup>17</sup>. Some of the issues will represent a significant challenge. The AWE Intermediate Level Waste (ILW) strategy has been a particular challenge during this reporting period. Given the current financial climate, the funding threat remains, but to support the enduring DNP it is vital to

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<sup>17</sup> "MOD Nuclear Liabilities Management Strategy" dated September 2011.

maintain the momentum generated on decommissioning and disposal as part of a demonstrably holistic approach to through-life safety management.

55. **Summary.** Progress in addressing decommissioning and disposal issues has been steady and safety performance is considered adequate. Nevertheless, these programmes do not directly deliver demonstrable Defence capability and the funding threat remains. Maintenance of the momentum generated on decommissioning and disposal is vital as part of a holistic approach to through life safety management. An enduring funding commitment is needed to maintain these programmes.

## Issue 8 – Fukushima Response

56. This issue is assessed as Amber (Situation Improving); Duty Holder attention is required to maintain an adequate pace of progress in evaluating and addressing “considerations” drawn from the Fukushima event. *This is a new Issue for 2012/13.*

57. The regulatory requirements and the responses from Authorisees in the DNP mirror those in the civil nuclear sector; in particular, the application of the ENSREG<sup>18</sup> Stress Tests to plant and facilities. These tests required Authorisees to evaluate the response of their facilities against extreme external events, irrespective of their estimated probability. DNSR was content with the responses from all Authorisees which, like those from Licensees, identified a small number of “considerations” for further review and sentencing. DNSR’s view of the resilience of the DNP was set down in a report<sup>19</sup> published in July 2012.

58. DNSR noted that, in many respects, the NRP and its supporting facilities are resilient to the type of external events which triggered the Fukushima incident. The docks and berths, though exposed, are designed against extreme weather in support of their function, and improvements have recently been made to facilities supporting Nuclear Emergency Response at both HMNB Clyde and Devonport Dockyard.

59. Turning to the NRP within an intact submarine, this is, by its function, in an enclosed environment protected from extreme natural events. However, DNSR and the NRPA recognised that lessons from the Fukushima incident should not be limited to the specific external events which compromised that plant’s safety defences, but should consider combinations of and consequential events which might previously have been considered beyond the Design Basis. Accordingly, the NRPA established a list of Stress Tests to be applied to the NRP taking account of its particular operating environment and the threats which this might generate. DNSR agreed this list, and work is ongoing to reassess the threats to the NRP from these Stress Tests (submarine faults). This will be particularly valuable for informing the design of the Successor SSBN.

60. Authorisees and the wider MOD have undertaken a number of further initiatives. A Fukushima Sub Group has been formed, under the auspices of the ESDF, to take a Submarine Enterprise wide perspective on sentencing Fukushima considerations and a Defence Resilience initiative. Similarly, MOD HQ has established a Fukushima Stakeholder Group with the aim of integrating the MOD response with that of the civil programme for a national emergency response organisation within a strategic framework

61. The responses, to lessons drawn from the Fukushima event, produced by Defence Authorisees and Licensees have been adequate to date. The approach used was the same as that adopted by civil nuclear industry. The intelligent and proportionate approach, particularly by the NRPA, yielded similar “considerations” to those arising at civil sites. Nevertheless, the sentencing of “considerations” will need continued priority attention to maintain pace with relevant good practice in civil industry. The need for robust and demonstrable development remains and DNSR will maintain regulatory engagement in this

<sup>18</sup> European Nuclear Safety Regulators’ Group (ENSREG).

<sup>19</sup> “Japanese Earthquake and Tsunami: Implications for the UK Defence Nuclear Programme – A Regulatory Assessment by the Defence Nuclear Safety Regulator” dated 17 July 2012.

area with the intent of reporting progress in the next 12 months. There is no evidence that safety has been compromised by, for example, failings in establishing the Design Basis Accident, and nuclear activities across the DNP, including continued operation of the nuclear powered submarine fleet, is supported by DNSR.

62. The enduring drive for 'Continuous Improvement' formalises the requirement to conduct PRS and Authorisees' PRS processes ensure that safety cases continue to consider relevant lessons, including those from Fukushima. The robust application of effective PRS processes remains vital across the DNP (see Issue 4).

