MAKING YOUR ESA CHOICE

Some of our graduates give their thoughts on the subject of working within the DESG Engineering System Anchors (ESAs)

We recognise that, in order to make a choice regarding an ESA, it can be useful to have some additional insight from graduates that are already working in these areas. Therefore, for your background information, here are some anecdotal thoughts from some of our graduates; with the aim of helping you in making your ESA choice. Each graduate has written their contribution in their own individual style, highlighting the points that they think you may be most interested in.

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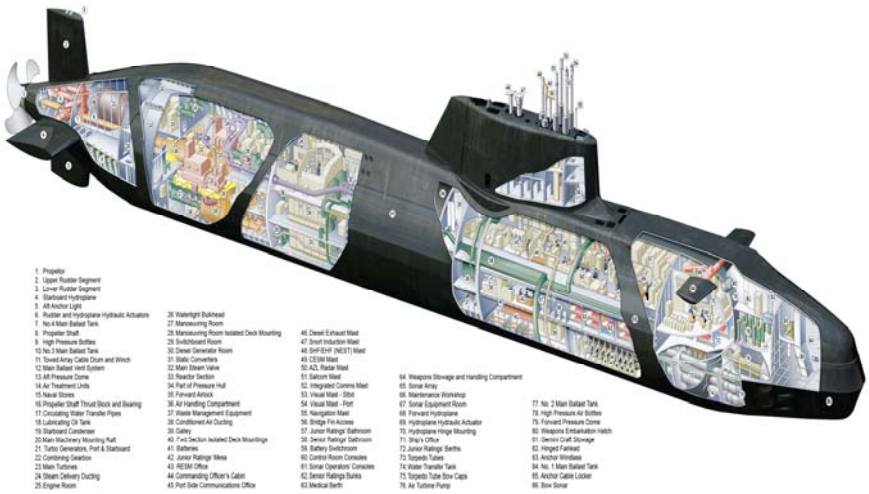
COST ASSURANCE AND ANALYSIS SERVICE (CAAS)

GAVIN

DEGREE DISCIPLINE: **BSc COMPUTER AIDED ENGINEERING**
ENGINEERING SYSTEM ANCHOR: **CAAS**

What is CAAS?



The Cost Assurance and Analysis Service (CAAS) is the MoD's centre of excellence for the costing and pricing of defence equipment.

Situated within the Defence Equipment and Support area of the MOD (DE&S), CAAS enables the continuous improvement of the process by which the MOD acquires the equipment needed by the UK's Armed Forces - and so enables risk reduction; ensuring the best value for money for the defence of the United Kingdom.

What will I be doing in CAAS?

As a graduate engineer, the suite of dedicated CAAS training courses will take you on the path to professional chartership; this includes a 5 week induction; which will provide you with a thorough grounding in the role of CAAS and the important and fascinating work that you will be trained to do.

CAAS engineers work closely with the Defence Industry to assess how they design, manufacture, deliver and support military capability in order to ensure that the best value for money is achieved. In the current economic climate it is critical that the capability procured and sustained for Defence is cost effective and affordable through the entire life cycle of the

equipment. As a Cost Engineer you will analyse in detail Defence Industry plans and bid submissions to win Defence contracts in order to assess their feasibility in terms of delivery and cost. To do this you will need a good grasp of technology, engineering processes, planning, scheduling and analytical techniques. You will negotiate with Industry to drive down costs in the areas you have assessed and identified as excessive. You will understand the technical risks of complex programmes to ensure that the MoD is not unfairly penalised if they materialise because this is an area that can drive up the overall cost of a programme, and in some instances can result in massive time implications. As a Cost Engineer you will work closely with Defence Industry, possibly on secondment, using your knowledge, experience and judgment to drive forward efficiencies from the outset of a programme and ensure value for the tax payers' money.

The CAAS Graduate programme will take you through a structured training programme that will enhance your ability to solve problems and analyse technical information. The knowledge and experience you gain through the programme will ensure that the MOD meets the needs of the UK Defence forces now and tomorrow through an affordable programme of works that will deliver on time and to budget.

Gavin's perspective of the Scheme

Background

I started my engineering career at the tender age of 16; I won a 1st year off the job training at Lucas Aerospace training centre in 1993.

After completing my first year I moved to a small tool making firm where they produced cold forming pressing tools, jigs/fixtures and variety of engineering components. I continued my training through a modern apprenticeship over three years where I learnt how to create complex components using a variety of machine tools. Alongside this modern apprenticeship I was sent to Burnley College to complete a City & Guilds craft course.

Once I had completed the apprenticeship I decided to go for a wander around the world for two years. Whilst travelling, I decided I wanted to progress my engineering career and promptly returned home to start my HNC in mechanical engineering.

I progressed through the higher education system collecting an HND in technology and then finally a Bachelors degree in Computer Aided Engineering from Preston University (UCLAN) in 2009.

Whilst completing my education I returned to engineering in a working capacity. I continued Tool Making and moved into the continuous improvement element of engineering.

Why I joined the MoD (CAAS)

Once I had completed my degree I decided that I had to broaden my engineering horizons again and started looking for a different engineering sector to move into, this is when I discovered that the Cost Assurance and Analysis Service (CAAS) within the MOD were recruiting Trainee Cost Engineers. I wanted to join the MoD due to the engineering variety that the MoD employs. Moreover, the MoD is renowned for investing in people and standard of training it supplies to the workforce.

After a successful application for the CAAS trainee cost engineer role I was posted into the Preston office Lancashire.

The Department: CAAS

Cost Assurance and Analysis service (CAAS) is a specialist branch, and has continuously served a succession of British Governments and has a long established since its inception in 1915. CAAS provides cost estimating and pricing services to commercial project teams on a range of development, manufacture, repair and whole life costing contracts.

Trainee Cost Engineering - 1st Year

The Cost Engineering Directed Development (CEDD) course that is tutored is completed over 1 year, it takes you through the skills and tools that are required to become a successful Cost Engineer with the MOD. Moreover, the course doesn't just stay with Engineering, it branches out to project management, accountancy and the commercial contracting world. The course is split up into segments and is delivered in a classroom environment in Bath/Bristol. The course in Bath/Bristol is where you join other aspiring cost engineers from across the country and camaraderie is soon built between the trainees.

The initial 5 weeks was most interesting and rewarded us with valuable information for our career progression and development. Although, there is a lot of information to retain and process we have enjoyed working as a team to help reach our incremental goals.

Running alongside the main Cost Engineers Directed Development (CEDD) course I have to complete the mandatory E-learning and start the Project Based L earning (PBL).

The PBL is the fun bit; this is where you start relating learning to the actual live tasks back in the office.

My first live task was to audit a pricing contract for a military aerospace combat aircraft at a large defence contractor. This involved going to the contractor's site and obtaining the relevant information required to complete the task. Additionally to this the Contractor afforded me a guided tour around the facility so I could physically see the items that were on the price list. The tour guided me through the main part of the facility where all the parts are manufactured and inspected to high specifications. The shear magnitude of the production line was an awe inspiring experience.

Another memorable task was to investigate costs associated with the new class of nuclear submarine reactors. As I had never worked in the nuclear industry and knew relatively nothing regarding the mechanics of nuclear reactors and I had a steep learning curve. However, the experience and knowledge gained from this task enabled me to become familiar and even talk to subject matter experts (SME) on an intermediate level.

DEFENCE ESTATES

(please note we are not recruiting graduate trainees for 2011 intake)

NICHOLAS

DEGREE DISCIPLINE: ***COUNTRYSIDE MANAGEMENT***
ENGINEERING SYSTEM ANCHOR: ***DEFENCE ESTATES***

Hi – I'm Nicolas; I have a degree in Countryside Management from Harper Adams University College and a Masters in Wildlife Conservation and Management from Newcastle University. My Engineering System Anchor (ESA) is with Defence Estates (DE). DE is new to the Graduate Scheme and I was one of the first graduates to start when I started in November 2008.

