

# The Nuclear Cluster

This month we focus on the Nuclear Cluster. Rear Admiral Andrew Mathews is Director General Nuclear.



The Nuclear Cluster is truly through-life and dual-accountable, so I don't think in terms of working for the DLO or DPA, I work for both. Its budget of £2 billion a year is managed by a team of 750 people, quite a small team for such a huge budget. As well as being dual-accountable I'm dual-hatted, because besides being Director General Nuclear, responsible for delivery of nuclear equipment, I'm also Controller of the Navy, which means I report to the Navy Board on procurement issues. I sit on the DLO Board, the DPA Board and the Navy Board, so the diary is never blank.

There are a couple of really big issues for this cluster at the moment, the first being the future of the nuclear deterrent programme, on which the government has stated that there will be a decision before Christmas. Press speculation is that we'll continue with Trident and introduce a new nuclear submarine, but we'll have to wait and see what the government decides. Clearly this will have a significant impact on us, and if it is decided to introduce a new submarine it means a new project and programme, which will certainly influence the shape of the cluster. If we go down this route, a new submarine would be delivered initially by our Strategic Options Group. Introduction of any new submarine would probably be planned for around 2024, which sounds a long way off, but is actually quite a tight timescale for something like this.

The second big issue for us is affordability, a pretty common problem across defence at the moment. When you're dealing with items like nuclear submarines, the costs involved can be quite eye-watering, so the money side can be a challenge. In particular, making the Astute programme affordable is currently occupying our minds. This is a project that's still on track in terms of keeping to its programme and is where it should be in terms of performance, but the costs involved are rising. One of the reasons for this is that, as yet, there is no new submarine programme following on behind, and as such the Astute programme is really paying for the submarine build industry. We currently have an unaffordable future programme, and we have to find a way of making it affordable with industry, in line with the maritime section of the Defence Industrial Strategy. Of course once the government's decision is made about the future deterrent, we'll have more information on which to plan for the future.

Working with industry to improve the way we build and support submarines is at the heart of cluster business. For example, the Nuclear Propulsion IPT is currently working very closely with Rolls Royce on a new procurement strategy to deliver an integrated support solution for existing reactor plants. This will be the same sort of commercial concept as that adopted for the Tornado aircraft, and is an interesting area of work for this

through-life IPT.

There are other major issues to deal with too. On the nuclear weapons front we are running the Nuclear Warhead Capability Sustainment Programme, which is all about sustaining key skills and facilities at Atomic Weapons Establishment (AWE) Aldermaston to ensure we can maintain the existing Trident warhead stockpile throughout its intended in-service life. This involves a large infrastructure programme and the recruiting of scientists and technical staff for AWE. The programme is worth about £1.7 billion over three years and is giving the Nuclear Weapons IPT a fascinating challenge.

Another key project, this time for the Submarine Support IPT, is getting HMS Victorious's refit, now known as Long Overhaul Period (Refuel), (LOP (R)) back on programme at Devonport. The LOP(R) of the second of the Vanguard Class submarines will take about 160 weeks and is costing about £250 million, delivering the boat back into service at the end of 2007. The remaining two submarines in the Class are programmed in for LOP(R) after that.

Of course part of our day to day job in the cluster is making sure we always have fully-equipped Trident nuclear submarines at sea, maintaining continuous at sea deterrence, and this responsible job

## Commodore David Jarvis is the Strategic Systems Integrated Project Team leader.

I draw together two different but complementary roles: I am leader of the Strategic Systems Integrated Project Team (StratSys IPT), which encompasses all management and purchase of Trident-related equipment; and my second role is that of Chief Strategic Systems Executive (CSSE), as whom I am responsible for the maintenance of a continuous deterrent and report up to the Assistant Chief of Naval Staff and ultimately the Navy board.

Both responsibilities are associated closely with the Polaris Sales Agreement, which was signed in 1963 when the US agreed to sell the UK Polaris missile, but has since been updated with the purchase of



An unarmed Trident missile is launched from HMS Vanguard during her Demonstration and Shakedown Operation

Trident. Under the sales agreement the IPT is responsible for the provision of the Trident D5 Strategic Weapon System and its supporting systems. As CSSE, however, I am the formal project officer for the agreement and as such work closely with the US project officer, Rear Admiral Stephen Johnson, on a wide range of related issues.

The IPT essentially handles the purchase of replaceable items associated with Trident and the in-service support. What we buy ranges from the missile itself, to equipment that powers its launch, fire control systems, navigation systems, trainers, and shore-support equipment.