63. **Summary. To date Defence Authorisee and Licensee responses to lessons drawn from the Fukushima event have been adequate. The sentencing of "considerations" will need priority attention by Duty Holders to maintain an adequate pace of demonstrable progress in line with relevant good practice in civil industry. Safety has not been compromised and nuclear activities across the DNP, including continued operation of the nuclear powered submarine fleet, is supported by DNSR.**

### Previously Identified Issues

64. A summary of the key issues identified in Defence Nuclear Environment and Safety Board<sup>20</sup> (DNESB) and DNSR Annual Reports over the past 5 years (2007 to 2011) is provided in tabular form at Annex B.

65. The nature of regulatory issues often means that suitable mitigating action requires a significant timescale, for example, those relating to *adequacy of resource* to deliver the DNP and those relating to *safety case improvement*. These issues remain priorities for DNSR and progress has been discussed earlier.

66. Issues that have been satisfactorily addressed during the 5 year period include those associated with:

- a. Successor SSBN Design Concepts.
- b. Contracting Strategy.
- c. Performance Management and Learning.
- d. Warhead Modification.

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<sup>20</sup> The DNESB has been replaced by the Defence Nuclear Regulation Stakeholder Committee (DNRSC).

## SECTION 3 – REGULATORY ACTIVITY

1. The purpose of this Section is to provide details of the regulatory activity conducted by DNSR to support its assessment of safety performance across the DNP. It includes: the main activities undertaken; the status of DNSR's organisation and resources; and an update on engagement with other regulatory bodies.
2. Activity Summary. In regulating the DNP during this reporting period, DNSR has:
  - a. Permitted over 45 significant nuclear activities.
  - b. Reviewed over 190 documented safety submissions.
  - c. Conducted over 80 planned inspections (many jointly with ONR).
  - d. Approved (as Competent Authority) over 5 transport packages for the transport of Defence nuclear materials.
  - e. Assessed over 20 Nuclear Emergency Response demonstration exercises.
3. No Safety Improvement Notices or Immediate Safety Requirements have been raised during the reporting period. DNSR considers that this is a possible consequence of its philosophy of early engagement with Authorisees and is evidence of the maturing nature of the DNP. Early engagement seeks to ensure that regulatory expectations are understood from the outset of projects, and facilitates the provision of appropriate advice when required.
4. DNSR has responded to over 25 formal information requests<sup>21</sup>. Following DNSR's establishment as part of the Defence Safety and Environment Authority (DSEA), the staffing approach for official correspondence has changed resulting in an increase in workload for DNSR.
5. Organisation and Resources. DNSR's professional complement is at 91%; 2 Inspector posts are gapped out of 23. The welcome establishment of a new Deputy Head post (at the Capt RN level) has led to the short term gapping of the Principal Inspector Operational Reactors post (at the Cdr RN level). Continued manning of the Principal Inspector Clyde & Fleet post at the appropriate RN rank is likely to prove challenging later in the year. Vulnerabilities exist in specific technical areas and DNSR is planning a number of initiatives to mitigate the impact of any loss of expertise. These include, establishment of a dedicated development post and working with ONR. It is anticipated that external resourcing pressures will continue to challenge DNSR's complement.
6. IRRS Style Review. Within the UK civil nuclear industry, ONR invite peer reviews<sup>22</sup> of their regulatory practice. While not a mandated requirement, DNSR has sought to adopt relevant good practice so far as reasonably practicable. To that end, DNSR has recently initiated a review of the MOD's nuclear regulatory framework broadly based upon the established practice of the International Atomic Energy Agency (IAEA) Integrated Regulatory Review Service (IRRS). The objective of the review is to compare the regulatory framework with relevant national and international guidelines.
7. Security Informed Nuclear Safety (SINS). A combined DNSR and ONR view on requirements for SINS in the Defence sector was introduced to stakeholders in the DNP in early 2012. AWE has provided an effective initial response and the approach is to define 'worst case' event scenarios and a 'bounding case' for specific facilities. The approach is similar to the application of the ENSREG Stress Tests following the Fukushima event. DNSR

<sup>21</sup> Including Freedom of Information Act requests, Parliamentary Questions and press enquiries.

