



NA-15 OFFICE OF SECURE TRANSPORTATION

GENERAL SAFETY PLAN 2008

For Training Activities and Exercises

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Revision Record

<i>Revision No.</i>	<i>Revision Date</i>	<i>Description</i>
0	6/2006	Initial Issue by C. Adair & J. Luculano.
1	2/26/07	Revised to include: <ul style="list-style-type: none"> • Section 4.4, Included information on obtaining dosimeters. • Section 4.5, Added information and guidance on Exertional Heat Illness. • Section 10.3, Updated munitions safe distance guidance for temporary issue points. • Section 10.3, Added 65-foot standoff requirement for 50 Caliber ESS to Table. • Section 10.5, Added information on Propellant Exhaust Gas Secondary Ignition phenomena. • Tab 1, Added instructions for Amending Site Specific Safety Plans. • Tab 3, Revised Wet Bulb Global Temperature Index definition. • Tab 3, Revised Warm Weather Work/Rest Table to match military guidance (reference included). Tab 3, Added military guidance and references on Exertional Heat Illness/Injury.
2	11/7/07	Revised to include: <ul style="list-style-type: none"> • Section 3.0, Included reference to the OST Training Policy and Standard Operating Procedure • Section 9.0, Addressed vehicle safety when traveling in convoy configuration to and from training sites • Section 10.3, Updated controls on use of smoke grenades (per dated 9/21/07 memo)
3	1/7/08	Revised to include: <ul style="list-style-type: none"> • Reference to Calendar Year 2008 • Section 4.6, Added information and requirements for Hypothermia • Section 10.3, Revised controls on use of smoke grenades for clarification
4	1/11/08	Revised to include: <ul style="list-style-type: none"> • Section 12.0, Revised hazard table to better reflect results of hazard identification and deleted the second example. • Section 13.0, Added new section to align with OST Operational Risk Management Policy. • Corrected Tab references • Tab 4, Deleted Supplement to AF-Manual 91-201, incorporated pertinent information into Section 10.4

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1.0 SUMMARY

Safety is paramount in conducting training and exercises. All exercises will be conducted with the highest regard for protection of personnel, property, and the environment. This document establishes a consistent baseline of safety and health oversight requirements, and guidance. The objective is to standardize Safety Plans, while precluding the need to add repetitive detail in Site-Specific Safety Plans.

This document focuses on safety activities and issues that are common to most training and exercise events and is the premise for Site-Specific Safety Plans. Site-Specific Safety Plans are developed to document the integrated analysis of the activity and the area where the activity will be performed. Site-Specific Safety Plan content will be commensurate with the complexity and risk of the activity, and will include the necessary and sufficient controls to perform the activity compliant with established requirements and risk thresholds¹.

2.0 SCOPE

The requirements established in this document apply to all OST training and exercise activities and are to be executed consistently by participating and supporting federal, contractor, and Agency organizations.

Specific safety requirements for exercise activities such as live fire exercises, convoy exercises and Opposition Force (OPFOR) operations are addressed in the Exercise and Lesson Plan Risk Assessments, Site-Specific Safety Plan Hazard Assessment Section, and detailed safety briefings. The preparation and dissemination of these documents and briefings always precede the activity. Briefings should be given daily and must be given anytime activities or conditions change. General safety briefings for extended training and exercise activities will be given just prior to the activity, to ensure information is accurate and timely. General guidelines for live fire exercises are found at Tab 2.

3.0 RESPONSIBILITIES

All personnel will comply with the directive and procedural requirements in the documents listed below:

- DOE M411.1, "Safety Management Functions, Responsibilities and Authorities Manual"
- DOE P450.4, "Safety Management Systems"
- DOE G450.4, "Integrated Safety Management System Guide"
- DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees"
- DOE M 440.1-1, "DOE Explosives Safety Manual"
- DOE M 470.4-3, "Protective Force"
- OST Policy 3.08, "Safeguards and Security Training"
- OST Policy 7.07, "Operational Risk Management"
- 3.08.01, "OST Training Standard Operating Procedure"
- OST SOP T-2 "Separation of Exercise Participant Live Fire Tactical Equipment and ESS Equipment During OST Sponsored Training"
- OST SOP T-4 "M127A1 White Star Parachute Ground Illumination Signal"

¹ Further instruction on Site-Specific Safety Plans and Hazard Assessments can be found in ESHB procedures.

- OST Manual 5.16, "Munitions Management Manual"
- Dye Marking Cartridge activities will be governed by Office of Secure Transportation (OST) SOP T-10, "Dye Marking Cartridge Training for OST Federal Agents".

If there is a discrepancy or conflict between orders and/or procedures, the more stringent will be followed.

All employees have the right and responsibility to report unsafe acts, conditions, or practices, without fear of reprisal. Employees also have the right to remain anonymous. Employees can do this by calling the Exercise Director, Exercise Safety Controller, OST Safety Manager at (505) 845-5094, OST Management or the DOE Office of Inspector General Hotline at 1-800-541-1625. All participants, safety professionals, or controllers have the authority and responsibility to stop an activity if, in their opinion, unsafe conditions develop or if they observe any unsafe condition or practice.

DOE Manual 411.1, "Functions, Responsibilities and Authorities" and DOE Policy 450.4, "Safety Management System" states: *...Each line, support, oversight, and enforcement organization within the Department is responsible for establishing and documenting how the specific functions and responsibilities assigned to them in the Manual are properly discharged. Separate organizational and operating documents will be prepared by each organization to define how its functions are to be carried out and identify who has the responsibility and authority to do so.* The following paragraphs define training activity responsibility and authority in accordance with these requirements.

3.1 Exercise Director

The Exercise Director has line management responsibility for safety and for performing work within authorized controls. Line management is responsible and accountable for integration of safety into the activity. As the line manager, the Exercise Director is responsible for setting clear expectations, directing the activity and bears accountability for the results.²

The Exercise Director is charged with overall responsibility for the exercise, to include pre-planning activities, assuring command and control during the exercise, and follow-up for any lessons learned. Specifically the Exercise Director is responsible for:

- (a) Assuring that all appropriate safety and security controls are in place prior to the start of, and during, the exercise;
- (b) Signaling the beginning and end of exercises, and for guiding and supervising the other controllers;

When the designated Exercise Director is the Approval Authority for the activity, he/she has final authority for exercise halts due to potential safety or security concerns³. In instances where the Exercise Director is not the Approval Authority, the final authority for potential safety concerns is delegated to the lead safety controller, as described in paragraph 3.3.

² DOE G450.4-1B, Volume 1, Chapter 1, 1.4.3

³ Section A DOE M 470.4-3, VII-10 08-26-05

3.2 Senior Controller (SC)

The SC has field responsibility for safety during all exercises, and will serve as the line manager during the activity. (NOTE: References to the SC apply to any instructors, exercise coordinators or program managers who have been assigned responsibility and authority for training and exercise activities involving OST personnel, support personnel, individuals and/or groups using OST-issued assets.)

The SC reports directly to the Exercise Director and is responsible for:

- (a) Developing and documenting the Execution Plan;
- (b) Ensuring that a sufficient number of technically qualified controllers are assigned to support each exercise event;
- (c) Identifying and supervising the exercise controller staff;
- (d) Assigning and directing controller staff to perform duties specified in DOE M470.4-3 "Protective Force"; (Safety Controller; Engagement Simulations Systems (ESS) Controller; Shadow Force Controller; Event Controller; Special Controller);
- (e) Ensuring that all controllers have attended on-site, pre-exercise controller training and are briefed on the scenario orientation;
- (f) All participant groups, are thoroughly briefed on their respective exercise scenarios, Rules of Engagement (ROE), Site Specific Safety Plans, and Security Plans;
- (g) OPFOR personnel (contractor or agency)
 - o Receive training on OST procedures for ESS exercises, site-specific requirements and controls, and
 - o Participate in safety walk downs of the exercise area.
- (h) Implementing and maintaining controls to ensure that the activity is performed within authorized limits;
- (i) Accountability of personnel (including technical support, observers, evaluators, staff, role players, and participants) and equipment at the end of each activity;
- (j) Reporting accountability information to the Exercise Control Center (ECC); and
- (k) Exercise debriefings (After Action Reviews) are conducted and documented.

3.3 Safety Controller

The Safety Controller has a single focus that encompasses the entire exercise activity – SAFETY. The Chief, ESHB will appoint a Lead Safety Controller for each training activity. The Lead Safety Controller may assign additional Safety Controllers to assist as necessary commensurate with the complexity and scope of the activity. These controllers may include an OPFOR safety controller, a logistics area safety controller, or operational controllers to oversee the safety of limited operational activities.

The Lead Safety Controller assists and advises the SC and must remain in contact with the SC at all times during the exercise. Although the Exercise Director/SC has line management responsibility for safety in accordance with Integrated Safety Management (ISM) Guiding Principles; the Safety Controller is responsible to the Approval Authority for ensuring activities are performed as authorized⁴. This provides for balanced priorities such that conducting the activity does not compromise the safety of personnel, property, and/or the environment.⁵

⁴ DOE G 450.4-1, Volume 1, Chapter III, Section 4.6, *ES&H must have clearly defined roles and responsibilities that ensure work is performed safely within the principle that line management is responsible for safety.*

⁵ DOE 5480.19, Section 5.e., *ensure that DOE Facility Representatives are assigned...and oversee the day-to-day conduct of operations at these facilities.*

The Safety Controller acts to advise and verify to the Exercise Director and/or SC on actions necessary to:

- Address conditions that pose a potential for severe injury or fatality,
- Enforce compliance with established safety requirements and controls, and
- Resolve dissenting opinions relative to safety requirement and controls implementation.

The Safety Controller is responsible for assessing the exercise or execution plan and ensuring that walk downs of the exercise area and safety briefings are conducted⁶. The Safety Controller also ensures that safety briefings specify the ROE, medical response, munitions, firearms, vehicle, and personnel safety⁷. Specifically, the Safety Controller:

- (a) Performs site specific hazard assessments
- (b) Develops and documents the results of the hazard assessment in Site Specific Safety Plans and Safety Briefings
- (c) Evaluates and documents readiness confirmation
- (d) Assists the SC in the development and conduct of Controller training
- (e) Verifies that required personnel are present for each safety walk down;
- (f) Conducts a safety walk down of the activity area with the Exercise Director, SC, Event Controllers, Shadow Force Controller, and other selected controllers (as appropriate) prior to the activity;
- (g) Verifies that controls are in place and maintained
- (h) Conducts the Safety Briefing, if appropriate; and
- (i) Coordinates with emergency management personnel to ensure emergency medical and fire protection services will be present or on call for the duration of the activity.

