



DEPUTY SECRETARY OF DEFENSE  
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WASHINGTON, DC 20301-1010

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MEMORANDUM FOR SENIOR PENTAGON LEADERSHIP  
COMMANDERS OF THE COMBATANT COMMANDS  
DEFENSE AGENCY AND DOD FIELD ACTIVITY DIRECTORS

SUBJECT: Department of Defense Requirements for Managing Brain Health Risks from Blast Overpressure

The Department is committed to advancing combat readiness while reducing risks associated with blast overpressure (BOP)<sup>1</sup>, in accordance with my June 8, 2022 memorandum, "Department of Defense Warfighter Brain Health Initiative — Strategy and Action Plan." This memorandum rescinds Assistant Secretary of Defense for Readiness Memorandum, "Interim Guidance for Managing Brain Health Risk from Blast Overpressure," November 4, 2022, and establishes DoD requirements and direction for the management of health risks to DoD personnel from exposures to BOP. This policy is not meant to preclude or unreasonably restrict commanders from conducting mission-essential weapons training. Rather, this policy establishes requirements for practical risk management actions to mitigate and track BOP exposures across the DoD. In furtherance of that intent, I direct the heads of DoD Components to begin implementing these requirements immediately and develop Component BOP risk management policies to maximize the readiness and health of the force in accordance with this memorandum.

Experiences by DoD personnel in training and operational environments demonstrate possible adverse effects on brain health and cognitive performance (e.g., headache, decreased reaction time, attention difficulty, memory loss) resulting from acute (e.g., single or short-term) and chronic (e.g., repetitive or continuous) exposure to BOP. Brain health effects from BOP exposures are not yet fully understood, but adverse health and cognitive performance impacts have been reported from acute exposures to BOP above 4 pounds per square inch (psi)<sup>2</sup>. An interim BOP exposure safety guideline of 4 psi will be used as a threshold to require initiation of appropriate risk management actions until further research is complete, defining brain health impacts from BOP exposure. Weapons systems known to produce BOP exposures exceeding 4 psi include breaching charges, shoulder fired weapons, 0.50 caliber rifles/guns, and indirect fires (see Attachment 1).

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<sup>1</sup> BOP is defined as the sudden onset of a pressure wave, above normal atmospheric pressure, which occurs from blast (e.g., explosions and weapons firing events). The pressure wave is caused by the energy released during explosions and weapons firing.

<sup>2</sup> Four psi was identified as a health-based safety guideline informed by evolving medical science. This level is different from those anticipated temporary exposure levels developed to protect the public from accidental explosives mishaps in munitions storage and transport that consider mishap probability as detailed in Defense Explosives Safety Regulation 6055.09, "Defense Explosives Safety," January 13, 2019. Additional details regarding the derivation of 4 psi are available in "Interim Recommendation for Blast Overpressure Exposure Safety for Brain Health," located at: <https://denix.osd.mil/auth/soh/programs/bop/>



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To manage brain health risks of BOP exposures, heads of DoD Components will:

- Ensure all new Active and Reserve Component accessions undergo cognitive assessments as part of the entry process by December 31, 2024. In addition, accelerate already mandated requirements to execute baseline cognitive assessments for currently serving high-risk Active Duty Service members by the end of FY 2025, and address the remaining Active and Reserve Component Service members, with the exception of the IRR, as soon as possible.
- Implement procedures and standards for training and operations that incorporate BOP risk management to minimize the risk of brain injury, including at a minimum:
  - Stand-off distances for personnel involved in training (e.g., instructors, range safety officers) in accordance with Attachment 2. Modifications may be made in situations where increasing stand-off distance inadvertently introduces a safety risk (e.g., recruit training activities). The “DoD Blast Overpressure Reference and Information Guide” may be used as a resource to support implementation efforts, located at [Health.mil/BrainHealthRisk](https://www.health.mil/BrainHealthRisk).
  - Stand-off distances for non-training audiences that maximize distance from the weapons system to the greatest extent possible.
  - Personal protective equipment for firers, trainers, and other personnel at an increased risk of BOP exposure.
- Minimize the number of personnel in the vicinity of BOP generating events (i.e., personnel who are not directly involved in the training or executing tasks associated with the training event) to minimize unnecessary exposure.
- Integrate BOP risk management within the weapons system acquisition lifecycle, including leveraging technology to reassess BOP hazards for legacy weapons systems that are anticipated to produce BOP exceeding 4 psi. Include warnings and cautions in weapon system technical publications (e.g., maintenance/operator manuals, maintenance/operator training) to mitigate BOP hazards that cannot be eliminated through design.
- Ensure compliance with safety warnings and restrictions in weapons systems technical and operators’ manuals.
- Integrate simulations into training strategies to reduce BOP exposure, when appropriate, and not expend excess rounds once training standards are achieved.
- Identify and track all personnel who are potentially exposed to BOP in the Defense Occupational and Environmental Health Readiness System-Industrial Hygiene (DOEHRS-IH), prioritizing those personnel who possess an occupational specialty

