

JIEDDO writer Michael Conderre explains how the organisation is providing ongoing EFP-defeat for America's warfighters

Strong the force is...

Blasting a slug of molten copper at speeds over 6,000 feet per second, explosively formed penetrators (EFPs) present a lethal – yet steadily diminishing – challenge to American and Coalition forces operating in Iraq and Afghanistan. “The physics of the EFP are straightforward,” said Army Lieutenant General Thomas Metz, director of the US Joint IED Defeat Organization (JIEDDO). “It’s a molten piece of metal, fired at close range and with a lot of energy. It’ll go right through a conventional vehicle hull.”

EFP incidents are down significantly since peaking in 2008. How? JIEDDO takes a comprehensive, parallel approach to stop EFPs. It researches advanced armour solutions to defeat the device, exploits forensic information and “red teams” to attack the enemy networks planting the devices and supports up-to-date training to prepare warfighters with the most effective tactics, techniques and procedures for countering EFPs. “The core of the organisation’s mission is to provide warfighters with the tools and information – a comprehensive set of counter-IED capabilities – that help train them, protect them and enable them to execute their missions,” Metz continued.

JIEDDO is the Pentagon’s lead for all efforts to combat improvised explosive devices – including the EFP – as a strategic threat. It was established by the Department of Defense (DoD) as a permanent organisation in 2006, and is committed to fighting IEDs with all available resources. JIEDDO has funded, and is continuing to fund, several EFP armour protection initiatives in its science and technology research efforts, according to a JIEDDO scientist. The organisation works closely with platform programme managers to ensure integration issues are addressed as early as possible in the research to ensure rapid transition of progress directly into a Program of Record.

JIEDDO’s work with the Program Management Office for Mine-Resistant, Ambush Protected (MRAP) vehicles

yielded promising results for Army platform builders for its EFP armour protection initiatives. It also established a process through the Joint Test Board to allow for defense industry access – with due attention to security – to the threat presented by EFP devices. This includes significant third-party research. Given the severity of the EFP threat, JIEDDO tried to involve all possible developers – not just government laboratories.

Parallel to these armour protection efforts, JIEDDO fielded a number of EFP-specific vehicle technologies to mitigate the threat. The RHINO system – a vehicle-mounted device which deflects an EFP away from a vehicle – was developed in May 2006 in Iraq. Since 2008, JIEDDO has funded, procured and fielded more than 16,000 RHINO systems to Iraq. More recently, JIEDDO developed and fielded a new system called Calilgo, designed to detonate EFPs from a distance. Based on the success of an initial fielding of system in 2008 to Iraq, JIEDDO has procured more than 200 systems. Developed in response to a Joint Urgent Operational Needs Statement (JUONS) from Central Command, the Calilgo initiative is currently undergoing an operational assessment for future refinements.

While JIEDDO has seen significant success in its efforts to defeat the device, it recognises that attacking enemy EFP networks is the most effective way of removing the threat from the battlefield. “During JIEDDO’s first year, defeating the device was our central focus in order to save the life and limb of our warfighters and innocent Iraqi and Afghan civilians,” Metz explained. “As our positive impact in this area grew, we increased our focus on attack efforts to go after the networks that finance, construct, emplace, and initiate EFPs. Once you start working left-of-boom by attacking the network, you really start making a difference. At that point you start going on the offensive.”

Leading JIEDDO’s network attack capabilities, the Counter-IED Operations

Integration Center (COIC) brings information to bear in the fight against EFPs. “We recognise that information is an element of combat power, but that power is only realised when information is shared, fused into knowledge and its content exploited,” said Metz, highlighting the COIC’s core focus on fused intelligence.

In a period of approximately six months, JIEDDO transformed a small group of men and women labouring over web pages trying to find nuggets of value into a robust information hub. The COIC can draw from more than 70 data sources, mine the data at incredible speeds and analyse it to produce actionable knowledge on EFP networks. Responding to more than 3,000 requests for support from commanders at every echelon, the COIC ensures warfighters receive real-time information as they need it. “The COIC has maintained a sharp focus on those insurgent networks that facilitate the use and employment of EFPs,” said Metz. “From financial support to supply chains, bomb-making techniques to arming and triggering devices, from recruiting to post-blast information operations, we strive to make it impossible for our enemy to hide from our analysts.”

To sustain that focus, JIEDDO aggressively establishes a broad network of partners from many other agencies and organisations. This allows the COIC to cut across traditional information barriers to provide relevant, timely and credible EFP-related information to the warfighter at the tactical edge of the counter-IED fight. The COIC is essential in countering the EFP threat posed by an adaptive, intelligent and persistent enemy. In Iraq, terrorists and insurgents using EFPs benefit from an educated and technologically sophisticated civilian population base, as well as foreign influence and support. “Our Competitive Strategies Group helps us look at ourselves through the enemy’s eyes, both in a social and technical way, in attacking the use of the EFP,” Metz

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continued. "It follows very much along the lines of a red team viewing a potential target from the perspective of an attacker to identify its hidden vulnerabilities, and to anticipate possible modes of attack."

