



Ahead of the rest
Typhoon helmet most advanced of its kind
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International skills
A global outlook for exchange apprentices
See page 15



Have team, will travel...
the Typhoon ferrymen
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News for BAE Systems Military Air Solutions people • September 2009

FRONTLINE

It's a joy to fly – MRA4 shows what it can do



Above: the first production MRA4, with a wingspan longer than the Wright brothers' first manned flight, lifts off effortlessly from Woodford. Chief Test Pilot Bill Ovel described it as "a joy to fly"

MAS begins talks

The decisions on potential job cuts and a site closure in Military Air Solutions reflect a business that is tackling change.

Following the announcement on 15 September, consultation has begun between the senior management, the trade unions and employee representatives to mitigate the potential job losses at our Woodford, Warton, Samlesbury and Farnborough sites.

Kevin Taylor, Managing Director, said: "Going forward, a key driver for me will be how we look after those people who either leave the business or stay on."

"I believe we have taken the right measures, in consultation with others, to ensure our employees are supported during this difficult time."

He continued: "It is with regret we make this announcement. However, we have to ensure we are the right size and shape to remain competitive and meet our customers' requirements in the future."

"We have had to make tough decisions across a number of areas of the business. Several factors have driven this announcement."

"These include MRA4 production coming to an end, the Airbus contract at Samlesbury ending, and work on Tornado, Hawk and Harrier declining as elements of these programmes draw to a close."

Kevin stressed that we need to maintain focus on delivering our commitments and highlighted the importance of mitigation through job opportunities connected with the availability contracts that we have in place with the UK MOD.

Editorial Comment - turn to page 02

Effective

The first production MRA4 took off from Woodford on 10 September for a successful maiden flight, with many of the site's employees proudly looking on.

At 16:45, PA04 departed for an 82-minute sortie, during which the aircraft performed manoeuvres to test aircraft handling and system operation before landing at Norwich Airport where its RAF livery will be applied.

After landing, Chief Test Pilot Bill Ovel said: "The aircraft performed very well and was a joy to fly."

"This was an impressive maiden flight and all of those involved in the development and manufacture of PA04 can be very proud of what

First production aircraft impresses on maiden flight

they have achieved. The RAF can look forward with confidence to the imminent arrival of an excellent weapons system and a worthy successor to the MR2."

Steve Timms, Managing Director of the MRA4 programme, said: "It's wonderful to see this aircraft take to the skies. The

MRA4 programme has been through some difficult times, and many people doubted this day would ever come.

"Over the last couple of years, through the hard work and dedication of all those involved, we've built confidence in our ability to deliver this aircraft."

"It's been a tremendous achievement by the entire team to hit this important milestone, and shows the MRA4 is on track."

"This is a hugely

advanced and capable aircraft, and to run a design and development programme concurrent with production activities has provided major challenges.

"Ultimately though, it's clear our engineers have developed a superb aircraft that has been brought to reality by a great set of people on production."

"Many BAE Systems sites have played their part while the excellent support of the customer within our joint

IT IS TO EVERYONE'S CREDIT THAT WE REACH THIS MILESTONE WITH AN AIRCRAFT THAT OFFERS THE RAF HUGE POTENTIAL

Group Captain George Martin, MRA4 Operations Manager

teams has been essential. over the coming months and years. We will continue to do everything we can to deliver a much-needed advanced capability to the RAF."

Group Captain George Martin, MRA4 Operations Manager, said: "It's a tremendously exciting day for all concerned in the design, development, manufacture and testing of the MRA4."

"The challenges faced on the programme have been significant and required considerable resourcefulness and determination over a number of years by all those directly involved."

"It is to everyone's credit that we reach this milestone with an aircraft that offers the

Continued on page 08



Above: Woodford employees turn out to witness the maiden flight and fly past

Student Pippa stuns Brough with £114,000 savings

Effective

We all know the stereotypical perception of student life – late nights, long lie-ins, unwashed clothes and no-go bedrooms.

And, if they do go away, on a gap-year for example, it's long periods of silence when things are going well, panic calls home for money when they are not – and endless nights of worry

for Mum and Dad.

Well, if you're Pippa Horton, aged 19 from North Ferris, you can forget all that.

Pippa came to BAE Systems to join the Military Air Solutions team at Brough during her gap-year, got stuck in – and in just 12 months saved the Company a massive £114,000.

In so doing it not only won her a place in the hearts of

the Brough team, it also won her Student of the Year title in The Year in Industry's Contribution to the Business Awards – which showcase exceptional achievements of students on paid 12-month work placements.

How did she do it? Pippa's work at Brough was extensive – but it was in the Structural and Dynamic Test Department, where she made the most impact,

working on a rig which mimics the forces acting on an aircraft.

She created and implemented a logistics system to manage the hydraulic actuators on the rig.

This made the actuator installation process more flexible and better able to cope with changes in delivery schedules.

As a result, employee resources could be used

more effectively and the more efficient monitoring and planning introduced by Pippa translated into savings of £114,000.

Pippa said: "I have had the most incredible experience at BAE Systems, working with intelligent, hardworking and exceedingly generous people."

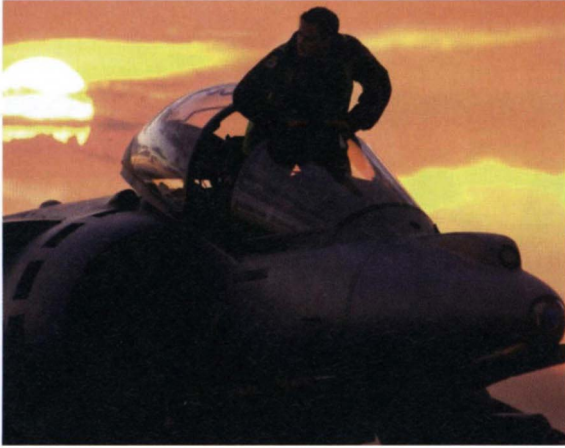
"I have really enjoyed my year in industry and I'm now looking forward to pursuing a career in engineering."



Above: Pippa Horton

MILITARY AIR SOLUTIONS

Working as an integral part of the team delivering effective air power, our aim is to give real advantage to the men and women of our customers' armed forces. Trusted to deliver – always.



Comment >

This issue of *Frontline* hits your desks following September's job losses announcement. It is with huge regret that I have had to announce job losses within the Military Air Solutions business.

My thoughts are with all those who will have to face the challenges, both personal and professional, that this will bring. We will work with the trade unions and employee representatives to do whatever we can to mitigate these job losses and to work through the process of implementing them in a sensitive and professional way.

I know that, for many, it will be particularly hard to understand why these job cuts are necessary when we are still seeking to win new business.

Sadly, this is an inevitable reflection of some of our programmes coming to an end. Our overall business remains strong and I am determined to ensure it continues to do so.

Alongside the difficult announcement we have made this month, we must not lose sight of the successes that the business continues to deliver.

The initial flight of the first production MRA4 this month is a tremendous achievement. It is an incredibly capable machine and one we can all be truly proud of.

Kevin Taylor,
Managing Director,
Military Air Solutions



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As the Salam Typhoons are delivered to Saudi Arabia from Warton (right), MAS has created a special team to deal with the new challenges raised by its growing export activities



Charting a way through international maze of rules

Team, effective

The Salam contract to supply 72 Typhoon aircraft to Saudi Arabia has brought new challenges for BAE Systems to comply with national and international export licensing requirements.

Contracting routes through Eurofighter and the partner countries (the UK, Germany, Italy and Spain), the aircraft's state-of-the-art systems, and the need to conform with the US International Traffic in Arms Regulations (ITAR) have led Military Air Solutions to create a new Typhoon Export Licensing team to support the business's increasing export activities.

Dave Osborn, Saudi Typhoon Project Director, explained: "We are exporting the most sophisticated product we have ever sold – a fourth-generation, fast-jet weapons system packed with components supplied from many different countries – including the US."

"More than 800 items on the aircraft are ITAR-controlled – from rivets and nuts, all the way through to full equipment sets and systems."

"While across the business there are pockets of knowledge on export licensing, no one area had the complete ITAR picture, so

we decided to develop a small team to deal with the issues raised by Salam."

This "virtual" team is comprised of representatives from the Project Management, Commercial, Legal, Procurement and Engineering functions. It also includes members of the traditional Import/Export teams, and is led by John Walters, Head of Export Licensing – Typhoon.

He said: "The core team is relatively small, but we have established a robust review

AS WE PUSH BACK THE BOUNDARIES, GREY AREAS REQUIRING CLARIFICATION BECOME MORE APPARENT

Karen Williams,
Legal Senior Counsel

process which encompasses the extended teams."

Karen Williams (Legal Senior Counsel) added: "We've learned a lot more about export licensing over the last couple of years and the lessons learned are being used to support the business teams, and to better inform our suppliers."

"Working on the US ITAR regulations has allowed the team to build a good rela-

tionship with the British Embassy in Washington D.C. – and with the US State Department which administers the ITAR."

Karen added: "Working closely with the Embassy and the US State Department means we can quickly find out what the Company needs to do to make sure it stays compliant."

"We're pushing the boundaries all the time with the Salam programme, and raising issues that the State Department hasn't had to consider before."

"Unfortunately, the ITAR isn't complete – not everything in the regulations is black and white, and the US authorities would acknowledge that."

"As we push back the boundaries, those grey areas requiring dialogue and clarification become more apparent."

John added: "The US State Department appreciates the fact that we want to work with them and the importance we attach to ITAR."

He added: "It's a two-way street. Because of our regular contacts, the State Department knows what is developing on the Salam programme 12 months, and even two years, from now. That knowledge allows them time and opportunity to plan their work."

Dave Osborn said: "These US regulations are just one set of international export licensing regulations with which we have to be compliant. We are also building the same strong relationships with the UK licensing authorities and their equivalents across Europe."

"The Export Licensing team has evolved out of the need to manage the business's obligations on the Salam programme, but we now have an opportunity to transfer this knowledge base to other export campaigns."



Have delivery team, will travel ...

Delivering fighter jets around the world requires a real team effort and involves hundreds of people across MAS, and depending on the customer, can often involve other business units.

While the concept of flying Hawks, Tornados or Typhoons thousands of miles, stopping off in what might on the surface look like glamorous locations, may sound appealing, the reality is somewhat different.

Having successfully completed the first leg of a recent ferry, pilots John Lawson and Paul Stone called Warton to give the signal for the ground crew which totalled nine people accompanied by a range of tools and spare parts, to board a support aircraft and join them in

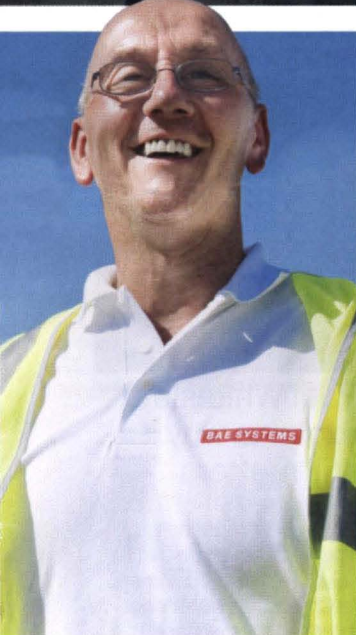
France. On other ferries the ground crew stay on standby and the pilots go it alone.

Project Manager Ged Curley took up the story. "Ferrying jets, to those not involved, sounds pretty straightforward – you take a jet, fly to its final destination via a few stops on the way for refuelling; simple – unfortunately it's not quite like that."

"A huge amount of work happens beforehand here at Warton to make that possible. Spares and tools have to be available together with the relevant export licences, and security and occupational health risks had to be identified. Airport customs clearances have to be organised and hotels booked for the team, so it's quite a logistical challenge."



Above: teamwork – a vital component for export success



Engineering Supervisor George Smith (left) and his ground crew colleague Clive Hardman (below) were among the team members who leapt in action and flew out to support the Typhoon operation when they were given the signal by ferry pilot John Lawson (above)

“YOU’VE ONLY GOT WHAT, AND WHO, YOU HAVE WITH YOU. SO EVERYONE DOES THEIR BIT, BOTH GROUND AND AIR CREW. TEAM SPIRIT IS WHAT GETS YOU THROUGH.”

George Smith, Engineering Supervisor

around the airfield at one stopover place.

“The real challenge comes when you have an issue on the aircraft – then that’s when the team really steps up to the mark. You’ve only got what, and who, you have with you. So everyone does their bit, both ground and air crew. Team work and team spirit is what gets you through.”

Ged Curley added: “Thankfully, on the most recent ferry, the only unforeseen problem was an air traffic controllers strike in Greece which meant we had to divert the jets to another airfield.”

Travelling thousands of miles in a military jet – designed for operational combat, not “island-hopping” – throws up different challenges for the pilots, including boredom.

Pilot John Lawson said:

“Most ferry flights are uneventful and unexciting since the aircraft are on autopilot for much of the time.

“But not having to look for bandits at 10 o’clock or ensure you meet certain flight test criteria, means you can take the opportunity to view the scenery which can be spectacular and quite different from the views we normally see when we are flying the Typhoon around Warton.”

George summed it up saying: “The recent ferry team was probably the most flexible team you could have taken anywhere – from the pilots and ground crew to the support staff at Warton. If we had a problem and called the UK at 3am I’m confident someone would have answered the phone.”