that, by nature of operational activities, regularly places them at increased risk of BOP exposures. See Attachment 3 for prioritized occupational specialties.

- Prioritize efforts to collect BOP exposure data consistent with applicable DoD guidance. The Under Secretary of Defense for Personnel and Readiness shall promulgate occupational exposure assessment data collection protocol for blast overpressure hazards in accordance with the established DoD issuance process.
- Establish and implement internal recordkeeping processes and procedures in advance of full DOEHRS-IH (BOP Module) functionality for managing BOP exposure sensor data. The Under Secretary of Defense for Personnel and Readiness will determine and communicate when full functionality is achieved.
- Train and educate personnel potentially exposed to BOP hazards on the potential adverse health and performance effects, including cognitive impairments, and risk management actions to protect themselves.
- Establish procedures to ensure personnel recognize BOP symptoms, report exposures to their command, and seek an evaluation from their medical provider if experiencing symptoms.
- Establish procedures to track and maintain oversight of BOP exposure risk management actions, including processes to request, and provide justification in writing for, any exceptions to the policies in this memorandum. When military requirements render compliance with this policy infeasible or inappropriate, apply risk management procedures in accordance with DoD Instruction 6055.01, "DoD Safety and Occupational Health (SOH) Program," as appropriate.

The Under Secretary of Defense for Personnel and Readiness is authorized to provide additional guidance to implement the direction in this memorandum.

Questions concerning this policy should be directed to the Office of the Assistant Secretary of Defense for Readiness.



Attachments:  
As stated

## ATTACHMENT 1

### Common Weapons Systems Associated with BOP Exposure (Non-Exhaustive)

<b>Category of Weapon System</b>	<b>Weapon System</b>
Breaching Explosives	Door: Net Explosive Weight (NEW) of .23 pounds (lbs) of Trinitrotoluene (TNT), slider - .30 lbs TNT
	Wall: NEW of 10.0 lbs – 14.0 lbs
Shoulder Mounted	M3, Multi-role Anti-Armor or Anti-personnel Weapon System (MAAWS)
	M136, Light Anti-Tank Weapon (AT4)
	M72, Light Anti-Armor Weapon (LAW)
0.50 Caliber Gun/Rifle	M107, Sniper rifle
	M2A1, Machine gun
	MK 15, Sniper rifle
	GAU 21, Machine gun
Indirect Fire System	Howitzers (all platforms) – 105 mm, 155 mm
	Mortars (all platforms) – 120 mm, 81 mm, 60 mm

## ATTACHMENT 2

### Recommended Minimum Stand-off Distances for Characterized Weapon Systems (Applies to Stationary, Land-Based, Open Terrain)