3.4 Controllers

Personnel assigned to controller duties must undergo a Controller Training Course that meets the criteria of the DOE National Training Center (NTC) prior to performing such duties. No one will be permitted to serve as a controller unless they have successfully completed the required course.

The foremost responsibility for controllers is ensuring safety during exercise activities. This includes enforcing participants' adherence to safety procedures and ROEs. In many instances, the Controller may be the only person at an event location watching for potentially hazardous situations during the exercise. The controller must be prepared to take immediate and decisive action to prevent accidents or unsafe conditions.

Personnel assigned controller duties will be responsible for enforcing or implementing the following general requirements during exercises:

- 1) Conducting safety checks and inspections of all ESS participants and vehicles under their control for live ammunition, prohibited articles, general safety considerations, and reporting the results to the SC prior to the beginning of the exercise.

⁶ DOE M 470.4-3, Section A, Chapter VII, paragraph 4.c(3)

⁷ DOE M 470.4-3 Section A, 08-26-05 VII-11

- 2) Prohibiting live fire weapons or ammunition of any type within the engagement simulation system (ESS) exercise area, except those under the direct supervision of a shadow force controller.
- 3) Ensuring exercise participants wear appropriate safety equipment.
- 4) Enforcing participant compliance with the Exercise Plan, Execution Plan, Operations Plan, Safety Plan, Security Plan, and Rules of Engagement.
- 5) Ensuring that participants handle/manipulate ESS weapons in accordance with live-fire operations procedures.
- 6) Ensuring that ascents to or descents from structures, vehicles, etc., are accomplished in a safe manner utilizing available stairs, ladders, ropes or other methods mastered in relevant training or exercises.
- 7) Stopping a specific activity, or the entire exercise, if unsafe conditions or acts are observed.
- 8) Accounting for personnel and equipment at the termination of the exercise, and reporting the results to the SC.

Controllers shall continually watch participant performance for signs of deteriorating physical and mental conditions. This deterioration may be caused by fatigue due to long workdays, lack of sleep, or excessive exposure to high or low temperatures. Controllers shall restrict participant involvement in activities where the deterioration may have dangerous consequences.

3.5 Participating Agencies

Participating agencies will be accountable for identifying materials, equipment, or operations for which they are responsible and which present significant hazards, such as explosives, weapons, toxic chemicals, power tools, motorized equipment, high temperature, flame or heat-producing devices, and high-voltage equipment. When such issues have been identified, a written safe operating procedure will be prepared by the responsible agency and given to the SC at least 30 days prior to the exercise. This procedure will, in addition to identifying the hazards, ensure that the operation has been adequately assessed, risks have been identified, and necessary safeguards have been established.

Each agency will be responsible to the SC for ensuring that personnel performing operations covered by the aforementioned procedures are thoroughly familiar with their contents before the start of operations. Each agency is also responsible for identifying instances where their operating practices are more stringent and may limit their participation. These restrictions will be integrated into the Site Specific Safety Plan and briefing. Conversely, less conservative practices must be identified, evaluated by ESHB, and accepted by the appropriate OST Approval Authority.

4.0 PERSONNEL SAFETY

Various evolutions of our exercise activities involve personnel in high stress situations. People under extreme stress tend to make more mistakes than they would under normal conditions; increasing the likelihood of accidents. Participants must be aware their attitude can greatly influence the safe outcome of the event. All personnel will use self-restraint and good judgment

and take precautions to prevent accidents. **BE ALERT. TRAIN AS YOU FIGHT, BUT THIS IS A TRAINING EVENT/TACTICAL EXERCISE AND SAFETY MUST COME BEFORE REALISM.**

Sleep deprivation can result in poor judgment, faulty decision, and accidents. Given the tempo of exercises, which may be conducted during day and night, and which may extend for many hours without rest, sufficient sleep is critical for participants. Participants must be afforded the opportunity to receive 8-hours of sleep every 24-hour period. Sufficient time must be allowed each exercise day for travel to and from the exercise area, as well as time to draw and turn in equipment, and still permit the 8 hours of sleep for participants.

Personnel must be trained and qualified in the tasks to be performed. They must understand the safety standards, requirements, and precautions that apply to their assigned tasks. Personnel conducting hazardous operations including, but not limited to, the use of chain saws, burn bars, all-terrain vehicles (ATV's), forklifts, winches, and maintenance or repair of power driven, or energized equipment must be trained in their proper use and maintenance or repair according to individual agency procedures. Evidence that this training has been completed (e.g., training record) must be made available as requested to the Safety Controller prior to the exercise.

All unauthorized personnel will be excluded from the exercise area. Authorized observers in the exercise area will exercise care to ensure they do not intrude into the exercise. They will also wear orange reflective vests during daylight and use blue glow sticks at night. Individuals, other than players, safety personnel, and technicians in the operational area, must be under the continuous and direct control of a controller to ensure they understand their roles and do not become involved in the exercise. Authorized non-play or "invisible" vehicles in the exercise area will be tagged with blue glow sticks at night and yellow ribbons during daylight hours. The markings on the vehicle must be visible from above, front, back, and both sides.

4.1 Hostages

Exercise hostages will not be physically abused. They may be physically searched and temporarily secured. In some cases, one or more hostages will be isolated from the rest of the hostages or released during the scenario. Under no circumstances will a hostage, prisoner, etc., be secured to a moveable object. This includes all motor vehicles or machinery whether capable of being energized or not.

Participants who may become hostages must be advised ahead of time that they may be detained for a short period of time. Any participant who has a problem with being detained should notify the SC and/or safety staff and should be excluded from that particular event.

In a short-term hostage situation, controllers must monitor the condition of the hostages at all times to ensure their physical and mental well-being. If a hostage develops a problem, he/she should immediately inform the controller who will release them from the exercise area. These situations must be reported to the Safety Controller.

For long-term hostage situations, the lead OPFOR will be responsible for the safety and welfare of hostages. The term "Real-Life Emergency" will be used in communications should a hostage or OPFOR member become ill or be suffering in any way. If a problem arises during a hostage event, it will be brought to the attention of the lead OPFOR IMMEDIATELY. The lead OPFOR

will also ensure all occupants of the facility are moved into a safe area during assault phases, and are provided with appropriate personal protective equipment and safety equipment.

4.2 Use of Medication, Controlled Substances and Alcohol

Participants taking prescription medication shall report this fact to the SC. The SC shall be responsible for determining whether a participant is safe to participate in exercise. The SC will contact the Human Reliability & Resources Branch at (505) 845-6677/6073/5356/4702/5219/5110, for guidance on specific prescription medications. The hazards associated with certain over-the-counter medications will be provided to all participants during the initial safety briefing.

Use or possession of any illegal controlled substance is strictly prohibited. If anyone detects the presence of an illegal controlled substance in the possession of a participant or if a participant is believed to be under the influence of an illegal controlled substance, the controller shall remove the participant from exercise play. Appropriate follow-on action shall be taken in accordance with applicable DOE/DOD regulations, appropriate portions of the United States Code (USC); and/or applicable state laws.

Players, controllers, technicians, and support personnel will not consume alcoholic beverages within an 8-hour period prior to reporting for duty. The possession of alcohol at an exercise site is prohibited. If a controller detects the presence of alcohol on a participant or if a participant is believed to be under the influence, the controller shall remove the participant from the exercise, and appropriate follow-up action shall be taken in accordance with DOE or local regulations.

4.3 Personnel Protective Equipment (PPE)

Wearing of eye and hearing protection **IS MANDATORY** when exercise scenarios require their use. Eye and hearing protection requirements will be briefed to participants during pre-exercise safety briefings.

During convoy scenarios, eye and hearing protection will be mandatory for all vehicle occupants if there is a possibility of ESS weapons being fired from inside a vehicle (see section 9.1).

Participants must be aware of the increased risk of ankle, knee, and elbow injuries during the exercise. Sturdy, high-topped boots with laces will provide some support to the ankle without producing undue stress to the knee. Elastic ankle supports are available for issue and will be provided upon request. Their use is highly recommended.

Hard shell knee and elbow pads are issued to participants to afford an additional degree of protection to knees and elbows. **OST personnel are required to wear knee and elbow pads during force-on-force and tactical scenarios.**

4.4 Radiation Protection

Radiation protection concerns are contingent on the site/facility. If there are radiological areas or concerns, host site and/or OST health physics and industrial hygiene need to be consulted for possible surveys or supporting data. This information will be documented in the Site-Specific Safety Plan and briefed to all participants as necessary.

If it is determined that dosimeters are required, the Safety Officer shall coordinate this request through the appropriate ESHB representative.

4.5 Exertional Heat Illness

Exertional Heat Illness (EHI) has been recognized as a substantial problem in military operations and training. It is a fairly common illness in healthy young adults undergoing strenuous physical training in warm and humid weather. EHI arises from sustained or heavy exertion, usually in a hot environment. Typically, onset is abrupt, occurring during or shortly after exertion, with orthostatic manifestations (faintness, staggering, or visual disturbance) leading to events such as collapse, confusion, and delirium. EHI is significantly different from the classic heat illness that is typically associated with extended exposure to a hot environment and that primarily impacts older people or those with weak cardiovascular reserve.

The most severe cases of EHI, similar to those in classic heat illness, are categorized as exertional heatstroke, exertional heat injury, and exertional heat exhaustion. Exertional heatstroke is characterized by early, severe, non-focal encephalopathy (neurological disturbance) with hyperthermia (increase in core temperature). Exertional heat injury is a progressive multi-system disorder, with hyperthermia accompanied by organ damage or severe dysfunction, e.g. metabolic acidosis, acute renal failure, or muscle necrosis. The external heat exhaustion is a reversible, non-life-threatening multi-system disorder reflecting the inability of the circulatory system to meet the demands of thermoregulatory, muscular, cutaneous, and visceral blood flow.

EHI requires urgent diagnosis and treatment. Although severe cases of EHI constitute clear medical emergencies, patients with EHI at milder levels also require urgent and aggressive management to avoid progression. Specifically and as recommended in reference noted below, (1) in controlled settings, emergency medical care for EHI should be arranged in advance, (2) if transportation to an emergency department requires more than 5 to 10 minutes, provisions should be made for administering intravenous fluids en route, and (3) management of military training centers should require that at least one medic is present on site while strenuous training is conducted, and when emergency vehicles leave the training site, strenuous activities should be stopped until medical support and transport are again available.⁸

4.6 Hypothermia

Hypothermia Developed Condition is a recognized problem in cold, windy and wet environments. Hypothermia develops in three medically recognized stages.