I'm currently based in the Environmental Support Team (EST) and spent my first placement within the Natural Environment Team (NET) and I'm now within the Environmental Planning Team (EPT). In the NET team I was predominantly assisting in the writing of management plans for areas of the Salisbury Plain. I was also assisting senior staff with researching and producing guidance on problem's as they arouse.

Within the EPT team I have been assisting in the production of Sustainability Assessment's and Environmental Appraisal's/Environmental Impact Assessments for the UK's training areas in Kenya. I am also assisting in the management of the Integrated Land/Rural Management Plan programme.

For my next placement I am looking at going to Cyprus and assisting with the Environmental Advisor in the Cyprus Sovereign Base Areas. This will aim to build upon my two earlier placements and develop my understanding of the MoD's activities and responsibilities outside of the UK.

I have so far been on a few ESA specific training courses but these that I have been on have been extremely interesting and supportive of all the work I have done. I have spent a day on the MoD's training area at Longmoor on a 4x4 Familiarisation course which gave me the chance to gain confidence when driving off-road. I have been on a couple of RAF Halton

environmental courses one on Environmental Law and Sustainable Development Policy and the other on Environmental Management System's (EMS).

As part of the NET team I have been invited down to Lulworth to attempt to try and catch some Sika deer to assist with a Bournemouth University research project into the effects of deer on the different habitats within the Lulworth training estate.

DEFENCE ESTATES

(please note we are not recruiting graduate trainees for 2011 intake)

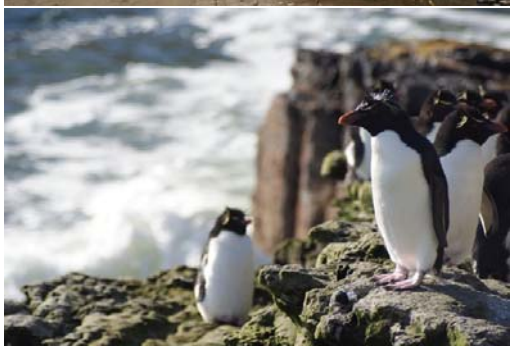
IAN

DEGREE DISCIPLINE: ***CIVIL ENGINEERING***
ENGINEERING SYSTEM ANCHOR: ***DEFENCE ESTATES***

I started on the DESG scheme early in September 2009 with a little apprehension of what to expect and where I would be working. These fears were soon allayed after I had completed the induction fortnight.

One of the core parts of the job is your work placements which allow you to move around and work with different teams in different environments (even outside the MOD). Since joining the scheme I have had many opportunities come my way; shortly after starting I went to the South Atlantic to work on some projects key to the operations in the Falkland Islands and Ascension Island. I spent 3 months on a remote part of the Falklands working with a small team of contractors and living with an equally small selection of RAF personnel.

It was a very strange experience to be so far away from home yet being a part of this small community on top of a mountain top. I won't lie, the project demanded some hard work, but it was worthwhile; in the three months that I spent on this project I was introduced to all aspects of site engineering and the problems that you encounter when you are so far away from the UK (especially with the Falklands weather!). I did find time to explore some of the amazing places there are in the Falklands, I saw so many different type of penguins and wildlife in my spare time. Whilst working near the main base I made full use of the facilities that they have available, climbing walls, a swimming pool and a well equipped gym.



Whilst in the area I was fortunate to have the opportunity to work on a remote island just off the equator, called Ascension Island. It was an amazing little island, and the weather was nothing short of amazing (30's consistently every day). I overcame daily challenges of project management on site – refurbishing a building isn't as easy as you may first think. Whilst I was there I was able to explore the small island; the main highlight was seeing the green turtles laying their eggs, and when I returned at a later stage, to see them hatching! In my free-time Ascension really did feel a little like paradise island.

I'm currently project managing on an American Base in the middle of Suffolk, as a project manager I am dealing with all the day to day problems you face with any project large or small; ensuring I am organised and communicating effectively with the stakeholders whilst ensuring the project keeps moving. The base, however, really does feel like little town America!

Aside from the core work I've had the opportunity to complete various courses and visits that support the graduate development. These have included the Defence Capability Centre in Shrivenham; seeing the history of armaments, tanks and ammunition as well as hearing interesting stories from the front line from military personnel. Prior to my work in the Falklands I completed my military driving training course for Landrovers which involved 7 days of on and off-road driving Landrovers to their limits; it was an amazing course to learn about the vehicles and get them dirty.

What has impressed me throughout has been the diversity of work available throughout the defence estate. In only a year I have had an amazing experience during my placements and have had the opportunity to work with many different people and companies in various disciplines. It's been an incredible learning experience.

My advice would be to look hard for placements, it’s a good idea to choose placements that will challenge you whilst also giving you the most back; it’s all about self-development at the end of the day.

I have no doubt been very fortunate in my first year, but there are similar opportunities available across all disciplines. I’ve had good support throughout and am well on my way towards Chartership.

LAND

OLIVER

DEGREE DISCIPLINE:	***MECHANICAL ENGINEERING/ENGINEERING SCIENCE***
ENGINEERING SYSTEM ANCHOR:	***LAND***

Ollie's DESG scheme, the story so far:

TEST IPT
Saw some of the issues with the demilitarisation of cold war era bar mines, got started on lots of training courses and had a good crawl around the armoured vehicles, aircraft hangar and the armoury in Shrivenham.

GDG: wrote and edited part of our GDG report and organised a GDG trip to the Damage Repair Instructional Unit in Plymouth at HMS Raleigh where we stopped a ship (ok, a giant 2 storey metal box full of ice cold water which rocked side to side) from sinking using only wooden wedges.

LWPB IPT

I was whisked up to the Lake District for a week for an excellent team building and leadership course.

At LWPB I organised a safety panel and a train the trainer course for a new infantry weapon, and even got a go at firing the weapon myself. I also helped bring the weapon to service.

During this placement I also attended one of the largest vehicle demonstration events in Europe, DVD, in the summer and got to play with new vehicle mounted thermal imagers, toured a lot of international vehicle manufactures and got taken for several rides around the test track in the new MAN DROPS truck and the KWV dingo armoured personnel carrier. At the end of the day I even got to drive myself around the Milbrook proving ground in a Landrover Defender 110 under the expert supervision of an off road instructor.

I also attended the small arms symposium learnt a lot about current and future developments in small arms, armour, and soldier power systems. I had the opportunity to fire a SIG 9mm pistol, a semi automatic shotgun and a 9mm carbine, all things a civilian in the UK would never normally be allowed to do.

One of my ESA courses was the land vehicle demonstration day – this comprised a tour of the facilities of the Defence Support Group (DSG) at Bovington and a play in a fully powered up the Challenger 2 tank, designating targets on the thermal imager then letting the over 10 tonnes of turret swing into place at the touch of a button. That afternoon, we watched a CVR(T) gunner's course take place on nearby ranges then toured the tank museum.

SUPACAT
Helped manage the design, manufacture and acceptance of a new Special Forces vehicle. Had dealings with users, subcontractors, IPT and all departments of the Supacat team. And then they let me fly around their local test track in a Jackal demonstrator and their 6-wheel logistic variant.

During this placement I attended a university careers fair to raising awareness of the DESG scheme for science and engineering graduates.

