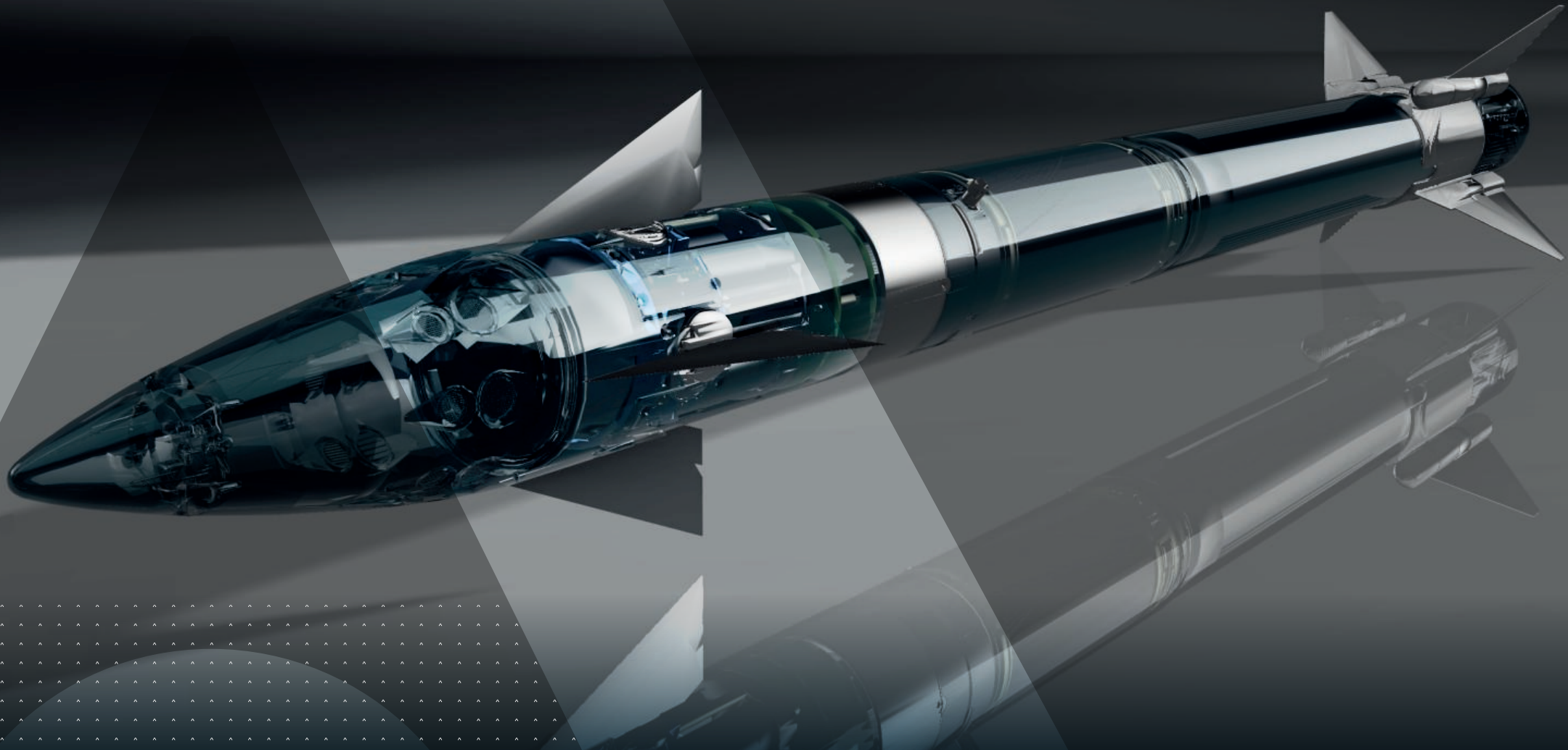


LMM

Lightweight Multirole Missile



LMM

Key Facts

Integrated onto 8 different platforms across air, land and sea

1

Demonstrated effectiveness against todays contemporary threats of FIACs and UAVs

2

In service with the UK MOD in 2019

3

Laser beam riding guidance with No Known countermeasure

4

Highly accurate precision strike with low collateral damage

5



Fire Control Systems

for all Environments

AIR

WILDCAT INTEGRATION



SEA

NAVAL GUN INTEGRATION



NAVAL LAUNCHER (MILAS)



NAVAL GUN INTEGRATION (SIGMA)



