



Ministry
of Defence

DEFENCE SAFETY AUTHORITY

ANNUAL ASSURANCE REPORT

April 2014 – March 2015

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INTRODUCTION

1. The Defence Safety Authority (DSA) was formed on 1 April 2015 when the organisations responsible for Maritime, Land, Aviation, Nuclear, Ordnance and Fire regulation were brought together, along with Corporate Policy Assurance, under a single 3* military head to establish an Initial Operating Capability. This Annual Report is written at a time of significant change to the way in which Defence Safety is governed and regulated. As well as the Secretary of State directing the formation of the single DSA, the Permanent Under Secretary also directed a review into the way in which Defence Safety should be regulated in the future. In support of this latter task, the Defence Safety Regulatory Review (DSRR) is nearing completion and will report separately to the Armed Forces Committee and the Defence Board later this year, with Full Operating Capability of the DSA currently programmed to be achieved on 1 April 2016. The role of the DSA is to safeguard Defence's capabilities and support its operational imperatives with appropriate and proportionate regulation. Since this Report has been written while the DSA transitions between its Initial and Full Operating Capability it reflects the level of regulatory assurance as seen by the legacy pre-DSA domain Regulators, a degree of self-assessment by the Top Level Budget (TLB) areas plus my own judgement. Overall, progress towards compliance with the Secretary of State's Health, Safety & Environmental Protection (HS&EP) policy is still somewhat short of the required level. Although good work has been done in several areas, the overall picture remains mixed; some organisations have improved, some have regressed and some have not progressed as far as expected.

2. Whilst provision of Suitably Qualified and Experienced Personnel (SQEP), particularly in the technical areas, is undoubtedly an issue across much of Defence, the term SQEP has become something of a mantra and care must be taken to understand exactly where the true shortages that have an impact on Defence safety outcomes actually lie. Any lack of progress with intractable issues such as this, or policy compliance in other areas, should be seen against the backdrop of a continuation in the high levels of Defence activity this year, including the successful re-deployment from Afghanistan, ongoing operations in the middle-east and Africa, and a re-invigorated overseas exercise programme. The redeployment from Afghanistan was a unique challenge and, from a safety point of view, was conducted in a highly competent manner which resulted in few incidents. It is clear that there are a number of significant safety risks across Defence which are being addressed by the Duty Holding community where they have the levers to do so. However, particularly when significant investment is required, the Duty Holders are not always sufficiently empowered to solve the issues that they face. There are several significant risks worth highlighting, including technical SQEP shortages, Mid-Air Collision risk, the material state of the Fuel and Gas infrastructure, Maritime Safety, and the issues around Supervision and Control across a wide

range of routine activity, both operational and training, including areas such as Adventurous Training (AT). I will expand on these later in this Report.

3. Of particular concern to me as Director General is the health of the Defence Regulators themselves. They must be capable of providing comprehensive levels of assurance if we are to truly understand and manage the safety related risks that the Department faces. The Military Aviation Authority (MAA), set up in 2010, was correctly resourced and is now maturing. It has developed into a highly competent Regulator, as reinforced during its 2014 external audit¹. However, there are weaknesses in the ability of some of the other Regulators to provide the comprehensive level of assurance required within their domain activities. Specifically, the Defence Maritime Regulator (DMR) and the Defence Land Safety Regulator (DLSR) are struggling to provide thorough assurance of the wide range and scale of activity within their areas of interest.

4. Transformation remains a significant feature of Defence business, and hence a potential safety risk, since organisational change has been recognised as a factor in many historic accidents. Further to last year's Annual Assurance Report², the new governance arrangements for significant Departmental change have been implemented, with Organisational Safety Assessments ongoing for: DE&S' change of status (now being covered under Acquisition Architecture Reform); the sale of the Marchwood Sea Mounting Centre; outsourcing of Logistics Commodities and Services and the Defence Fire and Rescue Transformation Project. These arrangements should ensure that the impact of change and how it impacts on safety specifically is assessed. The DSA will continue to work with Senior Responsible Owners across these change programmes to provide advice if safety concerns emerge.

5. The tragic loss of 9 lives during the reporting period acts as a reminder of the enduring need to remain focussed on safety. However, this loss is consistent with rates over the last 5 years which average 3.6 safety-related deaths annually for every 100,000³ members of the Regular and Reserve Forces. The overall figure includes 5 personnel killed in a Lynx helicopter which crashed on a training flight in Afghanistan, a vehicle crushing and a vehicle rollover accident in the UK, a crushing in a service lift on HMS BULWARK during maintenance activity, together with a drowning during an AT Kayaking expedition in Cyprus. The names of those lost in these safety-related accidents for the year 2014/15 are recorded at Appendix 1. There have been 3 Health & Safety Executive enforcements issued against the Department during the reporting period which include: a joint Army/Defence Infrastructure Organisation (DIO) Crown Censure for a fatal shooting at

¹ [MAA external audit panel report](#).

² [MoD Health, Safety and Environmental Protection Annual Assurance Report 2013-14 \(www.gov.uk\)](#).

³ See paragraph 38.

Castlemartin Range (that occurred in 2012) and 2 Crown Prohibition Notices against the Sea Mounting Centre at Marchwood in relation to the risk management process for the handling and storage of explosives on site.

6. On becoming the Director General DSA on 1 April 2015, I also assumed the role of primary Convening Authority for all Service Inquiries (SIs) into serious safety-related accidents and fatalities across Defence. The previous application of the SI process has been somewhat sporadic and at variance with that mandated by statute and policy. This has now changed. With the formation of the DSA all safety-related deaths, expensive equipment losses and incidents involving novel safety-related issues will be investigated in accordance with either statute or mandated policy. Lessons from these investigations form a crucial part of the process of improving Defence Safety and reflect to the Next-of-Kin, Coroners and the public how seriously Defence takes the loss of any person.

SAFETY ASSURANCE STATEMENTS

7. At the heart of the current regulatory approach are the Regulators' individual assessments of the effectiveness of the safety management systems present within each of their respective domains. However, the weight of each of these Regulator assessments is dependent upon the effectiveness of the Regulators themselves. The diagram at Figure 1 provides my impression of the capability, or level of oversight and assurance, each Regulator is currently able to provide. The graph is built on work from the DSRR and my judgement. A high degree of confidence can be attached to the assurance levels provided for the Nuclear and Aviation domains for example, while there is greater uncertainty as to the accuracy of the risk picture others are able to present, in particular Land and Maritime. The challenges faced by the Maritime Regulator are covered in depth later. A recent Health and Safety Executive audit⁴ found that the Land Systems Safety Regulator⁵ had weaknesses with regard to its audit, inspection and enforcement capabilities as a consequence of the disproportionately limited resources available to cover the wide span of domain activity it oversees. As a result, in some domains the risk picture is well understood and assurance of safety management systems can be well targeted, enabling a confident assessment of assurance to be provided. In other areas, the risk picture is less well understood and the Regulators less able to assure activity.

⁴ HSE Review of the MOD Land Systems Safety Regulatory Regime – 9th to 12th February 15.
⁵ The Land Systems element of the Land Regulator (DLSR).

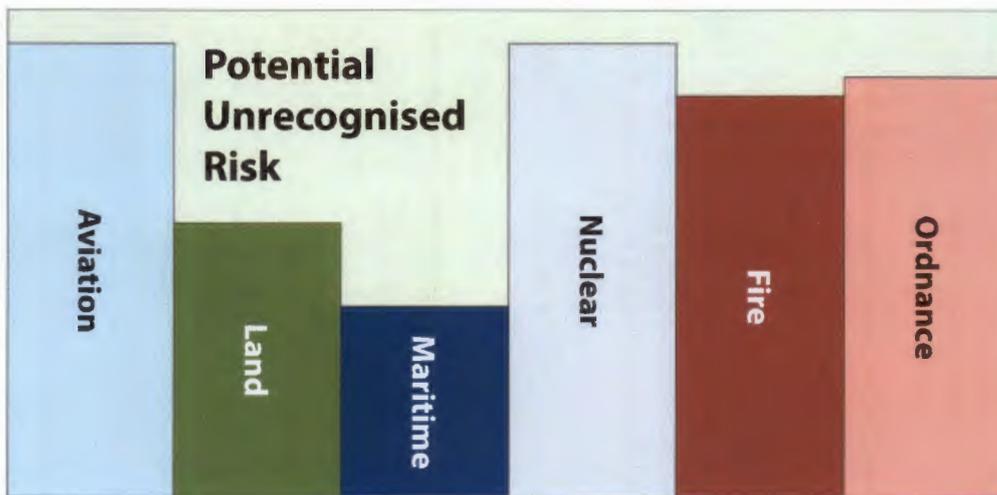


Diagram of Regulatory Health.

