5 Expenditure on night vision technology and training for search and rescue

5.1 The Irish Coast Guard is part of the Department of Transport. Its main role is in the provision of search and rescue, maritime casualty and pollution response services.

5.2 The Coast Guard operates a helicopter search and rescue service (SAR) delivered under contract from bases located in Sligo, Shannon, Dublin and Waterford.

5.3 In 2012, following a public tendering process, a company was awarded a contract to supply and operate the SAR from the bases for a period of ten years (July 2012 to June 2022), with possible extensions for up to three further years. The contract has been extended twice, and is now to run up to 2024.

5.4 The contract with the company provided for five helicopters to provide the SAR (one new helicopter and four in-service helicopters). The helicopters currently in use (in 2021) vary in age from just under seven years to around 15 years from the date of manufacture.

5.5 The cost of the SAR charged to Vote 31 Transport in 2020 was €60.014 million.

5.6 Prior to the commencement of the tender process, a report prepared in March 2010 recommended that the helicopters used to provide the SAR under the new contract should be fitted with a 'night vision imaging system' (NVIS). It was further recommended that night vision goggles and crew training should be provided when funding became available.

5.7 The 2012 contract specified that the Department would make a payment of €4.305 million,[1] or €861,000 per helicopter for future modification of the proposed fleet to accomplish NVIS compatibility.

5.8 The NVIS was delivered in three phases as follows

- modification of all five helicopters for NVIS compatibility
- the purchase of night vision goggles
- the provision of crew training.

5.9 The helicopter modification phase commenced in 2013, and the Department paid €4.305 million to the company in that regard. This included the implementation of night vision modifications to the cockpit avionic systems, rear cabin lighting and external lighting. This phase was completed in 2015. The new helicopter brought into service in 2015 was modified for NVIS prior to arrival for operation.

5.10 Following the completion of a competitive tender process, €527,000 was paid to the company in November 2015 for the purchase of 24 sets of night vision goggles. The goggles are carry-on equipment and calibration checks on the goggles are carried out every year.

1 Expenditure figures presented in this report include VAT at the relevant rate, unless otherwise indicated.

5.11 In 2009, the cost of training was estimated at an initial cost of €37,000 and ongoing running costs of €65,000 per year.

5.12 A proposal for the provision of initial and recurrent NVIS training for helicopter crews was received from the company in September 2017 at a cost of €4.144 million. This was broken down as follows

- pilot training — €3.154 million
- rear crew training — €411,000
- on-going training and maintenance — €579,000.

5.13 Following receipt of the proposal for training costs, a business case was developed in March 2018 to re-validate the rationale for progressing with the training. The business case recognised that the proposed night vision training expenditure was occurring at a late stage in the contract with the company but stated that any extension of the SAR contract would extend the useful life of the NVIS investment. The night vision goggles would remain the property of the Coast Guard and, on expiry of the current contract, the goggles would continue to be available for use by SAR crew. It was also stated that the planned replacement SAR contract would include the requirement that the helicopters be NVIS capable from the outset and the crews suitably trained in their use. The business case also anticipated that the full roll out of training would take a number of years to deliver in order to maintain operational capability.

5.14 In November 2018, an initial payment of €1.714 million was made to the company in respect of the training. Training on use of the NVIS and of the goggles commenced in November 2019, and is still ongoing.

5.15 The considerable elapsed time between the purchase and installation of night vision equipment and the provision of requisite training in the use of the equipment raises a concern that there may have been a loss in value for the money expended, especially in light of the approaching end of the contract term that commenced in 2012. Accordingly, the audit raised a number of queries with the Accounting Officer for the Vote for Transport as follows.

- How has the SAR benefited to date from the investment in the installation of NVIS equipment in the helicopter?
- If the intended benefits have not been delivered yet, when does the Department envisage they will commence?
- What, allowing for normal price increases, is the reason for the significant difference between the cost of night vision training projected in 2009 and the expected cost of the training being delivered now?
- Why did the Department make a significant up-front payment of €1.714 million for training, given the timescale of the delivery of the training programme?
- Could the investment in NVIS equipment for the helicopters confer a competitive advantage on the current service provider in the planned future tender competition for the provision of the SAR?