LAND

RAPIDRanger



RAPIDRover



APC

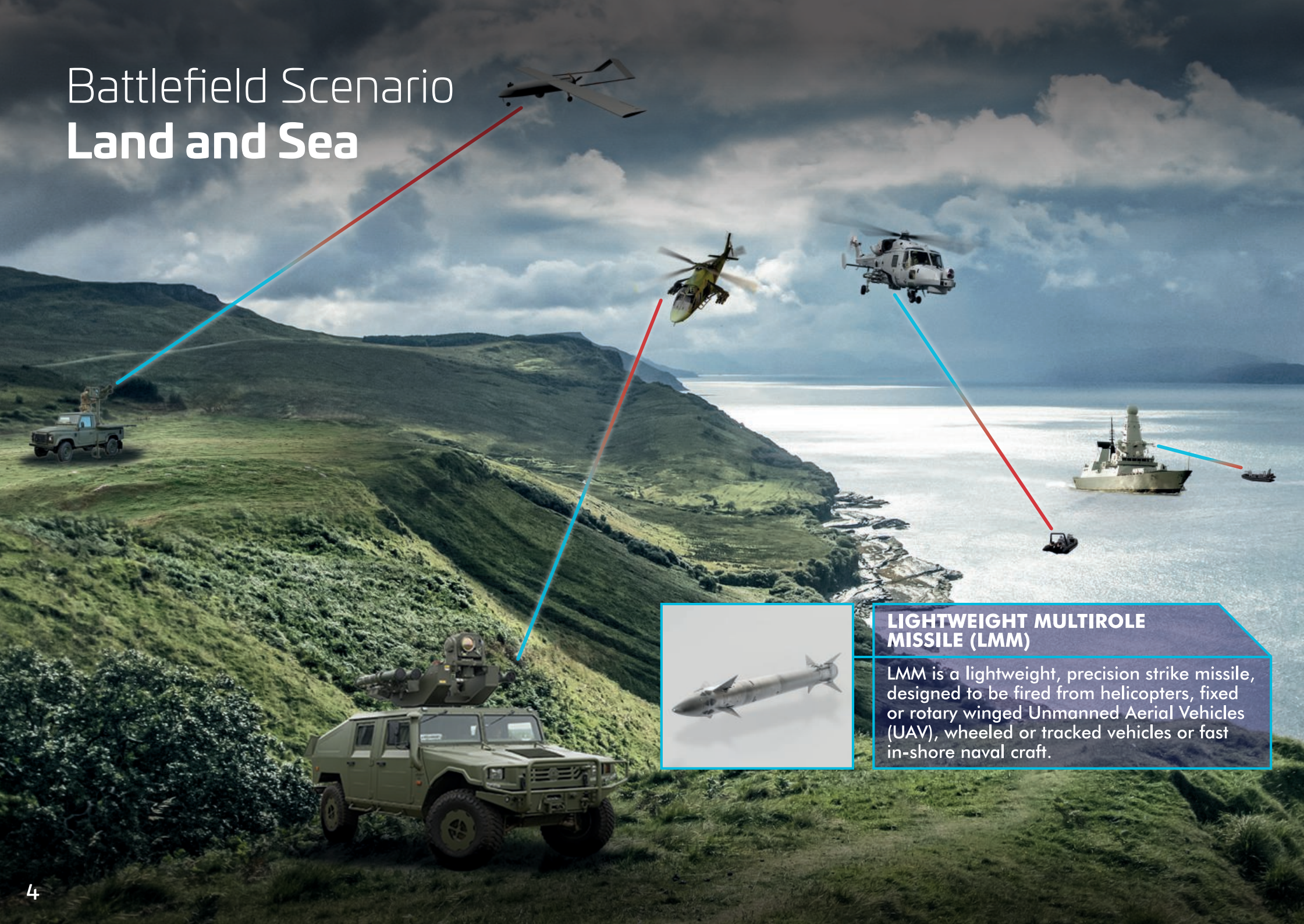


LML-NG



Battlefield Scenario

Land and Sea



LIGHTWEIGHT MULTIROLE MISSILE (LMM)

LMM is a lightweight, precision strike missile, designed to be fired from helicopters, fixed or rotary winged Unmanned Aerial Vehicles (UAV), wheeled or tracked vehicles or fast in-shore naval craft.

LMM

In the Naval Domain

The maritime environment creates a major challenge to conventional missiles in engaging FIAC (Fast In-shore Attack Craft) and small UAS threats, due to their high mobility, small signature, and the severe background clutter against which they operate - LMM provides the ideal solution.

