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Above: This view of P-3N 6603, taxiing to its parking bay at Andøya, shows the location of its Radiak sampling pod. (All photos via Author)

Under Arctic conditions in Europe: Norwegicin Orlong

ITH the delivery of five Lockheed P-3B Orions to 333 Squadron, Royal Norwegian Air Force (RNoAF), between January and March 1969, the squadron became the first P-3 operator in Europe. After a training period in the United States, Norway's first Orion arrived at Oslo/Fornebu Airport on April 10, 1969, and the Saints of 333 Squadron, based at Andøya Flystasjon (air base) in the north of Norway, are now the proud operators of four P-3C-III and two P-3N Orions. The Orions are tasked with antisubmarine warfare (ASW), and maritime patrol (P-3Cs), and aircrew training, search and rescue (SAR) and European Economic Zone patrol (P-3Ns). Considering Norway's large coastline, this places a high

Norway was the first European nation to operate Lockheed Martin P-3 Orions. Marco P J Borst reports on the roles of the Norwegian Orion fleet which is about to be updated in order to retain its anti-submarine warfare capabilities.

responsibility on the relatively small P-3 fleet. This is a particularly demanding task during the winter, when Andøya has little daylight, numerous snowstorms, strong crosswinds and a runway covered with snow and ice. In spite of this, hardly any P-3 missions are cancelled due to the weather.



Above: RNoAF P-3C-III Orion 3299 seen against a typical Norwegian winter landscape.

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Missions out of Andøya are similar to P-3 operations elsewhere in the world. What makes them so special during the winter is that, as mentioned previously, Andøya's runway is covered with snow and ice most of the time. Together with strong crosswinds of up to 50kts, this makes every take-off and landing an adventure to anyone not used to this environment. Norwegian P-3 crews, however, are used to such conditions and use their crosswind reference handbook, based on the experiences of P-3 pilots since the introduction of the aircraft. That said, a crew departing from Andøya under such adverse weather conditions is never sure if they will land at their home base after the mission is completed. If conditions worsen they will divert to an air base in the southern part of Norway.

No 333 Squadron's Orions still operate regularly over the international waters north of the Kola Peninsula. This is also the training area for the Russian Navy and Naval Air Force. It is not unusual, therefore, for the P-3s to make visual contact with Russian ships and aircraft. The present relationship between Russian and Norwegian units can be described as more relaxed than at the height of the 'Cold War' although even then they were hardly ever tense, with the exception of one dramatic incident — in September 1987 a Norwegian P- 3B collided with a Soviet Su-27 *Flanker* after 'some irresponsible manoeuvres by the *Flanker* pilot'. Fortunately the P-3 was able to make a safe landing and nobody was hurt. As for the Russian Navy; this typically mounts two major exercises a year with a number of surface units out in open waters, whilst submarines operate in this locality throughout the year. Russian High Command has stated that the submarine force will be given priority. After some initial setbacks following the demise of the Soviet Union this is confirmed by the number of submarine contacts made by the P-3s.

Maintenance

No 333 Squadron is a small self-contained unit. Almost everything that is needed to operate the Orions is available at the base. Most of the regular maintenance work is carried out in the two hangars at the base, which can accommodate five of the six Orions, by the Planning and Control Squadron which includes approximately 60 technicians (both military and civil). They have recently changed the maintenance cycle for the Orions - the RNoAF adapted the Isochronical Scheduled Inspection System (ISIS - utilised by the US Coast Guard) into their local ISIS-N, ('N' for Norway). This means that each aircraft goes through an inspection every 35 days, and every 70 days the Orions go through a corrosion inspection. During the winter, the Orions are washed inside the hangar because the local 'bird wash installation' is out of service for four or five months a year. One of the few effects winter operations have on the P-3s is that the aircraft sometimes get 'sand blasted' during landing! Sand spread on the runway in icing conditions may be blown against the fuselage when reverse pitch is selected during landing. This minor damage to the paintwork can lead to corrosion and so extra care is required to make sure it is regularly treated. Heavy maintenance (Scheduled Depot Level Maintenance - SDLM) of the RNoAF Orions is sub-contracted to Braathens SAFE at Stavanger airport. A couple of years ago this airline company outbid Scandinavian Airline Systems who had previously carried out SDLM



Above: Close-up of the Radiak pod mounted on the inner starboard underwing hardpoint of P-3N 6603. The pod and its associated system was designed and manufactured by 333 Squadron engineering personnel and is currently in the development stage. When fully developed it will be offered on the market to customers such as NATO.