Qinetiq
In their Force Protection Engineering team, I spent 2 weeks in Pendine on an international trial blowing things up, helped write a major part of the subsequent report, presented some slides from the trial to the customer and other interested parties, then drafted a paper on the trial. Unfortunately, the high classification of the report and trial prevents me from going into too much detail.

NEXT – Another IPT placement in Bristol, and if time allows, a general engineering course in Rugby, and some more courses at Cranfield University, Shrivenham on weapons and explosives before my re-grade, chartership, ministerial positions, er…

WOME

ALEX

DEGREE DISCIPLINE: ***AERONAUTICAL ENGINEERING***
ENGINEERING SYSTEM ANCHOR: ***WOME***

When people hear the words "Ordnance, Munitions and Explosives", they tend to think of big explosions. I don't have to explain this - if blowing things up doesn't appeal to you, then you're on the wrong ESA, and possibly in the wrong job. I've been on explosives trials, modelled the break-up of artillery shells on detonation, and calculated safety distances.

But the challenge isn't just making things explode - once you've got the chemistry right, that's not difficult. There has recently been increased emphasis on force protection, and in making British troops safe on deployment. I'm currently working with experts from industry, Dstl and Force Protection IPT to develop a counter-IED system, taking it from concept, through lab testing and optimisation, to production standard in the course of a six-month placement.

I've also worked on a UOR (Urgent Operational Requirements) to protect camps and bases from rocket and mortar fire, working with the contractor to ensure that the capability could be maintained and supported in the harsh conditions of southern Iraq. I've conducted research, supported by Dstl and the Foreign Office that will inform policy on future long-range strike capabilities. I've attended meetings at the highest levels; conferences and symposia with users, manufacturers, and experts from all over. I've worked with Army, Navy and Air Force personnel, and with overseas representatives from the USA, France, Germany, and Sweden.

The great advantage of OME is that it's truly tri-service, and truly international. It can either be an end in itself, or a stepping stone to wherever else you want to take your career.

AEROSPACE

TOM

DEGREE DISCIPLINE: ***ELECTRONIC ENGINEERING***
ENGINEERING SYSTEM ANCHOR: ***AEROSPACE***

First Year in DESG

Aerospace ESA – GDG 01/08 – Age 23

After passing the DESG assessment centre I joined the Aerospace Graduate scheme one year ago, in March 2008.

Unlike the careers that my friends from University have followed, mine has allowed me to design my own progress and plan my two years in a way that suits me. Initially, I spent 4 months working with an Engineering Operations team at RAF Henlow with whom I have travelled to dozens of UK MoD sites and, notably to Bahrain to work with the Royal Navy. I spent 5 months working in industry with Rockwell Collins UK which included travel to Norwegian Defence Department in Oslo and interaction with many defence contractors both UK and international. Having decided that I knew nothing of Defence at policy or strategic level, I undertook 3 months work in Whitehall, London. This gave me a unique opportunity to see how decisions are made at a much higher level than I had previously seen.

Choosing the Aerospace scheme has allowed me to complete several specialist training courses on Military aircraft including a fully sponsored, two week flying scholarship in Scotland. I have also been lucky enough to be scheduled to fly in an RAF Hawk later this year. During my first year, I have undertaken many other training courses; some examples include practical leadership, project management, environmental protection, presentation skills and acquisition.

Along with the other graduates in my group I have visited the Houses of Parliament, the Apache maintenance hub at Middle Wallop and completed Helicopter ‘dunker’ (Underwater Escape) training with the Royal Navy. The graduate scheme has also permitted me to apply for service in the Reserve forces and to receive special paid leave while training, something that many employers will not support.

Choice is the order of the day – Each of the friends that I have made on the graduate scheme has also sculpted there own development and the experience of each graduate so far has been entirely unique.

The endless opportunities within MoD couple with this freedom of choice should not be underestimated; I have drawn great satisfaction from exploring the direction in which I want to take my career in the future.

Photo’s below

GDG 01/08 in the Underwater Escape Training Unit – The ‘Dunker’

During a Visit to Middle Wallop – Tom Barker sitting in the Apache

AEROSPACE

NIK

DEGREE DISCIPLINE: ***ELECTRICAL ENGINEERING***
ENGINEERING SYSTEM ANCHOR: ***AEROSPACE***

The following will provide a snapshot of the opportunities available within the Aerospace ESA and my own experiences within the scheme thus far.

In order to do so the document will cover the following W's of the aerospace ESA:

- Who am I likely to work with?
- What am I likely to do?
- Where am I likely to work?

In doing so I hope to answer the bigger question of 'Why choose aerospace?'

Structure

This document is composed of 2 parts. Firstly there is a general overview of the aerospace ESA, specifically what placements, courses and opportunities are available. The second part summaries my roles and responsibilities within the Aerospace ESA, as well as any visits and opportunities I have experienced along the way.

Aerospace Opportunities

Placements

At present there are 72 MoD teams offering aerospace graduate placements covering a variety of different roles. Of these teams the majority are centred in DE&S and therefore are located in MOD Abbey Wood, however due to the size of the aerospace ESA there are plenty of other opportunities to be found across the UK and overseas. Some of the in-house teams offering placements are:

- Joint Combat Aircraft
- Hercules
- Tornado
- C-17
- Chinook
- Nimrod
- Unmanned Air Systems
- Typhoon

Complimenting this, there is a number of industrial placements/ secondments in companies such as Airbus, Rolls Royce, BAE Systems and QinetiQ. Furthermore many teams have the capacity

to accommodate several graduates concurrently creating a placement rich environment for aerospace graduates

Figure 1 - A RAF XI Squadron Typhoon releases an enhanced Paveway 2 bomb during Exercise Green Flag at Nellis Air Force Base in the USA (Archive picture) [Picture: Geoffrey Lee, Planefocus Ltd]

Roles

Many of the roles you will be expected to perform when working within the aerospace ESA will be similar in function to that of other ESAs. These typically are:

- Risk Management
- Safety Management
- Technical Management
- Logistics Management
- Programme Management

The one key difference however lies within the area of Safety Management, Airworthiness. 'Airworthiness is a term used to dictate whether an aircraft is worthy of safe flight' [http://en.wikipedia.org/wiki/Airworthiness]. Airworthiness is unique to the aerospace ESA and over your two years on the graduate scheme you will have the opportunity to develop and practice a working knowledge of the requirements and policies surrounding airworthiness in the MOD.

Courses

For aerospace graduates there are 4 ESA specific short courses, that are available as well as a host of other mandatory courses, in order that graduate improve and build upon their aerospace knowledge. These are:

- Military Aircraft Technology
- Airworthiness for Military Aircraft Course
- CPDA MSc modules
- Aeronautical Engineering - Introduction (DAPS 3)

These are extremely beneficial to all aerospace graduates over their future careers whilst also being interesting courses. There is also the possibility of undertaking a 12 hour flying experience course whilst on the scheme.

Extras

Firstly, there are several major programmes such as C-17, Typhoon and Joint Combat Aircraft that are international in nature. This lends itself to regular international communication in the forms of teleconferences and phone calls; however there is often the need for meetings which can take place in the UK but also overseas. Expect to find yourself travelling to the United States and to Europe on occasion depending on the team you are currently working for.

Figure 2 - Joint Strike Fighter test flight [Picture: JCA]

Secondly, there is a scheme in place whereby a lucky few MOD DESG graduates are given the opportunity to attend a short course were they will be taught to fly an aircraft. This allows the graduate to broaden their general awareness of aircraft and aircraft systems, introduce them to the skills required to pilot an aircraft and give the graduate an awareness of the potential difficulties faced by its operators and maintainers whilst deployed in a theatre of war. All of the above will aid the graduate in his career over the longer term, but it is also darn good fun!