8. On this basis, using a combination of each Regulator's own assurance assessment coupled with my own judgement of overall Regulator effectiveness, this year's Annual Assurance assessments are detailed below:

a. **Aviation.** Director Military Aviation Authority (D MAA) considers that the Defence Aviation Environment continues to face significant risks including shortages of SQEP, Mid-Air Collision and those associated with a return to contingent operations. As recommended by Haddon-Cave in the Nimrod Review, the second external audit of the MAA was carried out by the MAA External Audit Panel in Autumn 14 (MEAP14). The MEAP14, consisting of senior members of the Civil Aviation Authority, the Health and Safety Executive, the Department for Business, Innovation and Skills, United States and French Airworthiness Authorities, found the MAA to be fit for purpose as a regulator and confirmed that all of the Haddon-Cave recommendations had been successfully implemented. The MAA is now into its 5th year and has matured considerably as a regulator, to the extent where I have every confidence that the Duty Holder construct in the Defence Aviation Environment is working effectively, providing a strong risk management focus across all areas. Indeed, there are many areas across the Defence Aviation Environment, which encompasses the operation of military registered and operated aircraft by all 3 Services and contractors, where Substantial assurance could now be justified. However, there are still areas where shortages of SQEP are inducing stress to a point where overall assurance is reduced. A good reporting culture that reports near-misses exists, which reaffirms the view of a credible Regulator that is able to provide significant oversight. However, it is also a fragile domain where things can go wrong very quickly and involve large numbers of our people as we saw with the RAF Voyager incident (loss of control – April 2014). Indeed, Aviation will historically account for close to half of the safety-related deaths across Defence each year and is a domain which requires constant attention. Overall, D MAA assesses the Assurance level across the

Defence Aviation Environment to be **Limited**⁶ and whilst I agree with this assessment, this represents a strong Limited rating with Substantial across many areas.

b. **Land.** This covers 3 specific areas including Land Systems, Movement and Transport, and Fuel and Gas. The Regulator and TLBs highlight several areas of concern including SQEP provision and, particularly, a lack of experience at all levels. They also highlight Configuration Control of safety modifications across Land Systems as an issue, following absorption of the Urgent Operational Requirement vehicles into the Core Equipment Programme. Moreover, the lack of completion of Equipment Safety Cases remains a cause of concern to the Regulator. The Health and Safety Executive conducted an audit of the Land Systems element of the Defence Land Safety Regulator (DLSR) and found that there was an effective structure and the principles of good regulation were being followed, although weaknesses were identified with regard to the resources available to audit, inspect and enforce when required. I believe these observations highlight the existence of a significant boundary in the Land domain: the regulation of equipment and its use is well understood and exercised, but uncertainty exists as to how best to regulate activity across the whole Land domain. This is significant since most of the Risk-to-Life in this particular domain is focussed on activity undertaken by personnel, rather than as a result of accidents and incidents during the operation of equipment. Whilst the Regulator has assessed Substantial assurance across his area of interest, taking into account both comment from the Health and Safety Executive and DLSR's limited audit resource and capability, I assess that **Limited** Assurance would be more appropriate. In Movement and Transport, it is pleasing to note there has been improvement in most areas including reductions in non-compliances. For example, there has been a significant improvement in the transport of Dangerous Goods with 71% of units now compliant compared to 58% last year. I agree that Movement and Transport merits **Substantial**⁷ Assurance but this is fragile and somewhat of a sample due to the vast area of interest covered. Within Fuel and Gas, infrastructure remains the key issue. Overall, enforcement action has not resulted in any noticeable improvements to the safety failings identified and the DIO remains in a reactive position. With enforcement action being taken against 13% of sites during the year, the MOD cannot be assessed as compliant with legislation. Overall, **Limited** Assurance is appropriate in the Fuel and Gas domain.

c. **Maritime.** The DMR considers that Maritime Duty Holders are broadly achieving minimum safety standards. However, a range of 2nd Party evidence indicates a variety of

⁶ Limited Assurance – System of internal control operating effectively, except for some areas where significant weaknesses have been identified (DIA Assurance Classifications updated July 2014).

⁷ Substantial Assurance – System of internal control established and operating effectively with some minor weaknesses (DIA Assurance Classifications updated July 2014).

problems, of differing magnitudes and complexity, across the Maritime safety management system. The areas of concern span 3 areas; the current materiel state of the fleet, particularly amongst the older vessels or those in constant operational demand; the cumulative effect of maritime manpower shortages and sufficient experience amongst both frontline military personnel and in military and civilian specialist support roles in the DE&S, and also DMR. The DMR is currently unable to conduct any significant 3rd Party assurance, except in the case of diving, and this year offered only **Limited** Assurance of the Maritime domain. However, due to the severe limitations in its regulatory oversight, I believe that this assessment is probably generous and I would judge that the true level of assurance that DMR are able to provide lies closer to the No Assurance⁸ end of the spectrum, primarily due to its current level of resourcing. The Ship Safety Management Office and the Shipping Inspectorate within the DMR are currently severely understaffed and operating at 50% of the required capacity. Strenuous efforts to recruit have struggled to provide a competitive offer and therefore have been largely unsuccessful. DMR is also reliant on 3rd Party audit from the Defence Equipment & Support (DE&S) Naval Authority Group (NAG) and hence are contravening the Haddon-Cave principle of independent assurance since the NAG works for CofM (Fleet) DE&S. I consider Maritime safety to be a significant risk and more detail is contained in the Strategic Risks section of this Report.

d. **Nuclear.** Defence Nuclear Safety Regulator (DNSR) provides Substantial Assurance that the arrangements and management of nuclear safety across the Defence Nuclear Programme (both Propulsion and Weapons) continue to meet the exceptionally high standards required by external and internal regulation. This judgement aligns with Navy Command and DE&S assessments of nuclear safety performance. In addition, the Office of Nuclear Regulation (ONR) considers that the licensed Defence sites demonstrate adequate control of the nuclear and radiological hazards and have met the required safety standards in 2014/15. However, the ONR did ask that this statement should be read within the context of their full report⁹. Finally, advice provided by the Defence Nuclear Safety Committee also forms part of the picture¹⁰. Overall, with a wealth of evidence, I endorse this assessment of **Substantial** Assurance but Defence must not be complacent as failure to address an ageing demographic amongst Nuclear SQEP (NSQEP) across Defence could threaten this position in future years as we move into a significant period for the Defence Nuclear Programme.

⁸ No Assurance - System of internal control poorly developed or non-existent (DIA Assurance Classifications updated July 2014).

⁹ <http://www.onr.org.uk/documents/2015/annual-report-2014-15.pdf>.

¹⁰ [Defence Nuclear Safety Committee Triennial Review Report](#).

e. **Ordnance, Munitions and Explosives.** The Defence Ordnance, Munitions and Explosives Safety Regulator (DOSR) assesses that internal controls across all related Defence activities are currently operating effectively in relation to Ordnance, Munitions and Explosives and is therefore able to provide **Substantial** Assurance of safety systems. This assessment is based on extensive evidence gathered during audits and inspections and confirms that high standards are being maintained across Defence. I concur with this assessment.

f. **Fire Safety.** Despite the need to issue regulatory enforcement notices in a small minority of cases, the Defence Fire Safety Regulator (DFSR) judges that Substantial Assurance can be provided of the level of compliance with fire safety regulations across Defence. While I generally concur with this assessment, I note that concern does exist around competency of personnel appointed to fire safety duties and the clarity with which roles and responsibilities are defined, particularly in deployed locations. The placing of the DFSR within the DSA has been a welcome move which now provides independent assurance across a wide area of fire safety interest. I would therefore concur with this **Substantial** Assurance assessment, but would judge it to tend towards the Limited end of the spectrum.