Thales unique Laser Beam Riding guidance ensures that LMM is highly effective in cluttered naval environments against these difficult airborne and surface targets, which is just one of the reasons the Lightweight Multirole Missile has been selected to meet the operational requirements of the Royal Navy's Wildcat helicopter and the Royal Marines in an air defence role.

The compact and lightweight characteristics of LMM coupled with the recoilless launch of the 2 stage motor system makes LMM ideal for combining with traditional naval 20mm and 30mm gun systems or configured as 4 or 8

missile standalone launchers to deal with the swarm attack threats. LMM will extend current platform protection out to 6km, significantly enhancing the layered defence capability of patrol boats and ships.

THALES HAS IDENTIFIED 3 POTENTIAL CONFIGURATIONS FOR THE MARITIME ENVIRONMENT:

- 1) LMM WEAPON SYSTEM CUSTOMISED FOR INTEGRATION ON A FAST PATROL BOAT
- 2) AN ALL-IN-ONE WEAPON SYSTEM FOR LARGER NAVAL PLATFORMS
- 3) A HYBRID MISSILE/GUN SYSTEM COMPOSED OF LMM INTEGRATED WITH NAVAL GUNS

- ✦ CAPABLE OF IMMEDIATE LAUNCH CAPABILITY - NO SEEKER COOL DOWN
- ✦ ZERO RECOIL LAUNCH FOR RELEASE FROM LIGHTWEIGHT PLATFORMS
- ✦ FULLY CONTROLLED ENGAGEMENT USING MULTI-MODE SECURE GUIDANCE
- ✦ RAPID RE-ENGAGEMENT TO DEFEAT SWARM THREATS

LMM

In the Land Domain

LMM is designed to provide a rapid reaction to a wide range of surface threats including wheeled or tracked vehicles, towed artillery or static installations as well as providing a surface to air capability targeting UAVs and helicopters. The accuracy and effect of the LMM has been demonstrated against a wide range of targets with minimum collateral damage.

Thales has performed integration of LMM onto various gun systems and Remote Weapon Stations (RWS) thus increasing the defensive capability of Armoured Fighting Vehicles (AFV), light 4x4 vehicles and fixed installations. A two man portable launcher can also be fitted to flatbed vehicles offering an agile and rapidly deployable solution.



- + MULTI-ROLE CAPABILITY FOR LIGHT AND HEAVY PLATFORMS
- + IMMEDIATE LAUNCH CAPABILITY - NO SEEKER COOL DOWN
- + FULLY CONTROLLED ENGAGEMENT USING SECURE GUIDANCE
- + FIRE ON THE MOVE CAPABILITY
- + AUTOMATIC CUT-DOWN CAPABILITY FOR MISSILE IN FLIGHT, THEREBY PREVENTING FRATRICIDE
- + HIGHLY ACCURATE PRECISION STRIKE WITH LOW COLLATERAL DAMAGE
- + VERY FAST RE-ENGAGEMENT

Whether used with the man portable LML-NG or integrated onto a vehicle using the RAPIDRanger system, the ground based applications for LMM offer a highly mobile, urban optimised effector that can target both land and air based targets with precision and minimal collateral damage.