My DESG Journey

Placement 1

My working experience on the scheme began with the now Unmanned Air Systems team, then Tactical Unmanned Aerial Vehicle. Within the larger team I worked in a small Urgent Operational Requirement team supporting an Unmanned Aerial Vehicle (UAV), the Hermes 450. This UAV was in operation in both Iraq and Afghanistan and my responsibilities were to collate and manage the flight usage data and break down data coming from the two theatres and to compare these against the reports being handed to the team from the prime contractor.

With the data in hand I provided predicted usage information for use for the team and the operator in theatre, advised the team on the contractual implications of the usage and managed the discrepancies between my figures and the figures given by the prime contractor.

This placement provided opportunities for some limited engineering know how, some contractual awareness, lots of team working experience and communications skills coupled with managing customers and suppliers experience.

Figure 3 - Gunner Blackman, 47 Regiment Royal Artillery, with a Desert Hawk 3 UAV. In the background is the Watchkeeper UAV and an Apache helicopter [Picture: PO Phot Terry Seward]

Placement 2

Following on from UAVs my second placement was to be a fast jet placement working within Joint Combat Aircraft (JCA). JCA is the UK programme to replace the aging Harrier Fleet. In order to do so JCA are procuring the F-35B or Joint Strike Fighter (JSF) made by Lockheed Martin. The US leads the programme via the JSF Programme Office (JPO) with each of the partnering nations supplying personnel to man the office. The UK are 1st class partners with the US and therefore we have embedded UK specific requirements into the design of the F-35B variant and are therefore awarded a different relationship with the US compared to the other 7 partnering nations.

This placement gave me my first and best exposure to safety, structures and airworthiness as I was working within the technical team for the Safety Manager. However my output was not as high as expected due to the large learning curve when coming onto the programme. I did however have exposure to a huge variety of technical aerospace forums, issues and documentation and gained awareness and working knowledge of safety, airworthiness and structures. As a non aerospace engineering graduate I found this exposure to be of immense value.

One other exciting aspect of the work was that any decisions made at that time would have important repercussions later on in the programme life. This was due to the programme being at a very early stage and so we were covering new ground day by day.

Even so though I had little evidence in terms of documents written etc, I did have exposure to the Release To Service document, the Through Life Management Plan and the Integrated Test And Evaluation document. These documents are key documents in the acquisition process providing an audit trail of all the decisions made, detailing the structure and plan of the team in delivering its outcomes and proving that the aircraft is safe to fly.

As the team is split over Abbey Wood and Washington in the JPO one of the bonuses of working in JCA is a trip to Washington DC in order to attend several meetings. One of the meetings was the International Acceptance Working Group, with all 9 nations in attendance, where by I made up part of the UK presence. I cannot highlight enough how amazing this was as both an opportunity to learn and an experience of government level discussions and meetings. Not only was it a fantastic development opportunity but we were also given time to visit the city and experience the local culture making the trip invaluable.

Placement 3

My third placement was in the Surface Attack Heavy (SAH) team. This team is a cluster team with various projects running concurrently all supporting, modifying or researching aspects of the Storm Shadow Missile System (SSMS). I formed part of the In Service/ Logistics team working with a QinetiQ employee seconded into the team. My role was to aid in the construction of a dossier for their Surveillance And Life Extension (SALE) work.

This line of work involved looking into technical documentation searching for evidence and building up a body of evidence to support the SALE activities. Furthermore even though this is an aerospace suitable placement there was a huge amount of overlap with Ordnance Munitions and Explosives (OME), not uncommon in placements, providing an opportunity to increase my awareness of this different ESA.

Other activities were undertaken whilst on this placement, such as crafting a one page business case for the replacement of clock batteries within some ruggedised laptops being used as part of the SSWS. Other opportunities were aiding in the construction of several presentations for my line manager and instructing members of the team on the use of PowerPoint. These later opportunities prove the flexibility of the graduate, their ability to work as part of a team and the willingness and ability to improve not only yourself but those around you.

Figure 4 - Tornado carrying two Storm Shadow Missiles

Placement 4

This placement was a non aerospace placement secondment with BAE Systems. Although this provided little aerospace specific development it did prove useful in understanding the needs and practices of the defence industry when dealing with the MOD.

During this placement I undertook a host of various research tasks culminating in a report capturing my findings and recommendations.

Placement 5

My final placement on the graduate scheme prior to regrading into a C2 post is with Typhoon. I am currently being trained to undertake the role of Technical Publications Manager whereby I will be

directly responsible for managing the update, review and publication of three key safety documents, the aircrew manual, the operational data manual and the flight safety cards.

Typhoon is a large team with work being carried out covering all of the acquisition cycle, such as new technologies being researched and developed to be added to the aircraft, managing the in-service aircraft and disposal of some of the test and damaged aircraft. There is therefore lots of scope to undertake work and gain an awareness of virtually all aspects of the aerospace field prior to regrading.

MARITIME
(MARINE ENGINEERING)

OLIVER

DEGREE DISCIPLINE: ***MECHANICAL ENGINEERING***
ENGINEERING SYSTEM ANCHOR: ***MARITIME (MARINE ENGINEERING)***

I joined the DESG scheme at the end of the sixth form and attended the University of Southampton as part of the Defence Technical Undergraduate Scheme (DTUS). This entailed being a member of Thunderer Squadron, which is similar to an OTC (Officer Training Corps) or URNU (University Royal Naval Unit). At Thunderer, we were given the opportunity to work alongside members of the armed forces, including officers who were returning to university and officer cadets who would attend initial officer training after graduating. A range of leadership activities and adventure training was scheduled during the course of our university career, with the emphasis placed on participation and having fun. Exercises and expeditions were common, and amongst other things, I was able to spend two weeks every summer sailing in Germany, a week playing golf, a number of weeks hiking and gaining mountaineering qualifications, and was given the chance to play representative sport for the unit every week – all of which I was paid for!

Every summer, I undertook a placement in order to fulfil professional and MoD core competencies. The placements lasted for 10 weeks and ranged from working with an anti air guided weapon defence platform, to spending a number of weeks at sea on HMS Richmond as part of her sea trials programme.

Upon graduating and attending the DESG induction course, the highlight of my DESG career was about to begin: the chance to spend six months in Washington DC on secondment to the US Navy's research establishment at Carderock. Carderock is the navy's in-house research base which undertakes design and research for all the new ships they build. The work at Carderock was hugely varied, and included concept designs for high speed SWATH (Small Waterplane Area Twin Hull) transport ships, designing and gaining $70,000 funding for a remote control model ISO container handler and designing a speed/depth recorder on a very tight timescale for submarine applications. This last project resulted in the start of a process to obtain a patent for the design.

As well as undertaking diverse work in a unique environment, the placement was the ideal time to explore the US, and with the nearest ski slope an hour away, there was no shortage of reasons for us to get out of the apartment and see the country. Other than getting 25 skiing days over the course of the six months, trips to Florida, Georgia, Vermont, Utah and New York were all part of the experience!

Upon return from the states and getting back down to earth, my next placement was in Major Warships (now Capital Ships) at Abbey Wood. With immediate responsibility for generating refit requirements for two aircraft carriers, there was no easing back into the swing of things, but in the long run, these projects will be very useful for gaining evidence when it comes to getting chartered in a few years time.

The scheme has given me some of the best experiences of my life and when I speak to friends from university on other graduate schemes, there really is no comparison!