<sup>22</sup> In accordance with Euratom Nuclear Safety Directive 2009/7: ".....Member States shall arrange at least every 10 years for periodic self-assessments of their national framework and competent regulatory authorities and invite an international peer review of relevant segments of their national framework and/or authorities."



welcomes consideration of the approach across other Defence Authorisees/Licensees and will seek to work with the DNP through the ESDF.

8. Joined-Up Regulation. The formation of DSEA is enabling growing regulatory coherence within the organisation; for example, the developing working relationship between DNSR and the Defence Ordnance Safety Regulator (DOSR) on Project TEUTATES (covered in Para 12). The Defence Nuclear Programme Regulatory Forum (DNPRF) has met on several occasions throughout the period and supports a coherent regulatory approach in the DNP; members include DNSR, DOSR and the Defence Maritime Regulator (DMR).

9. The joined-up regulatory approach with ONR is fundamental to strong and seamless regulation of the DNP. The approach has been successfully maintained throughout the reporting period and DNSR's focus on through-life safety of the DNP continues to complement ONR's regulation. Effective working relationships at all levels has ensured that joint regulatory programmes and strategies are produced and implemented. Both regulators intend to continue to work to enhance the effectiveness of the working relationship. In the coming year this will include examination of the benefits of closer alignment of DNSR and ONR Annual Report structure. Joint engagement with DE&S is planned to explore regulatory implications of the down-selected options of the Materiel Strategy.

10. The MOD/SEPA Agreement<sup>23</sup> was signed in the period. Working relationships with the EA and SEPA are effective and continue to develop. Joint activities led by EA during the reporting period included provision of support to a solid waste characterisation inspection at AWE.

11. Openness and Transparency. DNSR is seeking to develop its approach to openness and transparency, recognising the approach being taken by external regulators (e.g. ONR). However, a careful balance must be struck in Defence with the requirements of national security and international relations.

12. International Collaboration. A good working relationship continues to develop between DNSR and the French Defence Nuclear Safety Regulator, DSND<sup>24</sup>, following the joint signature of the Memorandum of Understanding<sup>25</sup> regarding cooperation in the regulation of Project TEUTATES. Regular meetings have been held both in the UK and France including a visit to the new hydrodynamic experimental test facility currently under construction in France. The relationship will be developed further in 2013 through the conduct of joint inspection activities. DNSR and DSND will also continue to work closely to ensure that the safety management arrangements for the project meet the expectations of both regulators.

13. Stakeholder Engagement, Legislation and Regulatory Policy. DNSR has been engaged in an ONR led review of the Safety Assessment Principles (SAPs) for Nuclear Facilities. This review is being carried out to capture learning arising from the events at Fukushima.

14. DNSR has continued to produce its own Technical Assessment Guides (TAGs) as self guidance, where necessary for the DNP, to supplement the coverage of ONR's TAGs. DNSR adopts ONR TAGs as appropriate and contributes in the drafting process. Three DNSR TAGs were issued during the reporting period.

15. JSP 518<sup>26</sup> and JSP 538<sup>27</sup> are currently being reviewed and updated; it is anticipated that the amended versions will be issued in Q2 2013 following final consultation through the Defence Nuclear Regulatory Forum (DNRF).

<sup>23</sup> "Agreement between the MOD and SEPA on Matters Relating to Radioactive Substances" dated 24 September 2012.

<sup>24</sup> Délégué à la sûreté nucléaire et à la radioprotection pour les activités et installations intéressant la Défense (DSND).

<sup>25</sup> "Memorandum of Understanding on TEUTATES between DSND and DNSR" dated 1 December 2011.

<sup>26</sup> JSP 518 – Regulation of the Naval Nuclear Propulsion Programme, Issue 3.10 dated September 2010.

16. Authorisation Certificates. The initial Authorisation Certificates (including Accreditation for design activities) across the NNPP and NWP were previously issued individually over an extended 10 year period following the extensive team inspection of individual Authorisee compliance arrangements. All Authorisation Certificates have been reviewed and re-issued to reflect the extant scope of Authorised activity and the requirement for robust Authorisee interface arrangements.

