



The German P-3C program:

Where did things go wrong?

By Marco P.J. Borst

Germany's first Orion taking off from RNLNAS Valkenburg in May 2006.

photo: Jaap Dubbeldam

After 14 years of P-3 operations and just five years after they initiated three major upgrade programs, the German ministry of defense announced in June 2020 that the Orions will be retired in 2025. That is ten years earlier than planned. According to the press release of 17 June 2020, the no longer calculable total costs and the technical difficulties Airbus was facing during the implementation of the modernization programs, are the reasons for this dramatic decision.

When in June 2003 the Dutch government announced that it would discontinue the Maritime Patrol Aircraft Group and put the P-3C Orions up for sale, Germany unexpectedly saw an opportunity to replace its ageing Breguet Br1150 Atlantics. Only five months later, on 31 October 2003, a Letter of Intent for the purchase of ten Dutch Orions was signed, pending Dutch and German

parliamentary approval. Further negotiations between the Dutch, German and Portuguese governments led to a final agreement for the delivery of eight P-3C CUP Orions to Germany, leaving the remaining five Dutch Orions available for the Portuguese air force. The sales contract for these eight aircraft was signed on 15 November 2004.

The German navy's 3rd Naval Air Wing (MFG3) training detachment at RNLNAS Valkenburg in The Netherlands took delivery of the first P-3C CUP Orion on 28 February 2006 and only four months later, on 22 June 2006, the eighth and final P-3C was delivered to Naval Air Station Nordholz.

The sudden availability of a fleet of Orions meant that the German navy was switching fast. Too fast maybe. The German navy hardly had time to prepare for it because the Dutch MoD wanted to get rid of the aircraft

A German P-3C turning on the runway for take off.

Photo:
Martin Herbert



fast. Where the normal selection and preparation procedures for a new MPA would have lasted seven to ten years, the German navy had to do this in just a few months.

All eight aircraft were completely modernized before they were transferred to Germany. A few years earlier the Dutch ministry of defense had signed an FMS contract with the US Navy, who subcontracted Lockheed Martin to upgrade the Orion's mission equipment suite from the P-3C Update II.5 configuration into P-3C CUP. The P-3C CUP was comparable to, but not as complete as, the then latest USN P-3C AIP version. All ingredients were there for a long and successful career for the P-3 Orion in German service: the relatively cheaply acquired aircraft could easily operate until 2025 and even longer after additional modernization programs. However, operating the P-3 became an agony for the German navy with an anticlimax in June 2020, when the early retirement of the Orions was announced.

Poor operational readiness

As the owner of a fleet of eight Ori-

ons, the German navy has never reached a higher operational availability than three or four aircraft. A major cause was the applicable rule in Germany to contract the national aerospace industry for maintenance. Dornier Flugzeugwerke, known today as Airbus Defence and Space in Manching was contracted to do depot level maintenance but they did not have any experience with the P-3 Orion at all. This led to unusual long turnaround times and to a situation in which too many aircraft were in (or waiting for) Scheduled Depot Level Maintenance (SDLM) at the same time. Just five years after the German navy started P-3C operations, they presented dramatic figures on fleet availability during the P-3 International Operators Support Conference in October 2011. Four aircraft were at Airbus in Manching for SDLM, one was heavily cannibalized and down since 2006 and they had constantly one aircraft undergoing Isochronal Scheduled Inspection System (ISIS). Only two aircraft were available for operational duties: one at their home base and one deployed. Airbus and the German navy named

unexpected corrosion findings and long leadtime for structure components as reasons for the extremely long maintenance turnaround times. Also several upgrade programs, which were initiated all the time, were named as an important cause for the long down times.

In October 2013, maintenance provider Cassidian (now Airbus Defence and Space) presented their view on their experience with P-3C maintenance under the telling and not very trusting title “The seven-year itch...” At that moment Cassidian had performed five SDLM's and eight ISIS inspections since 2006. During the SDLM downtime, modifications like Airborne Collision Avoidance System (ACAS), Cockpit Voice Recorder (CVR), replacement of the obsolete HF (which wasn't touched during the CUP modernization), Tactical Common Datalink

(TCDL – limited to three aircraft), Kapton wiring replacement and Engine Instrument Display System (EIDS – one prototype installation, then stopped) were carried out. As a result of corrosion findings Cassidian had replaced wing rear spar upper and lower cords on all five aircraft that came through SDLM as well as replaced pressure bulkhead ring frames on three aircraft and repaired these on two.

