# Theater Air and Missile Defense Implications of Operations Iraqi Freedom and Enduring Freedom

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## Shear Skill, Energy and Tenacity of Patriot Soldiers Defeated Iraq's Tactical Ballistic Missiles

On 20 March 2003, Iraqi forces launched an Ababil-100 tactical ballistic missile (TBM) at coalition forces in Kuwait. One of the sensors in the U.S. Central Command's Theater Air and Missile Defense (TAMD) System immediately detected the launch, initiated an early warning alarm across the theater and passed an update report that predicted the missile's impact point to be in Tactical Assembly Area Thunder—where 4,000 Soldiers and the Aviation Brigade of the 101st Airborne Division (Air Assault) were assembled. Moments after the warning, sirens sounded across Kuwait. Soldiers headed toward bunkers, donning protective masks and their protective suits, and air defenders went to battle stations.

The 32nd Army Air and Missile Defense Command (AAMDC) passed instructions to firing batteries, including Delta Battery, 5th Battalion, 52nd Air Defense Artillery, a recently created "shortstop battery." The Soldiers of Delta Battery responded to the alert and destroyed the in-bound Ababil-100 with a direct hit, prompting MG Dave Petreaus, Commander of the 101st to state, "Patriot saved the 101st!"

This engagement signified the culmination of more than a decade of effort by the Army air and missile defense community to improve our nation's theater ballistic missile defense capability. The mixed results of Patriot missile defense during Operation Desert Storm in 1991, when Patriot had been unable to target the warheads of incoming Scud missiles, had left air defenders determined that, next time around, Patriot's performance would be conclusive and decisive.

The air and missile defense community's aggressive developmental approach spanned the full range of joint doctrine, organization, training, materiel, leadership, people and facilities. It required significant investment of

all resources—time, money, technologies, and personal effort—by the entire air and missile defense establishment.

Advancements in missile technology and associated radar and software corrected previous Patriot shortcomings in targeting the warheads of inbound missiles. As the need to defend American and coalition forces from ballistic missile attack became more probable after 9/11, the Army accelerated the early fielding of Guidance-Enhanced Missiles-Plus (GEM+s) and Patriot Advanced Capabilities-3 (PAC-3) missiles into the Central Command theater of operations.

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During the decade following Operation Desert Storm, the doctrinal approach towards defending the force from ballistic missile attack changed in two significant ways. First, rather than being an Army responsibility, TAMD became a truly joint and coalition effort. Learning the lessons of Desert Storm, the Kuwaiti government invested heavily in Patriot missile defense and backed up its materiel investment by forming a training partnership with U.S. air defenders. This investment would bear fruit during Operation Iraqi Freedom, for on 21 March 2003, an Iraqi TBM targeted a friendly assembly area in Kuwait, and a Kuwaiti battery destroyed the incoming Ababil-100.

At the same time, the Army led a joint effort toward the creating a comprehensive, joint and coalition TAMD architecture. Brigadier General Howard B. Bromberg, commanding general of the 32nd AAMDC, was designated as the Combined Force Air Component Command's Deputy Area Air Defense Commander to plan the overall TAMD fight and as the Coalition Forces Land Component Command's (CFLCC) TAMD coordinator for the coalition's ground-based air and missile defense plan. Bromberg led a joint staff through the development and rehearsal of the TAMD plan, and together they established an operational architecture to maximize situational awareness and improve timely engagement.

This comprehensive TAMD plan included providing the 108th Air Defense Artillery Brigade to the 1st U.S. Marine Expeditionary Force to extend missile defense coverage over Marines and United Kingdom forces as they maneuvered north through eastern Iraq and into the Basrah and Al Faw peninsula. Additionally, Army air defenders trained Marines and British Soldiers on sensor and communications systems, enabling integrated planning and execution of air and missile defense operations. These capabilities also provided Marine elements with visibility of all aircraft (friendly and enemy) flying in theater.

The second major change was a shift away from predominantly defensive efforts towards a more balanced offensive/defensive air and missile defense approach. This offensive effort, or attack operations, included aircraft from all services and other systems working together to coordinate joint fires against Iraqi TBMs in hide positions, in launch facilities, or on the move. This joint effort required significant integration of collection efforts, and continuous application of the intelligence preparations of the battlefield process to locate, target and attack Iraqi missile systems before they launched. In addition, the 32nd AAMDC passed voice early warning to the Kuwaiti Ministry of Defense and Ministry of Civil Defense, which then activated more than 100 sirens throughout Kuwait.

Upon assuming command of CFLCC, LTG David

*Brigadier General Howard B. Bromberg commanded the 32nd Army Air and Missile Defense Command during its deployment for Operations Iraqi Freedom and Enduring Freedom. He has since been nominated for promotion to major general.*

McKiernan reorganized the traditional staff structure into a staff organized around integrated operational functions. For air and missile defense, this meant expanding responsibilities beyond traditional air defense of ground units towards a more comprehensive function of operational protection across the theater battlespace. The operational sub-functions (Nuclear-Biological-Chemical Defense, Force Protection, and TAMD) were combined to form Operational Protection, which was placed under the oversight of the 32nd AAMDC. The CFLCC staff formed a Command Operational Protection Cell that conducted a vulnerability analysis of CFLCC nodes, including ports, pipelines, camps and other key facilities.