Accounting Officer's response

Benefits from the investment

5.16 The Accounting Officer set out the benefits which it is expected that night vision equipment can deliver for SAR capability (see Figure 5.1).

5.17 He further stated that training can only take place when the helicopters are correctly equipped. Consequently, the delivery of the whole system has been done using a phased approach. Benefits will be realised when training in the use of the NVIS has been completed and regulatory approval is received.

5.18 Training was due to commence in 2018. However, due to the departure of a training instructor and the need to hire a replacement instructor, training only commenced in November 2019. Training has continued since albeit intermittently due to Covid-19. The Sligo base received Irish Aviation Authority approval to carry out commercial air transport (CAT) regulated flights under NVIS in June 2021. Remaining training is due to be completed by 2022 at which point the benefits will be fully realised.

5.19 The Coast Guard has consistently pressed the company to deliver the training as quickly as possible, to explore all possible options and to engage with the Irish Aviation Authority throughout to determine whether certain elements could be accelerated, all with due regard to safety and to ensuring that the core SAR availability was unaffected.

Timelines for delivering benefits

5.20 The Accounting Officer stated that of necessity, the implementation of the NVIS has been done on a phased basis. Clearly, training can only take place when the helicopters are correctly equipped and goggles are available to use. Regrettably, the timelines have been far longer than original anticipated for reasons which have been set out. Benefits are realised when training in the use of night vision goggles has been completed and regulatory approval is received.

5.21 Benefits began to be realised when the company was approved for NVIS for CAT regulated flights — a first for a civil operator in Ireland. The Sligo base is operational for CAT operations from June 2021 and other bases will follow over the coming months. The remaining training is due to be completed in 2022 at which point benefits will be fully realised.

5.22 He stated that in relation to expected useful life of the NVIS equipment, the aircraft cockpit, cabin and all relevant lighting are compatible with flight using night vision imaging equipment. There is no specific life on the modification of the cockpit/cabin of the helicopters as the helicopters were modified with filters to allow for the use of the goggles. They effectively have no life limit. In relation to the night vision goggles, he stated that these are carry-on equipment and they will last until they no longer work. They have calibration checks every year and parts are replaced as necessary. They may become obsolete at some point in the future if replaced by more modern goggles or spare parts become difficult to source. The company typically carries a good stock of parts.

Figure 5.1 Department's expected benefits of NVIS for SAR

In relation to the anticipated benefits of NVIS, the Department stated that visual reference to the pilots' outside world is essential for safe and effective flight. During daylight hours, the pilot relies heavily on the out-the-windshield view of the airspace and terrain for situational awareness. During night flying, the pilot can improve the out-of-the-windshield view with the use of a NVIS. Overall, NVIS as an additional aid to navigation and search, in suitably equipped aircraft using appropriately trained crews enhances operational effectiveness and safety for both SAR and helicopter emergency medical service (HEMS) operations.

- NVIS have been shown to pick up small lights, such as lights on lifejackets, hand-held torches and distant vehicles at much greater ranges than the naked eye.
- When operating overland, NVIS assist the crew in navigating, seeing and avoiding terrain and obstructions as well as being able to identify survivors earlier than with the naked eye.
- Use of NVIS can increase the crew's overall search capability as NVIS enhances visibility.
- NVIS can provide a back-up to the forward looking infrared system (FLIR) if the FLIR suffers an unserviceability in-flight.
- NVIS can assist in identifying suitable landing sites more easily under SAR flight rules. This will also enable the helicopters to access the offshore islands that are without aviation infrastructure such as Inishbofin for medical evacuations under SAR flight rules.
- During night-time commercial air transport operations (i.e. HEMS incidents), landing is only permitted at company approved surveyed sites. NVIS has the potential to remove this restriction and allow crews to land safely at sites which have not been surveyed. This would extend the practical overland operational capability of the aircraft either for SAR or HEMS operations.

The use of night vision goggles compliments the use of NVIS. Overall, the use of night vision aid technology increases night-time situational awareness for pilots and technical crew. The use of the goggles permits the user to see objects that normally would not be seen by the unaided eye. The goggles use technology to improve different light spectrums and intensify light and thermal imaging technology allowing sight of an image and improving situational awareness in the dark. Use of night vision goggles markedly decreases the possibility of collisions with terrain or man-made obstructions.

