HATS in the

***Nigel Pittaway** tells the story of Australia's new military helicopter training system and the start of its first courses*

The Royal Australian Navy and Australian Army commenced flying operations with the EC135 helicopter in September 2016. *Able Seaman Sarah Ebsworth/Royal Australian Navy*

An EC135 helicopter painted with the 723 Squadron Taipans logo and Army and Navy, at the top of, and on opposite sides of the helicopter's fenestron. *Cpl Mark Doran/Australian Army*

The first series of rotary-wing pilots and aircrewman courses under Australia's new Helicopter Aircrew Training System (HATS) began in January and will deliver the first ab-initio candidates to operational Army and Navy squadrons for type conversion in the middle of the year.

More formally known as Joint Project 9000 Phase 7, the HATS training construct is, as the title suggests, a joint Australian Army Aviation Corps and Royal Australian Navy Fleet Air Arm initiative to provide state-of-the-art training for pilots, aircrewmen, aviation warfare officers (AvWOs) and sensor operators.

Although a joint training programme, HATS is conducted at HMAS Albatross, Nowra using Navy-registered Airbus Helicopters EC135 T2+ (H135) helicopters and a range of high fidelity synthetic training aids. An industry team led by Boeing Defence Australia is responsible for the delivery of the training system and instructors are a mix of military rotary-wing qualified flying instructors and subject matter experts and their civilian counterparts.

Although the programme was running seven months behind schedule during the development phase just a year ago, the first student courses began at Nowra on time and on budget, thanks to a great deal of effort by the defence-industry team to work through a range of problems.

HATS described

The new training system replaces traditional courses run separately by the two services (the Royal Australian Air Force has no rotary-wing aircraft) on elderly helicopter types which were no longer relevant in the preparation of students for the multi-engine, glass-cockpit world of modern military aircraft.

As such, JP9000/7 is being delivered slightly ahead of the Australian Defence Force's new fixed-wing pilot training system (PTS), which will replace the existing Pilatus PC-9/A aircraft with a new training system based on the Pilatus PC-21.

Prior to HATS getting underway, Navy rotary-wing training had been conducted by 723 Squadron at Nowra on the Aerospatiale AS350BA Squirrel, and Army students learned their trade at the Army Aviation Training Centre at Oakey in Queensland on the

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veteran CAC-built Bell 206B-1 Kiowa.

The Kiowa was introduced into service as a battlefield reconnaissance helicopter in the late 1970s and, despite some examples being modified in later years with an upgraded cockpit, which in some respects replicated a glass cockpit, was no longer considered effective to train crews heading to the MRH90 Taipan or Tiger Armed Reconnaissance Helicopter. In later years the training was conducted by Boeing Defence Australia at Oakey under the Army Aviation Training and Training Support contract.

The requirement of JP9000/7 was for a modern, twin-engine helicopter with a glass cockpit. It had to be night-vision goggle compatible and equipped with a rescue hoist to allow search and rescue training and actual SAR operations to be undertaken.

Training was to make the maximum use of synthetic training aids and both Army and Navy students would require some initial deck training aboard ship. Originally the plan had been to form the Joint Helicopter School within 723 Squadron at Nowra, but in the end, it was decided that a formal squadron construct would be a better option.

"723 Squadron was previously the Navy's ab-initio training squadron and we took a decision to run a squadron construct, rather than as a Joint Helicopter School, from the point of view of military ethos," explains Stuart Harwood, JP9000 project director for the Defence Capability Acquisition and Sustainment Group.

The competition

Five industry teams were formed to respond to the initial HATS request for information, comprising Boeing Defence Australia with Thales Australia and Airbus Helicopters; BAE Systems Australia, CAE and AgustaWestland (now Leonardo) with a bid based on the A109E Power; Elbit and Qantas Defence Services with an undisclosed helicopter; Raytheon Australia and Bell Helicopter (now Bell) with a bid based on the Bell 429 Global Ranger; and Australian Aerospace (now Airbus Australia Pacific Limited) with a stand-alone bid also based on the EC135. Lockheed Martin and Bristow had also announced their intention to run as an industry team, again with an undisclosed helicopter type, but did not place a bid.

An aircrewman uses the flight marshalling synthetic training equipment of the Helicopter Advanced Training System at HMAS Nowra. *Cpl Mark Doran/Australian Army*

A shortlist of three teams was announced in May 2013, with the Boeing and Raytheon led teams and Australian Aerospace proceeding to the next round of the competition. Incidentally, the project was initially referred to as AIR 9000/7 but changed to reflect its joint Army-Navy nature in 2014.

Boeing Defence Australia was ultimately announced the winner of the project in October 2014 and a month later it signed a four-year acquisition and a seven-year support contract which, if all options are exercised, means that the company could conceivably be responsible for the delivery of all Australian military rotary-wing training for the next quarter of a century.

"HATS has always been an important programme for Boeing and we're really looking forward to helping the customer with the next generation of Army and Navy aircrew training. It's part of our history, we've been supporting rotary-wing capability in Australia for over 20 years now," says Boeing Defence Australia's HATS director, Darryn Fletcher.

Since the end of 2014 the industry team has been engaged with the Commonwealth of Australia for the delivery of the HATS capability which, besides the fifteen EC135 helicopters themselves, includes full motion flight simulators supplied by Thales, part task trainers, desk top trainers, a helicopter marshalling virtual reality trainer and a range of other synthetic training devices and courseware.