MARITIME
(NAVAL ARCHITECTURE)

MATT

DEGREE DISCIPLINE:	***SHIP SCIENCE WITH NAVAL ARCHITECTURE***
ENGINEERING SYSTEM ANCHOR:	***MARITIME (NAVAL ARCHITECTURE)***

Background

I joined the MoD in 2003 as a student and studied at The University of Southampton. During my time at Southampton I was paid a bursary and ask to attend Thunderer Squadron's weekly training evenings. As part of the bursary I was also given the opportunity to undertake 10 week summer placements. I joined the graduate scheme in 2007 and undertook a number of placements and training courses for 18months. In 2009 I entered my final placement, which I will continue as a full time job. This placement is as the In-Service Naval Architect in the Design and Construction section of the Afloat Support team (Royal Fleet Auxiliary).

Why I chose Naval Architecture ESA

I studied Naval Architecture so the choice of my system anchor was particularly easy, but just because you did not study naval architecture, does not preclude you from this system anchor. The MoD offers a 1 year MSc conversion in the subject for mechanical engineers.

Placements

Student Placements

At University I was a member of Thunderer squadron which is set up as a quad-service unit for all sponsored students undertaking a degree at Southampton. In the squadron I was asked to attend a lecture once a week and attend two military exercises. The first was a 2 week induction course at Dartmouth Naval College and the second was in riot training, where I was asked to don a shield, helmet and boiler suite and told to walk though petrol bombs and negotiate a number of obstacles while being pelted by potatoes.

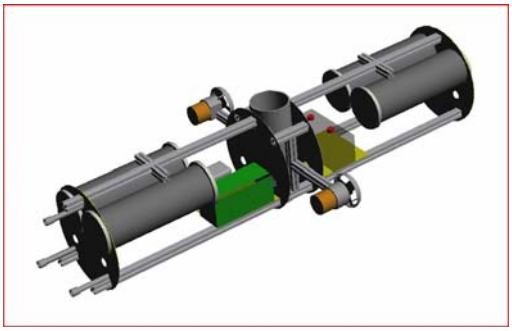
My first placement was in equipment support at Nuclear Service Support Manager Devonport. In this placement I was encouraged to visit and become familiar with many of the Royal Navy Ships and Submarines.

My second placement was in research and development at QinetiQ, Haslar. In this placement I was asked to develop a programme to analyses the dead ship tow experiments which were being undertaken in the tow tanks. At the end of the placement I was able to assist in the undertaking of the Landing Platform Dock towing experiments.

My third Placement was in project management at the Directorate of Equipment Capability - Chemical, Biological, Radioactive and Nuclear in main building London. I was tasked with undertaking the project management plan and updating the risk register.

My first Graduate placement was six months working at the Naval Surface Warship Centre – Carderock – Washington DC. During this placement I was tasked with developing a detailed concept design of a Global Fleet Station Ship. I completed this design and it has now been published at the MAST Conference and in the ASNE Journal.

My second placement was a three month course in general engineering held in Rugby College. The first 6 weeks comprised in lectures and the making of a compressed air driven motor and the second 6 weeks comprised of designing and building a submersible remote operated vehicle.



My third Placement was completed in the Future Surface Combatant Project team, where I spent 4 months assisting in the development of the project plan and was also tasked as the risk manager for this time.

My fourth placement was at University College London where I undertook the Submarine Design course. This comprised of 3 weeks of solid lectures and 6 week design exercise

My fifth placement was my DOT placement. This is the placement where you will re-grade into the post you complete as a graduate. This placement was equipment support were I was responsible for all In-Service Naval Architecture issues for 16 ships. This involves day to day liaison with the ships Executive Officers answering their naval architecture related questions and undertaking certification tasks relating to structures, stability and escape and evacuation.

Highlights

The highlights of the scheme have been many and varied, not just in the placements but in some of the training course I have been sent on. In my student days undertaking riot training which was particularly thrilling. Working and living in America was possibly the best 6 months of my life, the work was interesting and I was able to visit most of the east coast of America and spent 17 days learning how to snowboard. The course at Rugby College was very rewarding in the respect of meeting a large number of graduates across the GDG groups and having the opportunity to design and build a mini submarine. Also during my time as a graduate I was given the opportunity to attend a 10day sailing trip, on a Tall Ship around the Western Isles of Scotland to develop my team building and leadership skills. In addition to these courses I have also attended two inclining experiments on Type 45 and HMS Ocean and regularly visit the RFA Fleet around the country.

These highlights are just a small proportion of the opportunities that the DESG scheme has given me and will give you.

Advice

The best advice I can give is, if you don't ask you don't get, don't be afraid to supply innovative business cases to the DESG office, at worst they can only say no! The Naval Architecture community in Abbey Wood is small, but there are a lot of vacancies available to you once you have left the DESG Scheme and a lot of interesting work, get your name out there and opportunities will come to you.

COMBAT & INFORMATION SYSTEMS (COMBAT SYSTEMS)

TIM

DEGREE DISCIPLINE: ***MECHATRONICS***
ENGINEERING SYSTEM ANCHOR: ***C&IS (CS)***

Combat Systems is an incredibly broad area, covering almost every platform in all 3 services, resulting in a huge opportunity to get involved in a variety of projects and at every level. This also means that the Combat Systems engineer is continuously faced with changing demands, specifications and requirements.

During my time on the scheme I was able to appreciate the massive amount of work that is undertaken in getting a modern fighting machine from the realisation of a gap in capability to something being rolled out to the front line and into use by UK forces. In terms of Combat Systems this means weapons and sensor systems, communication systems and general IT. Working out what needs to talk to what, where to send information and where not to and how to connect it all together. In this day and age Combat Systems is one of the most critical and complex area of engineering.

During my time on the scheme I undertook a number of placements and training courses aimed directly at developing those skills needed to work effectively in the Combat Systems area. The first area to consider is technical knowledge, few university degrees teach you how radars work or the best method to redirect a missile in flight.

To gain this I spent 3 months training alongside the Royal Navy for one of their office training courses. This is designed to give young Weapon Engineering Officers the technical knowledge they need to run a ship's weapon and sensor systems. This is typical of a DESG course, only open to the Royal Navy or DESG graduates. It focused on learning basic communication, radar and sonar theory then combining it with knowledge of weapons systems to appreciate how a ship fights. Living in a military environment as a civilian certainly is an experience I will never forget, although it was not always easy it certainly opened up other opportunities. Leadership training at Britannia Royal Naval College being one.

To back up the theory I organised to spend 4 months working in the Royal Navy Weapons Trial section. The DESG scheme allows you to observe systems and equipment being used in the field. Highlights include assisting in live missile firings and conducting First of Class demonstration trials. This meant living onboard ships for days at a time, experiencing simulated engagements and seeing how a Combat System is used in a ship on the front line. Not exactly a normal 9 to 5 job.

The system of placements on the DESG graduate scheme allows for an appreciation of the whole scope of engineering in the MOD. I went from living firings one week to working in Whitehall the next. Working in the centre of government opened my eyes to policy, research and a world of emerging technologies. I spent a number of months looking at applications for ideas coming from industry and educational establishments. This used my engineering in different ways, meeting with experts and trying to understand and evaluate a vast range of technologies. Work here can affect projects for decades to come and with that comes working with some very senior people.

Working for a project team in Bristol can offer a huge range of opportunities, with Combat Systems your options are very rarely limited. Most platforms or weapons systems need to communicate and interact with the wider world. Arranging placements with teams at different stages of a project cycle mean different opportunities, from being involved in design, solving practical problems with installation of equipment on new platforms to supporting a piece of equipment in theatre with urgent operational requirements.

The MOD also offers a huge range of other development opportunities outside of courses on technical and core skills, such as project management, systems engineering and engineering skills. I took the chance to go as a member of staff on a Raleigh International expedition to Namibia for 3 months. A unique opportunity in any career. Designed to give MOD employees leadership experience while undertaking projects in a developing country, it was certainly the highlight of my time on the DESG scheme. Returning with a huge amount of new skills in teamwork, leadership, coaching, conflict resolution and thousands more shows the value of such an experience. Many of which can be used every day life as well as count towards gaining Chartership status.