Mild hypothermia where the body core temperature reaches 93.2-95 degree Fahrenheit (F). In this range, most people shiver vigorously. As the body temperature drops below 93.2 F, a person may develop altered judgment, amnesia, and dysarthria (inability to articulate words due to Central Nervous System (CNS) damage). Respiratory rate may also increase.

Moderate hypothermia is where body core temperature reaches 84.2-93.2 F. Oxygen consumption decreases and the CNS depresses further. Most people with temperatures of 93.2 F or lower, act as if in a stupor (drunken state). As the core reaches temperatures of 87.8 F or below, the body loses its ability to generate heat by shivering. At 86 F, patients become at risk for arrhythmias (heart beat change). Atrial fibrillation and other atrial and ventricular rhythms may be present. The pulse continues to slow progressively and cardiac output is reduced. At

⁸ *Medical Aspects of Harsh Environments*, Textbooks of Military Medicine, Published by the Office of the Surgeon General, Department of the Army, USA

82.4-86 F, pupils may become dilated and minimally responsive to light, a condition that can mimic brain death.

For severe hypothermia <82.4 F, the body becomes markedly susceptible to ventricular fibrillation and further depression of myocardial contractility. The outcome is Death.

Personnel with shivers that have had prolong extended exposure to moderate and severe cold, wet and windy environments require urgent diagnosis and treatment.

The following actions will be taken for all training and exercise venues where cold weather is expected:

- Participants are briefed/made aware of hypothermia symptoms and response.
- Additional external-warming devices (chemical portable hot packs) and blankets are made available.
- Emergency medical care for hypothermia is readily available (e.g., there is onsite capability to administer warmed intravenous fluids and availability of warmed, humidified oxygen is available if transport to emergency hospital care requires more than 5-10 minutes).
- Airway management and transportation should be undertaken as gently as possible to avoid precipitating ventricular fibrillation.

5.0 EMERGENCY AND MEDICAL RESPONSE

Prior to becoming involved in exercise activities, each participant will be briefed on the emergency resources available at the exercise site(s). The Site-Specific Safety Plan will include site-specific emergency response information. Tab 2 describes Live Firearms Safety Incident Response and Reporting Expectations.

Individuals reporting an Emergency should begin by saying:

"MAYDAY, MAYDAY, MAYDAY"

Be prepared to answer the following:

- Type of accident (personal injury, POV, wheel track mishap, property damage, explosives, etc.)
- Number of casualties or type/extent of injuries
- Ambulatory or litter
- Location of accident (Exercise area-grid; On-Post; Building, Street; Off-Post: Street, City, State)
- Give directions to the problem area.
- Stand by to assist emergency response forces, or have someone knowledgeable stand by.
- Name of person submitting information and means of contact

ANY person observing a life-threatening situation should initiate an **"EXERCISE FREEZE"** condition and immediately notify the nearest Controller who in turn will notify the SC. The SC has communication with all participants and can effectively freeze the exercise. When an **"EXERCISE FREEZE"** occurs, **EVERY PARTICIPANT** must immediately freeze **IN PLACE** until the command **"RESUME EXERCISE"** is announced. Use common sense when freezing

"IN PLACE", make sure that you are not expected to put yourself in harms way (e.g., in the middle of a roadway where you would be exposed to vehicular traffic).

5.1 Accident Reporting

All injuries, incidents, and accidents must be reported immediately to the nearest controller or safety professional. Anyone observing a participant who is obviously ill or injured will immediately advise the nearest controller or safety professional. Render first aid until help arrives, if trained to do so. Advise the safety professional of even minor injuries.

Federal employees will complete a Department of Labor Form, CA-1, Federal Employee's Notice of Traumatic Injury or Claim for Continuation of Pay, to document each exercise-related injury. Participating agency and contractor employees who are injured will follow their respective Worker's Compensation/Accident/Injury Reporting procedures.

Damage to equipment and vehicles must be reported to a controller at the end of each exercise. Controllers will be responsible for reporting property damage, as well as accidents and injuries, to the ECC at the end of the exercise. Serious accidents and injuries will be reported to the Safety Controller as soon as possible. The Safety Controller will take immediate measures to preserve the scene of the accident; further measures are contingent on management direction. This ensures that responsibility and authority for the investigation is commensurate with the event severity and protocols.

6.0 NATURAL PHENOMENA

Individuals must assume responsibility for protecting themselves from hazards in the exercise environment. This includes un-detonated explosive devices and ammunition, harmful snakes and insects, barbed wire fences, tripping hazards, open holes, etc. It is, however, the SC's responsibility to brief all participants on hazardous conditions specific to a particular event prior to the start of each activity. This is also true of the staging and supply areas.

When conducting pre-exercise safety surveys the ESHB safety professional will contact the appropriate Facility Forestry/Agricultural Department, local Environmental Office, or other knowledgeable resource to inquire about poisonous or protected plants and habitations, limits or restrictions for off-road driving, seeded or study areas, and endangered species. This information will be included in the Site Specific Safety Plan.

6.1 Wildlife

The ESHB safety professional conducting the pre-exercise safety survey will contact the appropriate Environmental Office or obtain data from a knowledgeable source on protected and endangered species and potentially dangerous animals, insects, and reptiles. The ESHB safety professional will evaluate the hazard and document the results in the Site-Specific Safety Plan.

6.2 Environmental Concerns

Many sites require the submittal and approval of an Environmental Checklist (ECL), Record of Consideration (REC) and Spill Plan before any training or activity is permitted. The ESHB Safety professional will identify protected areas and environmental requirements during the site safety survey and document specifics in the Site-Specific Safety Plan. Documents that may need to be generated and submitted include NEPA Certificates, Spill Plans, Burn Permits, and Protected Areas.

6.3 Weather

In the event of inclement weather, safety personnel, in conjunction with controllers and the Exercise Control Center, will monitor road and weather conditions. The "OST Inclement Weather Criteria for Courier Exercise and Qualification" will be used to determine if the exercise is to be postponed. The Safety Controller should advise the SC on the appropriate actions to be taken in the case of threatening weather. All outdoor operations, whether at the staging area or the exercise site, shall be discontinued when lightning storms are within a five-mile radius. Three blows of a horn or whistle may be used to signal severe weather conditions and cause the event to be postponed until conditions improve.

Weather conditions dictate specific health concerns. Hot weather concerns include sunburn, dehydration, heat cramps, heat exhaustion, and heat stroke. Cold weather concerns are dehydration, frostbite, and hypothermia. Creek beds and low ground in the exercise area are subject to flash floods. Participants should be aware of the potential hazards and not attempt to use such areas during inclement weather unless they have received approval to do so by the SC or his representative. Specific weather and associated safety controls will be addressed in the Site-Specific Safety Plan and safety briefings.

7.0 FIRE SAFETY

Prior to becoming involved in exercise activities, each participant will be briefed on the emergency firefighting resources available at the exercise site(s). The Site Specific Safety Plan will document site-specific fire response information. **PARTICULAR CARE SHOULD BE TAKEN TO ENSURE THAT EXERCISE OPERATIONS DO NOT CAUSE FIRES.** Controllers should direct participants away from exercise areas where combustible materials/vegetation are located, wherever possible.

7.1 Re-Supply Fuel Storage

Re-supply fuels, specifically gasoline, kerosene, and diesel fuel, shall be stored only in approved containers. They shall be clearly labeled for content, and shall be stored away from combustible materials. They shall not be stored within 50 feet of an ignition source such as an open flame, electrical, or gas operated equipment that could spark or short out. **"NO SMOKING"** signs shall be posted near the storage area. Fire extinguishers and other safety equipment (such as shovels, etc.) shall be stored in close proximity to the re-supply fuel storage area, but not with the fuel containers.

7.2 Re-Fueling From a Nurse Tank

When refueling a vehicle, generator, etc., from a nurse tank on another vehicle, both vehicles, or vehicle and generator must be turned off. There will be no smoking within 50 feet of the refueling area, and at least one Class 10B fire extinguisher shall be on hand during the refueling operation. Normal vehicle fueling operations will be conducted at established fuel stations on or off Post or commercial station.

8.0 LASER SAFETY

All equipment using laser-emitting diodes must be FDA-certified and will be subject to ANSI Standard No. Z136.6-2000, "Outdoor Safe Use of Lasers". Training areas must be posted in accordance with requirements.

Rules for using ESS devices that incorporate laser-emitting diodes:

- Do not stare into a transmitting laser;
- Do not look into a transmitting laser with binoculars or telescopes;
- Do not aim a transmitting laser at shiny or reflective surfaces;
- Do not direct a transmitting laser into another person's eyes.

9.0 VEHICLE SAFETY

9.1 Traveling to/from Training Areas

OST may travel in convoy configuration to designated training areas. Since there is no mission safeguard responsibility associated with this travel, OST carries limited operational equipment (e.g., firearms and small arms ammunition). Additionally, training interjects are focused on observation skills and intelligence gathering/reporting; responses to training interjects are passive/static. Primary hazards associated with these activities are those associated with normal vehicle operation and road/traffic conditions. Following established traffic laws, ensuring our vehicles are roadworthy, and employing our rest/drive procedures are considered sufficient preventive and mitigative controls.

9.2 Traveling within a Designated Training Area

All vehicles will be operated with reasonable care and judgment to minimize risk to the driver and to all other participants. Vehicles must be fully operational before being used. (This includes brakes, horn, hazard lights, turn signals, brake lights, headlights, must all be in working order.) Drivers and all passengers must observe all laws relating to vehicle operation, including seat belt laws and posted speed limits. Speed limits during an exercise shall NOT exceed posted speed limits. The following requirements will be covered in a pre-exercise/activity safety briefing.

The maximum speed limits for convoy vehicles, unless otherwise posted, are:

- a. On paved roads, 40 miles per hour (mph) during daylight and 20 mph at night under black out conditions;
- b. On dirt and gravel roads, 25 mph during daylight and at night, and 15 mph at night under blackout conditions.
- c. Once an attack is initiated the speed limit for all vehicles, regardless of surface being traversed, will be 25 mph during the day and 15 mph at dusk and at night.
- d. In assembly areas, and other areas with large amounts of vehicles or dismounted pedestrian traffic, or off road at night, the speed limit is 5 mph.

Additional requirements are as follows:

- a. Drivers and passengers MUST wear their safety belts in moving vehicles at all times. No one shall ride on running boards, fenders, hoods, bumpers, trunks, or top of vehicles. If OPFOR members are required to be in the bed of a moving pick-up during a tactical exercise, they must wear safety belts attached to passenger benches mounted to the bed of the truck for that purpose, or secured to the truck bed by a restraining ("Monkey Strap") device.