MILAS

Naval Launcher Firings 2018

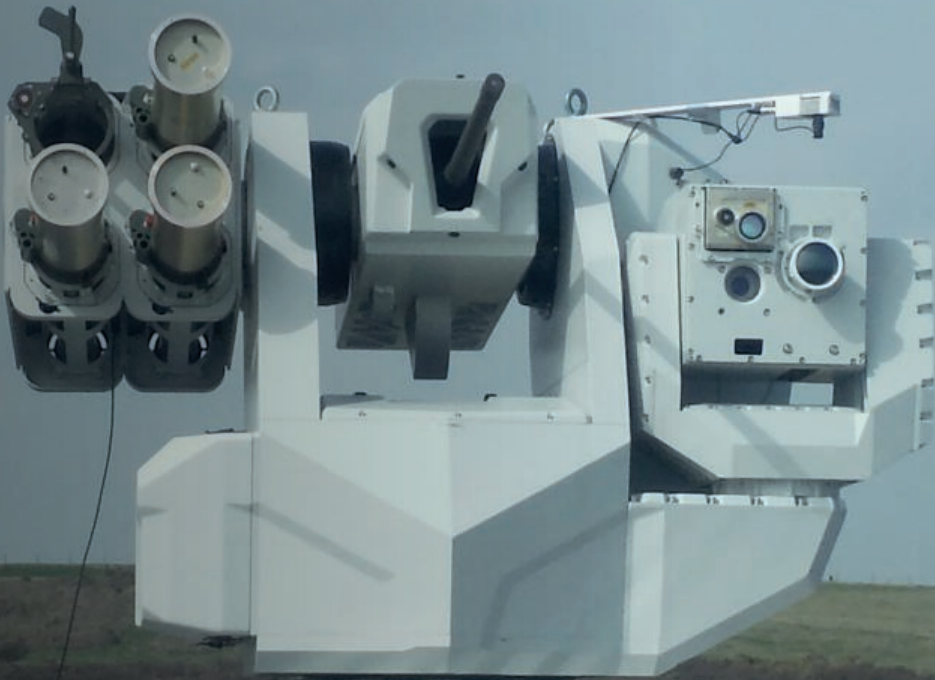
The remarkable capability of the LMM MILAS naval system was demonstrated for the first time in an operationally representative environment. Firings were from a 6 Degree-of-Freedom (DOF) motion platform, simulating the naval environment on 16 m and 30 m Patrol Boats in Sea State 2 and Sea State 4. The target was representative of a 5 m Fast Inshore Attack Craft (FIAC) directly approaching from 7 km at a rate of 20 knots. The target was engaged at a range of 6 km.

Telemetry and combat rounds were fired in direct hit and Proximity fuze modes. All firings were successful with the target hit.

This significant achievement is representative of many firsts, namely a new hybrid Gun/Missile Launcher (developed jointly between Thales and Aselsan), moving launch platform and representative moving FIAC target at extended range (missile launched at just under 6 km with range coincidence at 5.5 km).



- + 4 MISSILES FIRED FROM A 6 DOF MOTION PLATFORM
- + 4 HITS ON TARGET BOAT
- + TARGET APPROACHING AT A SPEED OF 20 KNOTS AND ENGAGED AT A RANGE OF 6 KM
- + HYBRID GUN/MISSILE LAUNCHER DEVELOPED WITH ASELSAN
- + DEMONSTRATES LMM ABILITY TO TARGET FIAC
- + MILAS LAUNCHER IN SERVICE



Royal Marines & Royal Artillery Firings

July 2019

The Royal Marines and Royal Artillery have successfully tested the LMM against a Banshee target firing a combined total of 90 LMM missiles. Having been fired from the LML (Lightweight Multiple Launcher), Thales showcases another platform variation that LMM can be fired from successfully. Additionally, it displays a clear surface to air capability to compliment the already established surface attack capability as well as increasing the target range to include fast moving agile UAV's.

"It gives us more utility across the battlefield and gives the brigade a different option. It means we can start enabling attacks on targets that won't be able to see us. It's got a laser beam system as well and it's a passive system so we won't be spotted by the enemy when we pull the trigger."

Captain James O'Rourke,
Officer Commanding of Air Defence Troop

- + MARINES FIRED 33 MISSILES AGAINST BANSHEE UAV TARGET
- + 2 QUALIFICATION ROUNDS AND 31 TARGET HITS
- + ROYAL ARTILLERY FIRED 66 MISSILES AGAINST BANSHEE UAV TARGET
- + 1 QUALIFICATION ROUND AND 6 TARGET HITS
- + FIRED USING THE THALES LIGHTWEIGHT MULTIPLE MISSILE LAUNCHER WHICH IS ALSO CAPABLE OF FIRING THE STARSTREAK MISSILE



HMS Sutherland Firings

June 2019

Thales working with MSI Defence, demonstrated the precision strike of the Lightweight Multirole Missile from the Type 23 frigate, HMS Sutherland.

Working closely with ship staff and DE&S, the Thales/ MSI team successfully engaged small fast manoeuvring unmanned surface targets which were closing on the ship in representing attack profiles.

Four missiles were fired - the first was a “pipe-cleaner” round to test the effect of LMM being fired from the launcher on the gun mounting.

The remaining rounds were telemetry missiles which fully characterise the missile accuracy and performance. (The combat missile deploys a lethal multi-effect warhead).

“The impressive result of this trial was achieved through the hard work and cooperation of a wide array of industry and defence partners and it was rewarding for Sutherland to have played such a key role in its success.”

