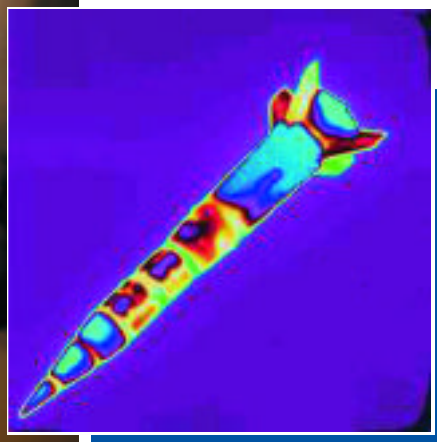
STANDARD Missile-3



SM-3 ON TARGET
SM-3 will provide Regional Defense against medium and intermediate range ballistic missiles and has demonstrated hit-to-kill capability

Benefits

- **Protection of military and civilian assets against medium and long range threats**
- **High velocity provides large defended areas and multiple engagement opportunities**
- **Leverages STANDARD Missile Family for cost-effective deployment**
- **Tactical design will permit rapid transition to contingency capability**

Sea-based Midcourse Defense

STANDARD Missile-3 is being developed as part of the Sea-based Midcourse Defense (SMD). The SMD system integrates SM-3 with the AEGIS Weapon System (AWS) aboard Navy Cruisers in order to provide an umbrella of protection against medium to intermediate range ballistic missile threats.SM-3 is compatible with the MK41 Vertical Launching System (VLS) currently deployed on many U.S. Navy and international surface ships.

