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## Precision Engagement & Global Mobility Systems Global Strike Systems

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### Standoff Land Attack Missile - Expanded Response (SLAM-ER) Backgrounder

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#### Description & Purpose:

The Standoff Land Attack Missile - Expanded Response (SLAM-ER) – the highly accurate man-in-the-loop cruise missile – is now in the international marketplace. The Republic of Korea purchased SLAM-ER as part of its Boeing F-15K program, and SLAM-ER has been released for multiple countries worldwide. SLAM-ER is the U.S. Navy's choice for surgical strike against high-value land targets and ships in port and at sea.



#### Customer(s):

More than 600 SLAM missiles in the U.S. Navy arsenal have been retrofitted with the SLAM-ER upgrade.

#### General Characteristics:

<b>Length:</b>	182.2 in. ship launch, 151.5 in. air launch
<b>Diameter:</b>	13.5 in.
<b>Weight:</b>	1,160 lb. air configuration 1,459 lb. ASROC configuration 1,520 lb. TARTAR configuration 1,523 lb. capsule/canister configuration
<b>Range:</b>	In excess of 67 NM
<b>Propulsion:</b>	Air-breathing turbojet engine (cruise), solid-propellant booster
<b>Guidance:</b>	Terminal: Active Radar Midcourse: Three axis integrated digital computer/strapdown attitude reference system
<b>Warhead:</b>	Penetration, high-explosive blast
<b>System Elements:</b>	Missile - Common for all launch platforms Booster - Added for surface, submarine and costal defense applications Launchers - Uses existing equipment or the Harpoon Canister

	Launcher Command and Launch System - Provides engagement planning and launch control
<b>Launch Platforms:</b>	Conventional/Nuclear Guided Missile Cruisers (CG/CGN)
<b>Ships</b>	Guided Missile Destroyers (DDG) Destroyers (DD) Guided Missile Frigates (FFG) Frigates (FF) Fast Attack Craft (FPB)
<b>Aircraft</b>	P-3 ASW Patrol S-3 ASW Patrol F/A-18 Strike Fighter B-52 Bomber F-16 Fighter Nimrod
<b>Submarines</b>	Nuclear Attack Submarines (SSN) Attack Submarines (SS)

### **Costal Defense Batteries**

An affordable inventory upgrade, SLAM-ER incorporates a number of improvements to the baseline SLAM, a derivative of the Harpoon anti-ship missile. These retrofit upgrades include planar wings to improve range and aerodynamic performance, an improved warhead to increase penetration and lethality against hardened targets, and software improvements that make it easier for the control aircraft to designate track on the target aimpoint.

While the missile is in flight, the Global Positioning System receiver/processor updates the missile's inertial navigation system. This helps to ensure that the missile's imaging infrared seeker is pointed directly at the target.

SLAM-ER is extremely accurate in the fire-and-forget mode (JDAM accuracy), but SLAM-ER's highly successful man-in-the-loop mode allows the pilot to precisely update the point of impact during the missile's final moments of flight. A data link in the missile is used to transmit an image of the target to the controlling aircraft. A key feature of the SLAM-ER's improved man-in-the-loop interface, known as the Stop-Motion Aimpoint Update, allows the control aircraft pilot to freeze the target scene video on his cockpit display, designate a precise aimpoint and then command a missile to attack that aimpoint. This unique SLAM-ER guidance mode will allow the missile to attack and hit critical aimpoints even when the aimpoints have no distinguishing infrared signature.

SLAM-ER's man-in-the-loop control system offers several tactically significant advantages over other types of standoff weapon guidance systems. Viewing the target scene in real time prior to impact allows target identification; reduced collateral damage; selection of a secondary aimpoint in the event that some portion of the original target has

already been destroyed; and an immediate indication of mission success. Time-critical aimpoint age is reduced to a few seconds, compared to hours or days for other weapons.

SLAM-ER is also the first missile that can be re-targeted after launch. With flex targeting, the warfighter can assess the state of the primary target through the missile imaging infrared video display in the cockpit. If the primary target has already been destroyed, the missile can be re-directed through the weapon data link to another target miles away from the original planned target.

In addition to retargeting, a demanding series of tests was conducted by the U.S. Navy recently that will allow the SLAM-ER to attack land targets moving at highway speeds. When delivered to the fleet in 2006, the capability will make SLAM-ER the first operational standoff weapon that can attack moving targets with surgical precision on land and at sea.

Designed for deployment from carrier-based and land-based aircraft, SLAM-ER can easily be adapted for ship launch. SLAM-ER can be launched from safe standoff ranges of more than 150 nautical miles.

**Background:**

In March 1995, the U.S. Navy awarded Boeing a \$99.4 million contract for engineering and manufacturing development of the SLAM-ER program.

SLAM-ER made its first flight on March 18, 1997, followed by 13 successful combined development/operational tests.

SLAM-ER received early operational capability in the summer of 1999 and verification testing was completed in March 2000. Full-rate production began in 2000.

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