## SECTION 4 – PRIORITIES FOR 2013 – 2014

1. The action by those responsible for implementing the DNP should reflect the assessment assigned to the issues in Section 2. The timescales to address the issues range from the short to long term and in particular they should:

a. Embed effective use of development posts; pursue a succession planning approach for the MOD civilian nuclear community; pursue greater freedoms to recruit ex-military skills; pursue lateral entry into the MOD civilian NSQEP community; and align remuneration for MOD civilian nuclear skills with other Government departments (e.g. DWP/HSE). (*Issue 1*);

b. Assess the safety impact of strategic organisational change and gain MOD authority approval (e.g. via DESC) prior to implementation; ensure holistic organisational sustainability and 'intelligent customer capability' is robustly considered e.g. in any retained MOD organisation; and continue to develop robust organisational baselines that justify the roles and resource needed to safely deliver and identify the core roles that must be undertaken by the MOD Authorisee. (*Issue 2*);

c. Continue to prioritise the commitment and attention to safely managing the existing ageing plant, facilities and infrastructure. (*Issue 3*);

d. Focus on the development and implementation of robust PRS processes, taking good practice from the DNP and wider; ensure the strength of Authorisee internal challenge; ensure a safety informed approach is taken in design avoiding late application of the ALARP process; and pursue a 'right first time' safety case approach. (*Issue 4*);

e. Pursue a Submarine Enterprise (including AWE) approach to development of a 'right first time' quality culture, including quality delivery from the supply chain. (*Issue 5*);

f. Engage early with DNSR on transport package development programmes and prioritise operational container approval requirements, recognising DNSR resourcing limitations. (*Issue 6*); and

g. Continue the safety culture development initiatives and seek to develop the organisational culture to firmly establish the characteristics of a high reliability and learning organisation.

2. In addition to routine regulatory activity, particularly focussed on the issues above, DNSR should:

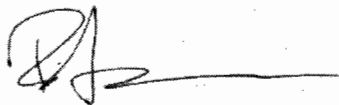
a. Seek to establish full staff complement; complete a scoping exercise to examine DNSR's long term sustainability recognising wider MOD organisational developments; and support the review to inform possible DSEA/MAA operation under common management. (*Section 3, Paras 5 & 9*);

b. Issue a DNSR Regulatory Strategy, including strategic themes. (*Section 3, Para 9*);

c. Complete an IRRS style review and establish a programme to suitably take forward any recommendations. (*Section 3, Para 6*);

d. Continue to enhance the effectiveness of the joined-up working relationship with ONR, to include working together with the ESDF. (*Section 2, Para 21 & Section 3, Para 9*);




- e. Continue to lead and develop the DNPRF promoting a coherent regulatory approach across the DNP. (*Section 3, Para 8*);
- f. Work with the Authorisees/Licensees to develop appropriate guidance in progressing SINS expectations. (*Section 3, Para 7*); and
- g. Issue updates to JSP 518 and JSP 538. (*Section 3, Para 15*).

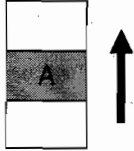

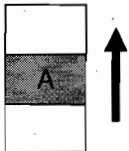
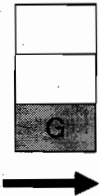
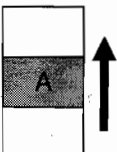


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## ANNEX A – SUMMARY OF KEY ISSUES (2012 – 2013)

1. A summary of key issues across the Defence Nuclear Programme is provided in Table A-1.
2. Within the Table, “*safety performance*” should be interpreted as follows:
  - a. Red. Significant and sustained Duty Holder attention is required to ensure maintenance of adequate safety performance.
  - b. Amber. Duty Holder attention is required to ensure maintenance of adequate safety performance.
  - c. Green. Safety performance is considered adequate.
3. Arrows indicate whether safety performance is assessed to be improving, degrading or remaining steady.
4. The safety performance assessment is an indicator of safety performance and needs to be read in conjunction with the relevant narrative. The assessment definitions have been updated this year to reflect relevant good practice and to re-focus the emphasis on Duty Holder action rather than regulatory intervention.