NAMIBIA
ENGLAND
BERMUDA
Raleigh
INTERNATIONAL
SCOTLAND
PROJECT MANA
HONG KONG
WALES

COMBAT & INFORMATION SYSTEMS (TELECOMMUNICATIONS INFORMATION SYSTEMS)

JOHN

DEGREE DISCIPLINE: COMPUTER SCIENCE
ENGINEERING SYSTEM ANCHOR: C&IS (TIS)

As a Graduate in the Combat & Info Systems stream I have had access to a huge variety of placements across the Defence spectrum, and in my two years on the DESG scheme I have seen some weird and wonderful projects and places!

After an initial five-month placement working on networking and interoperability policy – during which I spent most of my time getting to grips with the MOD world – I took my degree in Computer Systems Engineering to Dstl, the MOD research organisation, to assist a team working with artillery systems. They had a requirement for a programmer to assist on a specific task, and I was able to use my skills to really contribute to two important projects that have since been proven successful on the front line. The work saw me running models of new systems and liaising with military staff from instructors at the Royal School of Artillery to the commander of Khandahar Airbase, and almost saw me get a trip out to Iraq! Knowing that my resulting reports would be generating tangible Defence benefits – "saving lives", as we try and convince people when showing off! – was both exciting and truly satisfying.

After three months with Dstl I moved onto my third placement, working for NATO in Brussels, Belgium, for four months. Apart from enjoying a beautiful city in the middle of a wonderful summer (and 800 different kinds of local beer!), I was working in a very demanding and interesting multinational environment developing network applications. The placement saw me travel to important meetings in Germany and Luxembourg (the latter of whom awarded me a special gift for my efforts in assisting with the conference), where I presented my work to people from a variety of countries and disciplines. The opportunity to work abroad was enlightening and did wonders for my development, cementing my communication skills by testing them to the limit.

All the while during my first year on the scheme I was contributing to our Graduate Discussion Group's project. The GDG consists of all the other graduates you meet on your first day in the MOD and go through your induction fortnight with. They become your first friends in the organisation, and provide a lifeline for things to do, be they going out or finding a suitable new placement. Each GDG is given a project to complete over the course of the first year, culminating in a report and a presentation to Senior Civil Servants. As part of our research we met up numerous times in a variety of places, the highlight of which, for me, was our visit to HMS Raleigh in Plymouth and their Damage Repair Instructional Unit. The DRIU is a scary place, and the general public would probably pay good money for a go – access to such places is but one of the perks of the scheme! It is, essentially, a mock-up of a ship (including engine room, mess deck and quarters), with a load of holes in it. The whole thing is based on hydraulics which can tilt it 20° either way, and stood to the side is a tank of containing around 3000 gallons of water. You go in, in a very attractive orange rubber suit, holding a mallet and a bag of wooden wedges. When it all goes dark and loud, you have to bung up all the holes with the wedges before you drown – not a good idea with a hangover! The day was a lot of fun and, come presentation time, we were awarded "Best Presentation" for our project. All around, a bit of a winner!

My fourth placement was an industrial placement, working for a private company in Poole, Dorset. The company in question often handled Defence contracts, particularly for bomb-disposal robots and other equipment, but as a member of staff I was expected to help out in a variety of non-Defence contracts as well. Seeing life from the other side of the wall was eye-opening, and a valuable experience that has given me increased insight while dealing with contractors. It also gave me an opportunity to hone my technical skills, as I was often required to help in the workshop and I was only to happy to get out my screwdriver and start fiddling! After that I went to Abbey Wood, our main Bristol site and the place with the most MOD Graduates anywhere! I did some pretty cool stuff with networks (not an oxymoron, honest) that I'll have to gloss over, and then joined a team working with communications standards for common military radios. While it sounds rather dry, you could see real benefit in the outputs of your work in keeping all our systems talking to each other. Speaking to the users made this point particularly strongly, as they had their own views on the system and were grateful that we were doing all we could to keep the radios up to date and compatible with other systems. This placement also took me back into NATO where I could use my previous experiences to contribute to meetings and communicate effectively. The NATO work also took me to Virginia in the US, and Gran Canaria. A very stressful time, I'm sure you'll agree.

Having completed the initial two years as a Graduate I got my first "proper" job in a team who deliver training to all aspects of the military, from simulators to live firing and everything in between. Our team had a hand in that memorable Top Gear episode that saw Clarkson drive a Mercedes and a Porsche through a village whilst getting shot at by soldiers, and I personally work to deliver commercial software packages into the training environment which, to the uninitiated, often looks like I'm playing computer games to see how good they are. Which obviously it's not…

C&IS (CS)
Combat & Information Systems (Combat Systems)

ALAN

DEGREE DISCIPLINE: ***ELECTRONIC ENGINEERING***
ENGINEERING SYSTEM ANCHOR: ***C&IS (CS)***

Placements:

- **Aerial Target Systems** – *MOD Abbey Wood, Bristol*
- **Chinook Uncommanded Flight Control Movement Analysis** – *DARA Fleetlands – Gosport*
- **Nimrod Mk4 RADAR Trials** – *Air Warfare Centre - RAF Waddington / BAE Warton*
- **Future Business Group** – *MOD Abbey Wood, Bristol*
- **Naval Electronic Warfare IPT –** *MOD Abbey Wood, Bristol*
- **Typhoon (Eurofighter) IPT** – *MOD Abbey Wood, Bristol (starting May 09)*
- **Raleigh International In Namibia**
- **Princes Trust Enterprise Programme**
- **Directorate of Intelligence – Scientific and Technical** – *MOD Main Building, London (Starting Oct 09)*

I came on to the DESG scheme through the DTUS scheme which sponsored me through University. Since my time on the scheme I have been involved in a wide range of placements, all loosely connected to Combat and Information Systems (as an anchor, it covers nearly everything!). Below is short summary of what I have been involved in with each of my placements:

Aerial Target Systems – This placement involved creating Safety Case documents supporting the deployment of Aerial Systems, and pyrotechnics, into the Navy Maritime environment. Other roles included meetings with contractors and subcontractors to discuss safety issues regarding the associated hardware. I also had a role in updating the departments IT infrastructure to bring it inline with the MOD's guidelines. While on this placement I had the opportunity to attend test firings at the ranges in Wales and to spend time on Navy ships while compiling the safety cases.

Chinook UFCM Analysis – This placement involved creating a tool to aid the investigation of Uncommanded Flight Control Movements (UFCM) on the Chinook Helicopters. The tool was able to predict failures and aid the procedures involved, as more data was inputted the tool learnt and provided more and more accurate results. The placement finished by presenting to an invited audience and handing over the tool to the MOD. While on the placement I spent time flying in a Chinook and got to see the hands-on technical side of crash / component failure analysis.

Nimrod RADAR Trials –This placement involved the analysis of flight data from the Nimrod Mach-4, particularly with regards to RADAR analysis. During my placement I created a tool that automated the analysis of flight data, reducing flight analysis times from several days to several hours. I then presented these results to a board at RAF Waddington. I spent the majority of the placement working within BAE Warton.

Future Business Group – I was part of the team working on the DE&S and SIT initiative to create the 'Defence Technology Plan' whose purpose is to link current and future research to that of the development needs of IPTs in attempt to provide future cohesion between SIT research programmes and exploiting IPTS. This was my first placement as a full time employee. (released Feb 09 - http://news.bbc.co.uk/1/hi/technology/7913529.stm)

Naval Electronic Warfare – During this placement I have been the project manager for three supporting contracts into the Maritime Integrated Defensive Aids Suite (MIDAS) programme to supply a future defensive capability for the Navy. This has involved being the point of contact for all the contractors and running each of the projects from start to finish and by far the most responsibility to date and far more than you would expect as a graduate, essentially doing a C2 post.