Tranche 3 is huge boost to Typhoon export drive

Signing of production contract signals commitment to Eurofighter programme and collaboration

Delivery

The new production contract for 112 Typhoon Tranche 3 aircraft is a significant development for Military Air Solutions and gives a positive boost to the Company’s export efforts.

The breakdown of the contract signed by the four Eurofighter partner nations on 31 July is:

- 40 aircraft for the UK, including 24 replacement Typhoons for the RAF as part of the 72 aircraft order for the Kingdom of Saudi Arabia
- 31 for Germany
- 21 for Italy
- 20 for Spain.

Tom Fillingham, Director of Capability Enhancement and Aircraft Programmes, admitted it had been a busy seven months for the MAS and UK MOD teams involved in securing the Tranche 3 contract, which had been achieved primarily through finding a more affordable solution.

He said: “An important element of Tranche 3 is the need to reduce through-life costs for our customers.

“We recognised the need for more cost-effective through-life support costs some time ago, and we have been working with our partners and suppliers to develop relevant proposals.

“We recently agreed with the UK MOD an availability contract for the UK Typhoon fleet (Typhoon Availability Service) which has confirmed cost reductions in line with UK affordability for a significant proportion of the total support activities.

“In addition, we have also worked with our key suppliers to develop and submit a proposal to provide a five-year availability contract for two key systems on the Typhoon, namely radar and Defensive Aids Sub System (DASS), that offers our customers across Europe a potential 50 per cent saving over the life of the programme.

“We have used the lessons we’ve learned on Tornado and Harrier to develop a bespoke support service for radar and DASS that reduces the risk and allows our customers to keep their aircraft flying.”

He added that the relation-



Above: Tom Fillingham, Director of Capability Enhancement and Aircraft Programmes

ships built over several years were vital to the success of the programme.

“We’ve been in regular contact at every level to make sure our Tranche 3 proposals were meeting everyone’s needs. It’s been a big team effort involving not only MAS and the MOD, but our European partner companies, NETMA (NATO Eurofighter and Tornado

commitment, not just to the Eurofighter Typhoon programme, but also to European collaboration.

“It’s also hugely important in our drive to sell the aircraft overseas. The Eurofighter Typhoon consortium has ongoing export campaigns in Switzerland, India, Japan, Romania, Greece and Turkey and is exploring opportunities in other parts of the world.

“In the eyes of potential customers, the fact that 559 Typhoons are now under production contracts with more than 180 in service across six nations – the UK, Germany, Italy, Spain, Austria and the Kingdom of Saudi Arabia – sends a strong message that this is a hugely capable aircraft.

“We can go into negotiations with our future customers and explain, with confidence, exactly why they need Typhoons rather than aircraft manufactured by the competition.”

He added: “This contract is for 112 Tranche 3 aircraft and it will sustain many highly skilled jobs across UK industry and provide our nation with outstanding defence capabilities for years to come.

“While discussions will be held at a later date between the four partner nations regarding any follow-on Tranche 3 contract, having this core programme in place is absolutely key to our future prospects and puts us in an improved position to achieve success in our current and future export campaigns.”

“THIS CONTRACT WILL SUSTAIN MANY HIGHLY SKILLED JOBS ACROSS UK INDUSTRY AND PROVIDE OUR NATION WITH OUTSTANDING DEFENCE CAPABILITIES.”

Tom Fillingham

Management Agency) and government ministries in the four nations.”

The UK Defence Minister Quentin Davies attended the signing ceremony at Eurofighter HQ in Munich along with Air Chief Marshal Sir Stephen Dalton, who took over as Chief of the Air Staff from Air Chief Marshal Sir Glenn Torpy on the same day.

Tom Fillingham said: “Signing the Tranche 3 contract was a highly significant and symbolic statement by the UK and the other three European nations.

“It signalled their continued

“SIGNING THE TRANCHE 3 CONTRACT WAS A HIGHLY SIGNIFICANT AND SYMBOLIC STATEMENT BY THE UK AND THE OTHER THREE EUROPEAN NATIONS.”

Tom Fillingham



So what’s it like on a ferry? “Interesting!” said Engineering Supervisor George Smith. “It can be from one extreme to the other. You do get the chance to visit places you might otherwise not, but you are

then normally decamped into some hangar at the far end of an airfield so all you really see is the jet, aircraft flying in and out, and the hotel – if you’re stopping in one – although we did have some wild dogs wandering

Market of eastern promise

Real advantage

India has become the seventh of BAE Systems' "home markets", with an expanding economy, and a sense of confidence in its future that makes it one of the most exciting countries in the world.

BAE Systems is seeking to create an indigenous in-country footprint in its home markets and India is the latest to join Australia, Saudi Arabia, South Africa, Sweden, the UK and the US.

Building on his experience with India via the Hawk programme, Michael Christie has been appointed Senior Vice-President India for MAS.

As he got used to his new title and responsibilities, Michael told *Frontline*: "I've been heavily involved with India through the Hawk pro-

India offers MAS big opportunities for new business

gramme and since the aircraft entered service there last year the focus has become even more intense.

"India offers huge potential for growth among all of the BAE Systems businesses – on land, sea and in the air. It's one of the few economies in the world that is still growing, and there's no sign that its growth is likely to tail off anytime soon.

"It's a market to be successful in. The Indian economy is growing fast, and the country is very keen to become self-sufficient. That is where our experience of working with indigenous industries may give us an advantage.

"For many years this

Company has enjoyed a good working relationship with India. The Indian government purchased Jaguar fighters from the UK and we provided a licence that allows the aircraft to be built in-country to this day.

"The Indian government is committed to increasing the size of its army, navy and air forces, and BAE Systems is well placed to help."

Among the opportunities that Michael and his team will be working on is India's requirement for a new medium multi-role combat aircraft (MMRCA).

"At 126 aircraft, it's one of the biggest export contracts in the world that's open to free competition. We are supporting EADS, our Eurofighter partners, in developing the Typhoon bid, using the experience we've had selling the Hawk, and



Above: Michael Christie

the relationships we've built up with the Indian Air Force."

Another opportunity is around further sales of the Hawk advanced jet trainer (AJT), which will build on MAS's relationship with Hindustan Aeronautics Limited (HAL). India also presents opportunities in the unmanned aircraft systems sector.

Michael said: "The Indian Air Force has already decided that the Hawk will be its main AJT, and we are supporting HAL in its bid to win a contract for a further 57 Hawk aircraft – 40 for the air force and 17 for the Indian Navy. Winning that contract would make the Indian Hawk fleet among the biggest in the world."

Michael also aims to grow the BAeHAL joint venture software company set up 15 years ago.

"I'm a government-approved board member along with Julian Scopesso (President, BAE Systems India). We plan to support BAeHAL as they move into new areas of the market where it can support our efforts to win business across the entire BAE Systems portfolio.

"Our aim is to create an indigenous operation in



Above: the Hawk is the main AJT for the Indian Air Force

INDIA OFFERS HUGE POTENTIAL FOR GROWTH ... IT IS ONE OF THE FEW ECONOMIES IN THE WORLD THAT IS STILL GROWING

Michael Christie, Senior Vice-President India

a very hard market that will eventually be able to win significant contracts in countries outside the sub-continent."

Michael and his MAS team, some of which will be based in Delhi, will work alongside Julian Scopesso and the corporate team. "We'll

aim to develop relationships not only with HAL but also with some of the larger private companies, like Larsen and Toubro, and Mahindra Mahindra, as well, which would give us entry to the civilian markets of India in the future."

The Typhoon airframe testing team has made a complex task user friendly – with dividends

Real advantage

Typhoons are put through a battery of tests during their final assembly to make sure their enormously complex systems are working correctly.

The tests are part of a de-risking exercise designed to reduce the likelihood of problems being encountered.

Because the systems are so complex, the testing equipment and procedures themselves can also be highly sophisticated.

However, some smart thinking by the Engineering Airframe Testing Team within MAS has transformed one of the most complex and difficult of these tests into a quick and easy procedure, resulting in big savings in time and resources.

The test involves sending radio waves through the radio frequency (RF) cables on the aircraft. Once the cables are installed on the aircraft it is important to prove that the cables have not been damaged or routed in a way which impairs their performance.

Allan McCabe, Senior Manufacturing Engineer with the Samlesbury-based team, said the previous equipment, which had been used for the first tranche of aircraft, had proved difficult to use and it was not as reliable as the new equipment.

"We looked at the next generation of the equipment



Above: airframe test electrician Carl Brennan at work on the new radio frequency testing system which has transformed the process

Smarter thinking that saves time and money

and we saw that it too was going to prove unsuitable to the production environment – it was too delicate and wasn't very user friendly."

Working with an external software house within the National Instruments Company alliance, the team developed a machine that was both much more robust and much easier to use, with

a graphic display that walks the operator through all the stages.

Paul Hardman, Typhoon Production Manager, said the new machine had dramatically improved the usability and speed of the process.

"With the old system, it was so complex that it required a high level of product knowledge for the production line to use it. We were also having problems with false readings and variations.

"Even if things went exactly according to plan the test would take about nine hours, and if there were any problems it could take up to

• The radio frequency testing system is just one example of how MAS is driving down the costs of building Typhoons to help deliver the affordability challenge for future core programme and export orders

24 hours, with a lot of technical support needed from Allan's team.

"The test now takes less than two hours, every time. It is completely user friendly, and everyone on the line can use it with only an hour or so of training."

He said he had been particularly impressed by how closely Allan's team had worked with the end users on the build line to develop a solution that addressed all their concerns. "They really treated the user as the customer."

The RF testing system's success has been recognised beyond the build line: Allan and his team have been selected for the Silver Panel at this year's Chairman's Awards for their efforts.

Meanwhile, the team is looking to see where else its skills could be used across the business to save time and resources in production.

True excellence – service with a personal touch

Trusted

One man who knows better than most how service excellence has evolved within BAE Systems is MAS's Paul Whiteside. With 43 years experience in the Company, Paul, who retired in August, had four decades to get to grips with huge changes and massive developments in a major defence business.

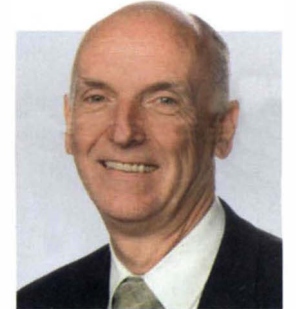
Here, Paul, Director Engineering, Internal Supply, shares his thoughts on what it means to him.

"In simple terms," says Paul, "it is all about adding an additional dimension to the role we already have. To me, this additional 'dimension' is all about relationship building and taking the time to empathise with colleagues and customers. Basically it is about treating people in the way you would wish to be treated yourself. Easy to say but hard to do.

"In my career, I have been lucky to have worked on all major projects since Jaguar and I can recall developing strong personal relationships with many colleagues, customers and suppliers.

"The most rewarding have been those where I took the trouble to get to know people on a personal level and in doing so achieved a mutual understanding of what was needed.

"Last year I was introduced to service excellence by Chris Daffy who runs the Academy of Service Excellence and I went into the session with my usual 'positive scepticism'. I have to say though, that I came out of it with renewed enthusiasm and a conviction that there was something in it that could



Paul Whiteside explains why it still matters

make a real difference to how we deal with both internal and external customers. As Chris would say 'it's not rocket science', indeed, it's easy to understand – but applying it consistently and then making it stick is the real challenge.

"The approach we are taking across Integrated Services is to introduce the structure, training and resources necessary to get everyone on board and equipped to embrace the concept.

"Many people have asked me why I have stayed so long with one company. To me it's been simple. Where else could you work on so many different world-beating projects? And where else would you have the wealth of talented people at all levels that ensure continual challenge and change to improve performance?"

"The introduction of service excellence is yet another example of how we are willing to pick up new ideas that, in this case, could be a key competitive differentiator in our objective to deliver a 'through-life capability service' to our customers."

BASICALLY IT IS ABOUT TREATING PEOPLE IN THE WAY YOU WOULD WISH TO BE TREATED YOURSELF. EASY TO SAY BUT HARD TO DO

THE TEST NOW TAKES LESS THAN TWO HOURS, EVERY TIME. IT IS COMPLETELY USER FRIENDLY, AND EVERYONE ON THE LINE CAN USE IT WITH ONLY AN HOUR OR SO OF TRAINING

Paul Hardman, Typhoon Production Manager

Paveway IV deployed on Tornado in six months

Effective

Six months of hard work by MAS employees is paying big dividends in Afghanistan where the latest generation of precision-guided bombs, fitted to the recently deployed RAF Tornado GR4s under an urgent operational requirement (UOR), are performing extremely well.

The UOR involved MAS integrating the Paveway IV onto the Tornados that have subsequently been deployed to Afghanistan as part of Operation Herrick.

It meant that part of the planned introduction of the Paveway IV across the Tornado fleet under the Capability Upgrade Strategy (Pilot) contract, or CUS(P), had to be brought forward, while still meeting all the other currently contracted work requirements.



Above: troops on the ground in Afghanistan are better protected following the introduction of the Paveway IV to the Tornado aircraft

Neil McKay, Project Manager CUS(P), said meeting the UOR meant working very closely with both the customer and the supplier, Raytheon.

"We only had six months to complete this from start to finish, and in parallel with that we had to carry out our other contracted work, so it was quite pressurised in terms of allocating resources and reprogramming and replanning activities."