- b. Vehicles may not be mounted or dismounted until they come to a complete stop. Parking brakes must be set and transmissions placed in "park" prior to occupants dismounting vehicle.
- c. **THERE WILL BE ABSOLUTELY NO ATTEMPT TO USE A VEHICLE TO CRASH, BLOCK, OR IN ANY WAY ENDANGER ANOTHER VEHICLE, PERSON, OR PROPERTY.**
- d. A vehicle following another vehicle shall never be closer than 2 seconds to the vehicle it is following, regardless of the speed they are traveling.
- e. Tractor/trailer rigs shall never be closer than 6-seconds to the vehicle it is following.
- f. If a vehicle is to be set on fire during an exercise scenario, it must have the gas tank removed or filled with water prior to starting the scenario. In addition, appropriate site coordination, permits, and approval must be obtained.
- g. All vehicle occupants in a vehicle where ESS weapons are fired must wear hearing protection, eye protection with side shields, and buttoned collars. The muzzle of the ESS weapon must be completely out of the vehicle windows before the safety lever is moved to "Fire" and the finger is placed on the trigger.
- h. Any window from which an ESS weapon is to be fired will be completely open before the weapon is pointed out of the window.
- i. No firing from open vehicle doors is permitted unless the vehicle has come to a complete stop, transmission put into park, and the parking brake is set.
- j. The driver will not fire from a vehicle until the vehicle has come to a complete stop, transmission put into park, and the parking brake is set.
- k. Drivers must be especially alert to the presence of wildlife crossing convoy routes. Driving during times of reduced lighting present the greatest hazard.

9.3 Off-Road Operation

Vehicles will not be operated off roadways unless necessary for exercise play and then only in those areas that have been coordinated and approved by the host site, SC and the OST ESHB Representative. In the event off-road driving is required, speed is determined by the terrain, road and weather conditions, and shall never exceed 10 mph. Transition from on-road to off-road will be accomplished with reasonable care and judgment. Before leaving a roadway, speed must be reduced to 10 mph or less. Controllers must ensure that off-road driving is accomplished in a safe and reasonable manner. It must be emphasized that all passengers (Federal Agents, controllers, OPFOR personnel, support personnel) must be seated in seats and seat belts fastened until the vehicle comes to a complete stop.

9.4 Non-Exercise "Invisible" Vehicles

Non-exercise vehicles will be identified by yellow streamers or tape during the day and blue "Glow Sticks" at night. These are for vehicles that must be in the area, such as the SC, safety personnel, logistics support and technicians. The yellow tape, streamers, or Glow Sticks must

be visible 360° around the vehicle and from above. Additionally, these vehicles will not be ESS equipped.

9.5 ATVs

Personnel operating ATVs must be fully trained and certified in their use. ATVs must be on-loaded to, and off-loaded from, transport vehicles in a safe and reasonable manner. Personal protective equipment must be used when operating ATVs, i.e., helmets, gloves, goggles, boots, long pants, and long sleeved shirts. Tactical helmets are not authorized for routine use on ATVs. Tactical Armor Helmets equipped with foam insert ballistic liner upgrades may be used when operating the ATV after exercise initiation when speeds are reduced to 25 mph or less. Any payload must be securely fastened, checked and approved by a controller prior to the ATV moving.

9.6 Emergency Vehicles

Emergency vehicles are NOT part of the exercise unless they are equipped with ESS equipment. In the event of a real-world emergency such as fire, traffic accident, or serious injury, "real world", non-play, emergency vehicles will respond. **DO NOT DELAY THESE VEHICLES FOR ANY REASON.**

It is unlikely, but possible, that an injured person will have to be transported in an in-play, ESS equipped vehicle. If this happens, it is likely that an "**EXERCISE FREEZE**" has been initiated and all participants have been notified. It is critical that everyone remains alert and aware of all developments. **NOTE: REMEMBER that during tactical engagements, participants are engaged in extremely stressful activities that require quick action and extreme concentration. Therefore, they may not be looking for moving vehicles before moving across a street, parking lot, field, etc. It is extremely important that all personnel remain alert and conscious of everything that occurs during the exercise or training activity.**

10.0 WEAPONS, MUNITIONS, and EXPLOSIVE SAFETY

10.1 ESS Weapons and Munitions Control

Munitions to support approved exercise activities are requested on Form 43, Logistical Support Request. Only those munitions that have been reviewed and approved as part of the Execution/Exercise Plan will be present and used at the exercise area.

Contractor munitions/explosives specialists and armory personnel will ensure that ESS weapons and blank ammunition and live fire weapons and ammunition always remain segregated and are never issued in a common area. When conducting simultaneous activities (ESS and live fire) all weapons and ammunition will be accounted for and secured in their separate designated staging area by the contractor munitions/explosives specialists or armory personnel. When this is completed, the SC or his designated representative will direct the munitions delivery vehicle to proceed to the designated live fire range issue point. All other live fire weapons will be under the control of, and secured by, the contractor logistics staff. All live fire ammunition will be secured in a designated storage area, away from the exercise area(s).

Prior to issue, Armorers will inspect all ESS exercise weapons to ensure that the required ESS modifications (porting and/or live round inhibitors, and blank fire adapters/blast deflectors) are installed. Armorers will inspect ammunition to ensure it is blank ammunition of the proper

caliber, appropriately color-coded, and that, as applicable, magazines to be issued are equipped with necessary live round excluders.

Upon receipt of their weapon(s) participants will inspect them to ensure that only ESS weapons and ammunition have been issued. ESS weapons shall not be loaded until authorized by the SC and shall never be pointed or fired at an individual who is closer than 10 feet (3 meters).

10.2 Sanitization

The Exercise Director has overall responsibility for ensuring that no live fire weapons or live ammunition of any kind are allowed into a force-on-force exercise area. Reference OST SOP T-2 for sanitization and separation procedures. Privately Owned Firearms (POF) are **NOT ALLOWED** at any OST event or facility. This includes training and testing events regardless of the location. Personnel must comply with all federal, state and local laws pertaining to carrying and transporting privately owned firearms. In addition, POFs will not be transported via any NNSA/OST conveyance, i.e., NNSA aircraft, government-owned vehicles or Logistic Storage Trailers (LSTs) or Mobile Training Trailers (MTTs).

Safety Controller(s) and/or Controllers designated by the SC will perform inspections of personnel, vehicles, weapons, and ammunition. This inspection will be accomplished prior to moving out of the staging area into the exercise area.

Controllers will ensure that:

- a. Only weapons with approved live round inhibitors and/or porting, and blank fire adapters or that have been permanently modified and dedicated for exercise simulation have been issued.
- b. Blank ammunition magazines/clips/belts (first link) are appropriately color-coded and, where appropriate, are equipped with live round excluders prior to issue.
- c. All tactical vests, travel bags, and vehicles entering the safe zone are inspected for live fire weapons, ammunition, and prohibited items.
- d. All inspected items are tagged and remain segregated.
- e. Participant vehicles, participant personnel and other items leaving the safe zone, remain under the supervision of a controller or are inspected prior to re-entry in the safe zone.

10.3 Transportation, Handling, and Storage of Munitions and Explosives

OST and its contractors are responsible for the transportation and storage of explosives at the exercise site and will comply with DOE and host site requirements for storage. Transportation will be in accordance with US Department of Transportation (DOT) regulations. Explosive devices **WILL NOT** be carried on commercial airline flights or in privately owned vehicles.

Explosives will be under the control of the munitions/explosives contractor until appropriate transfer of custody is accomplished by receipt to the SC or his designee. Explosives shall be protected from abnormal stimuli or environments such as impact, shock, high temperatures, and open flames. Smoking is prohibited within 100 feet of any temporary established issue point

when explosives are present. Smoking is also prohibited within 50 feet of any motor vehicle, trailer, railcar or material handling equipment loaded with explosives in shipping/storage configuration. No matches, lighters, other fire, flame, or spark-producing devices (such as generators) shall be taken into an explosive storage area or within 100 feet of a temporary established issue point. Vehicle-mounted generators on explosive transport vehicles will not be utilized when explosives are within 100 feet or in the vehicle. Hazard Class 1 explosives will not be loaded on, or unloaded from, any motor vehicle with the engine running. There will be a single entry and exit designation with "No Smoking within 100 feet" signs clearly posted.

All explosives will be issued away from the common assembly area with a 50-foot clear zone around that area. The issue point will display the proper explosives storage hazard signs on all 4 sides when explosives are present. Once all explosives and pyrotechnics are signed for, the area will be cleared of any excess explosives and signs removed.

Operations are conducted in a manner, which exposes the minimum number of people to the minimum quantity of explosives for the minimum period of time consistent with the operation being conducted. Completion of a test/activity involving explosives after receipt of a lightning alert may be allowed only if test/activity preparation has progressed to the extent that discontinuance of the event would represent a greater danger than completion of the activity or attempting to recover or download explosives. Direction for such conditions is found in the OST Criteria for Inclement Weather (Tab 3).

Participants who will use or handle explosive devices must have appropriate training from a competent exercise controller in order to participate. Participating agencies and/or personnel must certify that this training has been completed. The Exercise Director will ensure verification of such training is accomplished. Only trained technicians will handle, install, arm, disarm, and remove top decks, boom boxes, etc., from exercise vehicles.

The following table lists the conditions, safe distances, and other safety controls for ESS munitions, pyrotechnics, and explosives.