While JIEDDO's Competitive Strategies Group informs the organisation's wide range of efforts, its FOX initiative targets EFP networks where they operate in Iraq. The FOX teams – and other JIEDDO device-defeat and network-attack initiatives – work in conjunction and co-ordination with Task Force Troy, a brigade-sized Joint Task Force responsible for the counter-IED and counter-EFP mission within the Iraqi theatre of operations, to target EDFPS networks in Iraq. The FOX initiative provides warfighters with enhanced weapons intelligence and forensic exploitation capabilities. In 2008, JIEDDO deployed a complete FOX team and additional reduced-scale FOX teams. Future requirements for this capability will be calculated based on operational assessments from these teams. Today, FOX continues to support units in targeting, interdicting and suppressing EFP networks.

Troy's Combined Explosives Exploitation Cell (CEXC) receives and exploits this EFP evidence, gleaned intelligence from the device and channelling it to American, Coalition and Iraqi forces across the theatre. This force also includes Explosive Ordnance Disposal (EOD) battalions, whose EOD teams partner directly with the Iraqi Army bomb disposal companies and the Iraqi police counter explosive teams. According to a recent Task Force Troy report, "These Iraqi forces are showing a tremendous amount of success in both joint and independent counter-IED responses."

As the third part of its parallel approach, JIEDDO sustains a substantial focus on counter-IED training in order to ensure deploying soldiers, sailors, airmen and marines are properly trained on the equipment and capabilities highlighted. It funds the research, development and production of a number of surrogate devices to be used for training at military education institutions, home station training sites, and at major combat training centres for both active and reserve military forces.

The funding and production of these surrogate devices allows warfighters to get the same look, feel, and general EFP-defeat capabilities they will use in combat zones to defeat the current threats. The goal is to provide our deploying forces with an artificial EFP experience before they ever experience a real one.

"Realistic, effective pre-deployment training allows our warfighters to maximise the EFP-defeat capabilities we provide," said Gary Carlberg, JIEDDO's training chief. "This comprehensive realism is at the core of JIEDDO's *Train the Force* line of operation." JIEDDO's main training execution arm, the Joint Center of Excellence (JCOE) at Fort Irwin in California, identifies and fills training gaps created by JIEDDO's rapid fielding of counter-EFP and counter-IED capabilities to Iraq and Afghanistan. The JCOE trained more than 50 Army brigade combat teams and 48 Marine Corps battalions in 2008 – accounting for more than 100,000 individual service members.

"We work in concert with JIEDDO headquarters to ensure the tactics, techniques and procedures used for counter-IED training are correct, effective and emulated as well as possible," said David G Saffold, JCOE's deputy director. "We share JIEDDO's acquisition agility and we can respond quickly to keep the training current." This is exemplified by the Tactical Site Exploitation training offered at JCOE, which provides combat units with the tactics and familiarity needed to search for and exploit EFP and other IED components.

The five-day search training course begins with an instructional period, where the basic principles of search are explained and service members with prior deployments share their real-world experience. The trainees are given an in-depth view of what to look for, and then they go through hands-on exercises. Using occupied building search techniques and specialised search equipment such as gas tank fibre scopes, the trainees are allowed entry to mock Iraqi houses to conduct their search. Instead of finding completely constructed EFPs, the squads are required to search for components and potential explosive agents and chemicals.

Wires, battery testers, heavy-duty tape and spools of copper wire are only some of the items strewn about the houses for the trainees to find.

The components hidden within these houses, such as disassembled trigger mechanisms, are crafted in painstaking detail by the centre's bomb fusion cell. Integrating up-to-date device intelligence, the cell is able to create components that replicate those found in the field. The machinery is kept disassembled in order to familiarise service members with what an EFP may look like at any stage in its development and to help them identify the device as early as possible.

Items found within the houses are handled meticulously and with great care by the trainees. Accounting for the potential use of items found in these searches as evidence in the Iraqi justice system, the squads are trained on proper evidence handling and search reporting. The viability of the evidence collected could empower the emerging Iraqi court system to curb EFP builders, financiers and emplacers in the region, as well as securing areas. Biometric data, such as fingerprints on bomb components, is collected and used in further training sessions. In 2008, the JCOE invested more than \$180m to build and refine a comprehensive set of counter-IED programmes and equipment across 18 major training venues, ensuring all deploying service members are confident in counter-IED procedures and capabilities – including those related to EFP initiatives.

By leading efforts to defeat the device, train the force and attack the network, JIEDDO comprehensively supports the EFP defeat efforts of the Army, Navy, Air Force and Marine Corps and their international partners. Future efforts for the organisation's EFP-defeat mission include the development of detection equipment. "We are working very hard to figure out the signature for an EFP," said Metz, at the Association of the United States Army's 2009 Winter Symposium in Fort Lauderdale. "If we can devise the right sensor suite to recognise that signature, we can defeat this particularly deadly IED. The work done today will result in the success of tomorrow."