Source: Department of Transport

5.23 In relation to the expected life of the helicopters, the Accounting Officer stated that in general, medium range heavy helicopters remain in service for at least 25 years and are replaced by newer generation aircraft depending on role specifics and operating environment.

5.24 In relation to the maximum age of helicopters that it is envisaged will be acceptable for use under the planned new service contract, he stated that the age of an aircraft is not an evaluation criterion in the new contract. Proposed aircraft by a tenderer must meet certain role requirements and meet Irish Aviation Authority certification requirements. Typically, the older an aircraft, the higher the maintenance costs which would allow another bidder to outbid with newer economical aircraft. As an example, a medium heavy lift Sikorsky S61 helicopter in use in the UK was retired from SAR service in 2009 after 35 years' service.

Escalation of training cost

5.25 In relation to the difference between the estimate in 2009 and the actual cost to deliver NVIS training, the Accounting Officer stated that the original estimate was superseded to meet the current European Union Air Safety Agency (EASA) regulatory requirements for training crew on NVIS, whilst maintaining full service delivery during training periods.

Payment for training in advance

5.26 The Accounting Officer stated that the commercial training proposal included stage payments to deliver the training. The first payment was in part required for the company to have funding in place in 2018 to secure the training provider and on the basis that the training programme would commence as set out. No further payment has been or will be made to the company for the training underway until the Department is satisfied that all milestones have been reached, at which point it will seek a full account of the expenditure incurred by the company for this purpose.

5.27 He stated that it was the company's responsibility to ensure its crews are appropriately trained to conduct SAR in line with its contractual obligations and regulatory requirements, and therefore, it is a matter for the company whose staff are being trained to ensure the NVIS training is suitable and in line with regulatory standards. Therefore, the company has responsibility to organise the training and arrange the approvals from the Irish Aviation Authority in order to receive an aircraft operating certificate without which the aircraft cannot fly.

5.28 He stated that the company had the procurement capability and expertise to tender for the provision of NVIS training, compatible with the aircraft and aircraft modifications and to pursue approvals from the Irish Aviation Authority. The Department performing such a procurement would mean it takes ownership of all risks associated with the procurement of the service.

5.29 He stated that the company is the first commercial operation to be approved by Irish Aviation Authority for NVIS operations in Ireland. In order to secure approval, comprehensive revision of the company's operations manuals for CAT and SAR operations is required. All training, simulator, and line training course syllabi as well as operations must be approved by the Irish Aviation Authority before training takes place and once training is completed, application to Irish Aviation Authority for final approval is also required.

Potential for any competitive advantage

5.30 The Accounting Officer stated that re-fitting the helicopters to make them compatible with NVIS operations in the opinion of the Department does not confer a competitive advantage to the company in the future tender competition. It is best practice to use NVIS for the roles intended in coast guard operations and this is a standard fit in the UK and other jurisdictions for State functions such as coast guard, security and surveillance roles.

5.31 In the event that these helicopters are not used in the next contract, the training provided to incumbent staff will more than likely carry over to the new contractor through TUPE (protection of employees on transfer of undertakings) rules as in previous transitions. The goggles are owned by the Coast Guard and will move to the new contractor if this transpires to be the case.

5.32 The Department explained that the contract extension to 2024 is to facilitate the procurement of a new service in accordance with the *Public Spending Code* requirements and to have a seamless transition from one service provider to another.

Conclusions

5.33 In 2013, the Department paid €4.305 million to the company providing SAR in Ireland to ensure the five helicopters used for the service are equipped with NVIS capability. Another €527,000 was paid in 2015 for 24 sets of night vision goggles. An initial payment of €1.714 million was made in 2018 in respect of training that commenced in November 2019 and which the Department expects to be completed by 2022.

5.34 As at June 2021, only one of the four SAR bases had been approved by the Irish Aviation Authority for operating an NVIS-enabled service. The service from that base has commenced but it will be some time before all the bases are operating in the same way.

5.35 The potential benefits of night vision capability for SAR operations are acknowledged. However, significant payments were made from voted funds as long ago as 2013, and the planned capability has not yet been delivered across the service. On that basis, I am not persuaded that good value for money for the taxpayer has been achieved from this expenditure.