Above: In spite of frequent snowstorms during the winter months, very few sorties are cancelled due to the weather. P-3C-III 3299 Ulabrand is seen starting its engines during a snowstorm.

for the old P-3B Orions.

Starting in January 1998, all four P-3C-IIIs will go through the Update Improvement Program (UIP), performed as a Foreign Military Sales programme with the US Navy. The prime contractor is Lockheed Martin Tactical Defense Systems (LMTDS) in Eagan, Minnesota, while the modifications will be done at the Lockheed Martin Aircraft Center (LMAC) at Greenville, South Carolina. The UIP will be based on the USN's ASuW Improvement Program (AIP). However, Norwegian requirements dictate additional changes and add-ons.

The UIP was initially limited in scope to include replacements for the CP901 computer and the AN/APS-115 radar and the P-3C-IIIs will receive the AN/ASQ222 Data Processing System with the CP-2339 processor and the AN/APS-137(V)5 radar produced by Texas Instruments. The radar is capable of operation as both Inverse Synthetic Aperture Radar (ISAR) with imaging of contacts and Synthetic Aperture Radar (SAR) with surface mapping capabilities. The computer update includes the replacement of the AN/ASH-33 digital magnetic tape system with a state-of-the-art data storage system. A separate electronic support measures (ESM) work station will be established with a new spinning DF-antenna and a suite of signal processors, with a radar warning receiver, produced by Condor Systems, San Jose.

Communication

Communication will be improved with an Overthe-horizon Airborne Sensor Information System (OASIS III) and satellite communication (SATCOM). OASIS III is a third generation over-the-horizon targeting (OTHT) system that was first used by the USN with success during the Gulf War. The first two versions of OASIS had a separate work station but OASIS III is integrated into the current P-3 work stations.

Other updates incorporated in the UIP are the installation of new universal display and control stations (excluding the acoustic stations) with colour displays, programmable entry panels, trackballs and alpha-numeric keyboards, a new focal lens for the AN/AAR-36 infra-red detection system (IRDS) to increase its range, an AN/ARN-151 global positioning system (GPS), a new AN/AIC-41 inter-communications system, an AN/AAR-47 missile approach warning system and an AN/ALE-47 counter measure system (chaff, flares and jammer). The UIP update takes about six months per aircraft and as the modifications to several aircraft will overlap each other, 333 Squadron will only have two P-3C-III aircraft available for a considerable period. After completion of the UIP updates to the fourth 'Charlie', the RNoAF will probably dispose of its two P-3Ns. It is not known yet if funds will become available for replacements.

Until their retirement the P-3N Orions will continue to relieve the P-3C-III fleet by conducting pilot training flights, coastguard missions and flight-testing equipment. As an example of the latter, P-3N 6603 is currently involved in the development of Radiak, a system devised to detect and record radioactive radiation. Radiak consists of an equipment pod, four sensors below the aft fuselage and a separate work station in the rear of the aircraft. Development of Radiak was found necessary after the nuclear disaster in Chernobyl and an accident with a nuclear Russian submarine. Norway is sufficiently close to Russia for its potentially unstable nuclear installations to be of concern.

During a sampling mission the Radiak system's equipment pod, which is carried below the inner side of the starboard wing, collects air samples in a filter — a valve in the pod's nose can be opened via a switch on the radar operator's work station. On completion of the sortie the system is able to print out a map which shows the route flown by the P-3 and is colour coded to show the intensity of the radiation. When Radiak is fully developed, the system will become available in a roll-on/roll-off configuration. All four P-3C-III Orions will eventually be wired for Radiak and the system's heavy sensors will probably be carried in the P-3's weapons bay instead of its present installation below the cabin floor in the aft fuselage.

Anti-submarine warfare remains the primary role for 333 Squadron. Although there was a marked reduction in the Russian submarine fleet activity, in the period following the dismantling of the former Soviet Union, 333 Squadron has recently noticed an increasing number of Russian submarine and surface ship movements. Hence the need for constant vigilance and the UIP to ensure that Norway's Orions will continue to provide a capable counter to the potential maritime threat well into the next century.

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