9. It is clear that whilst the Defence Regulators are working at capacity, there are wide disparities in their ability to provide assurance. The disparities are caused by combinations of the following factors: limited technical SQEP, lack of audit capacity, non-risk based assurance approaches, lack of independence, lack of focus on Risk-to-Life and activity focussed in the wrong area, for example, too much emphasis on equipment regulation at the expense of activity or maintenance based attention. Overall, Defence is undertaking a significant transition in the way it manages Safety and the DSA and DSRR will provide the first step towards a single Safety organisation that is able to provide appropriate and proportional risk-based assurance across the spectrum of Defence activity. The answer may not necessarily be based on additional regulatory manpower, although there are shortages, but on “smarter regulation” which is risk-based and fed by reporting and safety data; the benefits of this are now being seen in the Aviation domain but investment is required in Information Technology across the other Regulator areas if similar benefits are to be realised elsewhere. At this time there are numerous risks to safety which have been identified and continue to receive the attention of the Duty Holding community. On balance I judge that the assurance levels provided by the Regulators are in many instances too low for comfort, potentially leading to unrecognised risk; the scale and scope of the risk that Defence is unwittingly exposed to will be the focus of the DSA's attention over the next reporting period.

STRATEGIC SAFETY RISKS

10. Following my appointment as the Director General DSA, I have identified what I believe to be the strategic safety risks that Defence currently faces. These are derived from the Risks-to-Life being held and mitigated across all of the Operating Duty Holder areas and comprise: the consequence of a lack of SQEP in roles and posts that can influence safety outcomes; the risk of Mid-Air Collision; the poor condition of the Fuel and Gas infrastructure and Maritime Safety including the current lack of effective Maritime regulatory oversight.

SUITABLY QUALIFIED AND EXPERIENCED PERSONNEL

11. The problem of ensuring that sufficient SQEP are available across Defence remains a key theme. The Defence Board has identified that achieving and sustaining the appropriate manpower numbers and skills to deliver Defence outputs is probably the single greatest challenge currently facing the Department. The Defence Safety community has this year again widely reported this concern. I am concerned about the shortage of SQEP in 3 main areas: at the frontline, particularly in aviation and maritime units and in engineering appointments generally; in safety critical posts within DE&S; and amongst the Safety Regulators – most notably for the future in the Nuclear domain.

12. While pinch points do exist in front-line manning levels, they are relatively well understood and are being actively managed by the Department and TLBs. However, concealed within the overall manning picture is a reduction in the experience levels of certain segments of manpower following a period of churn, both intentional as a result of planned restructuring, but also as a result of a less controllable voluntary outflow, typically involving personnel with transferable skill sets. The impact of the voluntary outflow in certain areas, such as aircrew and engineers, is a safety concern because, while overall manning levels can generally be managed through recruitment, the process of replacing experience is much less straightforward. The loss of this experience and the impact it has on safety outcomes, either directly through accident rates or indirectly due to a dilution in supervisory effectiveness, is much harder to track, quantify and actively manage. To a greater or lesser extent this situation is affecting all domains (and is being actively managed across all TLBs by Manning Pinch Point activity). In Army Aviation shortages exist amongst both Qualified Helicopter Instructors and the Sergeant to Major ranks of the aircrew cadre; this is coupled with a shortage of REME aviation engineers in several disciplines. In the RAF a large proportion of Trade Group 1 aircraft engineers have only limited experience on type and in the Navy submarine and shipping areas manning is extremely taut, resulting in the gapping of certain engineering appointments on some sea going deployments, and the increasing reliance on junior hands to fulfil

mandatory emergency roles within deployed crews. All of these examples highlight the increasing supervisory challenge that is being induced by reductions in experience levels at the frontline.

13. The key concern that Operating Duty Holders have outside their own areas is the availability of SQEP in DE&S to deliver the technical support they need to meet their Duty Holder responsibilities. Significant vacancies remain within the DE&S organisation with gapping of both military and civilian posts, although the latter is by far the most concerning as it is this cohort that should provide continuity and corporate memory. The lack of Service SQEP availability amongst Navy personnel has the potential to affect DE&S' ability to procure and maintain some Maritime platforms. In the DE&S Air domain, gapping manifests itself in routine airworthiness tasks not being addressed, ultimately transferring risks onto Operating Duty Holders. CofM(Air) has sought to help mitigate this with the successful introduction of an airworthiness Recruitment and Retention Allowance (RRA), although take-up has been lower and slower than anticipated. Within the Ships area of DE&S, the lack of SQEP has resulted in the prioritisation of work resulting in a lower level of day to day assurance activity. This is also reported by the NAG who are concerned that staff changes, gapped posts and support to non-core activities is adding risk to the Ship Certification process. While the NAG has recently had some success in filling posts, the lack of resilience remains. Overall, 7% of safety critical posts are unfilled across DE&S.

14. Within the Nuclear domain, the ability of the Department to sustain a sufficient number of Nuclear SQEP (NSQEP), both civilian and military, remains the principal threat to the delivery of nuclear safety. The Defence Nuclear Programme is busy and will be increasingly so, including significant commitments to build new nuclear facilities. The decision to refuel HMS Vanguard has added further pressure to an already demanding programme. To mitigate this, a number of initiatives are ongoing, including the introduction of a significantly enhanced RRA for civilian NSQEP in Dec 13 and the provision of dedicated training posts to assist the development of Nuclear Regulator staff. There is evidence that these are now beneficially impacting on the recruiting and retention of civilian NSQEP personnel. However, vulnerability remains in this small and highly skilled group and whilst safety has not been compromised, the lack of resilience increases the potential for project and programme delays in future.

15. Against the backdrop of a national shortage of engineers and technicians, compounded by the challenging age demographic¹¹ and the difficulties of matching pay scales offered in the private sector, the work commissioned by the Defence Board to satisfy the requirement for SQEP across Defence should lead to some improvement in this deep-rooted problem. Improvements in

¹¹ The Defence Economics Paper on External Factors Affecting UK Armed Forces Engineers and Future Prospects dated 9 May 14 notes that the UK 16-24 year old population is falling and estimates that 25% of UK engineers will retire in the next 10 years.

workforce planning and recruiting specifically to address the supply of critical skills should all help, but these measures have still to produce any identifiable impact at the front-line. The challenge facing the Department is made more difficult within the Civil Service because there is only a limited ability to match skills to posts by managing individuals within a constrained Human Resource framework. This has the potential to be compounded following the introduction of new pay freedoms within the DE&S which could unbalance the distribution of SQEP in safety related roles in other parts of Defence. It is clear that the provision of sufficient SQEP will continue to represent a significant safety risk across all domains for the foreseeable future and the DSA will continue to monitor the situation closely. Furthermore, initiatives must be designed, delivered and sustained in such a way as to ensure that any 'cliff-edge' future reduction in manning levels caused by the ageing demographic of our NSQEP workforce is not allowed to occur.

MID-AIR COLLISION

16. The risk of Mid-Air Collision continues to feature in the top level risks of all Aviation Operating Duty Holders. The UK Airprox Board continues to highlight the large number of near-misses between aircraft in flight (referred to as an "Airprox") in UK airspace, with data showing that in 2014 the number of military reported Airprox (94) exceeded that for 2013 (82). This is assessed to be as a result of a return to flight by the Tutor fleet during this reporting period rather than as a result of any fundamental change in military flying training in the UK or safety-related behaviour of Defence aircrews. Mid-Air Collision remains a significant Risk-to-Life and trends remain consistent, particularly in relation to the rate of military Airprox with civilian gliders, which have again been recorded with some regularity (accounting for 17.5% of all Airprox and 23% of those considered to be Risk bearing). This is possibly due to the lack of conspicuity of gliders, both visual and electronic, in comparison with conventional aircraft and helicopters, coupled with the absence of other barriers such as effective communications. While the conspicuity of military operated gliders has been improved, it remains a problem with many civilian operated platforms. The MAA held a national Mid-Air Collision conference in November 2014, after which the Civil Aviation Authority and I agreed (as the then DG MAA) to investigate collaboratively several themes that could help address collision risks between military traffic and General Aviation. One theme was the understanding and use of UK Flight Information Services by both military and civil crews, given their pre-eminence in UK Airprox Board reports. The intent of the collaborative MAA/Civil Aviation Authority work is to break down some of the barriers that appear to make elements of the General Aviation community reluctant to engage with military Air Traffic Controllers and promote a more flexible use of certain segments of military airspace. This may also assist in reducing some of the funnelling effects that can occur if traffic routinely seeks to route around, rather than through, military controlled airspace leading to higher traffic densities and therefore greater risk of Mid-Air Collision in certain areas. Breaking down these barriers should lead to an improvement in the

situational awareness of both controllers and all aircrew, both military and civil, since more users will be operating on the same frequencies in the affected areas.

