

Storm Shadow – A World Beating Capability



THE UK'S STORM SHADOW WEAPON SYSTEM WAS SELECTED IN 1997. HERE KEITH MOREY FROM THE DEFENCE PROCUREMENT AGENCY DISCUSSES ITS HISTORY AND ACCEPTANCE INTO RAF SERVICE IN 2004 AND THE OBJECTIVES FOR ITS FUTURE.

system, providing phenomenal precision, together with the specialised bunker-busting BROACH warhead has no known equivalent in the world today."

The UK originally commissioned feasibility studies to explore the possible requirement for a Long Range Stand-Off Missile in 1982; this work was eventually subsumed in 1986 into the NATO seven-nation Modular Stand-Off Weapon programme. This project proved abortive, and the UK subsequently withdrew from it. With the end of the Cold War, the UK's continued need for a stand-off requirement was reviewed and endorsed as part of the 'Options for Change' exercise. An international competition was launched in 1994 to meet the UK's CASOM

requirement, and seven companies responded.

MBDA UK's Storm Shadow weapon system was finally selected, and a development and production contract was awarded in 1997. The French Air Force are also procuring Scalp EG from MBDA France. This is the same weapon as Storm Shadow, with some national differences, mainly in mission planning area. Both weapons are based on the proven technology used in the French Apache AP anti-runway missile.

Although the two parts of MBDA act as separate Prime Contractors to their respective national Governments, they have taken forward the work as an industry collaborative programme, harmonising national requirements and merging procurement methods.

An integrated French and UK management and engineering team undertook this work. The two similar national Governments' technical requirements were harmonised into a single common technical solution. This common solution is reflected such that sub-contractors receive a single contract, which embraces the joint requirements. This has resulted in a collaborative programme that is transparent to both Governments, whilst attracting few of the procurement overheads often associated with government collaborative ventures. This approach has had the added benefit of driving down development and certification costs, and has ensured that both Governments obtain a greater weapon capability within the budget available. Components of Storm Shadow are manufactured in the UK, France and Italy and are finally assembled at the MBDA UK facility at Stevenage and Defence Munitions Beith.

In parallel with the industrial joint working, both Governments have in place a Memorandum of Understanding to share information and experiences in respect of co-operation in the field of air-to-ground stand-off missiles. This arrangement has been extended to cover the involvement of Italy.

Storm Shadow is equipped with a powerful UK-developed warhead and is designed to attack hardened targets and infrastructure, such as buried and protected command centres. Powered by a turbo-jet engine, with a range in excess of 250 kilometres, it will be carried by the RAF Tornado GR4 and Typhoon aircraft. The missile weighs approximately 1300 kilograms and is just over five metres long. Its maximum diameter is under one metre, and with its wings deployed, under three metres.

To give the weapon its required capability to penetrate and destroy very thick reinforced concrete, the major energetic component of Storm Shadow is the Bomb Royal Ordnance Augmenting Charge (BROACH) Lethal Package (LP). This is a dual charge system, consisting of a



On the 60th anniversary of the formation of 617 Sqn (21 March 2003), the squadron flew an operational mission to Baghdad, loaded with Storm Shadow for the very first time.

Precursor Charge (PC) to provide the penetration and a Follow Through Bomb (FTB) to provide the destructive power. A number of mitigation features incorporated in the design have enabled the system to meet challenging IM requirements, and have resulted in Storm Shadow being declared the first UK IM compliant weapon system in service.

The weapon's mission planning system allows target details to be loaded into the weapon's main computer before the aircraft leaves on its mission. After release from the host aircraft, the missile's wings deploy and the weapon navigates its way to the target at low level, using terrain profile matching and an integrated Global Positioning System. On final approach to the target, the missile discards its nose cone and uses an advanced infrared seeker to match the target area with stored imagery. This process is repeated as the missile dives onto the target, using higher-resolution imagery to provide maximum accuracy.

To meet an Urgent Operational Requirement, an Initial Operating Capability standard Storm Shadow missile was deployed for the first time in March 2003, to support combat operations in Iraq. A total of 27 missiles were fired from Tornado GR4s from No. 617 Squadron, and with post-deployment analysis demonstrating the missile's



exceptional accuracy, the effect on targets was described as devastating.

The effectiveness of the new capability was graphically demonstrated when missiles were fired from two aircraft flying different approach angles against a hardened command bunker, and both entered the target using the same impact hole! Squadron Leader Andy Myers, the Weapons Leader of No. 617 Squadron, said of Storm Shadow: "Deployment of the missile was one of the easier aspects of Op TELIC and the results obtained were outstanding. Without this weapon we would have had to get very close to some very nasty places!"

As well as delivering the UK programme, since 1999 the Defence Procurement Agency has procured the Storm Shadow Weapon System on behalf of the Italian Air Force, and a member of the Italian Air Force is an embedded in the CASOM IPT. Team Leader Richard Murray

said: "The experience of having an Italian Project Officer as part of my team has been unique, and I can safely say that both the Italian Air Force and the Agency has benefited from the arrangement." Deliveries of the first Italian operational missiles are planned for summer 2005.

By observing the UK programme, MoD Italy has seen the benefits of conducting an 'end-to-end' demonstration of the complete weapon system via a Service Evaluation Trial, and after a review of suitable sites, has selected the OTB range in South Africa.

Close co-operation has been maintained throughout the programme, with the UK, France and Italy sharing operational experiences, production and logistic information, as well as exploring opportunities for future co-operation on possible system upgrades.

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