Type	Condition	Safe Distances	Other Considerations
ESS – Blanks	Normal Operation	10 feet	ESS weapons shall not be loaded until authorized by the SC.
ESS – Blank M1A1 50 Caliber Blank	Normal Operation	65 feet (per Army FM 23-65)	ESS weapons shall not be loaded until authorized by the SC.
ESS – DMC	Normal Operation	3 feet	ESS weapons shall not be loaded until authorized by the SC.
M201A1 Training Grenade with Fuze	Regular and Mini		Noise Hazard
M124 Signal	Emergencies – Day: Smoke Night: Flare	Reasonable distance from personnel	Avoid fire hazard areas
Smoke Grenades - (Except M124 Signal, see above)	Used only in approved/defined training areas	<p>Within the Training Area:</p> <p>Downwind: 4 meters downwind (~13 feet)</p> <p>No wind: 4 meters radius (~13 feet)</p> <p>NOTE: The "Training Area" for the use of smoke will be defined as a 'Smoke Deployment Area.' The smoke deployment area is an area 50 meters in radius from a discharging smoke grenade.</p>	<p>Do not use indoors or in confined environments. All individuals in the training area will:</p> <ul style="list-style-type: none"> • Carry and be trained in use of gas masks pursuant to the OST RPP • Don gas masks when passing through dense smoke concentrations (visibility of <50 meters) or operating in "smoke haze" (visibility >50 meters) for longer than 4 hours
CTS 7290 Tactical Grenade	Regular and Mini	50 feet	Do not use in occupied areas ATF Accountable dunnage Noise hazard Shrapnel hazard
M49A1 Trip Flare	High Intensity Light – 1 minute	Reasonable distance from players	Fire and burn hazard Avoid fire hazard areas
M115A1 Artillery Simulator (Whistling)	Used by designated controllers only	115 feet from players	Noise hazard Fire and burn hazard Shrapnel hazard Avoid fire hazard areas
RPG Rocket	Normal Operation	30 feet to rear, 5 feet to each side	Fire and burn hazard Avoid fire hazard areas
M119 Whistle Sound Booby Trap Simulator	Pre-positioned	10 feet	Fire and burn hazard Avoid fire hazard areas

Type	Condition	Safe Distances	Other Considerations
Shape Charge Simulator ATWESS Cartridge		30 feet to front, 5 feet to each side	Handling limited to Honeywell technicians/procedures Noise hazard
Bomb Van/Command Detonated Booby Trap Simulator	Fully Loaded – SC-10/M-30, 24 count capacity	75 feet	Handling limited to Honeywell technicians/procedures Noise hazard
Vehicle Hit Indicator	<ul style="list-style-type: none"> ▪ Roof and top portion of vehicles ▪ Claymore mines operated by OPFOR 	10 feet to side	Handling limited to Honeywell technicians/procedures
Bang Box System (Top Deck)	Roof and top portion of vehicles	10 feet to side Eye/hearing protection in immediate vicinity	Handling limited to Honeywell technicians/procedures

10.4 Duds/Misfires

Unexploded Military Munitions are a potential hazard on any federal installation or training area where they may have been used both past and present. Do not approach suspected duds of any kind, or allow anyone else to touch or handle it. Mark the location with fluorescent engineer tape or orange cones and immediately notify your controller. The SC or Safety Controller will coordinate notification and proper disposal through the host site Range Control.

Pyrotechnic Misfires will be moved to a safe location and/or transported or deferred for disposal in accordance with host site Range Control procedures (see the event site specific Safety Plan). **An Interim Hazard Classification listing the item’s compatibility group as an “L” must be in place prior to moving unserviceable items off of a host site (public transport to home station)⁹.** In the event Explosives Ordinance Disposal (EOD) services are not available, misfired items will be handled in accordance with the following:

Type	Wait Time	Procedures
Ammunition <ul style="list-style-type: none"> • Small arm ≤50 cal • ESS 40 MM Training Cartridges	N/A	<ul style="list-style-type: none"> • SC or Safety Controller notifies host site Range Control. • SC or Safety Controller moves ammunition to a safe location. • Munitions Specialist will place in container marked as unserviceable. • Munitions Specialist will segregate from usable assets. • Munitions Specialist will transport to host site storage/disposal area.

⁹ DOE M 440-1.1A, Section 17.4.c(11) “Group L – explosives or ammunition... which present a special risk... Examples are damaged explosives, suspect explosives, and explosives, explosive devices or containers that have undergone severe testing...” A DOE or DOD Certifying Official issues interim Hazard Classifications.

Type	Wait Time	Procedures
Smoke Grenades (M18, M83, AN-M8) and Commercial Type	5 minutes	<ul style="list-style-type: none"> SC or Safety Controller notifies host site Range Control. PPE includes leatherwork gloves - SC or Safety Controller moves munition to a safe location. Munitions Specialist will place in container marked as unserviceable. Munitions Specialist will segregate from usable assets. Munitions Specialist will transport to host site storage/disposal area.
Surface Flares (M49 and MK-124 Series) Aerial Flares (M127 and AP25S Series)	30 minutes	<ul style="list-style-type: none"> SC or Safety Controller notifies host site Range Control. PPE includes leatherwork gloves - SC or Safety Controller moves munition to a safe location. Munitions Specialist will place in container marked as unserviceable. Munitions Specialist will segregate from usable assets. Munitions Specialist will transport to host site storage/disposal area.
M201A1 Flash Bang Training Fuse 7290/7290M Live Diversionary Grenades	30 minutes	<ul style="list-style-type: none"> SC or Safety Controller notifies host site Range Control. PPE includes long-sleeved shirt, hearing protection, leatherwork gloves, safety shield and/or goggles - SC or Safety Controller moves munition to a safe location. Munitions Specialist will place in container marked as unserviceable. Munitions Specialist will transport to host site storage/disposal area. Munitions Specialist will segregate from usable assets. Munitions Specialist will transport to host site storage/disposal.
Pyrotechnic Cartridges (SC-10/12, M22, M30)	30 minutes	<ul style="list-style-type: none"> SC or Safety Controller notifies host site Range Control. Handling limited to technicians/procedures. PPE is specified in these procedures.
M115A1 Artillery Simulator (Whistling)	60 minutes	<ul style="list-style-type: none"> SC or Safety Controller notifies host site Range Control. SC or Safety Controller establishes a 125-ft clear zone Follow host site EOD procedures.
40MM HE & HEDP	30 seconds - Muzzle of weapon pointed downrange	<ul style="list-style-type: none"> Used only on government owned/approved high explosive impact area ranges. Shooter shouts "Misfire" and keeps muzzle of weapon pointed downrange for 30 seconds. Remove round and examine primer for dents. If primer is not dented, attempt re-firing. Assuming second attempt fails: SC or Safety Controller notifies Host Site Range Control. Shooter, under supervision of the Range Safety Officer and/or Primary Instructor, will move cartridge to designated holding pit area per local range procedures. Munitions Specialist will transport to host site storage/disposal area. Misfired cartridges will NOT be transported off the host site.

10.5 Propellant Exhaust Gas Secondary Ignition (PEGSI)

Blank ammunition burns hotter and at a rate much faster than live ammunition. As a result of this rapid burn rate, some unconsumed gases and components can accumulate in and around

the firearm (especially around ejection ports), and with proper conditions and an ignition source, deflagration of gases can occur. The ignition source appears to be from combustible residues in and around the ejected cartridge. **The PEGSI phenomenon occurs relatively frequently and is inherent to all automatic weapons.** The following precautions should be considered whenever blank ammunition is used:

- Be cognizant of the PEGSI phenomenon
- Incorporate hazard information and controls into Site-Specific Safety Plans and applicable lesson plans.
- Ensure weapons are fired a safe distance away from combustible material.
- If acquiring Ghillie suits, purchase suits that are pretreated with fire retardant from the factory and also have quick release features. Ensure these features are specified in purchase requests.
- Ensure material used for camouflage remains clear of the flash area and is not highly flammable.

We must make every effort to ensure our training regimen is as realistic and safe as possible. Ensuring that exercise participants are aware of the PEGSI phenomenon may prevent future incidents.

11.0 End of Exercise Activities

The SC will ensure that all exercise participants are allotted adequate time and formally scheduled to restore exercise areas to their original condition, immediately, following the completion of any exercise. The responsible Controller will ensure that participants survey the entire exercise area, paying particular attention to those areas outside the immediate exercise area, where exercise debris may have inadvertently accumulated. As an additional measure, all exercise areas shall be re-inspected weekly by exercise participants and/or staff, to further ensure compliance with the above.

All recovered expended exercise munitions, expended shells, empty canisters or other munitions debris must be returned to the point of issue after each exercise. Waste generated from exercise activities will be removed from exercise sites and disposed of properly. At the end of each exercise event in which ESS weapons are used, all ESS weapons and ammunition shall be collected and accounted for under the direction of the SC. Live fire weapons and live ammunition will not be reissued to participants until all ESS weapons and ammunition have been returned and all personnel accounted for. The SC will notify the ECC that the event has terminated and that personnel are accounted for.

11.1 End of Exercise Accountability-Live Ammunition/Pyrotechnics

All ammunition, explosives and pyrotechnics expended for any purpose will be recorded and accounted for on the appropriate Ammunition/Pyrotechnic Expenditure Record or Form. These records serve two functions: first, they form the basis for an audit trail by recording user accountability and expenditures, and, secondly, they assist in maintaining an accurate record of consumption. As forms are completed, they will be used as the basis for inventory and stock control adjustments.

Munitions transported to off-site locations in support of one-time events such as Joint Testing Exercises will be maintained in OST inventory. Inventory and accountability of such items during the deployment are the responsibility of the assigned Training Command (TRACOM)

Armory personnel or munitions/explosives personnel on the site. Expenditures will be reported at the conclusion of each event.

Upon completion of mobile or dispersed exercise operations, a properly trained technician must inspect all returned loose small arms ammunition and explosives/pyrotechnics to ensure continued serviceability. If the serviceability of any ammunition or pyrotechnic can not be determined, it will be tagged as unserviceable and segregated in storage until disposition instructions are provided by the Logistics Manager. If an unsafe condition is suspected, refer to OST Manual 5.16, *Munitions Management Manual*, Section 2.C.2.

All munitions packing material, residue, and brass will be returned, in plastic bags, to the point of issue for the purpose of recovery and proper disposition of reclaimable residue/hazardous material.

Discrepancies discovered during an inventory will be documented. In addition to summary reports, Program Managers must submit detailed information of all inventory adjustments to the Property Manager. The Property Manager will determine if discrepancies found warrant a formal investigation. If discrepancies are formally investigated, the investigation reports become a part of the inventory summary report. Finally, if a discrepancy did exist, any corrective action taken or plans to preclude recurrence of discrepancies will be noted.

12.0 Hazard Identification and Assessment

By definition, a hazard is a source of energy or danger. Exercise routes, bridges, buildings, structures, surrounding ground conditions, and adjacent operations must be reviewed¹⁰ and evaluated for compatibility of the intended purpose or activity¹¹. Buildings and structures used for exercises but not habitation should still meet the intent of basic life safety code requirements (including electrical hazards) and be structurally sound. These structures must also be reviewed for historical or legacy contaminants (radioactive, chemical, asbestos, etc.) and basic health conditions such as rodent/avian droppings.

Facilities, buildings, and structures should be viewed with consideration for adequate staging areas, logistical set-up, pre- and post-training activity, exercise control center accommodations, briefing/classroom accommodations and sanitization set-up and control.

12.1 Overview Description

The exercise plan or execution plan should contain sufficient detail to enable a valid hazard assessment¹². In cases where sufficient detail has not been provided; the site-specific safety plan will be expanded to support the hazard assessment. This may include an explanation of the exercise/training activity and requirements for safe operation (exercise boundaries, dismount restrictions, play/no-play areas, and direction of fire). This section should also provide narrative site-specific features, such as utilities, terrain descriptions, and unique environmental conditions.