17. As DG MAA I covered the issue of fitting Airborne Collision Avoidance Systems, in particular to Typhoon, comprehensively in last year's MAA Annual Report¹². I continue to recommend this issue be pursued with haste. I am reassured that this view is now shared widely across Defence as evidenced by the fact that the physical and societal elements of the associated risk are now correctly allocated across the Duty Holding chain, with the risk of Typhoon Mid-Air Collision with Commercial Air Traffic now being held by the Chief of the Air Staff and the Secretary of State aware of the societal concern - pending a decision on the procurement of a Typhoon collision warning system. The integration of a Traffic Collision Avoidance System on Tornado is now well underway which is good news for Defence. The UK leads the world in integrating such a system into in-service combat aircraft and while the programme has encountered some technical difficulties with consequential delays to the Certification programme, the system was available and was being used for routine training flights in January this year.

FUEL AND GAS INFRASTRUCTURE

18. The condition and maintenance of the fuel and gas (which includes oil for the purposes of this report) infrastructure has again been identified as a major concern by the TLBs and the Defence Regulators. The Defence Fuel and Gas Safety Regulator (DFGSR) has reported that 70% of their enforcements issued this year have been for infrastructure non-compliances. Problems identified included failings in self-inspection regimes as well as a lack of essential maintenance at some facilities. The current state of the fuel and gas infrastructure presents a Risk-to-Life, threatens operational outputs and risks harming the environment. These issues have been reported for at least the last 3 years and to date the progress made has been patchy. The Department leaves itself open to significant criticism and reputational damage should any of these identified risks subsequently materialise. The fuel and gas infrastructure has suffered from a lack of investment over a significant period, combined with inadequate maintenance across an ageing estate. While there are several examples that could be selected, the DIO inspection of the Cyprus facility in 2014 illustrates the concern. It identified 166 defects, mostly environmental hazards, but also including explosive atmosphere rated equipment that, in hot/dry ambient conditions, did present risk of personal injury. In addition, the sheer volume of defects found indicates a fragility that could easily affect operational capability. While such deficiencies result in Prohibition and Improvement Notices being served by the DFGSR, some of the facilities, particularly within the

¹² [MAA Air Safety Annual Report 2013- 2014](#).

remit of the Joint Forces Command (JFC), represent single points of failure forcing Operating Duty Holders to either find alternative arrangements or accept the risk of continued operation.

19. The DIO holds the allocated budget to maintain the fuel and gas infrastructure and has shown some commitment to address these issues with an in-year inject of £23M¹³ to rectify defects. They have also improved their understanding of the Professional Inspection process which should speed up their ability to respond to enforcement action placed on them. However, these measures have not yet resulted in any noticeable improvements to the underlying safety failings. Neither have they allowed the DIO to move beyond a reactive position. Progress towards compliance with the Dangerous Substances and Explosives Atmosphere Regulations in particular has been slow. While the significant investment made by the DIO for improvements should go some way to improving the situation, it is clear that further measures are required to ensure that the Defence fuel and gas infrastructure fully complies with both legislative and operational requirements. The Defence Board has agreed the addition of £80M to achieve a basic package of legislative compliance for the 6 UK Oil Fuel Depots which are under the day to day management of the Oils and Pipelines Agency. However, the Statutory Regulator (the Control Of Major Accidents and Hazards Competent Authority) remains concerned about the deterioration in infrastructure, and a further significant injection of funding is likely to be required to ensure that these facilities can continue to support Defence needs in a safe and environmentally compliant way.

MARITIME SAFETY

20. The Maritime domain currently faces some considerable challenges, particularly as the demands upon an ageing fleet of vessels to satisfy a diverse range of maritime operations across the globe continue unabated. It is most likely that SQEP shortages, particularly in maritime engineering trades, are having an adverse effect on safety as are vessel fragility and maintenance issues. However, determining to what extent safety is actually being degraded by such factors, and how concerned we should be as a result, is not straightforward. Several different assessments of the Maritime domain safety picture exist, all of which can help to form a judgement, and after careful consideration I am persuaded that there is significant justification for concern.

21. The DMRs own assessment of Limited Assurance of Maritime Safety factored in his concerns over the implementation of previous regulatory safety recommendations and slow progress in rectifying individual vessel fragilities. A review commissioned by him has highlighted that many maritime Risk Control Systems are under stress. Reviews of technical documentation

¹³ In 2014-15 Defence Infrastructure Organisation committed circa £23M for improvements in active fuel infrastructure to mitigate risk of enforcement.

show the position worsening with 66% of publications not updated for over 10 years, requiring significant and sustained Duty Holder attention. A further DMR study found repeating patterns of occupational and platform level risk manifesting itself in accidents and incidents, indicating that underlying root causes are not being addressed. His assessment is supported by a series of independently commissioned reviews of Defence Maritime Safety conducted over the past 3 years. These reviews draw a picture of risk accumulating over time, while the experience base required to identify, manage and mitigate that risk at the front-line, within the TLB and in the DE&S continues to erode. As yet, I am not in a position to make a confident judgement of the overall safety situation in the Maritime domain. Therefore, I intend to use this Annual Report to expand upon some of the issues Defence currently faces with respect to Maritime Safety and report on the state of the Maritime Regulator, which is a key enabler for effective safety management across the domain.

22. Looking across each of the operating environments in the Maritime domain, I have concern about the robustness of ship ██████████ Safety Arguments, caused in part by the SQEP challenge but also due to the lack of organisational separation between the Ships ██████████ Operating Centres in DE&S and the NAG, which also sits in DE&S, who conduct assurance on behalf of DMR. Indeed, the Regulator is undermined by the vital dependency it has upon the DE&S-owned NAG to support it in conducting assurance in the Certification of maritime platforms and their key hazard areas. The NAG has a vital 2nd Party assurance role as well, and the lack of organisational separation and clearly delineated responsibilities between DE&S, the NAG and DMR together with similar issues within Flag Officer Sea Training and the Waterfront Coherence Authority, means that the 3rd Party assurance process is not independent. This lack of organisational separation of the NAG and its 3rd Party assurance role contravenes Haddon-Cave's principle of independence and has synergy with aspects of Nimrod. This lack of separation will be looked at further over the forthcoming year as part of the work flowing from the DSRR.

23. There are several indicators as to the current state of Maritime Safety that raise concern. It is increasingly being reported to the Regulator that ageing vessels are in a generally poorer material state than has previously been the case. Whilst safety-critical maintenance is reportedly being achieved and Naval Authority Certification is in force for key hazard areas, projects are achieving compliance ever closer to force generation deadlines. This compression generates its own risk and could lead to further erosion of Safety Arguments. However, the most significant indicator relates to SQEP shortages. In a similar vein to the problems being experienced in the Aviation and Nuclear domains, a shortage of engineering expertise, particularly amongst Senior Rate Engineers on ships and submarines, compounds an overall shortage in engineering manpower and increases the supervisory burden on those that remain. It also simultaneously weakens the ability of Duty Holders to conduct their own 1st Party assurance. This is coupled with a reported 30% shortfall in

the Engineering and Damage Control training staff within Flag Officer Sea Training, whose role is to provide 2nd Party assurance during the force generation process and also 3rd party assurance to the DMR. This further reduces the ability of the Operating Duty Holder to fully understand and manage the risk picture that Navy Command currently faces. History shows that in times of reducing financial resource and when staff are in short supply, Safety policy often fails to be fully resourced or implemented. Safety systems are further weakened when the means to assure policy compliance is also under stress. The assurance currently provided by my Maritime Regulator and by 2nd Parties within Defence is patchy at best and non-existent in places.

24. In a resource constrained and operationally demanding period, Defence needs to prioritise its resource and activity. Some of the concerns and indicators highlighted here are undoubtedly the result of this process, and need not necessarily be a problem, provided that any resultant risks are understood, managed and mitigated. Indeed, given the need to maintain operational outputs I would expect this to be happening in certain areas. However, to be sure that outputs can still be delivered without exposing our personnel to unnecessary hazards, the Duty Holders at all levels holding both the accountability and responsibility for Risk-to-Life need an accurate picture of the risks that exist within each of their areas in order to make appropriate decisions. Alongside the TLB's internal safety management system, the DMR has a crucial role to play in this by providing assurance to the Duty Holders, assessing the effectiveness of their safety management processes and, when not compliant with extant regulations, recommending the cessation of unsafe practices where no operational imperative exists. DMR needs to be fully manned to satisfy this function, as its current resources remain insufficient to undertake the full range of its Regulator responsibilities. Moving from the current situation highlighted here, to one where assurance of the effectiveness of the Maritime safety management system can be confidently and sustainably provided is not a straightforward task. It will take time and commitment to realise. I am reassured by signs that these issues are being recognised at the appropriate levels, and will outline the next steps that the DSA intends to take in this arena in the forthcoming DSRR Report. Overall, my priority is to enhance the Regulator's capacity so that DMR can provide a credible and authoritative service to both the Royal Navy and other TLBs.