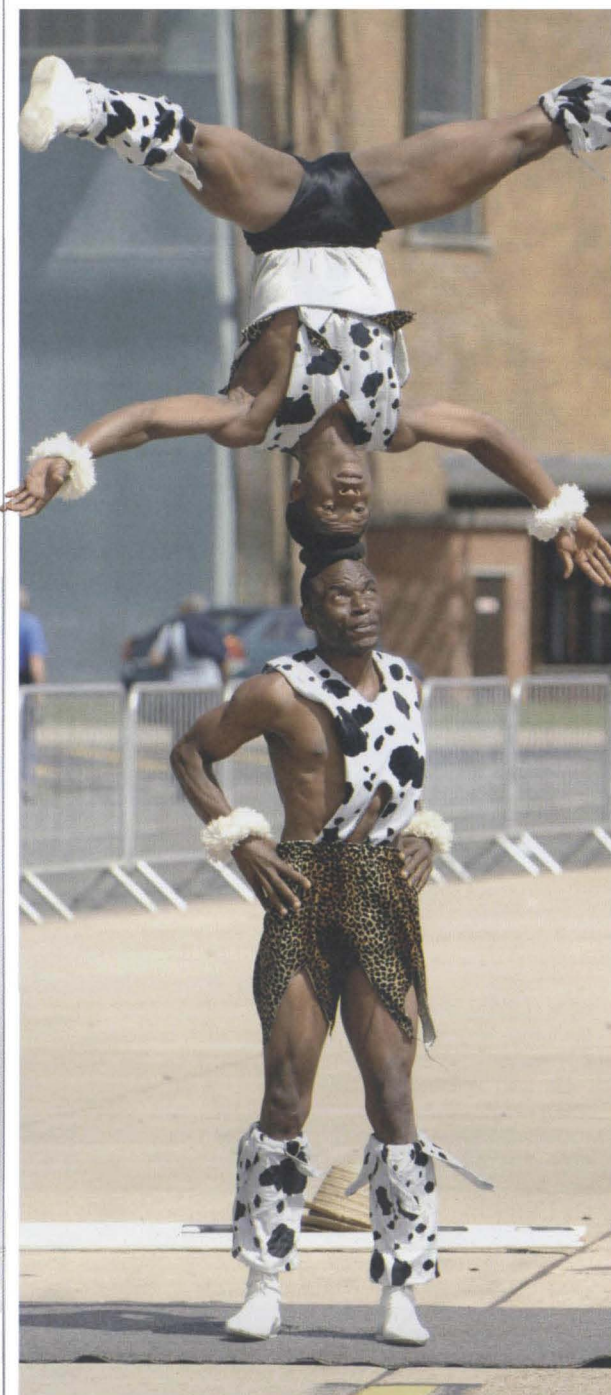
Paveway IV is both smaller and more accurate than ear-

lier models, and draws on the lessons learned in the Gulf and Kosovo campaigns where pilots had difficulties pinpointing targets through cloud. It entered service in Afghanistan on Harrier GR9s late last year and has proved itself to have a world-class strike capability combined with advanced flexibility.

Neil said MAS had received a lot of very positive feedback from the customer on the performance of the Paveway IV-equipped Tornados.

"Meeting this UOR was a magnificent achievement by the MAS team and Raytheon. We had the supply base and industry pulling together to deliver a very high quality product into service for a delighted customer."

Heads-up display as entertainers drop in on RAF Marham >



Above: as well as the traditional flying displays, there was plenty of unusual entertainment for visitors to the annual RAF Marham families day in July. BAE Systems supported the event and part of the money raised on the day will go to BAE Systems' Charity Challenge partner Sue Ryder Care



THE SUPPLY BASE AND INDUSTRY PULLED TOGETHER TO DELIVER A HIGH QUALITY PRODUCT FOR A DELIGHTED CUSTOMER

Neil McKay, Project Manager CUS(P)

Alliance is forging stronger links

Integral

In many ways, the success of BAE Systems and MAS depends on our suppliers. If they're not the very best, we suffer. The North West Aerospace Alliance (NWAA) helps make sure that the supply chain around Warton and Samlesbury is one we can rely on.

The NWAA Chief Executive, Martin Wright, explained: "We're different from other 'cluster' organisations. We examine the strategies of the big, prime companies in the North West of England – including BAE Systems – take time to understand them and develop world-class supply chain."

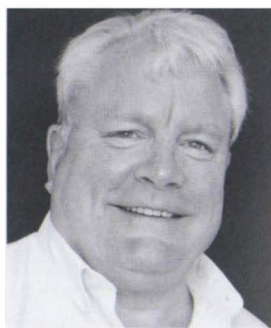
"In 2006 we created a £4.5m 'Supply Chain Excellence' programme, which is as good as it gets in the UK, and probably in Europe. It covers around 45 supply companies in the North West and helps them deliver the right products and services."

Martin explained how, with the assistance of BAE Systems and others, the NWAA had developed a rigorous diagnostic tool that helps get a very precise definition of the skills these

NWAA helps supply chain to deliver the best to BAE Systems

suppliers need. "Once the firms go through the diagnosis they get a mentor in the form of a senior production specialist from one of the three prime companies (Airbus UK, Rolls-Royce and BAE Systems).

"We have ten senior people from BAE Systems taking part. The mentor works with the supply firm for two days a month for anything up to three years."



THE WORK WE DO WITH BAE SYSTEMS IS CRUCIAL. WE CO-OPERATE IN SEVERAL AREAS

Martin Wright, Chief Executive NWAA

"This approach has helped deliver some very significant improvements. In one example of success, four of the six companies that have secured contracts on F-35 Lightning II

machining are on our programme. The fact that two of them hadn't done any work for BAE Systems before shows how the programme helps open up new opportunities for those

competing through the commercial tendering process."

As well as delivering for the companies involved, Martin added that one of the important factors is the value for money his organisation gives. For every £1 the North West Regional Development Agency puts in the NWAA's Supply Chain Excellence programme (ASCE1), the alliance delivers between £50-75 in return.

"That's over seven times more than some other programmes," he said.

Equally important is co-operation with BAE Systems. "The work we do with the Company is crucial. We co-

A SIGNIFICANT ALLIANCE

- The North West Aerospace Alliance represents companies and stakeholders involved in the North West Aerospace Cluster.
- It is responsible for "shaping the industry through strategic thinking and delivery, by driving innovation and providing supply chain excellence and other business support programmes".
- It achieves this through

working with key organisations in the industry to develop products, services and supply chain development programmes.

- The NWAA currently has 17 staff and a turnover of about £2.2m a year, which will increase significantly with the next phase of supply chain development.

Agreement to support F-35 production

A raft of agreements with external suppliers worth more than £500m has recently been signed to support F-35 Lightning II production.

BAE Systems' Integrated Procurement Services and the F-35 Procurement and Supply Chain teams have been working closely to deliver a long-term external supply chain solution

to support rate production.

This has enabled BAE Systems to sign long-term commercial agreements between local and international suppliers on the programme. The potential value of these contracts ranges from £35m up to £130m, with one contract going out as far as 2035.

Mike Marsden, Head of

Procurement F-35, said:

"The key to the success of the Samlesbury facility and the F-35 programme is the requirement for an affordable and external supply chain and its ability to deliver to the planned manufacturing rate of one aircraft per day. The suppliers BAE Systems has chosen to work with have shown they are able to

meet the high standards the Company is looking for, and we welcome the opportunity to work alongside them"

Four of the companies concerned are also actively involved in the North West Regional Development Agency-funded Aerospace Supply Chain Excellence Programme managed by the NWAA.

operate in several areas, including autonomous systems. We have a very good relationship with BAE Systems and we're always looking at ways we can help. Certainly, the level of investment we bring to the North West supply chain is not something a private organisation such as BAE Systems could achieve on its own."

Looking to the future, the NWAA has just bid for funding to deliver "ASCE2".

"This is a £6.6m programme that aims to develop complex skills, planning models, and shared services as well as drive innovation in the supply chain. We'll hear if we've received funding soon, and are confident of success. We'll then start the

programme, which will take us up to 2014. It will mean big challenges. For example, creating a shared services culture, where people have to co-operate in new ways, is a major task.

"But, we've been planning this next phase for more than 12 months, and BAE Systems has played an important part, alongside organisations such as the chambers of commerce, science establishments and universities, as well as the supply chain."

"The collective approach has worked so far and we believe phase two of this very exciting programme will take the North West supply chain up to the next level."

New helmet is the most advanced yet

Pilots can engage a target just by looking at it

Advantage

After several years of development work, a dedicated helmet for Eurofighter Typhoon pilots – believed to be the most advanced of its kind in the world – has just passed a major milestone and entered the customer type acceptance process.

The helmet – officially called the Head Equipment Assembly (HEA) – is packed with sophisticated electronics, including technology that allows a pilot to engage a target simply by looking at it.

In early September, about 60 representatives from BAE Systems' Rochester and Warton sites who have been involved in developing the helmet met at Farnborough to discuss how they could improve team-working across the Platform Solutions and MAS businesses to ensure the success of the HEA programme.

Mark Smith, Typhoon HEA Technical Manager who attended the conference, told *Frontline* that helmets had tra-



Above: Typhoon test pilot Mark Bowman says HEA is eagerly awaited

ditionally been for protection, for providing life-support such as oxygen and for communications.

"HEA does all of that very well, but what is new is the complex integrated avionics system that sits both within the helmet and within the aircraft itself.

"Two 'mini-projectors' within the helmet display positional and target information on the inside of the visor, while computers monitor the pilot's head position to determine where he is looking.

"He can target an aircraft just by moving his head rather than having to manoeuvre the

nose of the aircraft to point at the target – it gives a massive advantage."

He said keeping the helmet's weight down had been a major challenge but remarkably, the finished product weighs little more than a standard helmet.

Pilots are enthusiastic about the HEA. Typhoon Test Pilot Mark Bowman said HEA was as eagerly awaited by front-line pilots as head-up display (HUD) technology was 30 years ago.

"Where HUD provides a relatively small field of view upon which to present vital tactical information, the HEA

is truly panoramic, giving the pilot the ability to position aircraft sensors and weapons, constrained only by the extremities of the head's physical movement," Mark said.

"In combat, the HEA will allow the pilot to gain early tactical advantage, delivering him capabilities such as the first-shot opportunity or increased accuracy in quickly pinpointing ground targets. But capability does not stand still and while the front line will be delighted with the HEA we are about to deliver, this technology can be expected to be further developed in the future."

The HEA conference was supported by the UK customer, Wing Commander John Ball, who delivered a motivating presentation that provided a clear view of the importance of the HEA.

The HEA goals are to have a successful entry into service of the helmet and associated equipment and provide HEA with clearance for the full life of the aircraft.

Work is also under way to introduce night-vision capability to the helmet along with measures that will provide nuclear, biological and chemical protection.



Above: even with all its sophisticated electronics, the HEA weighs only slightly more than the traditional helmet

Harrier: the cutting-edge workhorse

Effective air power

In five years of continuous service in Afghanistan, Britain's Harrier aircraft have proved themselves one of the world's most effective platforms.

On Operation HERRICK, Joint Force Harrier (JFH) accomplished 8,557 sorties and 22,771 flying hours in support of NATO and coalition ground forces during the longest period of high tempo operations since the Second World War.

In the final 17 months of the deployment, only seven out of 2,673 planned sorties (0.26 per cent) were lost due to technical faults, demonstrating the Harrier's unparalleled levels of reliability and serviceability.

The deployment also witnessed the rapid, cost-effective and highly successful introduction of new equipment such as the Sniper advanced targeting pod and the Paveway IV precision-guided bomb.

Angus Currie, Head of Aircraft Capability – Harrier, said that even in their last year of the deployment the Harriers were still receiving breakthrough capabilities as a result of BAE Systems and

Reliable platform incorporates new equipment

its suppliers meeting – and even anticipating – the customer's requirements.

The aircraft has seen significant improvements with the introduction of the Helmet-Mounted Cueing System (HMCS) – which can allow the pilot to guide the targeting pod to potential targets just by looking at them – and the Defensive Aids System pod that releases flares to counter missiles.

Angus said operational feedback showed a need for an enhanced targeting capability along with the need to counter evolving anti-aircraft missile threats. "Working with our suppliers, the Company invested a significant amount of money up front to develop this capability. The design team at Farnborough, in collabora-



Above: Angus Currie

tion with BAE Systems Electronics, Intelligence and Support, was able to integrate new equipment onto the Harrier dynamic rig to demonstrate the HMCS to pilots. They were so impressed by its capabilities that it went straight to the top of their priority list.

"At the same time, the team identified that a defensive aids pod being developed for the Nimrod could be modified for use on Harrier, and the company developing that pod –

Danish firm Terma – worked to help us develop a fully costed integration.

"With the need identified and the technical feasibility demonstrated, the customer raised two urgent operational requirements (UORs) for the work."

Angus said both UORs were embodied at the same time, saving both money and time. "This was a very complex programme. The teams at Farnborough and RAF Cottesmore achieved what seemed impossible, with a true parallel design and embodiment programme delivering both capabilities on all the GR9s operating in Afghanistan by the agreed dates.

"When we delivered the planes they went straight into service in Afghanistan and were used from day one. Pilots from IV Squadron, who saw these UORs into Afghanistan, have described them as providing 'war-winning' capability."

The joint UOR team received a Director General Combat Air Commendation last month, presented by Air Vice-Marshal Simon Bollom, predicting the requirement and working to seemingly impossible timescales.

Spotlight on pilot-assisting technology >

HMCS

Designed and developed by BAE Systems, Electronics, Intelligence and Support at Rochester, the Helmet-Mounted Cueing System (HMCS) uses an existing Jaguar helmet coupled with an adaptation of the Typhoon helmet-mounted display optical tracking technology.