¹⁰ DOE M 470.4-3, Section A, Chapter VII, paragraph 4.c.(3), *The Safety Controller is responsible for assessing the PT plan and ensuring that walk-downs of the exercise area and safety briefings are conducted.*

¹¹ DOE M 470.4-3, Section B, Chapter III, *Safety plans must cover facility safety concerns specific to scenarios being conducted.*

¹² DOE M 470.4-3, Section A, Chapter VII, paragraph 2a, *The PT plan and training activity plan (or lesson plan, procedures, etc.) must define the scenario/activity and the exercise/training area in sufficient detail to allow a valid hazard assessment to be performed.*

Discussions with facility safety professionals and/or building managers/custodians may provide insight to hazards, restrictions, cautionary issues, et.al. The results of these discussion as well as local safety requirements should be integrated in the appropriate sections of the site-specific safety plan.

12.2 Hazard Identification Checklist

Hazards are identified and categorized based on the following Preliminary Hazard Checklist. These hazards are then evaluated using a "What If" approach to determine potential accident scenarios and resulting consequences (see example in 12.3).

Preliminary Hazard Checklist

<u>Electrical Hazards</u>	
Capacitors	<input type="checkbox"/>
Transformers	<input type="checkbox"/>
Batteries	<input type="checkbox"/>
Electric Arcs	<input type="checkbox"/>
Wiring, Exposed Conductors	<input type="checkbox"/>
Service Outlets	<input type="checkbox"/>
Cable Runs	<input type="checkbox"/>
Electrostatic Discharge	<input type="checkbox"/>
Standard Operating Voltages	<input type="checkbox"/>
Common Operating Voltages	<input type="checkbox"/>
High Voltages	<input type="checkbox"/>
<u>Gravity Hazards</u>	
Suspended Objects	<input type="checkbox"/>
Cranes, Hoists, Slings, Rigging	<input type="checkbox"/>
Forklifts	<input type="checkbox"/>
Scaffolds, Ladders	<input type="checkbox"/>
Excavations, Canals	<input type="checkbox"/>
Elevated Doors, Floors	<input type="checkbox"/>
Elevators, Stairs, Railings	<input type="checkbox"/>
Lifting	<input type="checkbox"/>
Surfaces, Obstructions, Uneven surfaces	<input type="checkbox"/>
Roof Staging	<input type="checkbox"/>
Falling Glass	<input type="checkbox"/>
Hidden Foundations/footings	<input type="checkbox"/>
Puncture probes	<input type="checkbox"/>
Open manholes	<input type="checkbox"/>
Bridges, Roadways; Limited thoroughfare capacity	<input type="checkbox"/>
Floor/roof openings	<input type="checkbox"/>
<u>Hazardous Materials, Substances, and Waste</u>	
Explosives, Energetic Material	<input type="checkbox"/>
Flammables & Combustibles	<input type="checkbox"/>
Corrosives (acids, caustics)	<input type="checkbox"/>
Etiologic Agents (virus, bacteria))	<input type="checkbox"/>
Toxic Material, Poisons	<input type="checkbox"/>
Carcinogens, Mutagens	<input type="checkbox"/>

<u>Oxidizers</u>	
Metals (Be, Cd, Hg, Pb, solders)	<input type="checkbox"/>
Solvents (halogenated, non-halogenated)	<input type="checkbox"/>
Radioactive/Fissile Material	<input type="checkbox"/>
Asphyxiants (inert gases or vapors)	<input type="checkbox"/>
Reactive/Spontaneously Combustible Materials	<input type="checkbox"/>
Irritating Materials	<input type="checkbox"/>
Metal Working Fluids	<input type="checkbox"/>
Adhesives	<input type="checkbox"/>
Hazardous/Mixed Waste Generation	<input type="checkbox"/>
Environmental Releases (air, soil, surface water, groundwater)	<input type="checkbox"/>
<u>Mechanical Hazards</u>	
Power Tools, Common Shop Equipment, Pulleys, Belts, Gears	<input type="checkbox"/>
Motors, Pumps, Fans	<input type="checkbox"/>
Compactors, Crushers	<input type="checkbox"/>
Transportation (motor vehicles, electric/gas carts)	<input type="checkbox"/>
Vibrations, Oscillations	<input type="checkbox"/>
Chips, Fragments, Shrapnel, other Flying Objects	<input type="checkbox"/>
Shears, Presses, Sharp Edges, Pinch Points	<input type="checkbox"/>
<u>Pressure Hazards</u>	
Boilers, Other Pressure Vessels	<input type="checkbox"/>
Stressed Mechanical Systems, Springs	<input type="checkbox"/>
Vacuum	<input type="checkbox"/>
Noise	<input type="checkbox"/>
Hydraulic Systems, Jacks	<input type="checkbox"/>
Compressed Gases	<input type="checkbox"/>
Jet Stream	<input type="checkbox"/>

<u>Radiant Energy Hazards</u>	
Intense Light	<input type="checkbox"/>
Lasers (Cat. I, II)	<input type="checkbox"/>
Lasers (Cat. III, IV)	<input type="checkbox"/>
Ultraviolet Light	<input type="checkbox"/>
Infrared Light	<input type="checkbox"/>
Magnetic Fields	<input type="checkbox"/>
RF Fields, Microwaves	<input type="checkbox"/>
Ionizing Radiation-Producing Machines (electron, proton, neutron, x-ray)	<input type="checkbox"/>
Nuclear Criticality	<input type="checkbox"/>
Ionizing Radiation	<input type="checkbox"/>
<u>Thermal Hazards</u>	
Heaters, Furnaces	<input type="checkbox"/>
Steam, Steam Lines	<input type="checkbox"/>
Plasma, Flames, Welders	<input type="checkbox"/>
Solar	<input type="checkbox"/>
Friction	<input type="checkbox"/>
Refrigerating Units	<input type="checkbox"/>
Cryogenic Materials	<input type="checkbox"/>
<u>Geographic</u>	
Water, lakes, rivers	<input type="checkbox"/>
Caves, confined spaces	<input type="checkbox"/>
Swamp	<input type="checkbox"/>
Cliffs, escarpments	<input type="checkbox"/>
Steep, loose terrain	<input type="checkbox"/>
<u>Other Hazards</u>	
Confined Spaces	<input type="checkbox"/>
Poor Housekeeping	<input type="checkbox"/>
Effects of other Facilities, Operations, Traffic Routes	<input type="checkbox"/>
Natural Elements (ice, snow, wind, rain, lightning, dust)	<input type="checkbox"/>
Snakes, Insects, Spiders, Other Animal Life	<input type="checkbox"/>
Other – Observers	<input type="checkbox"/>
Other – Low Visibility/Low Light	<input type="checkbox"/>

12.3 Hazard Assessment Tables

Hazards are evaluated by postulating accident sequences (“What If”) that describe how the hazard results in accident consequences. Although formats may vary, the following provides a illustrative example of what should be included for a hazard assessment.

Example – Hazard Assessment Table

<p>Hazard ID: Geographic –01</p>	<p>Hazard Type: Water, streams</p>
<p>Location: Stream flows east to west between Grassy Creek Rd. and the TVA Bull Run/Wilson Transmission lines.</p>	<p>Accident Sequence: Personnel fail to see stream and fall into streambed sustaining broken bones or head injuries. Drowning potential during high run-off periods.</p>
<p>Hazard and Accident Description: Bethel Valley Creek crosses the entire property from east to west. The streambed varies in depth from as little as one foot to as much as four feet. Personnel unaware of the stream location could sustain sprains and/or broken bones by falling into the streambed. During high run-off periods, water volume may present a drowning hazard for persons trying to cross.</p>	



This approach (addressing hazards in the context of planned or projected exercise activities) enables controls to be tailored (see Section 13.0) and balances the requirement to perform work safely with the need to conduct realistic training.

13.0 Operational Risk Management

Subsequent to identifying and assessing hazards, risk is evaluated and controls are developed. The controls are tailored to contain the hazard, prevent or alter the accident sequence, or mitigate the consequences. The process for evaluating the risk and determining appropriate controls is established by OST Policy 7.07 and further described in the OST Operational Risk Management (ORM) Manual for Training. Site-specific safety plans will include an ORM worksheet documenting the results of the risk assessment (see example below). As illustrated, each worksheet includes a risk value for “unmitigated” risk (assuming no controls are in place) and “mitigated risk” (residual risk assuming controls are effective). Approval authority is assigned commensurate with the mitigated risk:

- **Extremely High** – Risk Acceptor – ADA
- **High** – Risk Acceptor – OTL/OMO/OS – Office Managers
- **Moderate** – Risk Acceptor – Division Director/Command Chief
- **Low** – Risk Acceptor – DCO/UC/Training Instructors

Example Operational Risk Management – Temporary CQB Façades

Step 1 Identify The Hazard	Step 2 Assess the Hazard	Severity & Probability	Un- Mitigated Risk	Step 3 Develop Controls & Make Decision	Step 4 Implement Controls	Mitigated Risk Severity & Probability	Step 5 Supervise & Evaluate
Gravity-01/ Lifting 8'x12' plywood panels are heavy and unwieldy.	Injury to back from lifting and handling panels during assembly phase.	II, C	High	1. Assembly plan. 2. On-site Assembly Supervisor 3. Personnel trained in proper lifting techniques. 4. Panels lifted and handled using team concept. (Minimum of 2 personnel per panel) 5. Personnel use proper PPE	1 - 5	III, D Low	Monitor Controls AAR Evaluate Controls for Effectiveness
Gravity -02/ Suspended Objects 8'x12' plywood panels are heavy and unwieldy.	Injury to head or neck from panels falling over when stood up on end during assembly phase.	II, D	Moderate	1. Assembly plan. 2. On-site Assembly Supervisor 3. Personnel trained in proper lifting techniques. 4. Panels lifted and handled using team concept. (Minimum of 2 personnel per panel) 5. Personnel use proper PPE	1 - 5	II, E Low	Monitor Controls AAR Evaluate Controls for Effectiveness
Gravity-03/ Puncture Probes Wood panels and braces may have splinters.	Injury to hands and other extremities from splinters during both assembly and training use phases.	IV, C	Low	1. Inspect panels prior to handling during assembly phase. 2. Panels inspected by controllers prior to training 3. Personnel use proper PPE	1 - 2	IV, E Low	Monitor Controls AAR Evaluate Controls for Effectiveness
Gravity-04/ Ladders Ladders	Severe injury to body or even death from fall off of ladder during assembly phase.	I, D	High	1. Assembly plan 2. On-site Assembly Supervisor 3. Ladders inspected and approved for use. 4. Personnel trained in use of ladders 5. Team concept used whenever anyone is on a ladder. 6. Minimal time necessary spent on ladders. 7. Minimum height necessary used on ladders. 8. Ladders not used during training phase	1 - 8	II, E Low	Monitor Controls AAR Evaluate Controls for Effectiveness
Mech-01/ Power Tools Battery powered hand tools	Injury to eyes and extremities from improper tool use during assembly and maintenance.	II, D	Moderate	1. Tools inspected prior to use. 2. On-site assembly supervisor 3. Personnel trained in proper use of tools. 4. Personnel use proper PPE 5. Only trained personnel to use tools for maintenance.	1 - 5	III, D Low	Monitor Controls AAR Evaluate Controls for Effectiveness