Budget overruns

A couple of years before, in 2010, the German federal audit office (Bundesrechnungshof) looked into the costs of the P-3 Orion program. Instead of the planned € 388 million for the purchase and adjustments, it turned out that over € 500 million was spent on the Orions. On top of that it was expected that another € 300 million was to be spend on maintenance and repairs. Their con-

The German Orions spent a lot of time in maintenance docks, which resulted in poor operational readiness.

*photo:
Eric van Rossum*



clusion was that the navy had not checked the technical condition of the aircraft sufficiently before purchasing them and had taken them over in poor condition. That's a strange conclusion because the German navy had full access to the aircraft and all technical documentation from the early start of the program in August 2003 when the first German navy officers arrived at RNLNAS Valkenburg.

The Federal Audit Office's view that the planes were in poor condition was picked up by the press and took on a life of its own. But the Orions weren't in a poor condition at all. The aircraft were almost 25 years old when they were taken over by Germany and of course used aircraft show their age after years of intensive use and flying tactical profiles. And the last depot level maintenance under Dutch responsibility was most likely limited to only performing strictly necessary work to keep the aircraft in airworthy condition.

With over 20 years of experience with the Orions, the Dutch navy and its maintenance provider OGMA in Portugal had maintained the aircraft with a pragmatic and innovative approach. The lack of experience with P-3 airframes and the new owner's philosophy to work 'strictly by the book' may have caused situations in which earlier repairs were re-evaluated and not fully understood by Airbus and the German navy. And it may have made them decide to replace certain components instead of performing complicated but cost saving repairs. The long leadtime of these expensive structure parts caused delays and higher costs.

To value the statement that the technical condition of the Dutch Orions was poor when they were handed over to Germany, it's also worth to take a look at Portugal's experience with the P-3C CUP. After all, they bought the other five former Dutch aircraft, which had been operated and maintained exactly the same way as the eight aircraft that went to Germany. Important differences: Portugal was already an experienced P-3 operator and they contracted OGMA as their maintenance provider. Since 1982 OGMA has been providing a wide range of maintenance services and upgrades to various P-3 Orion operators. The Portuguese aircraft are reported to be in good technical condition and currently the air force intends to continue to operate them until 2030 without doing additional modernization programs.

Upgrade programs

Despite the not so very positive experiences with budget overruns and too long maintenance turnaround times at Airbus, the German government signed an FMS contract with the US Navy, who contracted Lockheed Martin to modernize the German P-3C CUP Orions. Lockheed Martin subcontracted Airbus Defence and Space for three important and expensive modernization programs in 2015: Instrumental Flight Rules (IFR) upgrades (€ 90 million), mission equipment upgrades (€ 210 million) and a Mid Life Upgrade (MLU), involving the replacement of the wings and horizontal stabilizers (€ 300 million). The first aircraft (serial number 60+02) undergoing the IFR and mission equipment upgrades was planned



The early beginning: the first German Orion at RNLNAS Valkenburg.

*photo:
Marco Borst*

to be completed by the end of 2018. The first aircraft (60+04) going through MLU was delivered back to the navy on 11 February 2021, with a turnaround time of almost 55 months, while the contract with Airbus had fixed turnaround times: 24 months for the prototype installation, 18 months for the second aircraft and 12 months for the remaining aircraft. Installation of the new wings on the first aircraft was completed in 2019, but several problems caused delays with the engine nacelles, horizontal stabilizers and the tail. A strange and alarming result, because carrying out P-3 Midlife Upgrades has been very successful at other companies. Lockheed Martin in Greenville SC (USA) and IMP Aerospace in Halifax (Canada) performed prototype installations in 18-24 months. After that re-winging combined with depot level maintenance was done in an average turnaround time of ten months.