HMCS gives the pilot the ability to immediately visually acquire the locations of targets and, more importantly, locations of friendly forces. What took minutes to achieve now happens in seconds, due to HMCS's ability to guide the pilot's eyes immediately to the real-world point where the targeting pod is tracking.

This not only allows the pilot to quickly identify targets hence, but exponentially increases his ability to immediately and accurately discriminate between friend and foe on a dynamic battlefield, such as that witnessed on a daily basis in Afghanistan.

The HMCS also affords the pilot the ability to look at the ground and use the helmet sight to designate a point of interest without having to aim his aircraft at the point; the targeting pod can then be immediately cued to begin investigation.

Not only is this process dramatically faster and more accurate than before, it takes away the need to descend into



Above: the HMCS cuts down time taken for pilots to identify targets

any danger or expose a presence to the enemy.

Defensive Aids System

The DAS Pod, designed and supplied by Terma in Denmark, is a development of their modular countermeasures pod, which has been specifically adapted for Harrier and complemented by the integration of BAE Systems' missile warning system.

This provides an automatic self-defence capability that can detect and defeat surface to ground threats while providing audio warnings to the pilot.

WHEN WE DELIVERED THE PLANES THEY WENT STRAIGHT INTO SERVICE IN AFGHANISTAN. PILOTS HAVE DESCRIBED THEM AS PROVIDING 'WAR-WINNING' CAPABILITY

Angus Currie, Head of Aircraft Capability – Harrier

Bringing Our Mission to Life >

'Being true to myself has been key to my success'

As part of the Bringing our Mission to Life activities, MAS has commissioned author Damian Hughes to produce a new book of inspirational stories and people from within our business.

In this, the third of a series of interviews to be featured in *Frontline*, Damian hears from Grace Johnston – a woman whose determination, intelligence, honesty and strength of character show how a successful career can come to those who have the desire for it.

When I first started working at BAE Systems, I was a 16-year-old apprentice, who was keen to get my hands dirty and be paid for the privilege.

I was one of only four girls in my intake to join and soon after, I found myself working on the shop floor as the only female among 100 blokes. To be honest, it was a brilliant experience as it taught me an important lesson that has served me well throughout my subsequent career.

I had always had pretty low self-confidence but when I was working with the blokes, I soon realised that they didn't judge me on whether I was a woman or what clothes or make up I wore but whether I could do the job or not. They assessed me on my own merits and this is a powerful lesson, which I have tried to remind myself of regularly.

After qualifying as an electrician, I eventually got the chance to get hands-on aircraft experience working on Tornado and Hawk as part of the Development flight line, which meant being heavily involved with a number of flight test trials and soon afterwards landed my dream job – a flight test engineer working on the avionics system of the Eurofighter Typhoon.

I was involved in the first guided firing flight of an air-to-air missile off a Typhoon, which was taking place in the UK. I was working alongside one of my senior colleagues, who broke his arm just six weeks before the launch. This meant that I was required to take the lead as test engineer on the armament control system, including co-ordinating our efforts with US, Italian and Royal Navy stakeholders.

My initial nerves – Was I good enough? Would it work? Could I cope? – soon came crashing in. I reminded myself that people should only judge me on my own merits and efforts and nothing else. I found myself thrown into the deep end and remembered to be honest and true to myself.

Firstly, I broke my task down into bite-sized chunks and tackled each one in turn. This included the bizarre task of having to gain special dispensation to be able to conduct the test on the same day as the Queen Mother's funeral.

Secondly, I didn't try to use fancy words or bluff my way out of situations. I tried to keep things simple and if I didn't know the answers, I said so. One senior manager actually commented that

'I DIDN'T TRY TO USE FANCY WORDS OR BLUFF MY WAY OUT OF SITUATIONS. IF I DIDN'T KNOW THE ANSWERS, I SAID SO. ONE SENIOR MANAGER ACTUALLY COMMENTED THAT I WAS THE FIRST PERSON HE HAD HEARD ADMIT THIS'

I was the first person he had heard admit this.

I think that it was partly this approach that helped us achieve success on the very first attempt, but I was very surprised when my efforts led me to being nominated as one of the finalists for the IIE Young Woman Engineer of the Year Award.

I had to go down to London for an interview and then again for the final, where it felt very surreal to be called to the stage as the winner.

Although I was surprised and delighted to win this award, I quickly started to worry as I was required to make speeches and presentations for the Ambassadors Scheme, which involved visiting schools and talking about my experiences.

This wasn't something I felt particularly comfortable with but I knew that it would be a brilliant experience and one that would help me in my future development. I was also aware that some people within work were especially cynical and dismissive of the award and what it meant.

Once again, I overcame my worries by remembering that I should remain true to myself and be honest as the award was something which I personally valued. This was a huge help and has done my confidence a lot of good.

I suppose that this, then, is the message that I would offer from my experiences. It is easy to listen to critics – including our own worries and self-criticism – and let that stop us from acting and doing what we really want.

If you can go home at the end of a day, look in the mirror and be completely honest with yourself about what you have and haven't done and are satisfied with the answers you give, that is the ultimate success.

Are you being honest?

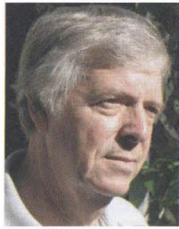


Above: Grace Johnston joined the business as an apprentice electrician aged 16, and went on to win the IIE Young Woman Engineer of the Year Award



Spotlight>

What lies beneath?



With the first MRA4 due to arrive at RAF Kinloss early next year, aviation journalist Peter Almond, in an article written for the national press, gives his personal views on the vital role the aircraft will play in the defence of the UK

Several years after they urgently took on new equipment for operations over Afghanistan, the RAF's Nimrod aircraft are to return to what they do best: anti-submarine and maritime patrols, including search and rescue.

The new Nimrod MRA4 – seen in fly-past at the Royal International Air Tattoo in July and due into RAF service in December next year – will effectively give up the overland role pursued so avidly by Nimrod MR2 crews to other new Intelligence, Surveillance, Targeting and Reconnaissance aircraft such as ASTORs, Watchkeepers and Reapers. The first MRA4 anti-submarine training course has already been started for instructors at RAF Kinloss.

The MR2 fleet will retire in 2011, and the modified role change marks a UK MOD acceptance of RAF concerns that aircrew operating the MR2s in the overland role are in danger of losing their anti-submarine warfare (ASW) skills at a time of rising submarine capability and activity around the world. There is also concern about tightening defence budgets.

"The Ministry of Defence recognised that unless it rebalanced the Nimrod force's commitments to the available resource there was a potential for skills to fade below a certain threshold," said Group Captain Robbie Noel, a Nimrod navigator and Station Commander of RAF Kinloss.

"They have been listening to commanders who say they need some relief from operations overseas in order to rebuild capability for UK tasks including protecting the nuclear deterrent and countering any terrorist threat from the sea."

The MRA4 will have only limited equipment for overland surveillance (Night Hunter), and only nine aircraft are now being acquired for maritime

search and rescue, surface attack and anti-submarine warfare.

A vital priority is an ability to defend Britain's Trident nuclear ballistic missile submarines against any surface or submarine threats. One of the navy's four Trident boats is patrolling "silent and deep" under the sea at all times, and long-range anti-submarine protection is also considered vital by the Navy for its two new aircraft carriers.

The new Nimrod's changed role, however, is questioned by some in the Army, which is desperate for more troops, intelligence-gathering and equipment for battles in Afghanistan. It believes future

■THERE MAY NOT APPEAR TO BE A CLEAR AND PRESENT DANGER RIGHT NOW BUT, OVER THE NEXT FEW YEARS, THAT PERCEPTION MIGHT WELL CHANGE■

Rear Admiral Chris Parry (Rtd), former head of the UK MOD's future threat assessment team

threats are more from al-Qaeda-type terrorism than risks needing "a handful of very expensive aircraft going back to chase Cold War submarines," in the words of one senior Army officer.

But both senior Royal Navy and RAF officials say that other aircraft will replace them in Afghanistan, and submarines are a persistent and expanding problem that aircrews are losing the skills to deal with.

According to recent information that the Federation of American Scientists obtained from US Naval intelligence the Chinese Navy doubled the number of patrols by its attack submarines to a record level in 2008 – one of which bumped into an

American destroyer on 11 June this year.

China has a new Type 094-class nuclear ballistic missile boat which is expected to take its first long range patrol soon, and with a developing hypersonic anti-ship cruise missile has greatly increased maritime combat capability. Upgraded Russian nuclear ballistic missile submarine patrols have returned to sea at levels not seen for a decade, with a probable ability to mount continuous patrols.

Among other developments this year, Iran commissioned three new Gadhiri minisubs at Bandar Abbas on 1 June, India is reportedly set to launch its first ballistic missile nuclear sub at the end of July, and even Australia is buying 12 submarines over the next 20 years.

And with Colombian drugs runners building a fleet of semi-submersible boats, each costing over US\$1m and often travelling thousands of miles to transport tons of cocaine along the rivers and coasts of Latin America, US officials fear they could be used by terrorists to reach America with deadly cargoes. Twenty-two such boats have been apprehended at sea since 2007, with many more believed to have gone undetected.

"There may not appear to be a clear and present danger right now but, over the next few years, that perception might well change," said retired Rear Admiral Chris Parry, until last year head of the Ministry of Defence's future threat assessment team.

"If certain states become more assertive at sea, or if Pakistan, for instance, collapsed, we would see a significant submarine capability, not to mention its nuclear weapons, available to make mischief in a strategically critical part of the world. You can't grow top-end anti-submarine warfare capabilities overnight."

Although Sir Glenn Torpy, retiring Chief of the Air Staff, said only in 2007 that



"looking ahead, I see the Nimrod MRA4 assuming the ISTAR role currently undertaken by the MR2, but with enhanced capabilities", budget cuts mean the overland Westcam X15 cameras, plus radio and mobile phone intercepts and relay communications urgently installed on the MR2s in 2004 for Afghanistan operations, will not be transferred to the new plane.

The Nimrod MRA4 is already being recognised as a huge advance on any maritime patrol aircraft before it. Although it looks essentially the same as the original 1950s Comet, the MRA4 is 93 per cent a new plane.

It is bigger and 30 per cent heavier, carrying 30 per cent more fuel and is 30 per cent more fuel efficient. At 6,000 miles it has nearly twice the patrolling range of the MR2, with three times the complexity and electronics of the B2 bomber.

Its Searchwater radar is able to cover a sea area almost the size of Britain from 40,000 feet. Equipped with long range

torpedoes, Harpoon anti-ship missiles, precision-guided bombs and defensive air-to-air missiles it will be the RAF's only long-range, heavy duty combat aircraft, with a potential of even being able to carry long range Storm Shadow cruise missiles.

It is a "leap in technology", according to Group Captain Noel, and will be able to do longer missions without refuelling. Even so, he said, "anti-submarine work is more an art than a science," and finding increasingly stealthy submarines, particularly in coastal waters where readings of variable water temperatures can be misleading and where acoustic signals can be obscured by surface ships, oil drilling and sonar decoys is a real challenge.

• This article does not necessarily reflect the views of BAE Systems. From time to time *Frontline* reproduces articles by independent journalists to offer an "outside view" of the Military Air Solutions business.

The MRA4 is a re-engineered, re-built aircraft that is 93 per cent new

Manufacture involves:

- 63,000 parts
- more than 200 key suppliers
- 1,500 major bought-out items
- 1,000 mission avionic line replaceable items

The MRA4 has an all-glass cockpit with many of the systems, displays and avionics developed for Airbus

Its advanced integrated mission system has built-in growth capability and flexibility

The aircraft gathers, processes and displays up to 20 times more data than the MR2

It is equipped with more than 90 sensors and contains more than six million lines of software code

MRA4 is able to fly 6,000 miles or 14 hours without refuelling – it can fly direct from its home base at RAF Kinloss in Scotland to Los Angeles or Buenos Aires without refuelling

It can scan an area the size of the UK every ten seconds

The length and wingspan of MRA4 are both longer than the Wright Brothers' first flight

MRA4 makes impressive first flight

Continued from page 01

RAF huge potential and is a credit to the Company."

The Group Captain added: "With excellent weather and the entire Woodford workforce out to watch PA04's take-off and fly-past, it was a truly a memorable sight. To one and all I offer my thanks and congratulations."

PA04 is the first of nine production aircraft to be built, and one of four to be delivered to RAF Kinloss before the aircraft is declared in service at the end of next year.

The aircraft will undergo test flights to prove all systems are working correctly before moving to Warton for training flights involving RAF crews, de-risking the entry into service and ensuring the MRA4 will be put to the best possible use when it reaches RAF Kinloss.



This aircraft is the fourth MRA4 to fly, with three development aircraft providing the evidence for the formal Release to Service for the platform.

Steve Timms said: "We've been working very closely with the customer and have just completed the test flying needed to provide the initial clearance that will allow the RAF to operate the aircraft, and also agreed the approach to supporting the MRA4 when it enters service, so we're making excellent progress on all fronts."

■IT HAS BEEN A TREMENDOUS ACHIEVEMENT BY THE ENTIRE TEAM ... AND SHOWS THE MRA4 IS ON TRACK■
Steve Timms, Managing Director, MRA4



An excellent demonstration

Customer

The latest version of the Nimrod reconnaissance aircraft has been given a seal of approval by the Chief of Defence Materiel.