REGULATED COMMUNITY – DUTY HOLDER ISSUES

DUTY HOLDING CONSTRUCT

25. There is growing evidence to support the view that Duty Holding arrangements and the responsibilities specified in JSP815 (Defence Health, Safety and Environmental Protection) are being adopted across Defence, but methods of implementation vary across the Department. While

I accept that one size cannot fit all when it comes to applying the concept of Duty Holding, we must remain true to the principles of responsibility and accountability being clearly defined at the strategic, operational and tactical levels when it comes to owning Risk-to-Life, all reinforced by a clear method of elevating those risks that cannot be controlled at each respective level of the Duty Holding chain. Work is continuing on improving coherence of the Duty Holding construct across the TLBs and across TLB boundaries. In general though, I am satisfied that any adaptations made to the principles outlined within JSP 815 remain within the spirit of the direction provided and suit the different circumstances found in each domain.

26. In the Aviation domain, where the Duty Holding concept is most mature, commanders tell us that they are able to be more forward leaning with risk management and are able to exercise increased operational flexibility as a result. An example of this would include tasking of the Air Transport fleet into unfamiliar territory within south Sudan in support of Aid operations in 2013¹⁴. While there is less evidence of these benefits being realised so obviously in the other domains as yet, it is encouraging to see various examples of action by Duty Holders, such as the pausing of activity where and when safety risks are identified¹⁵, thus demonstrating that there is increasing clarity about roles, responsibilities and authority. The most recent Organisational Safety Assessment of Navy Command Duty Holding, conducted in March 2015, highlighted that organisational changes made to their initial baseline Safety and Environment Management System¹⁶ in 2014 had '*demonstrably strengthened the level of safety achieved*'¹⁷. Although only recently modified, the Maritime model does now incorporate a clear set of Duty Holding principles flowing from the First Sea Lord, through a series of formally appointed Operating Duty Holders, in activities that carry either a Risk-to-Life or pose a Risk to the Environment. The model also includes a clear separation between Duty Holding responsibilities and the Command chain. Army Command has adopted a slightly different approach and as yet the Duty Holding construct does not appear to be so well understood beyond the senior levels of Command. Underneath the Senior Duty Holder level, there is some evidence that Operating and Delivery Duty Holders (DDH) do not always recognise the full extent of the responsibility and more significantly, the personal accountability, that comes with a Duty Holding appointment. However, the concept is starting to assert itself within the traditional understanding of the Chain of Command at the Operating/2* and Delivery/OF4-5 levels. In my view, more needs to be done within the Army to embed and align the Duty Holder construct into the culture of personal accountability that already exists, but I am

¹⁴ http://www.raf.mod.uk/rafcms/mediafiles/81DE276B_5056_A318_A88FA5929455ABC5.pdf pages 23-27.

¹⁵ Regulators have provided several examples of TLBs identifying risk, pausing activity while they are fully identified and investigated before recommencing activity once acceptable mitigations are in place. Examples include, but are not limited to, Army Command pausing a training exercise in Belize due to safety concerns and appointing additional staff in safety critical posts before recommencing, and the Air and Army Commands liaising over the provision of a suitably SQEP Airfield Operator at Colerne and Hullavington Airfields.

¹⁶ DCINC/20110516 Navy Command Duty Holder Construct, Roles and Responsibilities dated 16 May 11.

¹⁷ 20150713-Navy Command Duty Holding Organisational Safety Assessment dated 13 Jul 15.

encouraged by the efforts to address aspects of this within the current Army Command Review. A significant difference in the Army model is that Duty Holders do not own Safety Cases in the same way as occurs in the other domains. Instead, the Safety Cases are owned by Capability Directors who advise Duty Holders on the As Low As Reasonably Practicable (ALARP) status. In reality, this is a challenging concept to apply in the Land domain, since much of their Risk-to-Life resides in activity, as opposed to being centred around the use of equipment, which tends to be the case in the Aviation domain and, to a similar but lesser extent, in Maritime. The challenge is compounded by the large numbers of Duty Holders, particularly at the DDH level, that currently exist in the Army model. Irrespective of how the model is adapted to fit individual TLB circumstances, the principle that those with responsibility for Risk-to-Life are clearly identified, empowered and personally accountable remains key to effective safety management.

27. The introduction of governance and safety arrangements across other areas of Defence remains a work in progress, as in JFC where the application of the Duty Holding model has been established but remains under review. Elsewhere, the Fire Regulator reports that Duty Holders and appointed persons lack a full understanding of their fire safety responsibilities, particularly at overseas locations, where the problem is exacerbated by the nature of the turnover of individuals and a lack of continuity due to tours of shorter than the standard duration. Overall, key to any future judgement that Defence has successfully adopted the Duty Holding construct as originally envisaged by Haddon-Cave, will be our ability to demonstrate that Duty Holders understand their accountability and are focussed on Risk-to-Life activity, together with evidence of the active mitigation of risks to at least a level of being Tolerable and ALARP. To help further embed this risk management culture, the DSA is developing a Duty Holder education programme including the newly introduced MAA bespoke risk management training course. In many areas this is supplemented by TLB or domain specific Duty Holding training. Ensuring a uniform understanding and application of the Duty Holder construct across all domains and at all levels will be a major focus of the DSA once Full Operating Capability is achieved.

SUPERVISION AND SUITABLE EXPERIENCE

28. Across the majority of the Duty Holding community the provision of SQEP for safety roles continues to be a concern and clearly diminishes their ability to mitigate risk. This has been a recurrent theme over recent years and has been well covered within the Strategic Risks section of this report. While the consequences of the SQEP challenge are now more clearly understood, one by-product appears to be a reduction in the effectiveness of supervision at all levels over Defence activities which could incur significant Risk-to-Life. The effectiveness of supervision and control of certain activities was raised by a number of TLBs and Regulators in their inputs to this Annual

Report¹⁸. Recent fatal and non-fatal aviation SIs have identified supervisory issues at both the tactical and operational levels of command. Failings identified cover a range of issues, each of which potentially made accidents or incidents more likely to happen, increased the severity of outcomes, or demonstrated supervisory standards below the level we traditionally expect. It is likely that supervision was a theme in several other non-aviation fatal accidents during this reporting period. The death of a serviceman during AT in Cyprus, a further two separate transport-related accidents and a fatality during lift maintenance continue to raise concerns about the appointment of inexperienced people into supervisory roles. For example, while supervisors may be trained in the activity, they may not necessarily have been employed in or had sufficient exposure to, the activity they are being asked to supervise. In some cases rank or grade attained is seen as an appropriate supervisory criteria rather than a qualification and/or experience in the specific role.

ADVENTUROUS TRAINING

29. AT forms an essential element of military training, involving ‘controlled exposure to risk, to develop leadership, teamwork, physical fitness, moral and physical courage, among other personal attributes and skills vital to operational capability’¹⁹. All 3 Services conduct AT integrated within initial training and thereafter throughout a service person’s career as part of personal development. Participation levels in AT have been suppressed in recent years due to operational commitments, yet during the period 2010-15 we have still lost 7 personnel in AT accidents. The drawdown in Op HERRICK has resulted in participation increasing again to previous levels and, unfortunately, this has also resulted in a commensurate increase in accidents. There has been a 63% increase in AT major injuries from 2013/14 to 2014/15²⁰, and TLBs have recognised this in their Annual Assurance Reports. Defence has an exemption from the law that requires civilians providing AT activities to Under 18s to be subject to independent inspection and licensing by the Health and Safety Executive. The DSA is working with TLBs and the Health and Safety Executive to consider options to meet Secretary of State’s Policy requirement to put in place equivalent arrangements at Defence AT centres where we exercise such an exemption. However, this will capture only a small proportion of our total AT activity, and therefore the DSA Executive is now focussed on how best to improve supervision and control within this area in future. As a result of the death of a Royal Marine during a diving expedition to Egypt in August 2013, the RN conducted a SI²¹ which made a number of recommendations on the governance of AT in the RN, which have been shared with the other TLBs. The Army has conducted a review of governance of AT²² and is implementing

¹⁸ The Movement and Transport regulator within DLSR intervened to prevent potentially dangerous activity during 30% of their inspections this reporting period.

¹⁹ JSP419 Section 2 Para 7.

²⁰ Provisional data. D/Defence Statistics (Health)/121/2/13 28 October 2015.