As war approached, the Patriot force flowed into theater, and Patriot batteries deployed to defend strategically key nations in the region, including: Turkey, Israel, Qatar, Bahrain and Saudi Arabia. Patriot batteries integrated with Kuwaiti Patriot batteries to protect critical ports, airfields, bases and infrastructure in Kuwait. Finally, Patriot brigades were allocated to V Corps and the 1st Marine Expeditionary Force for protection of ground combat forces. The number of assets requiring protection, coupled with the theater's vast size, the availability of Patriot batteries—given the sealift transit time—and the fact 41 of the nation's 50 Patriot batteries were apportioned to Opera-

tion Iraqi Freedom, mandated a balance between strategic and tactical TAMD stances in the region. To rapidly generate a defensive capability in the area of responsibility, the 32nd AAMDC created the shortstop batteries. Shortstop batteries married Patriot crews, whose organic equipment was still in transit, with Patriot operational readiness float (ORF) equipment and by cross-leveling launchers from fully equipped batteries.*

The wisdom of this initiative was validated when D/5-52 ADA, a shortstop battery, engaged and destroyed the Iraqi missile that would have impacted the 101st Division's Aviation brigade. By the end of Operation Iraqi Freedom's Phase-3, shortstop batteries would shoot down a total of three Iraqi TBMs that were aimed at tactical assembly areas.

Despite the overall success of TAMD in Operation Iraqi Freedom, several challenges emerged. The first is coping with short-range ballistic missile threats and their reduced engagement timelines. Not only must the defense design consider this aspect of the threat, but the entire architecture (sense, warn, intercept) must be organized to deal with this threat, and air and missile defense Soldiers and leaders must be trained to make rapid, clear-headed decisions in a compressed engagement cycle. Those decisions, often complicated by incomplete situational awareness, must be rapid enough to enable TBM intercept and prevent TBM impact or effect on coalition forces, as well as ensuring no friendly aircraft operating in the battlespace is put at risk.

A second challenge experience in Operation Iraqi Freedom was the densely cluttered electro-magnetic spectrum. Never before have so many emitters been placed in operation in extremely close quarters. Patriot batteries, Sentinel radars, Field Artillery radars, U.S. Navy and Air Force airborne radars, and U.S. Marine Corps and U.S. Air Force ground-base radars all operated simultaneously in Operation Iraqi Freedom's battlespace. The number of types and quantities of emitters operating in a relatively constrained, noncontiguous and hostile battlespace greatly increased the potential for electro-magnetic interference issues and calls for greater synchronization of radar coverage and positioning planning in future operations.

The third challenge faced in Operation Iraqi Freedom was the cruise missile. While the Chinese-built, Iraqi-employed Seersucker missiles failed to hit a coalition asset or kill any coalition Soldiers, the ability of these older cruise missiles to penetrate friendly airspace and reach their targets serves as a warning the emerging cruise missile threat may be much closer than many believe. While Patriot can effectively engage and destroy cruise missiles, our Operation Iraq Freedom defense designs, for Patriot and short-range air defense assets, were not optimized to counter this threat.

The cruise missile is the emerging threat. The transformation of the air and missile defense force to composite battalions will provide an initial capability to counter this threat, but additional work is required to develop tactics, techniques and procedures to enable engagement of cruise missiles, while safeguarding friendly aircraft. Concrete coordination between air and missile defense batteries and controlling sector air defense centers and regional air defense centers will be essential. A concerted effort, along the lines of the post-Desert Storm Patriot PAC-3 effort, must be made by the joint force to defeat the cruise missile threat. Accelerated fielding of the Surface-Launched Advanced Medium Range Air-to-Air Missiles (SLAMRAAMs) and Medium Extended Air Defense Systems (MEADS), which provide a 360-degree cruise missile defense capability, is one such example of this effort.

The fourth challenge of Operation Iraqi Freedom was supporting the maneuver force's rapid advance on a noncontiguous and hostile battlefield with the Patriot system. Patriot is mobile, but it was designed for operations on the linear battlefields of Europe's Cold War, not for today's contemporary operational environment. V-Corps' and 1st Marine Expeditionary Force's rates of advance across Iraq's deserts and unimproved roads challenged Patriot's outsized equipment and Heavy Expanded Mobility Tactical Trucks. It was through shear skill, energy, and tenacity that the Patriot batteries maintained pace with the maneuver forces and sustained air and missile defense coverage over critical assets on the march to Baghdad. The MEADS will bring improved mobility and an operational concept that will enhance our ability to maintain pace with rapidly advancing ground maneuver forces.

## *The key now is to continue to improve...*

Operation Iraqi Freedom demonstrated that U.S. and coalition forces can successfully defend against TBM threats, that joint and coalition integration is the key to defeating missile threats, and that challenges such as cruise missiles continue to emerge. We saw this by the 11 TBM attacks against coalition forces during Operation Iraqi Freedom, all of which were either intercepted and destroyed by Patriot systems or allowed to land harmlessly in the Persian Gulf or open desert. Without air and missile defense, Iraq's ability to terrorize Kuwait, Saudi Arabia, Turkey and Israel would have significantly changed the pace and scale of the war. The key now is to continue to improve with the same drive and determination that characterized U.S. Patriot force modernization after Operation Desert Storm, so that in future campaigns every enemy missile can again be defeated. *—Released by 32nd Army Air and Missile Defense Public Affairs.*

**ORF equipment was pre-positioned in Kuwait to rapidly replace major components (radars, engagement control stations, electrical power plants, etc) lost to combat operations or out of action for extended periods due to maintenance issues.*