General Sir Kevin O'Donoghue joined the MRA4's management team on a two-hour flight in aircraft PAO2 from Warton, allowing him a demonstration of its mission system capability.

"My opportunity to fly in Nimrod MRA4 was invaluable," he said. "The crew provided an excellent demonstration of the aircraft's sensors and displays throughout the sortie and left me with a clear understanding of the contribution that MRA4 will make to defence."

Sir Kevin then saw the MRA4 production line at BAE Systems, Woodford.

After a detailed tour of a number of Nimrod aircraft in various stages of construction there followed a fruitful overview by both the company and the project team.

Sir Kevin complimented all concerned in the professionalism, motivation, determination and resourcefulness being shown to drive the aircraft into service.

He said: "I was hugely encouraged by the sight of the aircraft only weeks away from delivery and I do not underestimate the sheer hard work and dedication that it must have taken over the last 12 months to reach this position – the joint MRA4 team should be rightly proud."

• This article first appeared in the UK MOD's *desider* magazine



MY OPPORTUNITY TO FLY IN NIMROD MRA4 WAS INVALUABLE... I WAS HUGEY ENCOURAGED BY THE SIGHT OF THE AIRCRAFT ONLY WEEKS AWAY FROM DELIVERY

General Sir Kevin O'Donoghue



Above: Air Vice-Marshal Stephen Hillier aboard the MRA4



Above: the RAF crew after their successful six-hour sortie

First flight by RAF crew

Deliver

The MRA4 has been flown for the first time while fully crewed by the Royal Air Force, who took full responsibility for operating the aircraft and mission systems.

During the six-hour sortie the aircraft linked up with the Royal Navy in one of their regular exercises, and also completed handling checks as part of the RAF's operational test and evaluation of the aircraft.

Such tests are traditionally completed once aircraft are formally handed over, but incorporating such flights into the trials programme will

WHAT I SAW TODAY SAYS TO ME THAT WE'RE... MAKING GOOD PROGRESS TOWARDS THE FIRST DELIVERY OF THE AIRCRAFT TO THE ROYAL AIR FORCE NEXT YEAR

Air Vice-Marshal Stephen Hillier

ensure that the RAF is able to make best use of the MRA4 once the aircraft enters service.

On board for the flight was Air Vice-Marshal Stephen Hillier. The

Air Officer Commanding 2 Group was clear about what the MRA4 will provide to the RAF.

"What the Royal Air Force needs is the ability to continue the maritime patrol and search and rescue tasks, tasks the Nimrod MR2 has carried out successfully for very many years, and we need to sustain that capability, because those capabilities are vital.

"The MRA4 is what will give us that capability from next year and long into the future.

"What I saw today says to me that we're very much making good progress towards the first delivery of the aircraft to the Royal Air Force next year."

TAS team ramps up air base support

Integral

The shifting nature of defence requirements, coupled with new and more efficient ways of working, means that the shape and size of Military Air Solutions is always liable to change. Indeed planning for change, and coping with the demands it brings, is a challenge that faces us all.

As the "footprint" of MAS's operations at sites such as Woodford, Warton and Samlesbury flexes in one direction those on and around the air bases we serve can flex in another.

A case in point is RAF Coningsby. More than 100 MAS employees have taken up new jobs at the base this year as work there ramps up to meet the requirements of the Typhoon Availability Service (TAS) contract under which the Company is

the work provides a challenging, stimulating and rewarding environment with every day different."

Herman said that the prime purpose of TAS was to provide an affordable support solution for the RAF and a lot of work had gone into developing ways of measuring the output of the contract.

"It is important that both we and the customer understand the balance between output and costs, so that decisions can be made about reducing costs by reducing performance that is not required.

"We have set up a mechanism to measure the output of the service through a set of key performance indicators that are reviewed jointly, so there is true transparency for the customer around exactly what the outputs and costs are."

Early 2010 will see work start on the first of the Service Enhancement Packages contained in the contract, which will include supporting the stand-up of Typhoons at RAF Leuchars.

"We will also be increasing our maintenance capability and in October we will get UK MOD Maintenance Approved Organisation Scheme approval at RAF Coningsby, which is a requirement that will make us fully responsible for the output of the hangars there. A big responsibility to take but it is an essential part of being able to provide an availability service."

Herman said there was an important focus on improving the supply chain and the availability of spares as that was seen as an area with great potential for reducing costs. "Looking ahead we will be working to increase the capacity of the maintenance line so more tracks will be introduced within the hangar.

"We've also put a lot of attention on the review process we have set up so that everything is transparent – the customer takes part in most of our meetings, and we share problems and ideas. I have never seen such a close working environment and it is really paying off."

I HAVE NEVER SEEN SUCH A CLOSE WORKING ENVIRONMENT AND IT IS REALLY PAYING OFF

Herman Claesen, Head of Manage Business for TAS

partnering with the RAF in the maintenance and support of the aircraft.

TAS "went live" on its in-service date of 4 September, six months after the contract was signed. Herman Claesen, Head of Manage Business for TAS, said that with another 150 or so employees needed at the station within the next two years, recruitment remains a priority.

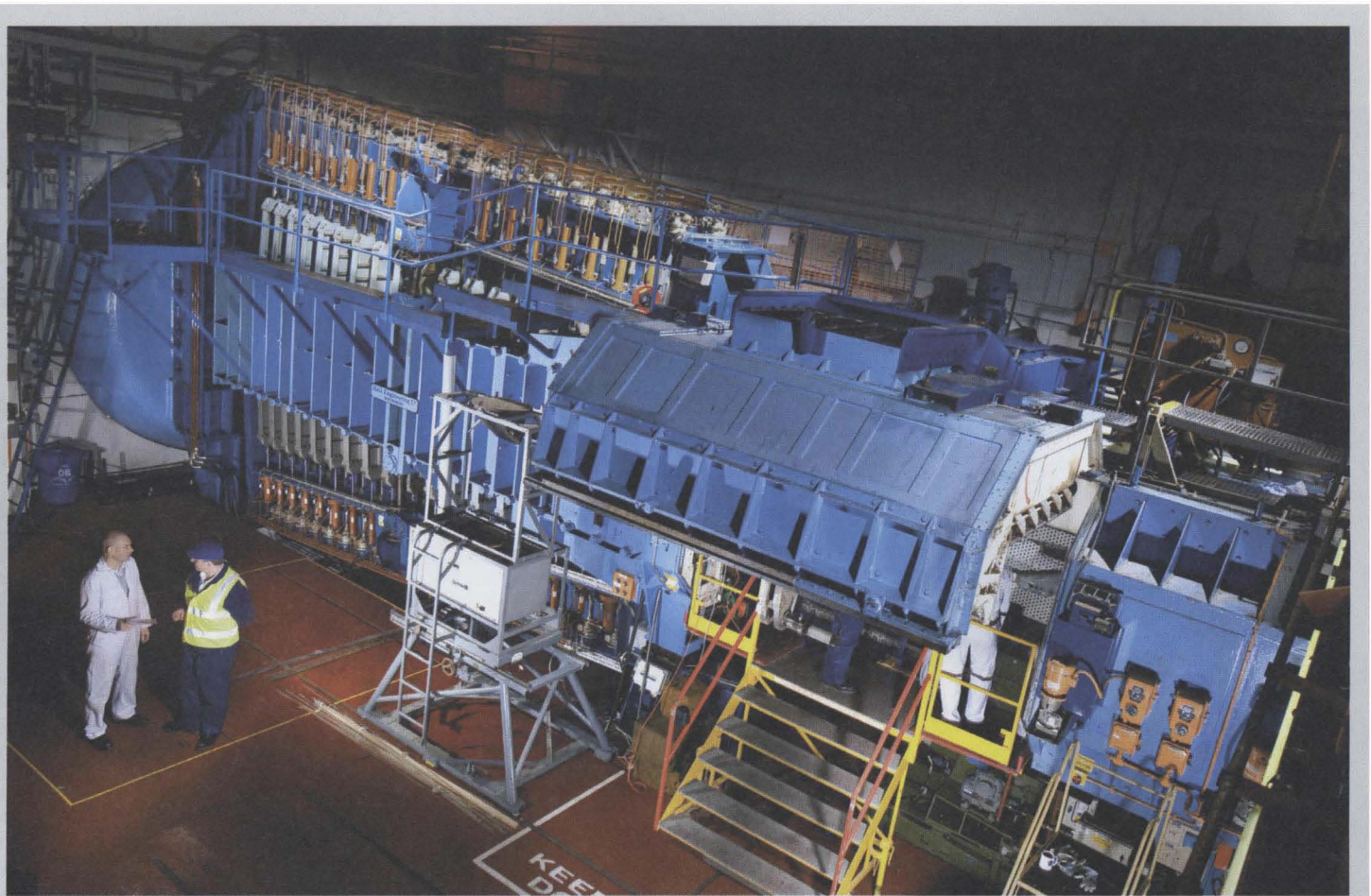
"We had 138 BAE Systems people employed at Coningsby at the end of last year, today we have 239 and we will eventually have about 450 people working here."

While people were being recruited locally and several had joined from the RAF, many were also transferring from MAS sites.

"The message we have been getting is that people who have made that move are very pleased. They find it a very exciting environment to work in. They share the customer and end-user experience, and the pace of



Above: the new BAE Systems Typhoon maintenance facility at RAF Coningsby



Above: fast mover – Warton's 1.2 metre high speed wind tunnel is the only one of its kind in the UK

Effective

It's official. Things now move faster in MAS's unique 1.2 metre high-speed wind tunnel. Why? Because Warton's wind tunnel team has now upped the run-rate in the tunnel from between four and five runs a day to more than six.

The secret for success in the only wind tunnel of its kind in the UK has been solid teamwork and the implementation of a new set of clear and consistent standards.

Operations Manager Brian Cleator told *Frontline*: "As a team we wanted to improve the way we worked the service we provided. To do this we were supported by the Integrated Services service system design team using both lean and service excellence principles to

The winds of change

achieve tangible results."

Brian explained: "Historically run rates in the 1.2m high-speed wind tunnel have always been in the order of four or five runs per day, but the team set themselves a target of six runs per day and have consistently been exceeding this target after the introduction of a number of small improvements. This has been facilitated by applying lean principles, which were underpinned by a well-structured communications process."

Teamwork, engagement and well-structured processes have been key to the success. Learning is now recorded and shared ensuring that any prob-

DID YOU KNOW?

- The Warton 1.2m high-speed wind tunnel is capable of testing air vehicles from Mach 0.4 to Mach 3.7.
- It was first commissioned in 1960 and has been used for a wide range of projects, including Lightning, TSR-2, HOTOL, Tornado, EAP and more recently Typhoon.
- It has a number of unique features, including the widest Mach number capability in the UK and it remains a key MAS capability for the future.
- More recently it has been successful in attracting a number of third party activities (equivalent to 23 weeks' facility occupancy in the last 12 months), helping to secure the capability for internal customers and providing revenue to the business.

lems encountered are unlikely to be repeated.

Clear and consistent standards also mean any problems are obvious and can be resolved quickly. Brian said the improved

standards have been implemented in everything from model parts storage and configuration, to health and safety."

While the productivity improvements have

delighted both internal and our external customers, the Customer Service Excellence programme has helped the team to re-visit exactly what the customer wants.

Brian said: "We are looking at ourselves to see how easy we are to do business with. We are using the principles learnt from the Customer Service Excellence team to help us engage our customers more effectively in understanding their requirements."

He added: "While there is still much to do we are already finding that we are receiving an increased level of interest from new areas, as our existing customers spread the word."

Partnered approach is paying dividends

Team

A new integrated vehicle health management (IVHM) programme being developed by MAS's Supportability Research team holds the promise of reduced downtime for aircraft in the future and is a prime example of BAE Systems' focus on through-life support.

The IVHM programme is being run through a centre of excellence set up in November 2008 at Cranfield University which aims to push this field of work forward.

As Anne Morris, MAS's Head of Supportability Research, explained, the work is already providing a host of benefits.

"The IVHM programme covers structural and system health management for our aircraft, helping us to find

Research benefits from collaboration through university

ways of spotting problems early – or even before they arise – and also reducing maintenance time and costs."

She added: "Along with us, there are several partners involved including Rolls-Royce, Boeing, Thales, Meggitt, East of England Development Agency, and the Engineering and Physical Sciences Research Council. This in addition to the experts from the university."

Anne believes the centre

and the partnerships it brings with it are now enabling MAS to carry out even more valuable research and achieve greater value for money in doing so.

"For example," she said, "by sharing some of the costs of the research we do at Cranfield we can significantly cut costs freeing up further funding for additional work."

And, she explained, it is not all one-way traffic. "We've donated equipment that is used on MSc courses, the students get the benefit, and we get data back on the performance of the equipment."

Anne said: "Our aim,



Above: as part of the collaboration at Cranfield, MAS has donated a fibre optics interrogator to the university. Pictured here are (from left) Jim Angus (Commercial Director of the IVHM Centre), Professor Ian Jennions (Director of the IVHM Centre), Jim McFeat (MAS R&T Supportability Technical Lead) and Peter Foote (Executive Scientist, ATC Sowerby)

working with the university and our partners, is to have the initial IVHM programme complete by the end of 2011. On legacy platforms like Tornado it will replace some maintenance and non-disruptive tests.

"On unmanned aircraft systems it will also help us detect damage due to wind turbulence, bird strikes and other factors. Because there's no pilot on these aircraft some of these incidents could be overlooked."