Raleigh International – Namibia – At the time of writing I am currently in the fund raising stage for this. This placement involves going to Namibia (Africa) for a month (on full pay!) with the charity Raleigh International on a leadership development programme. While I am there I will be building a playground for a remote school and trekking as well as driving through some of the many game reserves.

Princes Trust Enterprise Programme – I am working with a team of 10 other people to try and raise £20,000 in six months. This is held alongside other work / home commitments and is recognised as a development activity.

I am about to move to Typhoon IPT working on primarily engine management using a tool called FUMS (Fleet Usage Management System). One of my aims while I am in post is to liaise with the contract that supplies the software and with the rest of the typhoon IPT to get the system rolled out across the entire platform.

Other things I have completed while on the scheme is a whole host of training. One of which is the Advanced Project Management Professional (APMP) exam which is an internationally recognised qualification. There is also the opportunity to do a Masters degree, one of which offered was Cyber Warfare at Royal Holloway (London).

While on the scheme you are treated as a regular employee rather than 'the graduate' meaning you are able to get stuck in and get some real responsibility. In my last placement I have been managing three projects with the authority to approve changes to the contract, chair all the meetings and ensure timely project delivery. At the same time it is appreciated that you might not know everything and I have been drawing on the experience of the rest of the team when I didn't fully understand something. To summarise C&IS anchor – it opens a lot of doors and there are not that many placements that would be deemed unsuitable. I have never had anything I wanted to do turned down!

I have just returned from a month in Namibia (Africa) sponsored by the PPPA and Raleigh International. You would be hard pushed to find a better training opportunity than this. The month is run as a leadership development course and involved the following.

Workshop Phase:
3-4 days in a game lodge in Africa discovering who you are, how you work and how others around you work. This phase often attracts the most scepticism and on its own as with other leadership courses wouldn't be of much use - however the programme continually builds upon and reviews what you learn in this phase. This includes coaching skills, Myers-Briggs analysis, team building exercises and an introduction to the other phases. The coaching is a particularly useful skill to learn. You also learn how to give and receive useful feedback - again, something people approach with scepticism but with practice becomes a useful tool.

Practical Phase:
In this phase we travelled up to a remote school and after setting up camp went about planning and building a playground - working hand in hand with the local community at the school as well as having the options to teach classes and visit their homesteads / learn their traditions. In this phase you learn practical skills such as woodwork etc - but also continue developing the skills taught in the workshop phase.

Trek Phase:
This involves carrying everything you need to 'survive' for 4-5 days and walking around wild Africa (lions and all). Best suited for those looking to develop their empathy and what I described (although possibly not the textbook definition) - their 'huggy-wuggy' team skills - not to be dismissed as they are a major part in a leaders skills to get the best from a team.

Reflection Phase:
This involves breaking off into sub groups and alone to reflect on what you have learnt over the expedition and to feedback to others their strengths and weaknesses It is also the chance for some much needed R&R after 3 weeks constantly on the go.

It is very hard not to describe the trip as a jolly as it comes across as this when you explain it to people . It is a very tough 3 weeks but you don't really appreciate how much you really are doing as it is enjoyable and rewarding. The typical day started at 6am and we were still going beyond 8pm. Often in bed by 9pm as you are knackered.

This is the ideal placement for those on the DESG scheme due to the nature of being able to squeeze it between two placements. It currently runs once a year (throughout July).

NUCLEAR WEAPONS

JUDI

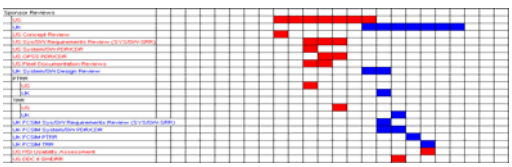
DEGREE DISCIPLINE: ***MATHEMATICS WITH MANAGEMENT***
ENGINEERING SYSTEM ANCHOR: ***NUCLEAR WEAPONS***

Placements undertaken

Systems Assessment, UK Software Facility
Here, I took on the role of performance and effectiveness assessment. This involved running models and analysing the outputs. This was a great chance to do a technical role rather than a project management oriented placement. There was also the opportunity to travel to the USA twice, once to the Applied Physics Laboratory in Maryland, and once to Cocoa Beach, Florida. As this is a placement that involves working with extremely sensitive data, it is not available for short-term placements.

A test of the Trident Missile

Strategic Programs Royal Navy, Washington DC and Naval Surface Warfare Centre, Dahlgren Division, Virginia
My task was to liaise with various US contractors in order to produce a generic joint US/UK software delivery schedule. A lot of the software the UK use operationally is provided by the US, and so maintaining the special relationship between the US and the UK is key. This placement was an excellent opportunity to see the differences between how the US and the UK operate. The key difference is seeing how the US manage funds with their much larger budget for strategic weapons. This was an amazing chance to work with many experts, and learn what they have to offer.



Part of the joint schedule I created

Targeting Systems, UK Software Facility
My role as the liaison officer between the customer and supplier involved managing two contracts. I attended regular meetings with the suppliers, managed the System Requirements Document, and allocated tasks from the customer.

Engineering Skills Course, Rugby College
This will be my next placement. An 11 week course where the first half is learning how to design and manufacture, and the second half is splitting up into teams, and designing and making something.

<u>Other Development Opportunities</u>

HMNB Clyde Visit
I had the chance to go on-board a V-Class submarine, and be shown around. We also visited the Trident Training Facility, where submariners complete their training, and Coulport Naval Base, where saw some of the components of the system.

A V-Class Submarine

Nuclear Weapon Foundation Course
This is a week-long course where you gain an awareness level of knowledge about the entire system. There are lectures from physicists at AWE where they teach you about the warhead, lectures from the Nuclear Movements Group explaining how they move nuclear material, and much more.

NUCLEAR PROPULSION

PETER

DEGREE DISCIPLINE:	***ELECTRONIC ENGINEERING WITH MANAGEMENT STUDIES***
ENGINEERING SYSTEM ANCHOR:	***NUCLEAR PROPULSION***

Background
I started at the MoD in October 2007 after completing a degree in Electronic Engineering with Management Studies MEng at UCL in 2005. Between University and the MoD I had a sales job but was looking for an opportunity to start a career in project management in an engineering field. I decided to choose Nuclear Propulsion as an ESA due to the opportunities is presented within the UK civil world as well as that in the MoD with a recently published white paper ensuring the future production of Nuclear Power stations to fulfil an energy gap in future years. I decided to choose to work for the MoD because of the amount of training and experience the DESG scheme provided me and the career progression it offered. The ability to tailor make my experience was also a key factor as several other graduate schemes, in the private sector, offered very limited exposure to other areas of the company.

Nuclear Propulsion Integrated Project Team (NP IPT)
My first role at the MoD was a 6 month position in NP IPT. The jump into a whole new world of Nuclear Engineering and Project Management and working with the Navy was quite a daunting one but very interesting and enjoyable. I began by working in Equipment Support, building a database for concessions on the current fleet of boats. This meant that I had to get up to scratch with the Nuclear Systems and Navy and was booked to complete the Nuclear Introductory Course at HMS Sultan. With the required knowledge my work became easier and more enjoyable allowing me to gain experience of Long Overhaul Period (Refuel) at HMNB Devonport. While at NP IPT I also gained further experience by visiting Rolls Royce in Derby to see the fabrication and Manufacture of the Nuclear Reactor and by having a boat visit on board HMS Torbay at HMNB Faslane. This allowed me to truly experience and understand the effects of my work, as many of the problems with the boat had been recorded in the database I had previously built.