Step 1 Identify The Hazard	Step 2 Assess the Hazard	Severity & Probability	Un- Mitigated Risk	Step 3 Develop Controls & Make Decision	Step 4 Implement Controls	Mitigated Risk Severity & Probability	Step 5 Supervise & Evaluate
Gravity-05/ Other Façade collapses due to poor design	Severe injury to personnel and training mission stopped.	II, D	Moderate	<ol style="list-style-type: none"> 1. Approved design. 2. Assembly plan. 3. On-site Assembly Supervisor. 4. Personnel use proper PPE 	1 - 4	II, E Low	Monitor Controls AAR Evaluate Controls for Effectiveness
Gravity 06/ Other Façade collapses due to loosening of panels during training.	Severe injury to personnel and training mission stopped.	II, D	Moderate	<ol style="list-style-type: none"> 1. Approved design. 2. Assembly plan. 3. On-site Assembly Supervisor. 4. Façade panels and bracing inspected prior to use. 5. Controllers monitor and inspect areas of façades that receive strikes and bumping from participants. 6. Panels that need maintenance will be fixed prior to another training run being sent through the façade. 7. Personnel use proper PPE 	1 - 7	II, E Low	Monitor Controls AAR Evaluate Controls for Effectiveness
Gravity 06/ Other Façade collapses due to severe weather	Severe injury to personnel and training mission stopped.	II, D	Moderate	<ol style="list-style-type: none"> 1. Approved design. 2. Assembly plan. 3. On-site Assembly Supervisor 4. Assembly and training stopped during periods of severe weather. 5. Personnel moved out and away from façade during severe weather. 6. Façade inspected prior to use after severe weather suspension is lifted. 7. Personnel use proper PPE 	1 - 7	II, E Low	Monitor Controls AAR Evaluate Controls for Effectiveness

Tab 1 – Amending Site Specific Safety Plans

The process for amending a Safety Plan include the development of an addendum that meets the following condition:

1. If the addendum enhances the approved control set (such as replacing an administrative control with an engineered barrier or revises the administrative control for better clarity or replaces an administrative control with a more effective administrative control):
 - Create an addendum; documenting the change on a single sheet of paper
 - Within the addendum, indicate the current state of operation, per the Safety Plan
 - Address, within the addendum, the change or changes in detail with rationale/ explanation for the addendum to the Safety Plan
 - Ensure the addendum does not exceed the coordinated/approved risk level of the Safety Plan
 - Coordinate the addendum with the Exercise Director, Senior Controller and Lead Safety person by signing the addendum
 - Indicate the change on the revision record in the original Safety Plan
 - Inform all controllers of the addendum
 - Update the Daily ORM form to indicate the addendum to the Safety Plan
 - Forward the addendum to OST management within 24 hours

2. If the addendum is a result of a hazard that had not been previously identified:
 - Create an addendum; documenting the change on a single sheet of paper
 - Conduct an assessment documenting the Hazard/Control Table for the hazard
 - Within the addendum, indicate the current state of operation per the Safety Plan
 - Address, within the addendum, the change or changes in detail with rationale/ explanation for the addendum to the Safety Plan
 - Ensure the addendum does not exceed the coordinated/approved risk level of the Safety Plan
 - Coordinate the addendum with the Exercise Director, SC and Lead Safety person by signing the addendum
 - Obtain verbal approval/disapproval from OST management to proceed with the operation
 - Forward the addendum to OST management within eight hours (if approved)
 - Indicate the change on the revision record in the original Safety Plan (if approved)
 - Inform all controllers of the addendum (if approved)
 - Update the Day of Execution form to indicate the addendum to the Safety Plan (if approved)

3. If the addendum reflects an increased risk level beyond the approved/coordinated Safety Plan:

- Create an addendum; documenting the change on a single sheet of paper
- Conduct an assessment documenting the Hazard/Control Table for the hazard
- Within the addendum, indicate the current state of operation, per the Safety Plan
- Address within the addendum, the change or changes in detail with rationale/ explanation for the addendum to the Safety Plan
- Obtain written approval/disapproval from OST management to proceed with the operation
- Do not proceed without written approval from OST management
- Coordinate the addendum with the Exercise Director, SC and Lead Safety person by signing the addendum (if approved)
- Indicate the change on the revision record in the original Safety Plan (if approved)
- Inform all controllers of the addendum (if approved)
- Update the Day of Execution form to indicate the addendum to the Safety Plan (if approved)

Failure to follow the above process will invalidate this procedure and require the Safety Plan to be followed.

Tab 2 - OST FIREARMS SAFETY GUIDANCE

OST FIREARMS SAFETY GUIDANCE STATEMENT

OST firearms-related activities shall be conducted with zero tolerance for serious accidents that result in life-threatening injuries. Authority for managing and executing firearms-related activities at OST commands, and training and evaluation venues resides with the cognizant OST managers. Each manager up the line, **including the applicable Agent Operations Command Director and Headquarters Program Manager**, will retain accountability for firearms safety performance results.

The purpose of firearms training, qualification, and evaluation activities is to ensure that OST Federal Agents have the knowledge, skills, and abilities necessary to survive a lethal confrontation with the DOE-defined Design Basis Threat.

OST management recognizes that firearms-related activities involve significant risks. On the basis of past firearms safety performance, OST management considers that the safety of the Federal Agents can be ensured by effectively and efficiently managing the risks associated with duty, training, qualification, and evaluation activities.

OST FIREARMS SAFETY PERFORMANCE EXPECTATIONS

Accident prevention is an important aspect of all safety programs. OST management considers that firearms discharges (other than marksmanship errors resulting in missing a target in training or qualification) that do not result in injury or significant property damage are accident precursor events. Proactive firearms safety programs must identify precursor events, investigate them, and develop corrective actions necessary to prevent accidents. Firearms-related incidents such as unauthorized discharges are to be considered as having the potential to cause serious injury or death.

UNAUTHORIZED DISCHARGE DEFINITION

The following definition of unauthorized discharge as defined by the DOE Protective Force Safety Committee is to be used for all OST firearms-related activities:

Unauthorized Discharge (UD) is the discharge of a firearm under circumstances other than either (a) during firearms training with the firearm properly pointed downrange (or toward a target) or (b) the intentional firing at hostile parties when deadly force is authorized.

The firearms currently in the OST arsenal and available for routine duty use are designed and manufactured so that the likelihood of the firearm discharging by any mechanism other than depressing the trigger is extremely unlikely. Similarly, individuals issued firearms are responsible for and capable of ensuring that the trigger is not depressed by any means except in the instances stated in the above definition. Therefore, neither DOE nor OST recognizes the term "accidental discharge" in official documents.

OST Interpretation of Unauthorized Discharge Definition: The above DOE definition was intended to tolerate task performance errors resulting in a firearm discharge by

Federal Agents Candidates in Agent Candidate Training in a traditional “square range” environment (i.e., all shooters on one firing line firing in the same direction at a line of targets).

A more stringent interpretation of the definition should apply once a candidate successfully demonstrates the ability to manipulate a firearm; shoots a qualifying score; and is authorized to carry firearms in the line of duty.

Consistent with OST’s interpretation of the definition and OST managements’ expectations, any firearm discharge in a close quarter battle simulator (also called live fire simulators or shoot houses) that does not impact within a bullet trap assigned to the shooter is an unauthorized discharge.

Since the DOE Range Design Criteria Guide requires that all fire in a close quarter battle simulator be directed into bullet traps, the walls of the simulator are not to be considered bullet traps in the Guide’s meaning, even if the walls are designed and constructed to absorb the effects of direct fire and ricochets.

Due to the close proximity and variable locations of personnel during close quarter battle simulator activities, there is no “safe direction” or “properly pointed downrange” other than gun-to-target line(s) between the shooter’s authorized firing position(s) and the shooter’s authorized target(s).

Though it has been found safe to carry firearms in the low ready position in close quarter battle simulator activities, it is neither safe nor acceptable to discharge firearms held at the low ready, or otherwise aimed off the proper target.

NEAR-MISS FIREARMS INCIDENTS

Definition: Near-Miss Firearms Incident: A firearm incident which would be classified as a Near-Miss Occurrence in accordance with DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information, Group 10*.

FIREARMS SAFETY INCIDENT RESPONSE AND REPORTING EXPECTATIONS

OST management expects that, when qualified Federal Agents or firearms instructors discharge their firearms as the result of a task performance error, the incident will be examined to determine whether it meets the definition of a reportable occurrence in accordance with this guidance and/or DOE M 470.4-1, *Safeguards and Security Program Planning and Management, Section N, Incidents of Security Concern*. The following actions by contractors and OST staff to address firearms incidents shall be taken:

A. Unauthorized discharges:

- 1) Personnel involved in or witnessing a UD shall immediately report the incident to a supervisor and/or range officer. (When ranges other than DOE controlled ranges are utilized, the following actions will be coordinated with the host site range control authority)
- 2) The individual firing the UD and other involved parties will be removed from training or relieved of duty immediately to allow the incident investigation to commence.