The IVHM, the Cranfield

centre and other developments, are a sign of interesting times for Anne's team. As she explained: "Last year we updated the R&T strategy in light of the change in business focus from design and development to through-life support. "As a result, supportability gained extra importance, and now it's been expanded to include availability, fleet management and through life. We'll now have more responsibilities and are likely to be busier than ever."

WE WILL NOW HAVE MORE RESPONSIBILITIES AND ARE LIKELY TO BE BUSIER THAN EVER

Anne Morris, Head of Supportability Research

Innovation spurs on F-35

Samlesbury capabilities boosted by new buildings and technology while US displays the future of air power

Integral

The new F-35 Lightning II machine shop at Samlesbury is taking shape fast: not only has it moved to the latest phase in its development after the last bolt was fitted in a golden bolt ceremony, but a new innovative machine that will be installed in the building has been developed.

Over the last ten weeks steelwork has been manoeuvred into place on the 9,000 square-metre machine shop. The ceremonial golden bolt, fitted on 12 August, brings to a close the current phase of the build.

Chris Addison, a project director on F-35, said: "It was great to be part of the ceremony to fit the final bolt into the structure of such an

IT WAS GREAT TO BE PART OF THE CEREMONY TO FIT THE FINAL BOLT INTO THE STRUCTURE OF SUCH AN IMPORTANT BUILDING

Chris Addison, project director on the F-35 programme

important building that will significantly enhance our manufacturing capability.

BAE Systems Investment and Infrastructure Services has worked in partnership with the machine tool supplier Starragheckert of Switzerland to design a new machine which will manufacture long thin titanium spars for F-35 tails.

This innovative five-axis machine tool costs about £5.5m and has taken three years to develop the concept and the design.

It will use two machine heads to produce two components simultaneously, effectively halving the item production period.

Martin Knott, Senior Facilities Engineer, said the design challenges were significant but in July the concept was successfully proved with the build of a single-spindle test head.

Based on this, the team placed an order for the first machine tool, which will be available for production in September 2011.

The F-35 Lightning II machining facility is essential in moving from low rate initial production to the full rate production of one aircraft a day by 2016.



First carrier variant for US Navy

The first F-35 Lightning II CV (carrier variant) airframe has been presented to the US Navy.

The ceremony took place

during the summer at Lockheed Martin's Fort Worth plant in Texas.

Over the coming months the airframe will undergo a

series of ground tests before taking its first flight towards the end of the year. This was the public debut of the carrier variant,

the third one in the F-35 Lightning II trilogy.

BAE Systems continues with its production of all three variants.

Nothing but the best for MEST

The latest building to be given the seal of approval at Samlesbury is the new Materials Engineering Support Test (MEST) facility.

Costing approximately £1.9m, construction work started in October 2008 and was completed ahead of schedule and on budget in July.

The facilities include seven laboratories and office space for 50 engineers. Investment in new technology includes a high-powered microscope costing £250,000.

Dave Holmes, Director of Investment and Infrastructure Services, said: "Our

focus to date has been on enabling Samlesbury site with an improved road infrastructure, a new site entrance and an attractive reception building.

"Having moved a significant element of the Warton population to Samlesbury, the two new office buildings are also now fully occupied.

"The MEST building is the first of a number of industrial facilities we are investing in and reinforces our transformation goal, which is to establish Samlesbury as the hub of MAS airframe engineering and manufacturing activities."



Defense Secretary visits Fort Worth

Dellver

The US Secretary of Defense, Dr Robert Gates, visited Lockheed Martin's final assembly operation for the F-35 Lightning II at Fort Worth, Texas, on 31 August, conveying optimism for the programme's future and emphasising the F-35's importance to global security.

Dr Gates walked along portions of the mile-long factory floor, where he stopped to speak with F-35 workers, and saw all three variants of the aircraft in different stages of assembly.

He also met BAE Systems F-35 test pilot Graham

"GT" Tomlinson, pictured left, who explained the helmet-mounted display system to the Defense Secretary.

At a news conference after his tour of the factory, Dr Gates said: "We cannot afford as a nation not to have this airplane.

"I was very impressed by what I saw this morning – by the investments that have been made in the production line, the robotics and automation.

"I'm heartened by what I've seen... but especially by the commitment of the people involved in putting this airplane together."

Working together to enhance flight safety

Team

Developing a safety management culture that can be adopted by every individual who is working on aircraft maintenance is a huge task ... but one that's vital to ensure the safety of aircraft and everyone involved with it.

The increasing number of through-life partnerships established with military and sub-contractors and the development of export activities has sharpened the focus on aircraft maintenance safety at MAS.

Steve Frost, Maintenance Function Safety Manager, MAS, leads the business's efforts to create a safety system that everyone can use to meet the requirements of the MOD regulator and continually improve our safety culture.

To help tackle this issue, MAS is developing a Safety Management System (SMS). The first major step on this journey was the establishment of an MAS Error Management System (MEMS).

This enables individuals to report a potential aircraft

SUCCESS DEPENDS ON PEOPLE BEING PREPARED TO HIGHLIGHT POTENTIAL ISSUES

Steve Frost, Maintenance Function Safety Manager

safety issue, which will then be thoroughly investigated and improvements suggested and implemented.

Steve said: "Our ultimate aim is for all of the partners involved in aircraft maintenance

across the UK to work together using a single safety management system enabling us all to maximise our learning from our experiences."

Key to this is establishing a truly effective safety culture. Steve continued: "We need a culture where people feel able to report any issue or error they see which could affect the safety of the product."

Through-life partnerships, already established on platforms such as Harrier, Tornado and Typhoon, bring a mix of cultures, with

PARTNERSHIP IN ACTION

"The adoption of this system in the depth maintenance environment is providing an excellent opportunity to work together with our supplier to improve safety."

Commander Brian Parsons

"Working together with BAE Systems to implement this process within our business is a key step of a long journey to continually improve safety of our operation here on Hawk Integrated Operational Support at RAF Valley."

Dave Broatch, Principal Engineer, Babcock Defence Services

BAE Systems, RAF and Royal Navy, and sub-contractors working shoulder to shoulder on maintenance tasks.

Steve said: "All of these

different cultures are now coming together and the common theme we have is that all of us want the aircraft to take off and land safely.

"Success depends on people being prepared to highlight potential issues, and no matter what process or systems we put in place, the key is culture.

"People have to feel comfortable and confident enough to report any issue."

In recognition of the progress that has been made, SMS has been rewarded with a BAE Systems Chairman's Award for the implementation of the process at RAF Valley in partnership with Babcock Defence Services.

HERTI has support for life built in at the start

Flexible and scalable model planned for UAS

Trusted to deliver

Military Air Solutions is developing a through-life support mechanism for unmanned aircraft systems (UAS) – even before they go into commercial production.

Wayne Scholz, Support Services Director for autonomous systems, is in charge of developing a through-life support model for products, such as HERTI.

Wayne told *Frontline*: "MAS is a 'can do' organisation full of people with great ideas and the ability to follow them through to the concept stage and beyond."

"Now we are taking that enthusiasm and vitality and using it to create a flexible support package for these exciting new systems."

"We have been given the opportunity to do something few people have done before. In the past, military customers who purchased a Typhoon or a Hawk had already owned other aircraft, so they had a preconception of how the new machine worked and was supported."

"With the UAS, there's no baggage to bring along."

WITH THE UAS, THERE'S NO BAGGAGE TO BRING ALONG. CUSTOMERS ASK US 'HOW DOES IT WORK?' AND WE HAVE TO BE ABLE TO OFFER THEM THE SUPPORT THEY NEED

Wayne Scholz



WE ARE TAKING OUR PEOPLE'S ENTHUSIASM AND VITALITY AND USING IT TO CREATE A FLEXIBLE SUPPORT PACKAGE FOR THESE EXCITING NEW SYSTEMS

Wayne Scholz,
Support Services Director

Customers ask us 'How does it work?' and we have to be able to offer them the support they need.

"They understand the capability they want, but they will rely on our assistance to specify how they will achieve that output."

Wayne and his team have learned plenty of lessons from the through-life

contracts already developed by MAS for the Tornados, Harrier and Typhoon programmes. And they have been talking to other land and sea support teams in BAE Systems as well as industry teams in the non-military world.

Wayne added: "We've visited different organisations and examined their support models to build up our understanding of world-class practice and considered how we can use that in our programmes."

"I'm particularly grateful for all the help and advice – and openness – my team has had from the other BAE Systems businesses who've helped us to understand their business models and support cultures."

"We are looking for a UAS support model that's flexible and scalable to meet the needs of different customers, whether they want to buy or lease and whether they need a small or large number of systems from us."

"We are a small team at the moment, but we will grow steadily and develop the ability to fully discharge through-life capability and support services for all of our customers."

"We still have a lot to do, but we will be ready for our first support contracts."



Above: because it is a new type of aircraft, HERTI customers will rely on BAE Systems people to advise them on how to achieve their desired outputs

ASTRAEA programme demonstrates promise

Integral

ASTRAEA, the £32m, three-year research programme set up to take the next steps in showing how unmanned aircraft can use the UK's commercial airspace, has now concluded its first phase.

The ASTRAEA (Auto-nomous Systems Technology-Related Airborne Evaluation and Assessment) programme investigated the key technology and regulatory issues surrounding the routine use of such aircraft.

The MAS Research & Technology team, based at Warton, led BAE Systems' involvement in the ASTRAEA programme, and completed a number of significant demonstrations.

Among its successes was a joint integrated synthetic environment demonstration at Parc Aberporth in Wales, that brought together a range of technologies and



Above: a new way of manufacturing carbon fibre wings during static tests

systems developed by the programme partners – including BAE Systems, EADS, Cobham, QinetiQ, Rolls-Royce and Thales – and illustrated how unmanned aircraft systems (UAS) could be operated safely in UK airspace.

Another BAE Systems innovation was the development of a vehicle systems

integration test facility to support the rapid prototyping, development and testing of different UAS. The interconnected rigs – including fuel, electrical and propulsion systems – can be used to test different setups of UAS components either independently or as an integrated system.

A vehicle health manage-

ment system was also installed and run on the HERTI OC1A vehicle during taxi trials at Walney Island in Cumbria.

And the most recent success was the design and assembly of UAS wings using a novel carbon fibre manufacturing process whose aim is to be more affordable.

Programme Manager Steve Whymark told *Frontline*: "We had significant involvement on this wing programme from colleagues across the business. The task was led by Brough and the manufacturing by Samlesbury, and the work was commended at the 2009 IET North West Engineering Innovation Awards."

He added: "Work has already started on a follow-on programme that will mature a selection of these systems further through a range of development and demonstration programmes."



Above: MOD personnel asked a lot of questions about the progress of the UAS programme at events held at Abbey Wood and Whitehall

Progress showcased at two MOD events

Showcase

A team from MAS recently showcased BAE Systems' unmanned aircraft systems (UAS) capability at two UK MOD events alongside Thales, Lockheed Martin and QinetiQ.

The events were designed to increase the awareness and understanding of the developments in UAS capability among MOD employees. Held at Abbey Wood and Whitehall, the events were attended by senior MOD personnel

and allowed the UAS Project Team to demonstrate the tangible progress in exploiting next-generation capability.

The MAS team is currently working on a number of concept demonstrator programmes such as Mantis and Taranis.

Steve Cobb, Head of Business Integration within AS&FC, explained: "These events provided MAS with an ideal opportunity to explain how we are making partnerships work in our UAS programmes."

"Team Taranis is seen as an exemplar MOD and

industry partnering arrangement and the template for future collaborative ventures. The partnering ethos and rapid prototyping achievements across all of the UAS platforms generated a lot of interest from members of MOD projects as diverse as submarines and artillery systems.

"There were lots of questions about project progress as well as our use of system intelligence to improve military capability and reduce through-life costs."

Expert training course is a hit across business

Tailored content delivers best practice in a day

Real advantage

A project management awareness course that is proving popular across BAE Systems businesses is not just a great example of sharing best practice and delivering expert training, but an effective way of reducing costs, too.

Alan Jackson is the MAS Project Management Processes Manager. He explained: "We're about to head off to Eurofighter GmbH in Munich and Platform Solutions in Rochester to deliver the one-day course.

"That follows a trip to Saudi Arabia, and attendance at our Warton sessions by representatives from Detica, the data security firm BAE Systems acquired last year. We've also had interest in the course from BAE Systems Australia.

"In fact, we have a full diary for 2009 including RAF bases, such is the popularity of the course."

The course began life about four years ago as a cost-effective, low-level introduction to BAE Systems project management principles for non-project managers and new people joining the Company in project management roles.

Before long, the reputation of the course grew among other BAE Systems businesses, and their interest increased when they discov-



Above: the course has become global, with sessions held in Saudi Arabia as well as interest from Australia

“WHEREVER POSSIBLE, EXPERTS FROM THE BUSINESS COME AND DELIVER THEIR OWN MODULES”

Alan Jackson, MAS Project Management Processes Manager

ered that MAS would provide the materials free of charge so that they could deliver it locally themselves.

"As a result, my colleague Don Hazeldine, the Project Management Learning and Development Manager, and I have been to Saudi Arabia to present four sessions to CS&S International," said Alan.

"The success of the course

is down to several factors, not least its focus on specialist input. Wherever possible, experts from the business come and deliver their own modules."

There are other advantages, too. "The fact that people from Detica came along to Warton – and more are due in the future – has several benefits. They get to know how we operate, so it helps make the integration of our new partner smoother, more effective and quicker."