Category of Weapon System	Weapon System	Minimum Standoff Distance from Blast Source (radial distance in feet)
Breaching Explosives	Water Door Charge 0.11 lb N.E.W. (Exterior Breaching)	13
<sup>1</sup> Shoulder Mounted	M3 Multi-role Anti-armor Anti-personnel Weapon System (MAAWS) Ammunition/Round Type: A557/84 mm HEAT TP 552	16
	M136A1 Anti-tank 4 Confined Space (AT4CS) Ammunition/Round Type: 84mm AT4CS-RS TP 552	10
	M72 Light Anti-Armor Weapon (LAW) Ammunition/Round Type: 66 mm HEAT	10
0.50 Caliber Gun/Rifle	M107 Sniper Rifle Ammunition/Round Type: A557/0.50 BMG – M33 Ball with Propellant: WC 860	7
	M2A1 Heavy Machine gun (Trailer-mounted) Ammunition/Round Type: 0.50 cal M8 API	7
	MK 15 Sniper Rifle Ammunition/Round Type: 0.50 cal M33 Ball	7
Indirect Fire System (Howitzers)	M777 155 mm Ammunition/Round Type: 2M231 charges (“2LIMA”)	<sup>2</sup> Measurement < 4 psi
	M109 A6/A7 155 mm Paladin Ammunition/Round Type: 66 mm HEAT	<sup>2</sup> Measurement < 4 psi
	M119 105 mm Ammunition/Round Type: M1 projectile, 105 mm HE M67 propellant system charge 6	<sup>2</sup> Measurement < 4 psi
<sup>3</sup> Indirect Fire Systems (Mortars)	M224 60 mm Ammunition/Round Type: M1061 (B29) HE mortar cartridge, 2 propelling charges	3
	M252 81 mm Ammunition/Round Type: M889A2 HE mortar cartridge, M223 propelling charge	7
	M120/121 120 mm Ammunition/Round Type: M933 HE mortar cartridge, M230 propelling charge	13

Notes:

<sup>1</sup> Posterior stand-off distances for shoulder mounted weapon systems will follow established, operational requirements for safe back blast area.

<sup>2</sup> Based on traditional firing team positioning, measurements are below (<) 4 psi; therefore, maximize stand-off distances to the greatest extent possible, while balancing training and safety requirements.

<sup>3</sup> When firing indirect fire system (mortars), mortar teams will assume a posture that is as close to the ground as possible, maximizing space below the muzzle of the tube.

### ATTACHMENT 3

#### Occupational Specialties at Increased Risk of Blast Overpressure Exposure

<b>*Occupational Specialty</b>	<b>Personnel Description</b>	<b>Service</b>
13A	Field Artillery Officer	Army
13B	Cannon Crewmember	Army
13M	MLRS/HIMARS Crewmember	Army
11B	Infantryman	Army
11A	Infantry Officer	Army
12B	Combat Engineer	Army
19D	Cavalry Scout	Army
12 Series	Engineers Branch	Army
12B	Combat Engineer	Army
31 Series	Military Police Branch	Army
31B (SRT)	Military Police (Special Reaction Team)	Army
31B/ DA	Military Police (Special Reaction Team)	Army
74 Series	Chemical Corps	Army
18 Series	Special Operations Forces Operators	Army
89 Series	Explosives Ordnance	Army
11H	Rescue Pilot	Air Force
19ZXA	Special Tactics Officer (STO)	Air Force
13D	Combat Rescue Officer (CRO)	Air Force
13L	Air Liaison Officer (ALO)	Air Force
31P	Security Forces	Air Force
32EXH	Civil Engineering (assigned to EOD)	Air Force
3E2XX	Pavements and Construction Equipment Specialists	Air Force
38E	Engineering	Air Force
3E8	Explosive Ordnance Disposal (EOD)	Air Force
3P	Security Forces	Air Force
3P0	Security Forces	Air Force
311	Rifleman	Marine
317	Scout Sniper	Marine
331	Machine Gunner	Marine
351	Infantry Assault Marine	Marine
352	Anti-Tank Missile Gunner	Marine
302	Infantry Officer (LtCol to 2ndLt)	Marine
303	Light-Armored Reconnaissance (LAR) Officer	Marine
306	Infantry Weapons Officer (III)	Marine
370	Special Operations Officer	Marine
802	Field Artillery Officer (I)	Marine
930	Range Officer (III)	Marine
1302	Combat Engineer Officer (I)	Marine
1802	Tank Officer (I)	Marine