Tom Weaver
HMS Sutherland’s Commanding Officer

- + 4 SUCCESSFUL MISSILES FIRED FROM ON BOARD HMS SUTHERLAND AT A 5 METER TARGET
- + “AT SEA” PROOF OF CONCEPT TO DEMONSTRATE LMM
- + CAPABILITY TO DEFEAT FIAC THREAT

FASGW (Light) Ground Firings

June 2019

Thales successfully completed the ground firing trial from the Future Anti-Surface Guided Weapon (Light) System at Royal Artillery Range Manorbier. The LMM’s, which are called “Martlet” by the UK Royal Navy, will provide a transformational Surface Attack capability as well as an enhanced level of protection for the UK Armed Forces.

The LMM integration kit of Laser Guidance Unit and up to 4 launchers (20 LMM) creates the FASGW(L) airborne weapon system which enters service in October 2020 with the UK Royal Navy.

During the trial the target boat was engaged at ranges from 3.5km to 4.5kms. At each range the LMM successfully hit the target.

- + 6 LMM SUCCESSFULLY FIRED
- + 2 MISSILES USED TO MEASURE EFFECTS ON LAUNCHER
- + 4 LMM SUCCESSFULLY HIT TARGET BOATS AT RANGES OF 3.5 KM, 4.5 KM AND 5 KM
- + FASGW (LIGHT) IN SERVICE WITH THE UK MOD OCTOBER 2020



RAPIDRanger Firings

RAPIDRanger has been designed to fire the hypervelocity STARStreak Missile which has been extensively deployed as part of the ForceSHIELD Integrated Air Defence System.

Thales has now integrated the LMM into the RAPIDRanger Fire Control system to offer a complementary capability to STARStreak offering excellent lethality against UAVs, Helicopters and even Fixed Wing Aircraft when operating in a point defence deployment.

During the trial the LMM was launched successfully and guided to the maximum range to confirm performance expectations. LMM then engaged a Banshee UAV target to confirm operational accuracy. The Banshee was successfully engaged with range coincidence at 3.4 km.

- + 9 SUCCESSFUL LIVE FIRINGS
- + BANSHEE TARGET SUCCESSFULLY DESTROYED WITH A SINGLE FIRING
- + INTEGRATION ACHIEVED WITHIN 5 MONTHS OF PROGRAMME START