"HATS has been an interesting journey for us and it's fair to say that there has been a fair few challenges along the way, it's quite a complex programme in terms of what the customer has asked us to do," Fletcher adds. "But at the end of December last year [2017] the programme achieved the initial materiel release milestone and what that in effect does, is allow us to begin the trial course this year."

The EC135

Fifteen EC135s have been acquired to support the HATS training continuum which, in its mature state, aims to graduate up to 130 students each year. All helicopters have now been delivered to Nowra, but not all 15 will be required on the line every day, even when the mature state is reached.

"The way we modelled the programme, taking into consideration the training outcomes required and the other things we have to deliver, the SAR capability for example, there were a number of different requirements that drove the customer to decide on 15 helicopters," Fletcher explains.

"Not all 15 will be required on the line to support that, there are maintenance requirements and other things which will be required and the system allows for that."

Boeing selected the T2+ version of the EC135 over the T3 variant because, at the time the decision was taken, the later helicopter was considered too immature. The first of the fifteen helicopters (D-HECG, msn 1179) flew for the first time at Donauwörth, Germany on January 16, 2015 and achieved Airbus Helicopters' factory acceptance qualification the following July.

The helicopter was delivered to Australian Aerospace (by then known as Airbus Group Australia Pacific and today as Airbus Australia Pacific Limited) in Sydney by sea. After its arrival in country, the cab was placed on the Australian civil aircraft register for a time as VH-AQG to support initial testing. The helicopter was then assigned its military serial and side code, N52-001/841, and delivered to Nowra in March 2016.

All fifteen helicopters had achieved factory acceptance at Donauwörth by November 2016 and, like the initial aircraft, all were delivered to Australia by sea, with the final batch arriving in August the following year. By the time the final aircraft arrived at Nowra, the fleet had already notched up over 1200 flying hours in support of the development of the HATS course.

Multi-role aviation training vessel

Australia is developing an amphibious warfare capability, based upon the two 27,000-tonne Canberra class Landing Helicopter Dock (LHD) ships that have recently entered service with the RAN.

The two LHDs will routinely embark all of Army's frontline helicopters, including the Taipan and Tiger and the CH-47F Chinook heavy lift helicopter, so deck training is one of the requirements of HATS, for Navy crews and their Army counterparts.

To support this training, a 3,000-tonne multi-role aviation training vessel, the M.V. Sycamore has been acquired from Damen's shipyard in Vietnam. Launched in August 2016, the 94m (308ft) vessel is operated by a civilian crew and will provide over 300 sea days per year in support of a range of training activities in addition to aviation, including sea familiarisation for recruits and officers, mine warfare training and diving support, practice

EC135 N52-001/841 during trials at HMAS Albatross. *Able Seaman Sarah Ebsworth/Royal Australian Navy*

torpedo/weapon recovery and consort duties.

The Sycamore is named after the Bristol Sycamore, the Fleet Air Arm's first helicopter, and the first of class flight trials with the EC135 were conducted off the east coast of Australia, in a range of weather conditions by day and by night, beginning in September 2017. Most ADF helicopters will ultimately be cleared to operate from the vessel and it has a hangar and the aircraft ship integrated secure and traverse system recovery system.

"The HATS course will provide training aboard Sycamore. The delivery of the ship itself and the crew is the Navy's responsibility and the way it's worked out is that Sycamore will be made available to meet HATS course requirements as one of its priorities," explains CASG's Stuart Harwood. "We plan ahead and say that we will need the vessel for a given pilot's course at a given time and the ship will appear off the coast here (at Nowra). HATS will do their flying training to it and the ship can then be re-tasked outside that time for other Navy or Australian Defence Force needs."

EC135 helicopters await their first trainees at the Joint Helicopter School at HMAS Albatross. *Cpl Mark Doran/ Australian Army*

Initial training course begins

The course, which began in January, forms part of the validation and verification (V&V) phase of HATS, which will lead to the initial operational capability milestone, currently scheduled to occur in the July-September timeframe.

It is actually two courses, one for pilots and one for aircrewmen with a third, for Navy AvWOs, to begin in February and the three form part of a trial course, which will be used to iron out any bugs found along the way. The pilots and aircrewmen courses have a total of 37 ab-initio students on them, split almost evenly between Army and Navy personnel, but future courses will most likely have a great proportion of Army students, due to the larger requirements of that service. Reflecting the specialised nature of the aviation warfare officer profession, just four students will be on the initial course.

"The initial courses are all six months long and the intention is to run them that way to ensure that we are testing the mission systems' capabilities to support that rate of effort," Stuart Harwood says. "We're entering a twelve-month period of verification and validation of both the courseware and the system itself. We've taken live students out of the training pipeline, they are graduates from their basic (fixed-wing) training courses and we are running them through HATS as if it was a mature course."

The initial course is also being overseen by an independent training development company to provide assurance that HATS is mature and it will be the delivery of their report, after the conclusion of the three courses, that will be the trigger point for IOC.

"The intention is to complete the course, the V&V agent will provide the report and we'll correct any priority findings out of that, at which stage Navy will accept the training packages and then we'll start the next course," Stuart Harwood adds. "We're looking to start that mature training throughput around September or October this year."

Final operational capability is dependent upon the proven ability to conduct two of each course concurrently, to test the capacity of the system and to verify that it can be achieved. If all goes to plan, HATS will achieve this milestone sometime in mid 2019. **AI**