Issue	Potential Mitigation	Safety Performance
<p><b>1. Resources and Nuclear Suitably Qualified &amp; Experienced Personnel (NSQEP)</b></p> <p>Incorporating Issue 1 (Adequacy of Resource) &amp; Issue 2 (People) from 2011 Annual Report</p> <p><i>Section 2, Paras 2–11</i></p>	<ul style="list-style-type: none"> <li>• Maintain continued senior management focus.</li> <li>• Provision of robust organisational baselines.</li> <li>• Embed effective use of development posts.</li> <li>• Pursue a succession planning approach for the MOD civilian nuclear community.</li> <li>• Pursue greater freedoms to recruit ex-military skills.</li> <li>• Recruitment via lateral entry into the MOD civilian NSQEP community.</li> <li>• Alignment of remuneration for MOD civilian nuclear skills with other Government departments.</li> </ul>	
<p><b>2. Strategic Organisational Change</b></p> <p>Incorporating Issue 1 (Adequacy of Resource) &amp; Issue 3 (Front Line Responsibilities) from 2011 Annual Report</p> <p><i>Section 2, Paras 12–22</i></p>	<ul style="list-style-type: none"> <li>• Assess safety impact of strategic organisational change.</li> <li>• Gain MOD authority approval prior to implementation.</li> <li>• Ensure holistic organisational sustainability and ‘intelligent customer capability’ is robustly considered.</li> <li>• Continue to develop robust organisational baselines.</li> <li>• Sound leadership and safety management.</li> <li>• Consistent application of sound organisational change processes.</li> <li>• Early regulatory engagement in strategic change initiatives</li> </ul>	
<p><b>3. Ageing Plant, Facilities &amp; Infrastructure</b></p> <p>New Issue</p> <p><i>Section 2, Paras 23–28</i></p>	<ul style="list-style-type: none"> <li>• Maintain senior management focus to reduce risk of slippage in plant/facility replacement projects.</li> <li>• Continued prioritisation to ensure safe management of existing ageing plant, facilities and infrastructure.</li> <li>• Ensure EIMT plans are robust and fully implemented.</li> <li>• Reinvigoration of UK SIP.</li> <li>• Maintain a holistic approach to infrastructure investment across NNPP through the SEIF.</li> </ul>	

Issue	Potential Mitigation	Safety Performance
<p><b>4. Safety Case Improvement &amp; Safety Management Arrangements</b></p> <p>Incorporating Issue 4 (Safety Case Improvement) &amp; Issue 5 (ALARP Demonstration) from 2011 Annual Report</p> <p><i>Section 2, Paras 29–37</i></p>	<ul style="list-style-type: none"> <li>• Focus on the development and implementation of robust PRS processes.</li> <li>• Ensure a safety informed approach is taken during design avoiding late application of ALARP process.</li> <li>• Implement 'Safety Case on a Page' methodology across DNP.</li> <li>• Pursue a 'right first time' safety case approach.</li> <li>• Ensure the strength of internal challenge.</li> </ul>	
<p><b>5. Quality of Product (incorporating Control of Work)</b></p> <p>Incorporating Issue 6 (Control of Work) from 2011 Annual Report</p> <p><i>Section 2, Paras 38–45</i></p>	<ul style="list-style-type: none"> <li>• Pursue a Submarine Enterprise (including AWE) approach to development of a 'right first time' quality culture.</li> <li>• Pursue quality delivery from the supply chain.</li> <li>• Delivery of a Submarine Enterprise Quality Strategy.</li> <li>• Maintain NRPA and MOD customer oversight of build quality at BAES and RRS sites.</li> </ul>	
<p><b>6. Transport &amp; Package Approval</b></p> <p>New Issue</p> <p><i>Section 2, Paras 46–50</i></p>	<ul style="list-style-type: none"> <li>• Engage early with DNSR on transport package development programmes.</li> <li>• Prioritise operational container approval requirements across DNP.</li> </ul>	
<p><b>7. Nuclear Liabilities</b></p> <p>Incorporating Issue 8 (Nuclear Liabilities) from 2011 Annual Report</p> <p><i>Section 2, Paras 51–55</i></p>	<ul style="list-style-type: none"> <li>• Maintain the commitment and momentum generated on decommissioning and disposal recognising that the funding threat remains.</li> <li>• Maintain focus on delivering against commitments in the MOD's Nuclear Liabilities Management Strategy.</li> </ul>	
<p><b>8. Fukushima Response</b></p> <p>New Issue</p> <p><i>Section 2, Paras 56–63</i></p>	<ul style="list-style-type: none"> <li>• Close out remaining 'considerations' identified for further review and sentencing following Stress Tests.</li> <li>• Further consideration of risk associated with ageing facilities.</li> <li>• Complete assessment of threats to submarine NRP from Stress Tests.</li> <li>• Take an enterprise wide perspective on addressing the Fukushima considerations, including a Defence Resilience approach, via the ESDF.</li> </ul>	