Alan gets documented feedback as part of the

course process, but he has also received detailed comments from people who have attended.

Alistair Hudson is a senior manager in the Law Enforcement Business Unit at Detica. He took part in a session in May and was suitably impressed.

"The aim was to see what BAE Systems had in place for project management training and find out if it was suitable for our junior-level consultants.

"I thought it was content rich, made great use of time

“THIS IS THE WAY FORWARD FOR CONSULTANTS WHO ARE LOOKING TO RUN THEIR FIRST PROJECT”

Alistair Hudson, Senior Manager in the Law Enforcement Business Unit at Detica



Above: the course's content, delivery and presenters have earned high praise in feedback from participants

and the presenters were excellent – professional and engaging. We've now added the course to our training curriculum.

"This is the way forward for consultants who are looking to run their first project."

Ken Groves, Head of Project Management Function, added: "One of the characteristics of an excellent

company is the ability to identify and share best practice across the organisation.

"Over time, we have collated a wealth of subject matter expertise to produce the Project Management Awareness training module we have today. We knew that other BAE Systems businesses could gain benefit from it as we do, and it's gratifying to

see them starting to take up our offering."

If you're interested in the course go to Peopleportal, (course 2524), where you can find out more. The sharing of best practice within project management is a prime example of how we can deliver a culture of total performance. Read more on this in issue 4 of BAE Systems News

Performance Review shows improvements for MAS

Trusted

MAS programmes have posted improvements in the annual Performance Review conducted by Defence Equipment & Support (DE&S), with an average increase in their ratings of nearly double the industry average.

The review is a perception-based assessment in which DE&S – MAS's biggest UK customer – runs the ruler over its key suppliers. This year 15 MAS programmes were assessed as part of the overall BAE Systems review.

During the review, 11 characteristics, such as responsiveness and management of suppliers, are assessed and awarded a score from zero to ten.

Drew Steel, MAS Performance Review Manager, said that, between

2008 and 2009, MAS programmes improved their scores by an average of 11 per cent – almost double the industry average. "Our highest scoring programme achieved a score of 8.2, the same as the overall highest scoring key supplier, while one of our programmes registered a 31 per cent improvement, year-on-year."

This year's overall MAS score was bang on the review average, at 7.1. Drew said that while it was a good score in isolation, a lot more needed to be done for MAS to keep improving its rating.

"If a customer is looking to place a contract, are they likely to look at the 'average' companies? I suspect not. The customer's perception of our performance really matters."

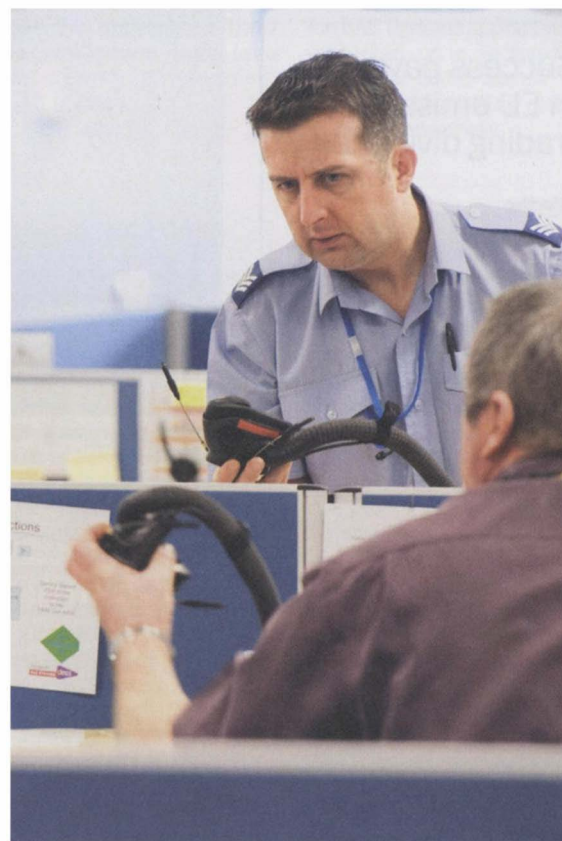
Drew said simple things could make a significant difference, like how a tele-

phone enquiry is dealt with, how well we turn good ideas into effective solutions, and how hard we try to explain why something has gone wrong. All of these things can be and have been commented upon during past Performance Review assessments, he said.

"What is being assessed is the opinion our customer has formed about us over the whole year. No-one is exempt from, immune to or excluded from the activities that shape the outcome of Performance Review. You can, and you do, make a difference.

"The next assessment phase, Performance Review 2010, will take place next January and February – what you do today might affect our score."

For more information, contact Drew Steel at Warton 55547 or drew.steel@baesystems.com



Above: because the Performance Review is based on the customer's opinion, all activities make a difference

Another honour for winner Keith

Keith Thomason, winner of the 2008 Bee Beaumont Engineering Award, will be presented with the Royal Aeronautical Society's Young Persons' Achievement Commendation at the CEAS 2009 Conference for Young Professionals in Manchester in October.

This latest honour came as Keith this month told *Frontline*: "The nomination process for BAE Systems' Air Sector Engineering Awards 2009 is now open, an event which recognises outstanding achievement.

"I was thrilled to win my award last year. It would be great to see new successes being recognised this year."

"I didn't set out to win any awards, I just did my job to the best of my ability and was willing to stick my neck out for what I believed to be right.



Above: Bee Beaumont winner Keith Thomason

"I would say, don't be afraid to think imaginatively to overcome problems and use your hard won knowledge and experience."

News in brief >



Above: BAE Systems RAF Coningsby played host to a visit by a group from the International Aerospace Summer School (IASS), who got to see Typhoon up close. As part of their visit, the 11 teachers and 29 students, from Austria, Germany, Greece, India, Italy, South Africa, Spain, Switzerland, Turkey and the UK, were also given a tour of the Battle of Britain Memorial Flight. The IASS course has been supported by the Eurofighter consortium of BAE Systems, Italy's Alenia Aeronautica, EADS Germany and Spain's EADS CASA since 2006. It sees the students taking part in a week of aerospace-related activities at Cranfield University. Course director John Farley, an ex-BAE Systems chief test pilot for the Harrier programme, said: "We are aiming to motivate and educate the students by giving them hands-on experience of aircraft. They are tomorrow's aerospace engineers and designers."

Raising the bar for software research

The UK MOD-funded Software Systems Engineering Initiative (SSEI) consortium has been awarded a £3.5m contract extension to fund additional research activity.

The project, which is managed by Military Air Solutions for the MOD, was set up in 2008 to determine how both new and existing software systems can be optimised for maximum efficiency, flexibility and value for money.

The growth in complexity of software means that today, between 80 and 90 per cent of the functionality of aircraft such as Typhoon and the F-35 Lightning II is enabled by software.

SSEI Programme Manager Jane Fenn, who is based at Brough, said: "With the MOD, we have already selected 11 research tasks and awarded eight contracts to our university and

industry partners.

"We've introduced a project health check that will review MOD projects, identify risk areas and provide advice on how the delivery teams can address those risks."

She added: "The MOD wanted support and reassurance that the information presented to them by outside consultants is technically accurate and appropriate, especially where they don't have such skills within their own teams."

"We are helping to raise the bar for software development and making sure the MOD is getting consistent advice."

"We are also organising a conference at the MOD in Abbey Wood in November that will attract 250 delegates from among MOD integrated project teams/delivery teams, core partners and associates."

Go green and travel for free

MAS is offering employees using its new company bus services into its Samlesbury site a limited period of free travel in October so they can boost their green credentials without denting their wallets.

The Company is committed to promoting alternative forms of travel and has been operating three bus routes into the Samlesbury site in line with its pledge to promote green travel where possible. The measure is one of many being taken after consultation with the local planning authorities to make Samlesbury one of the greenest-thinking sites in the Company portfolio.

While the services, the first of which began in

April, are very popular with those who use them, the buses are still far from full – and the free travel promotion aims to boost interest in the scheme which could save many employees hundreds of pounds in motoring costs and help the environment.

So between 5 and 16 October inclusive, employees who leave their cars at home will be able to travel free. Even when "normal" service resumes and fares have to be paid, the charges will remain modest – and highly competitive with other more conventional forms of commuting.

Andrew Lamb, Investment and Infrastructure Services Manager, said: "This is an opportunity not to be missed, try it – you may get to like it."

For further information on the scheme go to the MAS intranet A-Z and look under 'T' for travel

How texts carry an important message on safety

Effective

More than 69 per cent of accidents are caused by a slip or trip across MAS. This was the message highlighted in a recent poster campaign across the business.

Although this has gone some way to highlight the issues associated with slips and trips in our business, there's still much more we can all do to improve things, according to Danny Martland, Head of Safety, Health and Environment.

"In many ways this is a cultural thing," explained Danny. "Put simply, we don't believe it will happen to us and we tend to ignore some of the main causes of these types of accidents."

"Spills are a prime example and you will often find that a spilled drink or other liquid is ignored when we all know the responsible thing to do is to wipe it up."

"Using mobile phones and texting while walking distracts people and has led to accidents, yet it's something

Don't fall down on the job – pay attention to the new poster campaign

many people still do. Another potential cause of accidents is inappropriate footwear.

"We have to remember that we are working in an industrial environment and wearing appropriate footwear should be a commonsense decision."

"It's often these simple things that are the causes of accidents and I firmly believe that we can all challenge and improve the way we do things ourselves a bit more."

"The ongoing slips and trips campaign provides some simple safety tips and these will be reinforced through a series of road shows which will be running at MAS sites between now and the end of the year."

"The campaign sets out to

USING MOBILE PHONES AND TEXTING WHILE WALKING DISTRACTS PEOPLE AND HAS LED TO ACCIDENTS, YET IT'S SOMETHING MANY PEOPLE STILL DO

Danny Martland, Head of Safety, Health and Environment

We have the power to save energy

Success pays off in EU emissions trading dividends

Effective

Between them, our sites at Warton and Samlesbury consume enough power to heat and light a small town.

With 15,500 employees in a range of different jobs, MAS is constantly on the lookout for ways to save on gas, electricity and water consumption.

Not only does it save the Company money – it helps to build up valuable energy allowances, currently worth some £180,000 a year, that we can trade to other companies under the European Union's Emissions Trading Scheme (EUETS).

Stuart Barker, Estates Sustainability and SHE Manager, said: "In the last six years, we have reduced our gas consumption by a third and we will continue along that path to reduce the amount that we use.



Above: managing energy consumption and carbon emissions is a key business issue

"We monitor and report on all of our utilities related CO₂ emissions – mainly from gas usage – from about 50 different gas meters. At the end of the year they are independently verified and declared to the Environment Agency, whereupon we are allowed to trade our allowances."

Making savings in consumption pays real dividends for MAS. Sites that do not have enough allowances – agreed in advance with the UK Government as part of the country's commitment to the

69% of lost time accidents are caused by slips and trips. Don't let yourself become a statistic.

Top ten tips:

- Trip hazards - spot it - report it - make it safe!
- Clean up spills immediately
- Keep your area tidy
- Tidy away trailing cables and airlines
- Be vigilant - be aware of potential hazards
- Wear appropriate, sensible footwear
- Don't use mobile phones whilst walking
- Don't allow yourself to be distracted by others
- Don't take shortcuts – stick to the walkways
- Always use the handrail on stairs



MILITARY AIR SOLUTIONS

BAE SYSTEMS

Above: the latest poster in the slips and trips campaign aims to raise awareness of the impact of accidents

engage people and we will be providing give-aways at the road shows in order to spread the message," said Danny.

"People often forget about the human impact of these types of accidents, which can affect your quality of life not just at work, but at home as well."

One very positive aspect of the safety exemplar story is the number of safety kaizens or improvements ideas that have been submitted. Nearly 10,000 have now been completed and this

demonstrates that people are starting to think much more about improving the safety for everyone's benefit.

"I would like to encourage people to keep the improvement ideas coming," said Danny.

"Most accidents that take place in the business could probably have been prevented by a safety kaizen, so within the thousands of improvements made already we have probably prevented a number of accidents and that's a really positive message."

DID YOU KNOW...?

- More than 25 million working days are lost annually in the UK as a result of workplace accidents, injuries and ill-health.
 - 70 per cent of workplace accidents could be prevented if employees used the proper safety control measures.
 - Slips and trips, often resulting in broken bones, are the highest cause of major incidents.
- Source: RoSPA

something about it. If they tell us where we can save heat – for example heating process baths when they're not needed – we can take action.

"If every one of MAS's employees got involved in saving energy we could shave 10 per cent – £1m – off our annual energy bill."

The next phase of EUETS will see emissions from civil – but not military – aircraft included from January 2012, bringing a further challenge to BAE Systems in mitigating its costs.

Stuart said: "Our Corporate Air Travel service will be included, and we are already preparing for it by asking CAT to capture and record their emissions data from now on."

Eco Day message for schoolchildren

Engineers from MAS visited a local school to tell children about BAE Systems' efforts to save energy and help the environment. They were among several speakers taking part in an Eco Day at Balshaws High School in Leyland. The invitation came via the South Ribbles Community Partnership. Stuart Barker said: "I think the exercise helped to open children's minds to what's happening in the real world around them."

complain when buildings are not warm enough but often don't report it when a building's too warm. If colleagues tell us when we are using heat unnecessarily we can do

Kyoto Protocol on greenhouse gas reduction – face a fine of 100 Euros per tonne for emissions that their allowances don't cover.

Stuart is a pioneer in environmental engineering, having gained his degree in 1998, well before the subject came to the fore.