Independently of the sales agreement, the IPT provides all the targeting hardware, software and support and a lot of the analysis work. The IPT also manages some of the operational aspects and handles all US and UK documentation and modifications. We use a large number of US procedures, so the work we do is quite different from how the UK would normally do its business. For example, management of our finances is different because we have to work alongside the US systems. In short, we are a one-stop-shop for the Trident weapon system, which is deployed on the four Vanguard Class submarines; Vanguard, Victorious, Vigilant and Vengeance. We have around 150 people in total which includes staff in Abbey Wood, Devonport, Faslane, Washington DC and Georgia.



Our biggest recent achievement, for which we gained a Chief of Defence Logistics Commendation, was HMS Vanguard's Demonstration and Shakedown Operation in October last year. She had just finished her Long Overhaul Period (Refuel) and she travelled to Cape Canaveral for a series of routine tests, which culminated in the test firing of an unarmed missile. This was the final part of getting her back into full working order and ensuring the effectiveness of the weapon system, so demonstrating that she could go back on patrol. It was a pretty spectacular success for us.

At the moment, we are all extremely interested to hear the government's decision on the future deterrent, so we are keeping a close eye on how that develops because any decision will involve us in a major way. Also, as part of normal business, we are working our way towards some major equipment upgrades. These involve inserting commercial off-the-shelf equipment into the Trident weapon system to ensure continuing reliability and reduce future costs. That's a big programme and will involve my team for at least the next ten years in a lot of technologically complex upgrades and changes.

Aside from all the ongoing work the team has, my main vision for the future is maintaining our primary objective which is to support the continuous at sea deterrent, hopefully for the next 20 years.



## Howard Mathers is the Submarine Support Integrated Project Team leader.

The Submarine Support Integrated Project Team (Sub IPT) is made up of around 200 people. We have five key outputs; ensuring the Vanguard Class submarines are fit and available to go to sea; doing the same for the Swiftsure and Trafalgar Class submarines; running a number of capability improvement projects; being responsible for the UK's submarine rescue system; and disposing of all our submarines. Around half of the IPT consists of the submarine design authority. All the submarines in service today were designed by the MOD which means we carry a lot of responsibility for their safety, capability and availability. 75 per cent of our budget is spent on the overhaul programme in Devonport where, at 12-year intervals, we refuel and upgrade all the safety systems on submarines. We've three of the big overhaul projects running at the moment; HMS Talent, HMS Triumph and HMS Victorious.

Our biggest achievement in the last year was supporting HMS Vanguard through post-overhaul sea trials, and playing our part in her missile trials while at the same time supporting continuous deterrence with the other submarines. Although the deterrent programme is co-ordinated by Chief Strategic Systems Executive, we are responsible for getting the submarines to the point where the missile is launched whenever required. We have also seen a marked recovery in the



HMS Vanguard leaves dock at Devonport

availability of Swiftsure and Trafalgar Class submarines. Together this has been a tremendous achievement for the whole team. Additionally, the Submarine Escape and Rescue team was famously involved in the Russian submarine rescue last August and Commander Ian Riches was honoured with an OBE for it. Running in the background has been the Support and Upkeep Improvement Programme which, since it began in January 2003, has reduced the costs of submarine work by £40 million a year. The team received a Chief of Defence Logistics Commendation for that work in June.

At the moment, I'm working on an element of the Maritime Industrial Strategy and the Submarine Acquisition Modernisation Programme called Transforming Submarine Support. We're looking to find ways in which both the contractor and business unit can make savings as currently there is no real incentive for the contractor to save money. Another big project coming up for us is a maintenance period on HMS Torbay next year. This boat is based in Devonport and normally her maintenance would be carried out there, but we're moving

the submarine to Faslane. The work package will be carried out by a combination of Babcock and DML so it's quite a radical project for us.

In the immediate future, HMS Talent will go on sea trials at the end of the summer, before returning to the Fleet around Christmas after her three-year overhaul, including a major weapons upgrade. Also, we will be working more closely with the Astute IPT in the DPA as HMS Astute should be at sea in two years and needing support. We are also awaiting the publication of the Committee on Radioactive Waste Management report on the management of civil and submarine waste, which will launch the next phase of our disposals project, ISOLUS. In the longer term, we face challenges on the design authority side as we are over 15 per cent undermanned and it is difficult to find design engineers in the MOD with a deep specialism in submarines. My hope is that through looking at recruitment, training and the way we work with other teams and with industry, we'll find a more satisfactory way of ensuring we continue to have the right people to do the job.

## The Nuclear Movements team is made up of around 40 people based in Bath.

**T**he Nuclear Movements team is a relatively small one and because of the nature of the work we do, it includes safety and security experts as well as logistics specialists. We are unusual in that we are actually an operational unit which moves defence nuclear material around the UK and overseas.