**Table A-1 Summary of Key Issues (2012 – 2013)**

## **ANNEX B – SUMMARY OF KEY ISSUES (2007 – 2011)**

1. A summary of key issues, as identified in DNESB and DNSR Annual Reports over the past 5 years, is provided in Table B-1.
2. Within the Table, a Red (High) current status suggested that significant action might be necessary within 12 months; Amber (Medium) and Green (Low) risks had commensurately longer realisation periods.
3. Arrows indicated whether the Current Status was assessed to be improving, degrading or remaining steady

Issue	Regulatory Risk	Suggested Strategies & Controls	Owners & Managers	Status				
				2007	2008	2009	2010	2011
<b>1. Adequacy of Resource</b> Lack of adequate resource to deliver the defence nuclear programmes safely.	Risk to the protection of the workforce and to compliance with JSP 518 & JSP 538.	a. Identify organisational baselines and essential level of resource (human & financial) required to deliver programmes safely. b. Compare with existing level of resource and where necessary seek appropriate additional resource.	CoM(F) & NC Managers: NP-Hd Authorisees	→	→			
<b>2. People</b> Measures already in hand may be insufficient to address the present and predicted shortage of NSQEP in the Royal Navy, among MOD civilians and in defence contractors.	Risk to the protection of the workforce and to compliance with JSP 518 & JSP 538.	a. Continue to implement present initiatives b. Grasp outstanding reward and lateral recruitment issues. c. Consider crown control and industrial sustainability in outsourcing decisions.	COM(F) & NC Managers: DSM, NC & NP-Hd Authorisees	↓				
<b>3. Front Line Responsibilities</b> Navy Command is in control of submarines "at sea" but is not the authorisee.	Risk to demonstrable compliance with legislation and defence policy	a. Investigate migration of the authorisation for submarines "at sea" to NC from CSSE (weapons) and NP (propulsion). b. Integrate developing thinking from Haddon-Cave Duty-Holder workstream.	NC Managers: NC, NP-Hd, CSSE			→	↓	→
<b>4. Safety Case Improvement</b> Safety Cases in the DNP are inconsistent against current good practice; integration of safety analyses for the reactor and weapon needs to be expedited.	Risk to compliance with regulatory requirements.	a. Continue the development of reactor and weapon safety analyses. b. Integrate these analyses into activity safety cases. c. Embed the disciplines of Periodic Review of Safety.	COM(F) & NC Managers: Authorisees & Approving Authorities	→	↑	→	→	→
<b>5. ALARP Demonstration</b> The demonstration that the risk from DNP activities is ALARP is inconsistent and tortuous to uncover.	Risk to demonstrable compliance with legislation.	a. Teach disciplines of ALARP justification and embed in culture.	COM(F) & NC Managers: Authorisees & Approving Authorities		↑	→	→	→
<b>6. Control of Work</b> The number of incidents remains too high.	Risk to the workforce and public safety and to the environment, in both short and medium term.	a. Maintain current momentum in identifying and implementing best practice. b. Continue the momentum in addressing safety culture.	COM(F) & NC Managers: Authorisees	↑	→	↑	→	→
<b>7. Co-operation</b> Co-operation between Authorisees and between Authorisees and Approving Authorities needs to be improved & formalised.	Risk to compliance with JSP 518 & JSP 538.	a. Develop and agree documented arrangements between Authorisees. b. Develop and agree documented arrangements between Authorisees & Approving Authorities. c. Provide compliance statements for FAC1 (Duty of Co-operation).	COM(F) & NC Managers: Authorisees & Approving Authorities	→	↑	↑	→	→
<b>8. Nuclear Liabilities</b> Full funding has not been allocated to deliver the Nuclear Liabilities Strategy.	Risk to meeting Government policy.	a. Allocate funding to meet the liabilities declared in the MOD Strategy.	DSM Manager: SM-CE	↑	↑	↑	↑	→

Table B-1 Summary of Key Issues (2007 – 2011)