Contracts terminated

As early as 2015, the Federal Audit Office checked for defects in the contracts as well as technical, financial and temporal risks. The German ministry of defense thought that Airbus knew the airframes well enough from previous maintenance jobs and expected no additional costs for condition assessments. But on 17 June 2020 the German Ministry of Defense announced to have terminated the contracts for the three modernization programs with immediate effect. The non-performance of Airbus Defence and Space had caused major operational readiness problems. To make things worse, a refueling incident damaged aircraft 60+01 beyond economical repair in March 2020. Two aircraft undergoing the MLU re-wing program when the decision to prematurely end the modernization programs was taken, will be completed. But no further aircraft will enter the re-wing program. Because of this decision the German P-3C CUP Orions will be early

retired in 2025 instead of 2035. Aircraft 60+02 (undergoing IFR and mission equipment upgrades) was in a status that any try to bring it back into flying condition would have been way too costly if not impossible. It will not be completed and was or will be returned to the navy in a not airworthy condition. Because of the disturbed relation with Airbus Defence and Space and the unusual high costs of € 25 million per aircraft, all further depot level maintenance is cancelled. As a result of this, two aircraft which are due for SDLM have already been withdrawn from use. The absolute low point was reached in January 2021, when at some point none of the eight German Orions was airworthy.

P-3C fleet status January 2021:

60+01 w/o (fuel tank incident)
60+02 Manching (avionics update)
60+03 Manching (MLU)
60+04 Manching (MLU)
60+05 wfu (due for SDLM)
60+06 grounded (contaminated tanks)
60+07 wfu (due for SDLM)
60+08 in 600 hours inspection

Conclusion

The main reasons for the failed German navy P-3C Orion program are the hasty start in 2003, the decision to contract a domestic maintenance provider with no P-3 airframe experience and the decisions to replace corrosion-affected structure parts instead of repairing them. On top of that the contracts for depot level maintenance and modernization programs were based on confidence and contract clauses to keep Airbus to agreed delivery times were not used to force Airbus to perform better.

The future

With the Orions being phased out in 2025 and the German navy taking part in the German-French development of the Maritime Airborne Weapons System (MAWS), the current plans call for an interim solution for a period of only ten years (2025 – 2035). Possible candidates under consideration were the Airbus C295M MPA, the Rheinland Air Service RAS-72 version of the ATR -72 and the Boeing P-8A Poseidon. Next to these the French government, in an attempt to keep Germany aboard in the MAWS project, has offered four modernized Bre-

One of Germany's eight P-3C CUP Orions in a hangar at its homebase NAS Nordholz.

*Photo:
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guet Atlantique 2 aircraft as an interim solution. But that was never considered to be a serious option by Germany.

The German navy is facing three challenges now. The first challenge is to maintain operational readiness of MPA capability until 2025 with only four P-3C Orions instead of eight. And the number of aircraft will further decrease: as soon as an aircraft is due for depot level maintenance it will be parked in the grass. By 2023 the German P-3 fleet will consist of only two aircraft. The second challenge is to select, procure and implement an interim aircraft for a period of ten years, while investing in a new MPA is normally done for a longer period of time. The third challenge is to continue taking part in the MAWS which is to be introduced in 2035.

The latest news is that the German navy prefers the Boeing P-8A Poseidon as their interim solution. That does not really make sense unless you do not allow that the

interim solution has less capabilities than the outgoing Orion. The P-8A is an expensive and complex platform but is the only one that can fulfill all operational requirements. However, spending € 1.5 billion on five Poseidons is not very cost effective, taking into consideration that the change to yet another platform within ten years after introduction of the Poseidon will mean another large investment. The German ministry of defense currently does not have the budget for the procurement of five Poseidons, so purchasing a cheaper type of aircraft would be more obvious. But by playing the Poseidon-card as the only serious option, the German Navy puts some pressure on the parliament. If money can be made available for the P-8A, it will almost certainly mean that it will not be introduced as an interim aircraft. The Poseidon could in that case be Germany's MPA for the next 30 years and that could mean the end of German participation in the MAWS project. The German parliament is expected to take a decision before the Summer break.

The P-3C CUP Orion is leaving the German Navy by 2025.

*Photo:
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