

SAR S-92

The MCA's new Workhorse

Since the early 1960s, the S-61 has been plucking people in peril from mountain tops, cliffs and treacherous seas, saving thousands of lives across the globe every year. Today, Sikorsky is trying to build on this aircraft's impressive record with the SAR version of its new S-92 helicopter.

At the moment, just a handful of these modern, large twin-engined helicopters serve in the SAR role. For the past year, four S-92s have been plying their trade for the UK's Maritime and Coastguard Agency (MCA) operating from two bases on Britain's northernmost tip – at Sumburgh in the Shetland Islands and Stornoway in the Outer Hebrides. From here, the helicopters have been providing a vital rescue service – both on- and offshore.

Rescue genesis

For years, this service was provided by Bristow Helicopters using S-61s, but it was hoped that whatever aircraft was selected by the UK Ministry of Defence to replace the RAF's Wessex and Puma support helicopters would also replace the service's SAR Sea Kings and the civilian S-61 aircraft. However, this idea was dropped when the government unveiled plans for a harmonised military/civilian search and rescue helicopter service (SAR-H).

The Bristow contract to provide helicopter SAR services to the MCA ended in 2007, leaving a shortfall in capability until 2012, when SAR-H would begin, so an interim five-year contract to provide cover was drawn up. In December 2005, this was awarded to CHC, which had offered a mix of S-92s and AgustaWestland AW139s.

Ian McLuskie, SAR business unit leader with CHC said: 'The coastguard were looking for an innovative and capable solution for the interim contract. When assessing the long-range mission we looked at all the new types available, the EH101 [now AW101], the EC225 and even the Mi-17, but the S-92 best met our requirements for the demanding task in the outer islands.'

CHC has been operating the S-92A in the offshore oil and gas industry support role since 2005, flying from Aberdeen and bases in Norway, Denmark and Australia, and building up



A welcoming sight for any survivor, the S-92 has performed well in its first year of service, carrying out more than 270 rescues.

When it comes to search and rescue, Sikorsky's S-61 Sea King has a formidable reputation, but the company's S-92 is already establishing itself as a worthy successor with one operator.

a great deal of experience on the type.

Sikorsky unveiled the first SAR CHC aircraft at Heli-Expo on 1 March 2007, and operations began in mid-October of that year. All four aircraft were online and ready for missions by 1 December as the MCA contract required.

New technology

'The equipment on board inspires confidence,'

explained McLuskie. 'This is an aircraft built to the latest JAR 29 specifications and the systems are at the cutting edge. The engine performance of the aircraft means it can hold hovers even in severe downdrafts coming off cliffs, and single-engined performance is far superior to that of the S-61.'

The aircraft's all-weather performance allows it to launch in conditions that would have

grounded its predecessor. One of the keys to this is its Rotor Ice Protection System (RIPS). Icing would have forced the S-61 to take a longer route, perhaps along the coast, rather than a straight line through dangerous conditions.

'The MCA has seen a 20% increase in rescue missions at its bases, which is attributed to the increase in speed and capability that the S-92 offers,' McLuskie said. The S-92 can cruise at 151 kts, with a radius of action of around 200 nm, which means helicopters based in the Shetlands can fly as far as Bergen in Norway or the Faroe Islands and still return to base. Auxiliary tanks fitted in the cabin can almost double the range, although these are bulky and take several hours to install.

The Goodrich winch system is mounted over the starboard front entry door, and is ideally situated according to McLuskie, allowing both winchman and pilot to share a similar field of view. The high cabin means that he or she can stand up during winching operations, and provides space for a fully equipped Rearcrew

Mission Station. The aircraft's Automatic Flight Control System also has a range of SAR-specific search patterns integrated in the autopilot, reducing pilot workload and improving flight crew situational awareness.

The SAR S-92 is fitted with a Honeywell Primus 701 full-colour weather/search radar, and has a Chelton 935-11 direction finder. An onboard maritime automated identification system (the Saab SAR AIS transponder) is also fitted to the aircraft. The system has to be fitted to vessels displacing 300 tons or more, and allows the helicopter to quickly locate a ship in distress so the crew can fly directly to it. In busy waters, it enables the crews to identify the correct ship while a SkyTrac satellite communications and tracking system allows the aircraft to communicate over long distances or beyond line of sight. Crews regularly use the system to call hikers or climbers in distress on their mobile phones directly, allowing the airmen to assess the situation before they arrive. These capabilities are augmented by a Spectrolab SX-16

Nightsun, slaved to an FSI MX-15 FLIR, while the aircraft also has a Skyshout loudhailer system.

One of the least expensive, but most effective, items of equipment on board is a Toshiba Toughbook laptop. Software on this computer contains detailed Ordnance Survey and topographical maps, combined with terrain information allowing them to be viewed in 3D. 'It's Google Earth in the aircraft,' says McLuskie, 'but it allows the crews to plan their routes in and out, particularly during onshore rescues.'

Pilot's view

Captain Richard Dane flies the S-92 from the Stornoway base. A former Royal Navy pilot with 25 rotary- and fixed-wing types under his belt, including the V-22 Osprey tilt-rotor, he told **ROTORHUB**: 'Having flown SAR missions in the Sea King with the Royal Navy, this aircraft will outperform that one in every respect.'

'The aggregated avionics improve situational awareness, allowing you to focus more on the mission. Pilots can feel positive about entering and exiting a SAR mission situation, because they know what is going on around them.'

'I think the S-92 has already proved itself – the statistics from the first year will show that we have already been able to complete more rescues than in previous years because the response times and aircraft performance mean that we can be tasked to more missions each day.'

'The emergency services now have the option to send us on missions to the Glencoe area, something which the S-61 rarely did, and that's because of the S-92's performance.'

Just three months after the commencement of S-92 operations, the crew of a Stornoway-based S-92 was recognised for their bravery when they rescued the 14-strong crew of a Spanish fishing boat after it ran aground under cliffs at St Kilda in high winds gusting up to 70 kts.

By August 2008, the four aircraft had completed more than 200 missions, and statistics released by the MCA at the beginning of 2009 showed that the two S-92s at Sumburgh attended 104 rescues, while the Stornoway pair had attended 172.

It is clear that CHC is happy with its choice of platform. 'The MCA wanted a modern and innovative approach with the interim contract, and I think they got that with this aircraft,' explained McLuskie. The Coastguard helicopters have always been seen as integral parts of the communities in which they are based. Over 20 years, the islanders on both the Shetlands and in the Hebrides took the S-61s to their hearts, and CHC hopes local residents will soon feel the same way about the S-92s. **Tony Osborne**



The Stornoway-based 'Romeo Bravo' practices winching operations from a fishing boat. Winching operations are facilitated by the pilot and winchman sharing a similar field of view.