We work very closely with the Royal Marines and the MOD Police, and also with AWE plc, all of whom provide specialist support to the transportation operation. The DLO is the lead organisation, and defence nuclear movements are carried out under the operational command of the Chief of Defence Logistics, but we have close working relationships with these other organisations, and all four of us are represented on the road in the convoy.

Currently, as well as the day to day operations, we have a range of projects in hand to replace our vehicles over the next few years. It's not a big fleet, but it is quite an interesting challenge, as they are specialist vehicles.

Our other key area of business is the Nuclear Accident Response Group (NARG). It's extremely unlikely that there would ever be an accident involving the release of radioactive material in transit. However, we do have an emergency response capability, and there are many people across the DLO in the Bath/Bristol area and at Coulport who belong to the NARG, which forms one part of the overall MOD nuclear accident response. They carry pagers with them and are ready to respond at any time, with the civilians being paid a small allowance for the potential inconvenience of living in the field for some weeks,

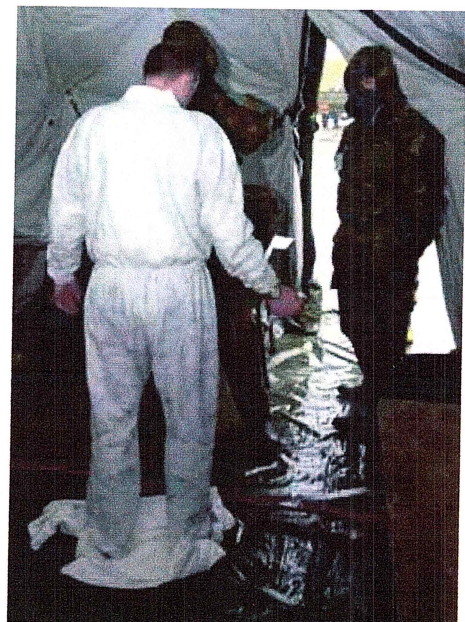


**The Nuclear Movements team: An operational unit that moves defence nuclear material all over the world**

whilst they help resolve the situation, and also for deploying away on exercise. The DLO NARG interfaces regularly with other MOD units and non-MOD authorities that would respond should the extremely unlikely accident occur. It's a very important task and we depend on a large number of volunteers, from across the DLO, to provide the specialist support we need to be able to retain this 24/7 emergency response capability.

Like many teams in the DLO, we receive many Freedom of Information requests. We are a visible military operation, attracting attention from anti-nuclear organisations and interested members of the public. We also receive a number of media enquiries, so one of our challenges is managing the volume of work this brings to the team.

Since we actually deliver an operation, being situated in Bath is not necessarily ideal, and in the future we are assessing the pros and cons of potentially moving the operational headquarters to Coulport and delivering the transportation service from the Clyde. We're working very closely with the Naval Base Commander Clyde team, to understand exactly what this transition would mean for the team here, for people at the Clyde and Coulport in particular, and for the



**A member of the DLO Nuclear Accident Response Group gets decontaminated on a training exercise**

Royal Marines, MOD Police and AWE. As with any operation, the people are the most crucial element. We must ensure that we've bottomed out the skills issues associated with moving the operation to a different area. We will also need to consider options for relocation of personnel, for those who want to relocate, and the future position for those who don't. Once we understand all of the implications, we will be in a position to present a Main Gate business case to the Defence Logistics Investment Board, which should be in April next year, with a recommendation to either move the operation to Coulport or stay here in Bath.

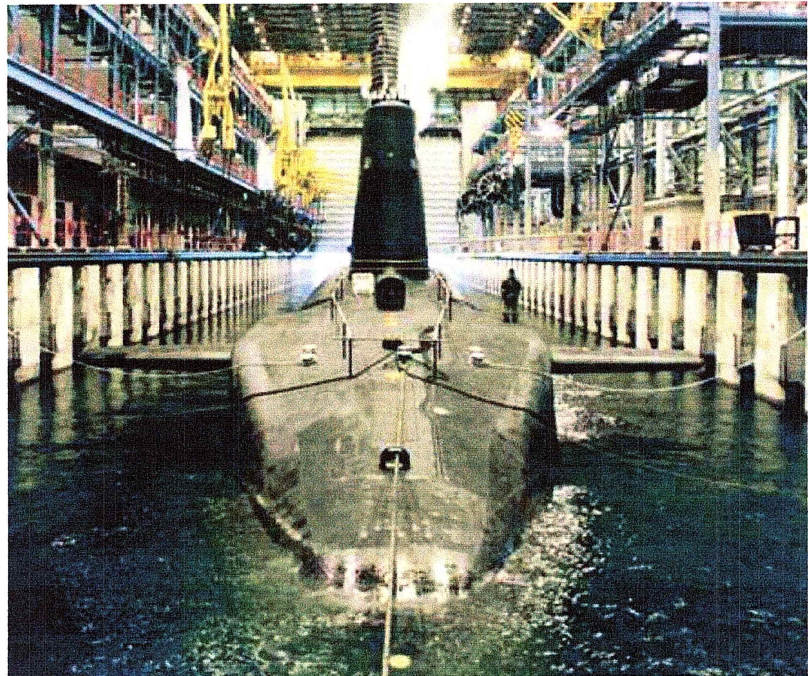
## Martin White is the Director Nuclear Cluster.