<b>*Occupational Specialty</b>	<b>Personnel Description</b>	<b>Service</b>
1803	Assault Amphibious Vehicle (AAV) Officer (I)	Marine
2305	Explosive Ordnance Disposal Officer (II/III)	Marine
313	Light Armored Reconnaissance Marine	Marine
1834	Amphibious Combat Vehicle (ACV) Crewmember	Marine
1371	Combat Engineer	Marine
1834	Amphibious Combat Vehicle (ACV) Crewmember	Marine
1371	Combat Engineer	Marine
6199	Enlisted Aircrew/Aerial Observer/Gunner	Marine
8024	Combatant Diver Marine	Marine
2336	Explosive Ordnance Disposal (EOD) Technician	Marine
811	Field Artillery Cannoneer	Marine
351	Field Artillery Cannoneer	Marine
367	Light Armored Reconnaissance Master Gunner	Marine
7212	Low Altitude Air Defense (LAAD) Gunner	Marine
1867	M1A1 Tank Master Gunner	Marine
8071	Special Operations Capability Specialist (SOCS)	Marine
6177	Weapons and Tactics Crew Chief Instructor	Marine
P01A	Chief Master-At-Arms (CMAA)	Navy
P03A	Harbor Security Patrol Leader	Navy
P04A	Harbor Security Boat Training Supervisor (HSB TRASUP)	Navy
P10A	Nuclear Weapons Security Specialist (NWSS)	Navy
P11A	Physical Security Specialist (PSS)	Navy
V020	Fire Controlman (FC) Combined "A" School (BL-1)	Navy
V020	Fire Controlman (FC) Combined "A" School (BL-1)	Navy
V030	Gunner's Mate (GM) Combined "A" School (BL-1)	Navy
V031	Gunner's Mate (GM) Combined "A" School (BL-0)	Navy
V01A	ACB-12 GCS MK 160 MODs 14-16/EOSS MK 20 MOD 0 FC	Navy
V02A	Close-In Weapon System (CIWS) Phalanx Block 1B Baseline 2 Technician	Navy
V15C	FC GM	Navy
V18A	CIWS MK-15 BLOCK 11-14 Technician	Navy
V19A	Phalanx Close-In Weapon System MK 15 MOD 11-14, 21, 22, and 25-28 Technician	Navy
W000	Mineman (MN) Apprentice Technical Training (BL-1)	Navy
717B	Small Arms Marksmanship Instructor	Navy
718B	Crew Served Weapons (CSW) Instructor	Navy
726A	UDT/SEAL Candidate	Navy
758B	Salvage/Construction Demolition Diver	Navy
775B	Maritime Security	Navy
779B	25mm Machine Gun System (MGS) MK 38 MOD Gun Weapon System (GWS) Technician	Navy
787A	Naval Special Warfare Small Arms Organizational Level Maintenance	Navy
800G	Individual Augmentation (IA) Support Assignment-Basic Combat Unit Member	Navy

<b>*Occupational Specialty</b>	<b>Personnel Description</b>	<b>Service</b>
803G	Individual Augmentation (IA) Support Assignment-Counter Rocket Artillery and Mortar (C-RAM)	Navy
804G	Expeditionary Force -Combat Skill	Navy
810G	Maritime Expeditionary Security Force (MESF) Coxswain	Navy
811G	Maritime Expeditionary Security Force (MESF) Operator	Navy
819G	Individual Augmentation (IA) Support Assignment Military Transition Team/Iraq Assistance Group	Navy
820G	GWOT IA/ILO Combat Training (NIACT)-Deployed	Navy
837A	Naval Special Warfare (Combat Support)	Navy
853A	Force Protection Boat Coxswain	Navy
854A	Naval Special Warfare (Combat Service Support)	Navy
1130	Unrestricted Line Officer billet requiring Special Warfare (SEAL) qualification	Navy
1140	Unrestricted Line Officer billet requiring Explosive Ordnance Disposal (EOD) Warfare Qualification	Navy
1180	Unrestricted Line Officer billet for a student in training for Special Warfare qualification	Navy
1190	Unrestricted Line Officer billet for an officer in training for Explosive Ordnance Disposal (EOD) qualification	Navy
5100	Staff Corps Officer billet requiring Civil Engineering specialty	Navy
7150	Warrant Officer (Line) billet requiring supervision in Special Warfare Technician specialty	Navy
7170	Warrant Officer (Line) billet requiring supervision in Naval Special Warfare Combatant-Craft Crewman	Navy
7200	Warrant Officer (Line) billet requiring specialty of a Diving Office	Navy
7480	Warrant Officer (Line) billet requiring supervision in Explosive Ordnance Disposal Technician specialty	Navy

\*Including civilian equivalent occupational specialties.