

J5F SKI JUMP TRIAL

In February this year, the Pentagon's JSF Program Office announced that three-month-long ski jump trials had begun at US Naval Air Station Patuxent River in Maryland, kicking off the live flying element of the effort to bring the F-35 to the deck of HMS Queen Elizabeth

in 2018. The trials are necessary because British and Italian aircraft carriers all have the famous ski jumps, which were originally installed in the 1970s and 1980s to improve the take-off performance of the old Harrier Jump Jets. By adding the 12° ski jumps, the Harriers could take off

with more bombs and did not have to use as much thrust and fuel to get airborne.

British and Italian Harrier operations were transformed by the ski jumps and both countries want their F-35s to continue to benefit from using them. The Royal Air Force sees the ski jump

as complementing its shipborne rolling vertical landing (SRVL) concept to enhance the performance of F-35s in a wide range of operating scenarios.

To date, F-35 deck trials have taken place on US Navy flat-tops, which lack ski jumps. Until now, the US Navy and Marine Corps





have opted not to go for ski jumps, claiming they reduce deck space for aircraft parking and flight operations flexibility, although critics have claimed that the US Navy 'cats and traps' lobby has wanted to stop anything that might threaten the case for nuclear aircraft carriers, fitted with



catapult-launched fast jets.

The Pax River ski jump was installed more than five years ago under a contract with Williams Fairey Engineering Limited of Stockport in Cheshire. Prefabricated metal sections were built in the UK and then shipped across the Atlantic to be ready by 2012 for the first trials, but the decision by the UK government to switch to the catapult launched F-35C meant it was mothballed. When the UK switched back to the lift fan-powered F-35B jump jet variant, the ski jump suddenly found it was needed again and work had begin to bring it back into use.

INTEGRATED TEST FORCE

The F-35 Lightning II Pax River Integrated Test Force (ITF) partnered with ATR's Geomatics and Metrology team to perform a high-fidelity survey of the ski jump to make sure it was ready for use.

"Launching off our Pax ski jump paves the way to F-35Bs launching off our international partnerships that feature ski jumps," said Bob Nantz, the Pax River F-35 ITF external environment and performance lead. "The significance of the Pax ski jump shape is connected to aircraft loads and performance modeling. Ideally, the loads will never limit the launch weight or speed, thus allowing the maximum performance benefit."

In the run-up to the tests starting, experts from ATR Geomatics and Metrology employed electronic differential

leveling and total station measurement techniques during surveys in 2014 to check for drift in construction and determine precise deviations in both vertical and horizontal components of the ramp.

"We captured hundreds of elevation readings, determining the relative vertical difference between points," said Fred Hancock from ATR Geomatics and Metrology. "We also obtained precise angular distance measurements to determine if the ramp edges were parallel to the center line. This helped us to know whether the ramp was at all skewed."

Hancock said that the team achieved readings accurate to within one millimeter.

"The razor-sharp accuracy of the Geomatics team's survey is a key part of the process leading to future ski-jump operations at sea," Nantz said.

Sylvia Pierson, spokeswoman for the Pentagon's F-35 program office, said two British pilots, one from BAE Systems and the other from the British Royal Navy, would use the first F-35B jet to complete the testing through into late May 2015.

BAE Systems' lead test pilot for F-35, Pete 'Wizzer' Wilson, who will take part in the trials, said, "The team at Patuxent River have got more than 2,000 hours of flying under their belts for the F-35B variant and the handling and performance of the aircraft has shone throughout." ■

MOD SUFFERS AVIATION ENGINEERING RECRUITMENT CRISIS

A shortage of aviation engineers across the UK armed forces could impact on airworthiness inspections and certification, according to the head of the UK Military Aviation Authority, Air Marshal Dick Garwood.

In his annual report for 2014, Garwood raised concerns about shortages of suitably qualified and experienced air engineers across the Royal Air Force and the British Army's Royal Electrical and Mechanical Engineers. He reported that in key areas of both services' air engineering career groups, between 40% and 50% of personnel have less than two years of engineering on their type. Outflows of experienced aircrew, particularly instructors, is also becoming a more frequently voiced concern, he said.

Garwood highlighted a shortage of qualified engineers in the UK procurement organization, Defence Equipment and Support (DE&S), as a particular cause for concern. "MAA assurance activity sees this manifest itself most typically as routine airworthiness tasks not being addressed, which ultimately transfers risk onto operational duty holders [in frontline commands and units]."

He said a strategic challenge program has been set up to address the issue to target recruitment retention efforts. While the recent re-organization of DE&S by increasing its human resources freedoms to bring in more outside management expertise may improve the situation, Garwood expressed worries that "unintended consequences that may flow from the DE&S moving to a pay and grading structure that is different from the rest of the MOD's mainstream science and engineering community; in particular where this affects the ability of the MAA, and other MOD regulators, to recruit civilian staff with experience of procurement and support to ensure that regulation is delivered effectively."