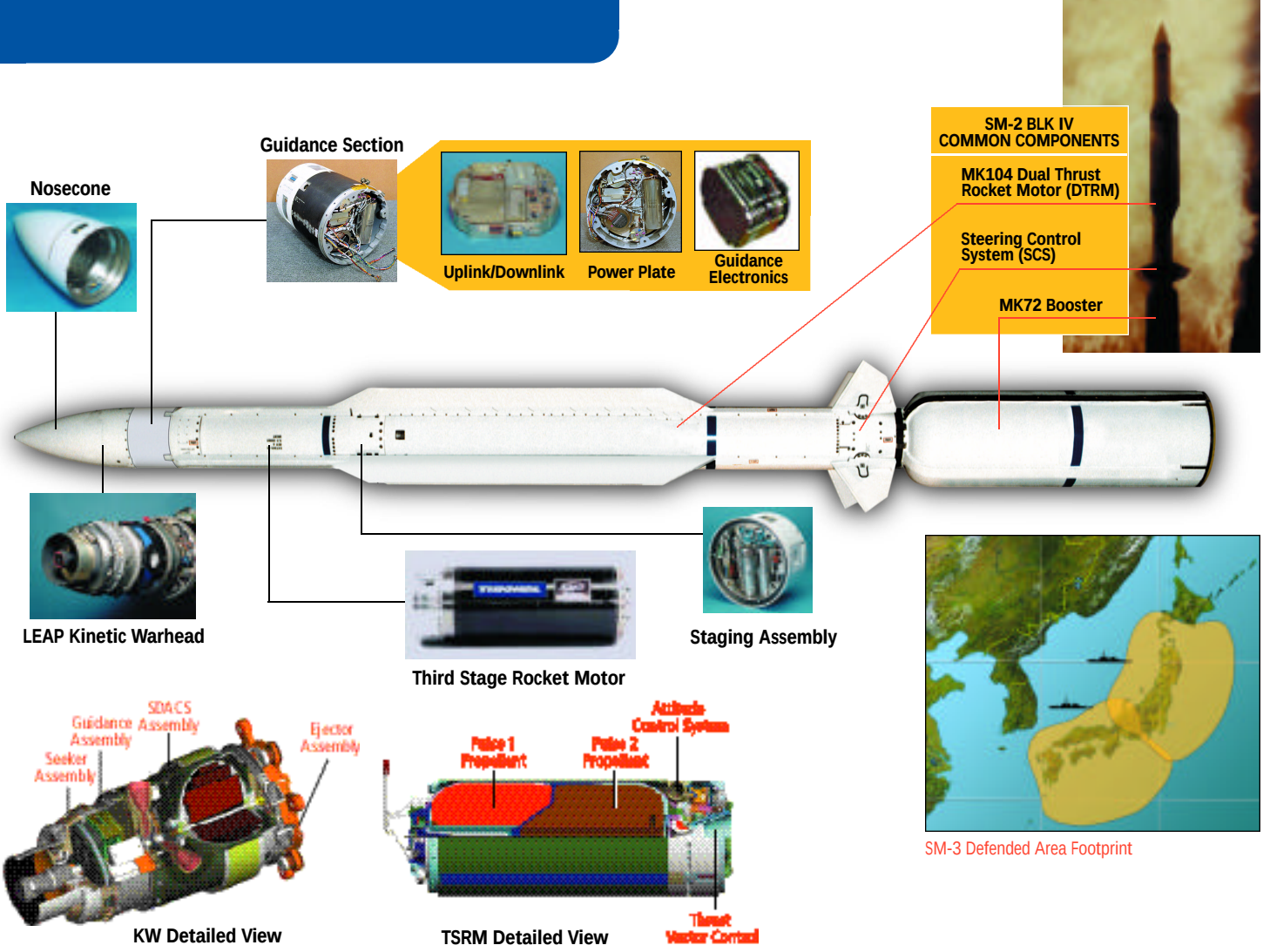
Evolutionary Design

SM-3 is an evolution of the STANDARD Missile family, and is based on the proven SM-2 Block IV airframe and propulsion.

Subsystems unique to SM-3 include the lightweight nosecone, the Kinetic Warhead (KW),the Third Stage Guidance Section, the Third Stage Rocket Motor (TSRM) ,and the Staging Assembly. The SM-3 Kinetic Warhead is an evolution of the Lighweight ExoAtmospheric Projectile (LEAP) developed in the mid-1980s to demonstrate hit-to-kill technology.

Concept of Operation

As a ballistic missile rises above the horizon, it is tracked by the ships radar and that information is passed to the SM-3, which vertically launches and begins a pitch-over trajectory. After the MK72 booster burnout and separation, the MK104 Dual Thrust Rocket Motor (DTRM) ignites. Following MK104 burnout and separation, the TSRM ignites and provides axial thrust and attitude control. The Third Stage propels the KW to very high burn-out



velocity during the exo-atmospheric midcourse phase. The GPS-Aided Inertial Navigation System (GAINS) in the guidance section accurately guides the missile on an intercept trajectory. During flyout, the missile can receive in-flight target updates from the ship to further improve its trajectory. The two-pulse motor design and integral Attitude Control System provide mission flexibility.

After the first pulse of the TSRM, the nosecone is ejected uncovering the Kinetic Warhead. Following a interpulse delay, the TSRM's second pulse is ignited and again the third stage proceeds towards the calculated intercept point. The KW is ejected and immediately searches for the target based on data received from the third stage. The KW will acquire the ballistic missile warhead with a high-resolution seeker providing long acquisition range,target discrimination, and aimpoint identification for the intercept guidance solution. A Solid Divert and Attitude Control System (SDACS) provides robust divert capability and precise attitude control to ensure a direct hit. As the KW closes on the target, it will identify the target payload area and shift its guidance aimpoint to ensure a lethal hit. The KW destroys the threat with the kinetic energy of a high velocity impact.

Rigorous Design and Testing

The SM-3 test program follows the Navy's philosophy of incrementally increasing capability and reducing risk. Extensive ground testing of the missile subsystems and early ship integration with operational ship crew training have led to several successful flight tests as part of the AEGIS LEAP Intercept (ALI) demonstration program. This attention to detail resulted in a direct hit of a target during Flight Mission Two (FM-2). The energy released at impact is equivalent to a city bus travelling 600 miles per hour.

SM-3 design philosophy has been to incorporate most of the tactical design requirements during this early demonstration phase. This will enable a quick transition to a contingency capability following the completion of ALI testing.

Operational Flexibility

The flexibility of sea-basing and the high velocity of the SM-3 provides multiple engagement opportunities with the capability to intercept threats in their ascent, midcourse, or descent phases. The inherent mobility of the ship gives the operational commander the ability to defend an entire geographic region while maintaining multi-mission capability.

Continuous Evolution

The SM-3 program strategy provides spiral upgrade path for the SM-3 design. SM-3 will continue to evolve to pace emerging longer range and increasingly complex ballistic missile threats.SM-3 will continue to fulfill the nation's sea-based midcourse defense mission far into the future.