²¹ FOST/20140624-Adventurous Training Service Inquiry-OS dated 24 Jun 14.

²² CGS/ArmyInsp/AT_Review dated 23 May 14.

recommendations, including embedding AT within its Duty Holding construct, and Air Command has also conducted a detailed examination to identify where Risk-to-Life responsibilities lie for its AT and Sporting activities. The DSA will also work with the TLBs to ensure that appropriate levels of governance and assurance for unit sponsored/delivered AT are put in place.

OCCUPATIONAL HEALTH AND SAFETY

30. Occupational Health and Safety issues have the potential to cause permanent damage to our personnel, both military and civilian, if left unchecked. Issues such as the effects of noise or vibration at work are governed by UK legislation which sets appropriate limits beyond which personnel should not be exposed. The Army has identified that the impulse noise produced during operation of certain weapons systems (such as the AS90, Light Gun and certain mortars) exceeds the 140dB Exposure Limit Value contained within the Control of Noise at Work Regulations 2005. To mitigate this, control measures have been put in place to reduce noise exposure levels, including firing on lower charges where feasible, but it will remain necessary to expose some troops to noise levels above the exposure limit in order to sustain realistic training.

31. Certain equipment platforms, when used in operationally essential roles can also expose operators to levels of vibration in excess of the Control of Vibration at Work Regulations 2005. The Defence Land Environment Working Group for Vibration at Work has been set up to define the extent of non-compliance in this area and will report its findings during the next reporting period. It aims to review 134 platform types across the Army inventory in order to understand the totality of the issue. Equipment assessments will then be prioritised according to those with the highest risk before appropriate mitigations and exemptions are pursued. In some operationally essential roles, certain categories of small boats can exceed prescribed vibration limits. Where this is the case, each platform and role has been considered by the affected Duty Holders, and where necessary and permissible, suitable exemptions have been sought through the DSA to ensure that operational output is not impacted whilst reasonable safeguards are put in place to protect personnel.

REGULATED COMMUNITY – DUTY HOLDER FACING ISSUES

DUTY HOLDER FACING ORGANISATIONS

32. The relationships between the Regulators and the Fin Mil Cap and DE&S organisations continue on a generally positive vector. There is now a considerable body of evidence to support the conclusion that safety, and the cost of safety, is being considered early in the procurement

cycle. In June 2014 and following the completion of the Tornado GR4 Mid-Air Collision SI, Deputy Chief of Defence Staff (Mil Cap) conducted a review setting out how safety would be managed in future in the procurement and sustainment of capability across Defence. While the review sought to demonstrate to the Secretary of State how the lessons of the Tornado Collision Warning System procurement had been learned and implemented across the MOD's capability area, it also reported that there is now much greater emphasis on, and clarity of accountability for, safety risk management, such that safety-related options are explicitly identified in the planning process and a robust audit trail is maintained of safety-related decisions. It also identified that processes are now in place to ensure that emerging safety-related equipment requirements are highlighted and managed appropriately. These findings are augmented by other Departmental processes that also now ensure joint and senior oversight of capability requirements, including those that impact on safety or regulatory requirements.

33. Within the capability delivery space the DE&S continues to evolve as an organisation. One of the primary challenges faced during this evolution remains the provision of SQEP as previously highlighted. More specifically, recent DSA Regulator audits have noted examples of where DE&S has had difficulty in matching resources to task due to these pressures, and have seen a noticeable increase in Industry outsourcing in certain areas as a result. Despite this mitigation, there is evidence that gaps, particularly amongst Band C staff, are leading to a backlog in routine work. Examples of this from the Aviation domain would be the slow progress that has been made by the UKMFTS Project Team in response to the MAA Warning Notice issued in March 2014, or reports from the Movement and Transport Regulator (MTSR) highlighting that on a number of occasions the requirements of regulations concerning dangerous goods or substances/items hazardous to health have not been met. For example, a number of products, identified as dangerous to health, have entered the supply chain without being accompanied by the required safety information (Safety Data Sheets). More generally though, failures to address legislative requirements such as these during the acquisition process can result in equipment being withdrawn from service for modification or delayed into service while exemptions are sought thus affecting operational outputs. While DE&S continues to develop innovative strategies to address its internal SQEP issues, which is welcomed, there remains a need to ensure a coherent approach to how we manage those with critical skills for Defence across the whole Department.

34. The DIO also continues its process of transformation which during this period has seen the introduction of a Strategic Business Partner. As a Duty Holder-facing organisation, the DIO has the potential to affect a range of Risk-to-Life activities undertaken by all Front-Line Commands. Operating Duty Holders therefore need to have confidence that where DIO has responsibility for the upkeep of infrastructure/equipment that interfaces with their Risk-to-Life accountabilities, an

effective process is in place that ensures DIO owned infrastructure is fit for use. This is particularly important since DIO holds the levers in these circumstances to mitigate risks to be ALARP rather than the Operating Duty Holders themselves. DIO must develop the capability to ensure that appropriate people within the organisation are identified to drive improvements in the organisation's safety culture to the point where individual and organisational Duty Holder-facing roles and responsibilities are clearly understood; this is currently not the case and is a source of frustration to the Regulated Community. Engagement with the new Management Executive of the organisation has been positive thus far. However, how the new Strategic Business Partner Model will operate within the explicit accountabilities required to effectively manage Risk-to-Life remains to be seen; this is particularly applicable to the DIO's management of its sub-contractors who deliver individual projects. To that end, following an initial MAA advisory visit to the DIO this year, the first assurance inspection of the organisation (planned by the MAA for Spring 2016) will be a useful first review of DIO safety management.

35. Finally, from a Duty Holder-facing perspective, generally positive safety behaviour from Industry continues to be observed. Many of the Industry partners with whom Defence has contracted, principally through DE&S or DIO but also through the Front-Line Commands, are still required to comply contractually with Defence policy and regulations that pre-date the formation of the MAA or the DSA. At present only the MAA conduct in-depth assurance of Defence Industry partners; indeed the MAA also endorse Industry Accountable Managers (Military Flying) and approve Design and Maintenance organisations. Experience in this sector has highlighted the majority of Industry organisations recognise the benefits of this approach and have willingly complied with our revised and more relevant regulatory requirements. As a result I am confident that from an Air Safety perspective at least, our relationship with Industry continues to develop positively. Since a component part of safety will always be in the hands of Industry, irrespective of the domain, this model provides a useful aiming point for the other Regulators to aspire to when experience, capacity and resource allows, since comparable benefits will exist with our non-Aviation Industry partners.

DEFENCE SAFETY OVERSIGHT - POLICY AND REGULATIONS

36. The MoD is required to comply with all applicable safety and environmental protection legislation (including legislation giving effect to the UK's international obligations), unless an exemption for Defence exists. Where this is the case, it must be demonstrated that our outcomes are, so far as is reasonably practicable, at least as good as those required by the equivalent legislation. This ensures that the HS&EP requirements of Defence policy satisfy the UK legislative

framework which in turn ensures that the Secretary of State's Policy obligations are met²³. It is essential that Defence is aware of, and can influence where appropriate, emerging legislation in order to avoid any potential major constraints on capability or activity downstream. The DSA undertakes this role for Defence with respect to HS&EP policy. In doing so, my staff are mindful of the need to make policy and regulation proportionate and to minimise the compliance burden while, nonetheless, ensuring that our policy and regulatory framework is fit for purpose. Key work undertaken this reporting period to achieve this is described briefly below:

- a. A Defence-wide review of HS&EP policy and regulatory documents²⁴ has been initiated to ensure that they align with Defence needs. The work will continue into the next reporting year.

- b. The MAA has been actively engaged with our international colleagues, both within Europe and North America. The main effort has been with the European Defence Agency through the Military Airworthiness Authorities Forum. This body aims to harmonize European airworthiness requirements and create the potential to share documents and artefacts with other European military airworthiness authorities, where this has been enabled by recognition between nations of the respective authorities' acceptability. This simplifies the re-use of airworthiness information and approvals between nations, offering the potential for DE&S to reduce programme risks and exploit financial savings on collaborative projects (including new work on legacy projects like Typhoon). Similar work has been undertaken with the US Army, USN and USAF and work is in hand to test the re-use of US Army Certification artefacts in support of the potential procurement of Apache AH-64E to meet the requirements of the Apache CSP.