As a Two Star Cluster Leader, Director General Nuclear has a great deal of other responsibilities, so there isn't a lot of time left for him to act as a normal Cluster Leader. Therefore, I take on that role for him, taking an overview of the three DLO Integrated Project Teams (IPTs), and the DPA's Nuclear Propulsion, Nuclear Weapons and Attack Submarines IPTs, plus the Strategic Options Group. Alongside the IPTs and spanning both organisations is the Nuclear Programmes and Resources (NPR) team which supports the work of the cluster and for which I am responsible. Looking from a cradle to grave perspective within the Cluster, the Strategic Options Group covers concept work as we look at potential options for the future, and the Submarine Support IPT covers both in-service support and disposal.

A key issue for the NPR Team, especially in light of the McKane report, is how we should be formed to support our cluster and exactly what processes and structure we should have to best deliver programme management. Fundamentally, the team is trying to take the resources available and balance them between the IPTs to produce the right outputs now and sustainably in the future.

Perhaps the most significant issue for us is the decision on the future of the strategic deterrent, to be announced by the government later this year. That decision will shape



A Trident submarine in the ship lift at Faslane

our whole forward programme; it affects what we do, what structure we should have and it shapes industry's view as to how they can support us. It will affect the entire supply chain which builds and supports our submarines. We're now at a point where that supply chain is fragile and it is costing us significant sums to buy and support equipment that is close to obsolete. This is forcing us to take a fundamental look at the Astute class with a view to re-designing systems within the boat and the supply chain that supports those systems to reduce both initial procurement and through life costs.

As well as looking at the future submarine programme, we're also managing challenges which are common to all teams; in-year management of resources and looking at how we retain specialist expertise. In our case that means commercial, financial, submarine and nuclear specialists. Our relationship with our suppliers is also a key focus for us. We need to ensure we've got the right relationships that have reward for performance at their core.



HMS Spartan, a Swiftsure Class submarine, leaves Faslane

This team is really a pioneer for joint working, which will translate well into the future DLO/DPA organisation. Our future team obviously depends on the implementation decisions coming out of the McKane report, but the effect on us can only be positive. We're already working across those boundaries at the moment so it shouldn't be too difficult for us.

falls to the Chief Strategic Systems Executive. There are a lot of different elements that need pulling together for this to work effectively, and of course we work closely with our American colleagues. Naturally, safety is paramount in all that we do, and none more so than in the movement of nuclear convoys around the country, managed by the Nuclear Movements Team. These convoys make an impressive sight and a lot of preparation and organisation is required.

The recent announcement about the proposed DLO/DPA merger has not had too big an effect on this cluster because we already work across both organisations. That's not to say that there's still more work for us to do in terms of looking at our organisation and shaping ourselves to improve performance, but I think we've got the concept right, and it's working. Rather than just focusing on their individual teams, people are now seeing how their piece delivers into the wider nuclear programme and are thinking in a different way. I know there are concerns about the different cultures of the DLO and DPA, and how these will be brought together, but from my experience with this cluster, it simply hasn't been an issue. There has, and continues to be, a healthy exchange of people from what were the DLO and DPA sides of the business. This will be the way of things in the proposed merged organisation too, which can only be of benefit to individuals and the business overall.

Working in the nuclear area presents engineering, technical and business challenges in a truly unique and complex area. Because of the risks involved, we simply couldn't afford to pay industry to manage them, and therefore the MOD retains high quality, technical people for this work. The cluster is a team in which you can build a career and can face enormous challenges. This for me, is the attraction, and it is what makes working in the cluster so exciting and interesting.



Trident: supported by the Nuclear Cluster



On board HMS Vanguard prior to her successful Demonstration and Shakedown operation at the end of last year. The Nuclear Cluster was heavily involved in preparing the submarine.