



# MISSILE WARNING AND DEFENSE

## LEADING PROVIDER OF MISSILE DEFENSE SOLUTIONS

Northrop Grumman is deploying end-to-end missile defense expertise and mission know-how to assist the warfighter in deterrence, detection, discrimination and defense against the world's most complex threats. Our model-based systems engineering and modular open systems architecture approach enable us to quickly evaluate architecture trades, accelerate design and manufacturing and increase operational efficiency for deployed systems. We

support a truly integrated network in the battlespace to meet our customers' vital mission of creating better, stronger, smarter and more resilient systems.

### INNOVATION AND SUCCESS

Northrop Grumman brings more than 60 years of proven innovation, end-to-end missile defense capabilities, advanced manufacturing techniques and strategic industry collaboration to support our customers' most complex missile defense programs.

### WE ARE:

- The leading provider of short-, medium-, intermediate- and long-range high-fidelity targets used for testing and verifying the nation's missile defense systems.

- Responsible for designing, developing and testing the silo-launched Ground-Based Interceptor (GBI) booster, used for Ground-Based Midcourse Defense (GMD).
- A key developer of the Command, Control, Battle Management and Communications (C2BMC) system that integrates and coordinates Ballistic Missile Defense assets to maximize system performance.

### DEFINING AND DELIVERING

Northrop Grumman is pushing the boundaries of what is possible, bringing forward new and emerging technologies and expanding today's functional capabilities to protect against ever-evolving threats.



## **NORTHROP GRUMMAN IS:**

- Digitally transforming the Ground Missile Defense (GMD) Ground Weapon System, as the prime contractor responsible for updating and modernizing our country's homeland missile defense.
- Developing an innovative Next-Generation Interceptor (NGI) to enhance the current GBI fleet that defends our country against ballistic missile threats from rogue nations.
- Providing NGI, ground systems, fire control and engagement coordination for the country's planned upgraded GMD system.
- Developing the Integrated Battle Command System (IBCS) with the U.S. Army. IBCS connects sensors and effectors into one command and control system so warfighters can swiftly act on data.
- Delivering on one of Joint All-Domain Command and Control's (JADC2) foundational goals – the ability to connect and fuse multi-service sensor data to multi-service weapons – through our modular, open systems architecture, enabling decisions at relevant speed and achieving operational advantage over adversaries.
- Advancing groundbreaking solutions to detect, track and defeat hypersonic missiles in various phases of flight. Our Glide Phase Interceptor uses an innovative design to improve reliability, cost and performance.
- Designing and producing propulsion capabilities that are a national asset, making us the leading provider of solid rocket motors for many applications, including interceptors and targets.
- Leading the way in next-generation nuclear deterrence as the prime contractor on the LGM-35 Sentinel intercontinental ballistic missile weapon system.

## **TRANCHE 1 TRACKING LAYER (TITRK)**

We will build and deploy a proliferated low-Earth orbit constellation of 16 satellites with infrared sensors for the Space Development Agency's TITRK. TITRK will detect, identify and track hypersonic weapons and other advanced missiles from the earliest stages of launch through interception. Northrop Grumman will leverage its experience with the Tranche 1 Transport Layer, to provide a resilient, low-latency, high-volume network in space to support U.S. military missions around the world.

## **OVERHEAD PERSISTENT INFRARED (OPIR) – NEXTGEN POLAR (NGP)**

Northrop Grumman's Next-Generation OPIR polar-orbiting satellites, or NGP, are a key element in strategic missile warning for our nation's defense. NGP will cover the northern polar region – the shortest route for a missile to travel toward the United States and the most difficult region to monitor from space.

Our NGP satellites operate in highly elliptical orbits and will advance the missile warning mission into a more capable next generation: their modernized sensors will provide excellent coverage of the entire northern hemisphere and are fitted with new resiliency features to stay in the fight in contested scenarios.

## **HYPERSONIC AND BALLISTIC TRACKING SPACE SENSOR (HBTSS) SATELLITES**

The HBTSS's agile sensors will maintain quality tracks of threats and enable handoff for targeting enemy missiles, including hypersonic threats launched from land, sea or air. Responding to cues from the warning and custody layers, an HBTSS constellation will augment the existing OPIR network of sensors by providing high-precision target tracks to battle management and fire control systems, supporting intercept of advanced missile threats – including hypersonic glide vehicles.

## **BALLISTIC MISSILE DEFENSE SYSTEM OPIR ARCHITECTURE**

Northrop Grumman developed an operational missile defense capability called BOA – which stands for Ballistic Missile Defense System (BMDS) Overhead Persistent Infrared (OPIR) Architecture. BOA provides a high-fidelity, measurement-level 3D tracking capability enabling the BMDS to queue sensors through C2BMC and track and engage incoming threats.

## **SPECIALIZED WARFIGHTER DEVELOPMENT CONTRACT**

We are the prime contractor for the Missile Defense Agency's (MDA) Specialized Warfighter Development Contract (SWDC) providing essential modeling and simulation capabilities for the warfighter through MDA's Threat Modeling Center, Missile Defense Advanced Simulation, and the Missile Defense Space Warning Tool (MDST). MDA leverages these Northrop Grumman capabilities to support 24/7, high-fidelity early warning training for BMDS validation and verification, Aegis certification, and exercise support. We also provide essential missile defense integration through radar analysis for live-fire missile events at the Pacific Missile Range Facility and support to the Missile Defense Space Center for Cubesat and other capabilities.

From research and development to design and manufacturing, Northrop Grumman is tackling the toughest problems in missile defense, ensuring operational readiness and the ability to eliminate the threats of today and tomorrow.

## **FOR MORE INFORMATION**

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