LMM Key Features

LIGHTWEIGHT - 13 KG

>MACH 1.5 VELOCITY

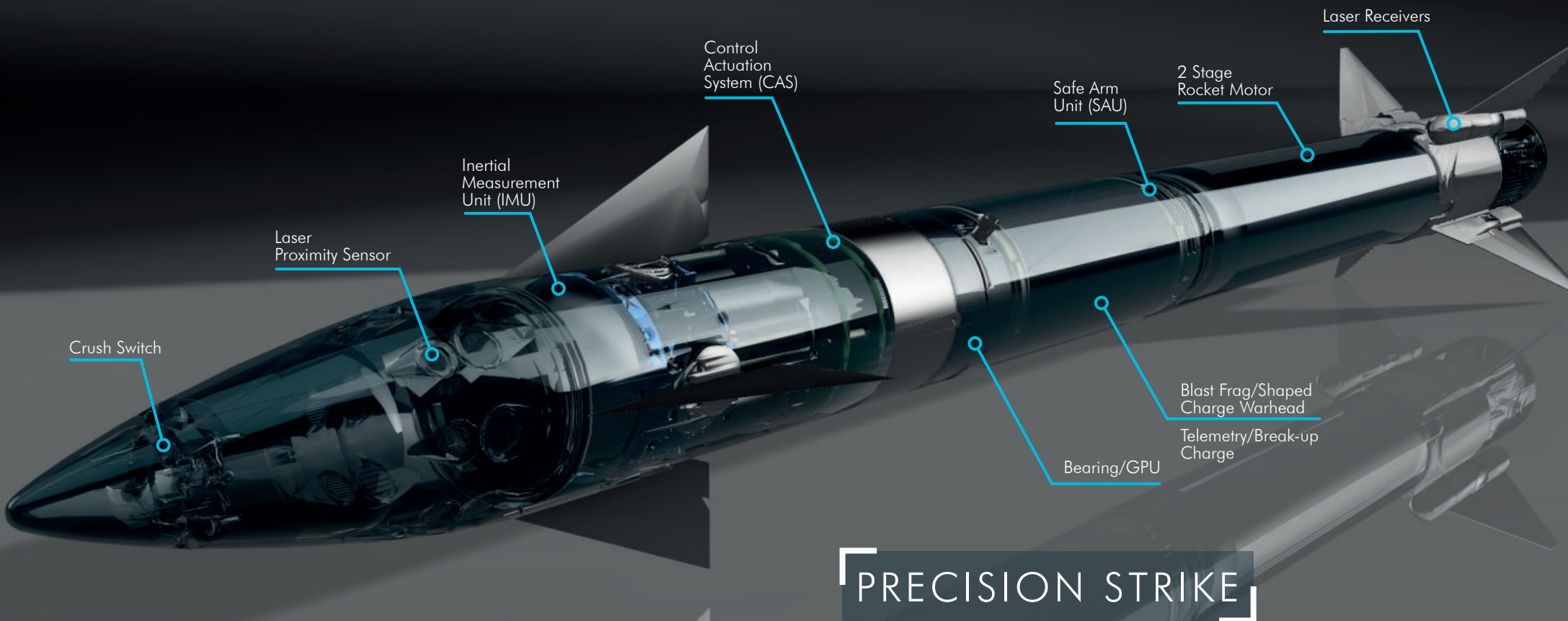
RANGE >6 KM

IMMUNE TO COUNTERMEASURES

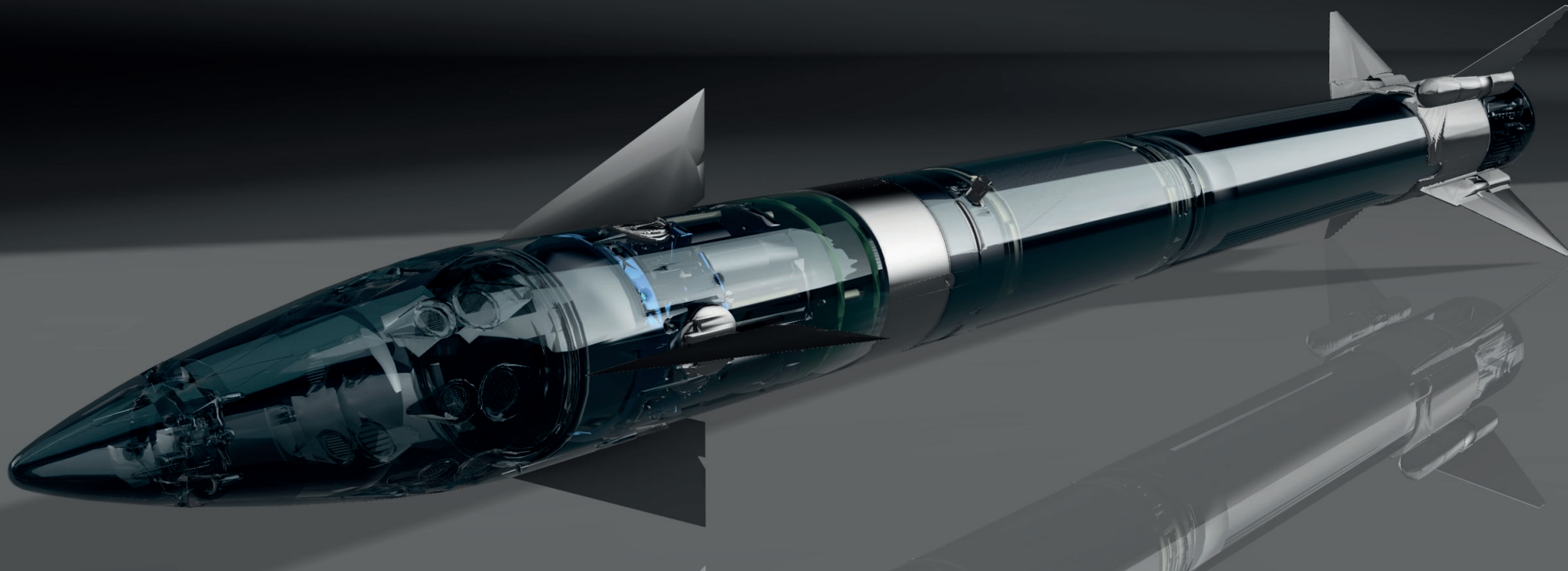
IMMEDIATE LAUNCH CAPABILITY

INFLIGHT CUTDOWN CAPABILITY

COST EFFECTIVE



THALES



Providing
tomorrow's
capability
today



Alanbrooke Road,
Castlereagh, Belfast,
Northern Ireland, BT6 9HB
United Kingdom
T: +44 (0)2890 465 521
E: dawn.ross@uk.thalesgroup.com
> thalesgroup.com/uk <