A member of the Chartered Institute of Water and Environmental Management, he has seen energy and sustainability climb up the agenda at BAE Systems.

Stuart said: "People rightly

Spotlight on apprentices >

Skills learning on an international stage

German exchange programme helps to give apprentices global outlook

Real advantage

With fewer places available at university for students and the offer of a chance to earn as you learn, apprenticeship schemes have never looked more appealing and for one group of lucky MAS apprentices the chance to add an international dimension to their training is just one more bonus.

The group recently participated in the annual Apprentice Exchange scheme sponsored by the British Council and run by BAE Systems in partnership with Rolls-Royce, UK, EADS (European Aeronautic Defence and Space

global outlook and training in technical innovation that is cutting edge."

This year's activities got off to a flying start with the arrival in the UK of a group of craft, technical and business apprentices from Germany.

After a tour of Warton and Samlesbury, the students moved on to participate in placements within a number of business areas including Typhoon production and final assembly, Tornado design, fabrications and electrics.

While working in these different areas the students were able to compare manufacturing techniques used back in their own business, identify benchmark practices and understand the cultural differences in a workplace environment.

A schedule of social events included visits to the National Football Museum in Preston and the Science and Industry Museum in Manchester.

The three-week visit culminated in presentations about their thoughts on the whole exchange experience.

Jonathan Edmondson, MAS apprentice, said: "The exchange has definitely been the best opportunity I have grasped in my career so far, not only for my education and picking up best practice but also forming new friendships and experiencing another way of life."

Janine Muller, MTU apprentice, said: "Because of the exchange I have learned more about the British and the Bavarians, but also more about me."

"I have met some new friends and overcome the language barrier with a lot of jokes and dictionaries. I think the work and leisure experience are an enrichment of our life."

Xchanging Instructors at



Above: MAS apprentice David Sharples (right) and his German partner from EADS, Danny Plotz, at Warton

the Preston Training Centre, Dave Brooks and John Connor, have seen the scheme go from strength to strength over the years and said: "This exchange scheme is considered a model of best practice and this year for the first time we've expanded into the

supplier base bringing Rolls-Royce in as a fourth partner, giving two of their apprentices the chance to be involved. It's great to see the apprentices grow in confidence both in a workplace environment and socially.

"It's also a chance for

both sets of apprentices to develop both language and key skills."

In August, after 60 hours of German language training, the BAE Systems apprentices embarked on a reciprocal visit to the EADS and MTU sites in Manching and Munich respectively.

You're hired! Gary joins competition judging panel

Effective

It was a case of "apprentice-turned-Sir-Alan" for Gary Stephenson this year. The Brough-based MAS quality engineer followed up his winning part in last year's Apprentice Innovation Challenge by becoming a judge in this year's event. This is a first.

His chance came about after a conversation with Charity Challenge Campaign Associate James Hayward who suggested a winner from the current year should be nominated on the judging panel of the following year.

Gary said: "There were two judging days where the nine teams involved made presentations," he added. "I know lots of people involved in these sort of things say they had a really hard time making a decision, but it's really true."

"It was great to take part. I got a different perspective on all sorts of subjects and it increased the value of my learning from last year. I got new experiences, too. On finals day, because I was the first apprentice who'd moved on to be a judge, I was asked to give a short speech."

Gary said: "I hope this aspect of the Challenge is retained and one of this year's winners can be a



Above: Gary Stephenson

judge next time. I got a lot out of it and I think the Challenge benefited, too."

The annual Apprentice Innovation Challenge is held in association with the UK's partner charity.

Apprentice teams from across the UK business were given mechanical and electrical challenges based on real situations faced by this year's partner charity, Sue Ryder Care.

For the mechanical challenge, the teams had to design and build a device to help nurses evacuate people with limited mobility in an emergency.

The electrical challenge was to create opportunities for people with severe physical restrictions to enjoy and take part in music therapy.

At the award ceremony at Duxford Imperial War Museum, a special commendation was presented to the MAS team from Warton, which produced a device that has the ability to enable a patient with disabilities to be easily transferred from a bed to a chair and evacuated from the building using tank-style tracks.

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THE EXCHANGE HAS DEFINITELY BEEN THE BEST OPPORTUNITY I HAVE GRASPED IN MY CAREER SO FAR

MAS apprentice Jonathan Edmondson

Company) and MTU Aero Engines of Germany. Celebrating its tenth anniversary, the scheme is designed to promote British-German co-operation in the field of work-based training.

Katie Epstein, Director of Technical and Vocational Education at the British Council, said: "BAE Systems and its partners are to be congratulated for developing this programme over the last ten years."

"These skills give them a

First graduates from unique scheme

Effective

A unique BAE Systems Ael apprenticeship scheme is celebrating success as its first-ever graduates have emerged from Bournemouth University with full honours degrees.

The scheme is the only computer software development apprenticeship in the country that gives successful candidates the chance to finish with a degree of this type.

Jason House, Luke Ferguson, and Graham Law are the talented apprentice graduates who

made up the first intake in 2004. They have just returned from nine months at university to add their new skills and expertise to the business. Jason said: "The scheme gives you a good start in your career. The Company has been very good to us and taught us some key skills."

It is that security and

support the business offers that makes a difference as far as Luke is concerned.

He said: "A lot of our friends from university are having real difficulty getting a job in the current climate. But we've left school, joined the apprenticeship scheme, enjoyed work experience, come out

with an honours level degree and have been welcomed back into the business."

Graham highlighted the advantages of combining work and university. "We've been able to transfer all the skills we learn here to our course at university."

"And, if we have any questions or problems we can go directly to our colleagues in BAE Systems. Others at university don't have that type of back-up."

Jason, Luke and Graham believe the business benefits too. Their experience allows them to take more

responsibility at work.

Compared with others joining BAE Systems without industry experience, they can handle more complex tasks. What's more, they have the chance to integrate more quickly, and pick up and apply knowledge at a faster rate.

Reports from the business indicate that successful careers lie ahead for all three.

It seems they're the first of a regular flow of top class people to come from this groundbreaking scheme.

WE JOINED THE APPRENTICESHIP SCHEME, CAME OUT WITH AN HONOURS LEVEL DEGREE AND HAVE BEEN WELCOMED BACK INTO THE BUSINESS



Above: (left to right) Jason House, Luke Ferguson and Graham Law



Above: members of 3 Squadron take a look at Typhoon going through the R2 upgrade programme

RAF technicians see behind the scenes

Team

For the first time since forming a Typhoon Squadron in 2006 at RAF Coningsby, 3(Fighter) Squadron technicians recently visited Warton.

It was a chance for the squadron to see the activities that are undertaken on their aircraft, give them an understanding of the constraints the Typhoon maintenance team works within, and to help to build even closer working relationships.

Small groups of personnel from the Typhoon maintenance team in Warton's 5 Hangar known as Typhoon Maintenance Unit (TMU) West are regularly sent to RAF Coningsby to do just the same thing.

Senior Aircraftsman "Spense" Spenser said of the visit: "I thought it was very useful as it allowed me to get a good overview

3 (F) Squadron enjoys 'valuable' visit to Warton

of the Typhoon project as a whole. From production to modification, we were shown many aspects of the BAE Systems Warton Typhoon facilities including manpower and management.

"As an air maintenance mechanic on Typhoon on 3(F) Squadron, I thought the visit was very valuable as it gave me a better understanding of the aircraft I work on."

The squadron's visit also included a tour of the Typhoon Final Assembly Facility where they witnessed the Tranche 2 aircraft at various stages of assembly.

Anthony Eccles, TMU West Operations Manager, said: "These visits remind the team here at Warton of

the impact they have on front-line operations.

"Having a connection with the pilots and ground crew who operate and support the jets when we've delivered them to RAF Coningsby can only help improve the quality of service we deliver."

Personnel 3(F) Squadron operate the aircraft on a daily basis, including support to the Quick Reaction Alert activities at RAF Coningsby.

Wing Commander Jez Milne, Officer Commanding 3(F) Sqn, said: "The traditional customer-supplier relationship between the RAF and BAE Systems is often undermined by rumours and exaggerated anecdotes.

"Visits such as this promote real mutual understanding and meaningful communication that is genuinely helpful in achieving our shared goals."

Chairman's Awards going from strength to strength

The BAE Systems Chairman's Awards are going from strength to strength and this year Military Air Solutions has submitted a record number of nominations. The awards, which now include an assessment of corporate responsibility, give everyone a chance to be recognised, and help capture the very best ideas in the business. In this issue of *Frontline* we take a look at three Bronze-winning nominations – one from each of the categories of Innovation, Transferring Best Practice and Enhancing Customer Performance.

Life in the fast lane

Enhancing Customer Performance

When the F-35 Lightning II programme came to Samlesbury, it was clear it was going to have a massive impact on the site and on the surrounding roadways. The programme put in place to plan for and deal with that impact is a real success story.

In 2005, a masterplan was drawn up to take Samlesbury into the future. It was clear the F-35 programme would have an effect on both the manufacturing and office facilities looking towards 2017-2020. The end result needed to be something special.

The plan included new office and reception buildings, a new site entrance, and significant road changes.

Before submitting the plans in 2007, computer simulation was used for traffic analysis and when, in April 2008, outline approval was given, it was subject to a number of conditions, including consideration being given to "green travel".

This meant ensuring fewer single occupant vehicles by providing car sharing schemes and a bus service and providing facilities for cyclists. The investment the

Company made in the new road system was match-funded by the North West Development Agency.

Nigel Aspin, nominator of this Bronze award winner, explained how consultants were brought in for the project. "One looked at archaeological and ecological issues as well as the overall site infrastructure plan which supported the manufacturing and office facilities. "Two of the many challenges we faced involved the relocation of the great crested newt and appropriate recording of significant archaeological finds."

Nigel said: "In creating and building the new site facilities we've really supported our green agenda.

"We've considered environmental issues, equipped ourselves with renewable energy, and sustainable technology, and we've solved an important traffic impact issue. I think all the teams involved should have a real sense of pride in what they've delivered."

The facilities were opened in March 2009. Visit Samlesbury, or just drive past, and you can see the impressive end result.

WE'VE REALLY SUPPORTED OUR GREEN AGENDA

Nigel Aspin



Above: the new face of Samlesbury – the reception building

Doing the maths

Innovation

Maths is like Marmite – you either love it or you hate it. Just as well then that two Bronze award-winning F-35 Lightning II teams working at Samlesbury love it – it's what their everyday job is all about.

Prognostic Health Management (PHM) is used to test aircraft life and how it degrades over time.

Within MAS two teams drive this facility: the Structures PHM (SPHM) engineers and the Off-Board PHM (OBPHM) engineers.

Now, by working together, they have devised and developed a smarter, leaner way of working producing savings in both man-hours and money.

To monitor airframe

NOW WE CAN DO IN THREE MONTHS WHAT USED TO TAKE A YEAR

Michelle Wolfenden

health, a series of mathematical calculations, or "algorithms", are created by the Structures team. This can involve up to 2,000 lines of 'code' per element of the job.

The Off-Board team then work these calculations into multiple lines of code before putting them into the Autonomic Logistics Information System – popularly known as ALIS. This is the system that monitors F-35 airframe health.

Doing all this was time-consuming and expensive. But now, by creating their

own "in-house" software product and importing tested algorithms, they have successfully reduced costs by 75 per cent, development time by 60 per cent, and sustainment costs by 45 per cent.

Fort Worth-based Michelle Wolfenden, part of the Off-Board team, nominated the idea for a Bronze award.

She said: "When the teams formed this idea, it was considered too simple to be a solution to what was a complex problem. But they made it work. Now we can do in three months what used to take a year."

With the success of the new innovation, the teams have also considered its transferability across and how it can be used in the future.



Above: the Chadderton team that made it all happen – from left, Sue Dawson, Hazel McGregor, Jayne Fisher, and Steve Kilroy. The fifth member of the team was Louise Laughton

'One Oldham'

Transferring Best Practice

The inaugural One Oldham Business Awards were a glittering success in April with the help of a small team from our Chadderton site.

The awards were the brainchild of the *Oldham Evening Chronicle's* Martyn Torr. He saw the need to recognise the skills and innovation of Oldham businesses but needed support to launch the project.

Enter Steve Kilroy, MAS's Chadderton Site Manager, and Louise Laughton, Chairman's Awards Campaign Manager. Both felt their experience gained from working for BAE Systems and involvement in the Chairman's Awards scheme could help the project.

At a meeting with the *Chronicle*, they looked at what they could offer using the Chairman's Awards process as a benchmark.

With a small team from Chadderton, Steve and Louise provided a wealth of expertise. And, on the back of this, the One Oldham Steering Group was formed.

With management help from the BAE Systems team, the steering group, working alongside the Oldham business community, was able to start planning the event. About 10,000 businesses were approached and sponsorship for this first event totalled £35,000.

After months of planning and hundreds of hours of personal time put in by the team, the awards evening took place at the Queen Elizabeth Hall in Oldham.

Five hundred key stakeholders attended, including North West business leaders, councillors, MPs and the Asian business community. The event was a huge success.

"This was an amazing opportunity for us to give something back to the local community," said Steve. "It's important that we encourage and support other local businesses to succeed and, as individuals we certainly found the experience rewarding."

He added: "We couldn't have done it without the team."

THIS WAS AN OPPORTUNITY FOR US TO GIVE SOMETHING BACK TO THE LOCAL COMMUNITY

Steve Kilroy, Chadderton Site Manager