- c. Work has been undertaken by the DSA to negotiate and implement new or revised working arrangements with a number of the Statutory Regulators that regulate Defence; a revised agreement with the Health and Safety Executive has been developed to reflect the organisational changes in Defence and to recognise the role of the Defence Regulators. A new general agreement between Defence, the Maritime and Coastguard Agency and the Marine Accident Investigation Branch was signed in December 2014. In addition, a new agreement was forged with the Office for Nuclear Regulation in January 2015, following their separation from the Health and Safety Executive, detailing the high-level intentions for coherent regulation of the Defence Nuclear Programme.

²³ [Joint Service Publication 815 Defence Environment and Safety](#) describes in high-level terms the corporate system for management of environmental protection and safety in Defence.

²⁴ Including JSP 815 (Defence Health and Safety and Environmental Protection); JSP 418 (Management of Environmental Protection in Defence), JSP 375 (Management of Health and Safety in Defence), JSP 392 (Management of Radiation Protection in Defence) and JSP 426 (The Fire Safety Manual).

d. The Movement and Transport element of the DLSR has sought to address several cross-TLB regulatory issues. These include the review of a number of exemption certificates issued to allow military vehicles to operate on UK public roads, seeking exemption to speed limits for military tracked vehicles and seeking exemption to the wearing of seat belts for certain purposes when conducting activity in Operational Military Vehicles.

e. The Ordnance Regulator, DOSR, provided subject matter expert input into the Health and Safety Executive's issue of new UK legislation - Explosives Regulations 2014 (ER2014). This enabled the new regulations to be issued as planned on 1 October 2014. In their role as the Competent Authority in Great Britain for military explosives, they also issued 140 new classifications for military explosives, a process which identifies the hazards posed by explosive substances and articles when packaged for transport. I intend to extend the DSRR study work in this particular area to examine in much more detail, as a pilot, the area of Explosives regulation and explore the feasibility and potential benefits of taking this entire Defence activity outside of the statutory framework, towards a Defence constructed goal-based regulatory regime.

ENVIRONMENT

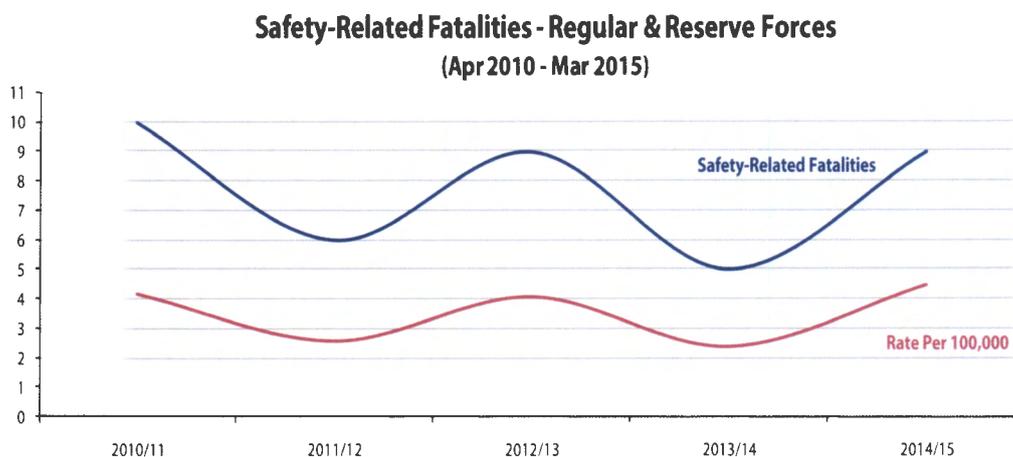
37. The DSA ensures that Defence continues to meet its Environmental Protection policy obligations. In this area fuel spills remain the most realised risk. Historically, Defence has reported approximately 100,000 litres of spilt fuel per year; however, this is not uniformly distributed. In January 2014, a single incident at RAF Leeming resulted in the loss of 130,000 litres of aviation fuel during a cross-base fuel transfer, with approximately 62,000 litres escaping into the River Swale. The Environment Agency issued an Enforcement Notice (Level B – to restore and remediate) to Station Commander RAF Leeming. Defence conducted a SI to ensure that the incident was properly investigated, lessons were learned and appropriate recommendations put in place to prevent a recurrence. This process concluded in February 2015 and a full copy of the SI report has been passed to the Environment Agency. Since January 2014, the DFGSR's²⁵ inspection process has included environmental assurance. This represents part of a wider move towards Risk based assurance and so far has identified environmental risks with regard to Oil Water Interceptors, Unit Spillage Response Plans and Road Tanker Delivery Stands. These areas will become the focus for DFGSR regulation and assurance activity over the forthcoming year. Specific actions will include working with Air Command to resolve the supervisory and experience

²⁵ The Defence Fuel and Gas Safety Regulator.

level related issues identified in the SI into the fuel spill at RAF Leeming, and the roll-out of a safety assurance regime for the storage and handling of industrial gasses on MOD sites.

DEFENCE SAFETY STATISTICS

38. There were a total of 9 safety-related fatalities in the period covered by this report. This represents a 50% increase from the 6 safety-related fatalities in FY 2013/14; however, this increase is largely as a result of a single fatal accident involving Lynx ZF540 in Afghanistan in Apr 14 in which 5 UK servicemen were tragically killed. A brief summary of each of the incidents that resulted in potentially safety-related fatalities is at Appendix 1. The graph below illustrates, by FY, both the actual number, and the rates per 100,000, of safety-related deaths during the period April 2010 – March 2015.



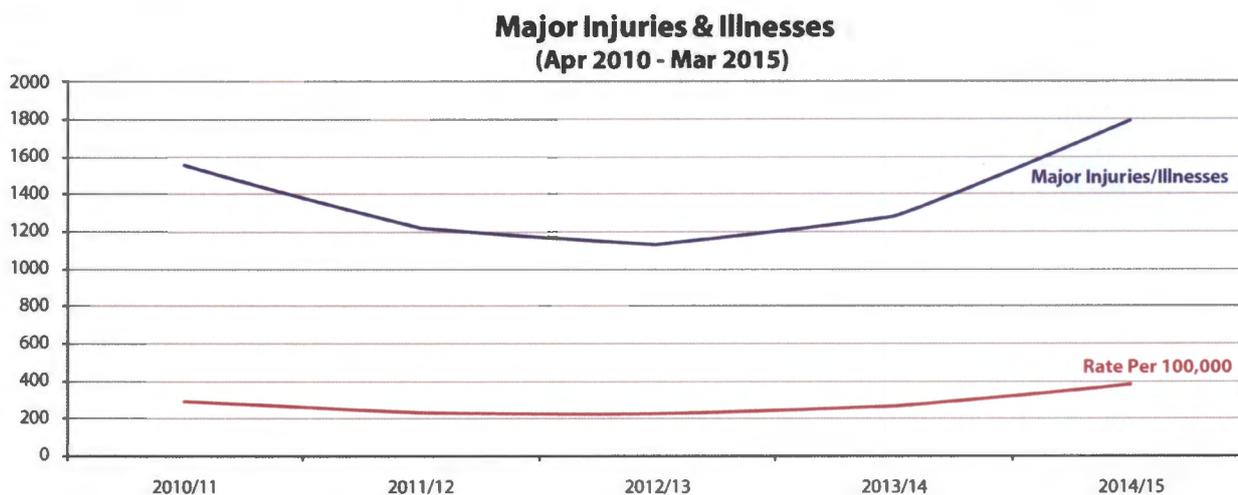
Source: DSEA & Defence Statistics²⁶

39. In FY 2014/15 there were 1,790 major injuries and illnesses reported; this is an increase of 40% from the 1,281 recorded during the previous year. The annual rate (per 100,000) of major injuries and illnesses increased by 44% during the same period. In this context ‘major injuries and illnesses’ are those reported by Defence under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013²⁷, and using their definition, major injury covers anything from loss of limb, loss of sight or severe burns to fractures and dislocations. Likewise reportable illnesses range from asbestosis or occupational cancers to medical complaints such as Carpel Tunnel Syndrome and occupational dermatitis. The graph below presents both the actual number, and the rates per 100,000, of potentially safety-related major injuries and illnesses during the period April 2010 – March 2015. While Defence Statistics have yet to fully analyse the factors that lie behind this profile, early indications are that an increase in AT and Sport within the Army TLB, concomitant

²⁶ Core numbers for safety-related fatalities (in blue) include UK Regular Armed Forces and Reservists on duty. This excludes battlefield casualties & off duty and non-safety related Transport Accidents. Crude rates (in purple) include UK Regular Armed Forces and Reservists.

²⁷ <http://www.hse.gov.uk/riddor/>.

with a reduction in activity on operations, may lie behind the upswing in injury rates since 2012/13²⁸.