As well as the equipment support role I took on project management roles by helping organise and co-ordinate our sections office move and also completing a cost analysis for the UK-US exchange programme which is currently being used to shape the future of the Naval Submarine Fleet.

Systems Engineering
After NP IPT I jumped at the opportunity to complete the Systems Engineering course at Rugby College. While at Rugby we learnt various skills including turning, milling, welding, electronics (I was fairly good at this, hydraulics, CAD and fitting. These skills were then put to use in project teams where each group was allowed to manage and build a project. Some of the projects while I was there included a walking insect robot, a stair climbing machine, a ground effect plane, a speed boat, a submarine and a tank. This allowed me to practice project management techniques, including resource and time management, cost benefit analysis, project planning and also my previous manufacturing skills. This was an incredibly enjoyable course giving me full exposure to simple project management while also allowing

me to work with my hands, an opportunity which is very rare within the MoD. It also helped with getting to know some more of the graduates in the MoD outside those in my GDG.

BAE Systems
I then joined BAE Systems in Barrow to gain experience with working with MoD suppliers. While at BAE Systems I worked in the Electrical Design team working on Astute Boats 1-4. While there I completed work writing a Comms Training Aid Book which was ultimately to be used to train the offices on the Astute Class boats. I also completed a project to design the Reactor Compartment Communications System, despite the fact I had very little experience with comms systems while at University. Most of the project involved looking at COTS solutions, meeting with suppliers and designing and developing solutions which best met the requirement of the Reactor Comms. While working on this project I also managed to gain access to the Reactor Compartment, something I know not very many people will ever have the chance of doing. I also helped design solutions for radio comms problems for the Astute Class boats. This involved many meetings with the MoD, operations teams, Fleet and comms suppliers to devise standard operating procedures for the comms system and also help devise mitigation solutions to reduce risk and error with the radios. The best thing about my time at BAE was seeing where all the work I had been doing fitted on to the boat, seeing how my work would affect the user and seeing the kit I designed being used but the current staff and hopefully those in the future.

While I was at BAE I was given charge of a BAE apprentice which helped develop my people management skills and allowed me to gain new skills which I may not have been able to learn at other placements.

HMS Sultan
I decided while at Barrow that I had completed a role at the MoD (management), at BAE (Supplier) so the only place left was to work with the customer with the Navy. I took a role at HMS Sultan, a naval training base in Gosport near Portsmouth, working in the Nuclear Department on a Masters style research project. My research topic was the Navalisation on Generation IV Nuclear Reactors. This research was based around looking at the future technologies in Nuclear Engineering and whether they would be applicable to the Naval Nuclear Propulsion Programme. This placement gave me free reign to develop new ideas on the cutting edge of technology looking at areas of research to include Hydrogen technology, supercritical water and well as the different Nuclear Reactor Technologies.

At HMS Sultan I also completed the Nuclear Systems Designers Course, a mid level course to understand the ideas and principles of designing a Nuclear Reactor, and the Nuclear Accident Procedures Course, a course used to help teach the police, naval bases, health physicists, local government and medical teams deal with nuclear accidents. All these courses helped me learn a great deal and will aided me to gain more nuclear specific roles in the future.

Safety, Sustainable Development and Continuity Division (SSD&CS)
My current and final role on the graduate scheme is a policy role at Main Building looking at sustainable development in the MoD. I chose this role to give me an opposing view to the idea of utilising Nuclear Power by looking at waste reduction, greater efficiency, implementing procedural changes to reduce environmental impact amongst other things. This role will give me greater understanding to how changes are implemented, not only in the MoD but government as the topic is very political at the moment and of great importance for the future. My jobs include writing policy documents for different environmental schemes, participating in road shows to help embed sustainable development in MoD projects and developing the departmental and monitoring process for SD in the MoD.

Extra Curricular Activities
The MoD has allowed me to do many things including visit submarines, aircraft carriers, naval and army bases but has also provided me with great opportunities to develop other skills. While at Abbey Wood I developed the MoD 5-a-side football league which ran across

all departments with 2 leagues of 8 teams competing for promotion relegation and ultimately the MoD Cup. It also allowed me to develop my fitness in other areas as I completed classes in Boxercise, pilates and circuits helping me train to complete the London Triathlon, 2 marathons and a 45 mile Ultra Marathon. Other courses and placements have enabled me to make many friends, not only graduates, throughout the MoD to ensure that I am welcome wherever I may end up.

Future

Through the graduate scheme I have been able to apply to do a masters in Nuclear Technology and Safety Management. I was thankfully able to delay my re-grade and essentially gain a new skill which will aid me in the future, while being paid! Also I am lucky enough to be able to have time off to complete a trek to Peru an experience that I am sure I would have missed had I not been on the graduate scheme.

OPERATIONAL ANALYSIS

BEN

DEGREE DISCIPLINE: ***AEROSPACE***
ENGINEERING SYSTEM ANCHOR: ***AEROSPACE/OPERATIONAL ANALYSIS***

Operational Analysis

Although, I started the DESG graduate scheme on the Aerospace systems anchor, I spent much of my time working around areas that would be covered within the Operational Analysis (OA) system anchor.

I spend two placements working for the Royal Air Forces Air Warfare Centre, performing two vastly different roles. I was first attached to 41(R) Squadron which is the RAF's Fast Jet and Weapons Operational Evaluation Unit, which is responsible for testing and evaluating all the RAF's weapons and modifications to fast jet aircraft before they go into service. During my time on the squadron, I performed a variety of tasks, notably helping out with trials planning and in the creation of a weapons accuracy database. I was responsible for the development of a piece of software that was used to analyze the accuracy of the Litening III Laser targeting pod. Most of the work I completed led up to a 5 week detachment with the squadron to California, helping to perform analysis on a number of important weapons and aircraft trials. This placement offered plenty of opportunity to get 'up, close and personal' with combat aircraft, weapons and their effects, it's not everyday you can sit in and play with a powered up Harrier or inspect the damage that a 2000lb laser guided bomb makes first hand!

My second placement with the AWC was with the Joint Force Air Component Headquarters (JFACHQ) based at RAF High Wycombe. JFACHQ is the UK's deployable air command and control organization that in times of war deploys to theatre and runs the air campaign. Civilian analysts are attached to the JFACHQ and are able to deploy with the command at times of war with responsibility of measuring and reporting on the effectiveness of the air campaign as well acting as a focal point for queries that require objective scientific advice or specialist knowledge. The analysts are also deployed on exercise a number of times a year, both at home and abroad. A placement at JFACHQ offered an excellent opportunity to increase my knowledge and understanding of how the RAF works and how a strategic air campaign is run.

Although not OA but related to it, I spent time working within Science, Information, Technology (SIT), based in MOD Main Building, Whitehall, which is responsible for managing the MOD's research budget helping flesh out the departments research management policy, which defines how the department identifies & defines exactly what research is required to meet requirements to fill future capability gaps. I was helping to flesh out the policy for the management of research and development program and particularly how future requirements were to be defined and recorded. This placement offered an excellent opportunity to see how high level policy is formed and to develop how I interacted and worked with senior officials.

I have enjoyed all my OA related placements and because of this I have decided to take up a permanent posting within the JFACHQ. Working within OA has allowed me to really integrate into the ‘sharp end’ of operations, specifically with the RAF. In my opinion, no other area offers this level of integration with the end user or offers anywhere near the level of interesting work. There is also scope for those who are interested to complete tours working in operational theatres, which I am very eager to do in the future.