Source: Defence Statistics, AINC, NSINC, AIRS, DINC, DIOINC, JFC/HOCS, IRIS, Trading funds.²⁹

ACCIDENT INVESTIGATION

40. In my capacity as Director General DSA I assumed responsibility on 1 April 2015 as the primary Convening Authority for safety-related SIs across Defence; however, during the period of this Annual Report, as DG MAA, I convened 4 aviation SIs. Several themes identified during these investigations continue to occur such as: operator errors, deficiencies in supervision and the disappointing administration of flying documentation and currencies. While each SI results in a set of recommendations that aim to prevent recurrence, I believe that a more holistic approach may be required to address some of these persistent themes. The DSA should be able to provide this beyond just the aviation domain. The aviation SIs convened were:

a. **Parachuting accident (23 April 2014).** While on an exercise in Greece, a soldier sustained significant injuries whilst parachuting [REDACTED]. The SI found that the cause of the accident was a deliberate and sustained turn at low level with insufficient height to complete the manoeuvre.

b. **Lynx (26 April 2014).** An Army Lynx AH Mk9A helicopter crashed whilst conducting gunnery training in Afghanistan with the tragic loss of all 5 Service personnel on board. The

²⁸ <https://www.gov.uk/government/statistics/defence-personnel-health-and-safety-statistics-financial-year-201415>.

²⁹ Core numbers (in blue) calculated as follows; includes UK Regular Armed Forces, Reservists, Cadets & MOD Civilians. Excludes Battlefield injuries, off-duty transport accidents, contractors, other civilians, directly employed labour, locally employed civilians, Royal Fleet Auxiliary and Military Police Guard Service.

SI concluded that the accident was a Controlled Flight into Terrain event. The inquiry is complete and has been published.

c. **Gazelle (2 June 2014).** A Gazelle HT Mk3 helicopter, being operated by the Empire Test Pilots School, sustained significant damage to its tail during an engine-off-landing training at Boscombe Down Airfield due to aircrew handling after touchdown.

d. **Watchkeeper (16 October 2014).** A Watchkeeper Remotely Piloted Air System, operated by Industry, crashed whilst landing at West Wales Airport, Aberporth. The SI has yet to conclude, but is likely to focus on software logic issues connected with the Automatic Takeoff and Landing System and use of a Master Override facility.

41. **Reports Published.** The following SI Reports have been published in this period:

a. **Tornado Mid Air Collision (3 July 2012).** Three crew members were killed following a Mid-Air Collision over the Moray Firth in Jul 12 due to unrecognised converging flight paths. Of note, following publication of the SI Report, the Scottish Crown Office elected not to convene a Fatal Accident Inquiry as they concluded that it could not better and would only repeat the highly-detailed investigation into the tragedy already conducted by the MOD.

b. **Voyager (9 February 2014).** An RAF Voyager en-route from the UK to Afghanistan, pitched down unexpectedly resulting in a number of minor injuries to the passengers and crew. The pitch-down was caused by an inadvertent physical input to the Captain's sidestick by a camera that had jammed between the armrest and the side-stick unit.

42. **Support to Non Statutory Inquiries.** Where I have elected not to conduct a SI but the potential existed for Unit level lessons to be learned, the Military Air Accident Investigation Branch was released to support front-line units in the following Non-Statutory Inquiries:

a. Scan Eagle Crash due to engine failure – Arabian Gulf (June 2014).

b. Bell 212 heavy landing in degraded visual environment – Kenya (June 2014).

c. Hermes RPAS engine failure – Afghanistan (July 2014).

- d. Zephyr High Altitude Pseudo Satellite crash – Ascension Island (August 2014).
- e. USAF F15 pilot ejection following loss of control – Lincolnshire (October 2014).
- f. Bell 212 heavy landing in confined area – Kenya (January 2015).
- g. Typhoon/Tucano Airprox – RAF Coningsby (March 2015).

SUMMARY

43. This Annual Assurance Report is written at a time of significant change in how the regulation of safety is conducted across Defence. The formation of the DSA and work on the DSRR has shown that there are gaps in the assurance of safety across Defence caused by legacy processes and behaviours, a wide range of safety cultures, an inconsistent and in some areas institutionalised lack of reporting of near-misses and safety data. Some domains also suffer from a lack of regulatory resource. This is for the DSA leadership to address following the Permanent Under Secretary directed Review; however, all aspects of this work will not be implemented by the projected Full Operating Capability on 1 April 2016. Indeed, some of the cultural changes will take several years to fully embed. Of note, the Duty Holder concept now appears to be gathering momentum across Defence in areas outside of Aviation where the concept is approaching full maturity. In all TLBs, Duty Holders are generally getting to grips with their accountabilities and responsibilities for safety but there are still improvements to be made. Ensuring a degree of consistency and coherence into how each TLB pursues these concepts is important work for the fledgling DSA. Indeed, in the short time that the DSA has existed, conversation with Commanders following incidents has shown some encouraging signs of a refreshing attitude and approach to safety within their areas of responsibility. Of course, in many ways this is a necessary change and shift in attitude as we see the Coroners in England and Wales, the Procurator Fiscal in Scotland and families of the deceased all demanding increased accountability for the actions of those in positions of authority when and where an accident occurs. The SI process for safety-related accidents is now embedded within the DSA, and will help Defence more generally by providing authoritative and independent safety investigation with a mandated Inquiry into deaths deemed to be safety-related.

44. It is clear that Defence Duty Holders are mitigating Risk-to-Life in several areas where there is considerable scope for the loss of military and civilian life and the accompanying reputational damage. The risk of SQEP shortages, particularly in technical areas (but not exclusively so) is

undoubtedly having an impact on safety. We must all be alert to this. Of note, we are now seeing that it is often the lack of experience that has most impact on safety in that supervisors are being diverted from their responsibilities to assist or supervise lower level tasks. Indeed, we are seeing more incidents where supervision and control of activity lies at the root of the problem, whether it is operationally significant activity or something like AT where deaths in Defence appear to occur with some regularity. The good thing is that our commanders tend to be safety aware and will normally, and rightly, back off in peacetime rather than compromise safety. This means that the impact of these shortages is often seen in the form of reductions in outputs rather than accidents. The Duty Holders are comfortable where they hold the levers to provide mitigation to the risks for which they are responsible; it is where they carry the risk but do not have the levers that frustration is often evident. The most often cited example involves DIO holding the levers for infrastructure improvements and repairs while Duty Holders remain accountable for any Risk-to-Life incurred. Other than SQEP across most areas, I rate the risk of Mid-Air Collision, the poor state of the Fuel and Gas (which includes Oil) Infrastructure and Maritime Safety as Defence's Strategic Safety Risks. The risks are being held and mitigated by the Duty Holders but there remains the possibility of catastrophic failure. The risk to Maritime Safety, and certainly the assurance of it, is compounded by the lack of effective capacity in DMR.

45. Whilst there are undoubted weaknesses in our safety processes and the assurance of safety across Defence, this should be seen against the backdrop of continued and intensive operational activity and an accident rate that is relatively low in comparison to historical norms. Indeed, the redeployment from Afghanistan should be seen from a safety point of view as highly successful in relation to the magnitude of the task in comparison to the low number of safety incidents and accidents that occurred. However, safety performance can go down as well as up, and therefore as the report also highlights, there are areas where we should be concerned and focus our attention over the next reporting period. Overall, this Report provides a mix of assurance of safety across Defence during the period 1 Apr 2014 to 31 Mar 2015, which ranges from a rather patchy Limited tending towards No assurance in Maritime, Limited in Land³⁰, a strong Limited (close to Substantial) in Aviation and Substantial in Nuclear, Ordnance and Fire.

Director General DSA

³⁰ Covering Land Systems, Fuel and Gas and Movement and Transport.

APPENDIX 1: DEFENCE SAFETY - RELATED FATALITIES

There were 9 safety-related fatalities during the period 1 April 2014 – 31 March 2015:

Lynx Helicopter Crash – 26 April 2014

Captain Thomas Clarke
Warrant Officer Class II Spencer Faulkner
Flight Lieutenant Rakesh Chauhan,
Corporal James Walters
Lance Corporal Oliver Thomas

Logistic Vehicle Accident – 29 April 2014

Private Cameron Laing

Jackal Accident Warcop Range – 4 June 2014

Sergeant Mark Foley

Accident during Lift Maintenance on HMS BULWARK – 11 June 14

Leading Engineering Technician Neal Edmonds

AT Kayaking Accident – 12 March 2015

Private Jamie Sawyer