- 3) Training, qualification, or evaluation activities in which a UD occurs will be stopped immediately in order to allow the incident investigation to commence (except for urgent national security activities as determined by the appropriate manager).
- 4) UD incident scenes will be secured as accident scenes in order to preserve evidence.
- 5) Written statements will be immediately obtained from all involved parties.
- 6) All involved personnel, observers, and bystanders will be interviewed as soon as practicable. Interviews should be accurately documented in detail.
- 7) Evidence from UD incident scenes will be collected including, but not limited to:
 - Photographs, if possible;
 - Accurate, measured diagrams of the scene showing locations of all participants/observers/bystanders, target locations, direction of fire, bullet(s) and fragment(s) impact(s) locations;
 - Ammunition details including lot number; firearm type including features and serial number; firearm condition immediately after the UD; and
 - Environmental conditions such as temperature, wind speed and direction, and lighting conditions.
- 8) The firearm(s) associated with the UD will be cleared and made safe under observation by a firearms instructor who will record the condition of the firearm and any comments on any observed firearm-related topics such as malfunctions.
- 9) The firearm(s) associated with the UD and any involved equipment (such as holsters, tactical bags, body armor, equipment vests or other equipment), will be immediately taken into custody as evidence and controlled to preserve and record the chain of custody.
- 10) Testing to duplicate events will be performed only with concurrence of cognizant contractor and OST officials, under written test plans, and in a manner to preserve evidence.
- 11) The recent working schedule of the person(s) involved in firing the UD, and other pertinent details that may have contributed will be documented.
- 12) After the investigation is completed, the cognizant OST authority must:
 - Release the UD incident scene;
 - Release firearms, related equipment, and other evidence for use;
 - Authorize the personnel identified in paragraph A.2 above to return to duty; and
 - Authorize resumption of the activity suspended because of the UD.

TRAINING ON OST's FIREARMS SAFETY GUIDANCE AND FIREARMS SAFETY EXPECTATIONS

Initial and periodic refresher training regarding the requirements of this OST guidance shall be provided to the following OST federal and contractor personnel: Federal Agents and all levels in the chain of command such as firearms instructors, range safety officers, training managers, operations managers, safeguards and security directors, and any other personnel responsible for firearms safety program development, implementation, and assurance activities.

Tab 3 - OST Inclement Weather Criteria

INTRODUCTION

Training is a very important aspect of the OST Federal Agent mission. The rigorous physical activities involved during Operational Readiness Training (ORT), Unit Training, Agent Candidate Training (ACT), and Joint Testing Exercises (JTX), as well as live-fire training and physical fitness training, require constant vigilance, concentration, and perseverance by all parties to assure accomplishment of the training mission. A vital aspect of Federal Agent training is their safety and health. To ensure a safe training environment, the following environmental factors must be taken into account during field training activities.

If other environmental training guidelines exist for a particular site or activity, the more restrictive guidelines will be utilized.

PURPOSE

The following are guidelines for Federal Agent training during inclement weather. Many hazards exist when training is conducted during periods of extreme heat and humidity or during periods of exceptional cold weather. Fog, dust, sleet, high winds, snowfall, or rainfall can impair a trainee's vision, footing, and ability to manipulate a weapon, or otherwise degrade the training environment so as to create potential safety hazards to both the trainee and those around him.

RESPONSIBILITIES

The Course Manager/Training Specialist/Safety Manager is authorized to postpone, or cancel, any performance-based training/qualification activity that he believes to be unsafe or exceeding the approved criteria for inclement weather.

It is the direct responsibility of the Course Manager/Training Specialist/Safety Controller to point out and correct all unsafe training activities or to halt training, if appropriate. The following criteria are established to assist the Course Manager/Training Specialist/Safety Controller in determining when the training environment is unacceptable. Course Managers/Training Specialists/Safety Controllers must take great care in evaluating individuals being trained and the prevailing conditions under which they are being trained prior to making a final determination.

It is the responsibility of any training staff member, support member, or participant to point out any unsafe or potentially unsafe, condition or conditions that may impact training safety.

CONDITIONS

The following factors will be taken into account to determine when training activities for ORT, ACT, JTX, Unit, weapon qualification/training, or physical fitness training/qualification are to be postponed or canceled.

- 1. WET:** Off road vehicular travel shall be restricted when soils are significantly wet. All training/qualification activities shall cease when precipitation is such that is adversely affects operation of firearms, interfaces with stability of footing, impairs ability to manipulate weapons and see targets, or adversely affects road surfaces/driving tracks. Heavy rains can cause local flooding in training areas and raise water levels of streams and creeks to dangerous depths, and

disguise deep holes and other underwater hazards. Training areas should be surveyed prior to initiating training events to ensure no water hazards are present. Trainees should be cautioned against attempting to ford any water barrier unless they have permission of their Controller. Hail, sleet, or ice storms are especially hazardous to outdoor training operations, and training should be suspended when these conditions arise.

2. COLD: The chill indices (page 36 and 37) shall be used to determine when activities shall be suspended for live-fire training and activities other than live fire training respectively. For example, at 30 degrees Fahrenheit and with a wind speed of 29 miles per hour, all live-fire activities will be suspended.

3. HEAT: Heat stress is defined as a “thermal environment which is stressful to humans” and is measured by using the Wet Bulb Globe Temperature (WBGT) Index. This Index was developed by the military and is modeled after the human subject.

The WBGT Index is comprised of three temperature values:

- The Wet Bulb is used to determine the amount of cooling provided to the human subject through evaporation. This evaporation is a function of airspeed and humidity. The Wet Bulb temperature represents 70% of the total Index.
- The next temperature value is Dry Bulb or standard air temperature. Dry Bulb measures the effect of the convection and conduction, heating or cooling a human. The Dry Bulb temperature represents 10% of the total Index.
- The final temperature value is the mean radiation temperature of the environment (known as the Globe temperature). The sun, radiation from hot pipes, furnaces, and open process ovens are all examples of radiant sources. This final temperature represents 20% of the total Index.

The WBGT Index shall be used to determine when conditions are such that all outdoor training and qualification activities must be limited or terminated. The WBGT Temperature Chart and definitions shall be used in making this determination. Since the Federal Agent Facilities are located in different areas of the country, it cannot be assumed that they are all equally acclimated to an extremely hot, humid climate such as exists at the Transportation Safeguards Training Center at Fort Chaffee, Arkansas, during summer months. Therefore, Course Managers/Training Specialists/Safety Managers are responsible to evaluate the level of work against the WBGT Index to determine if the activity should be limited or suspended/terminated (see Work/Rest/Water Consumption Table).

NOTE: The table that identifies examples of the three levels of work is located under Classes of Activities.

Course Managers/Training Specialists will ensure ample supplies of water and/or athletic beverages are readily available to trainees during all hot weather training to ensure replacement of their lost body fluids.

4. OBSCURE WEATHER: All outside activities shall cease when conditions such as blowing dust, sleet, rain, snow, hail or fog obstruct the ability of the trainees to see clearly or to traverse terrain safely, or handle their weapons, equipment or vehicles in a safe manner.

5. LIGHTNING: All activities shall be postponed when any lightning strikes within five (5) miles of a training location. Where available, Lightning Detection Systems (LDS) shall be used to determine if outside training is to be postponed. If the LDS is not in use, or if training is being conducted in a remote location where no lightning detection exists, the Course Manager/Training Specialist/Safety Controller shall count seconds between the lightning discharge flash and the audible report (thunder). One can estimate five (5) seconds per mile, e.g., if the count is twenty-five (25), the lightning is considered in the immediate vicinity (5 miles) and all outdoor training will be terminated.

When a weather front is no longer a factor, and when lightning is no longer in the immediate vicinity, training may be resumed. The ECC can verify that the weather front has left the training area by monitoring the National Weather Service broadcasts and/or local weather reports.

HYPOTHERMIA


Symptoms	First Aid
Confusion, bizarre behavior, withdrawal from group interaction May become unconscious with nearly undetectable breathing and pulse	This is a Medical Emergency Evacuate to medical care facility Prevent further cold exposure Remove wet clothing Warm by covering with blankets

FROSTBITE

Symptoms	First Aid
Skin becomes numb, turns gray or waxy white in color. Is cold to touch and may feel stiff.	Prevent further cold exposure Remove wet clothing Warm by covering with blankets Evacuate to medical care facility

Wind Chill: Cooling power of wind on exposed flesh expressed as an equivalent temperature under calm conditions.

CHILL INDEX ¹³													
TO BE USED TO DETERMINE WHEN <u>LIVE FIRE</u> ACTIVITY IS TO BE POSTPONED													
Wind Speed MPH	Actual Temperature in Degrees (Fahrenheit)												
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	
	Equivalent Temperature in Degrees (Fahrenheit)												
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68	
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95	
15	36	22	9	-15	-18	-36	-45	-58	-72	-85	-99	-112	
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124	
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133	
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140	
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145	
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148	



Live fire activities are permissible at the discretion * of the Training Instructor	No Live Fire Activities Permitted	
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* The Training Instructor is to take into account other climate conditions such as precipitation, fog, lightning, etc.

¹³ OST has adopted a more conservative approach for addressing cold weather factors. Less conservative approaches assume a standardized, issued, cold weather gear that has been analyzed to determine cold reduction capability. This assumption is not valid in addressing OST cold weather parameters.

CHILL INDEX ¹⁴												
TO BE USED TO DETERMINE WHEN TRAINING (OTHER THAN LIVE-FIRE) ACTIVITY IS TO BE POSTPONED												
Wind Speed MPH	Actual Temperature in Degrees (Fahrenheit)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature in Degrees (Fahrenheit)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-15	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

←

Activities are permissible at the discretion * of the Training Instructor

No Activity Permitted

→

* The Training Instructor is to take into account other climate conditions such as precipitation, fog, lightning, etc.

OVER-HYDRATION

Proper fluid replacement (hydration) is one of the most essential elements in heat injury prevention. The newly revised fluid replacement chart (below) describes the amounts of fluid replacement and work/rest cycles for acclimated personnel undergoing training. Of particular note is the fact that the revised maximum hourly fluid intake should **NOT** exceed 1.5 quarts and the revised maximum daily intake should **NOT** exceed 12 quarts.

Work-Rest Cycles¹⁵

The recommended threshold WBGT value for initiating hot weather guidelines is 75 F depending on the work intensity. As the WBGT value increases, physical work should be reduced (or more frequent and longer rest periods), or under extremely severe conditions (WBGT index >90 F), possibly suspended. Work schedules should be customized to the climate and work intensity.

The table below provides work/rest and fluid replacement guidelines for heat-acclimatized participants in a training environment (assuming average participant wearing BDU and hot

¹⁴ See Footnote 13 on previous page.

¹⁵ TB MED/507/AFPAM 48-152(1), March 7, 2003, Headquarters, Department of the Army and Air Force, *Heat Stress Control and Heat Casualty Management*

weather). The guidelines support at least 4 hours of work. Three time-weighted work intensities are provided representing easy, moderate, and hard tasks; (more specific examples are provided on succeeding pages). Rest means minimal physical activity (sitting or standing), accomplished in shade if possible.

CAUTION:

- Hourly fluid intake should not exceed 1.5 quarts.
- Daily fluid intake should not exceed 12 quarts.
- Wearing body armor increases the WBGT Index by 5°F.
- Humid environments increase the WBGT Index by 5°F.
- Wearing MOPP or SRF over garment increase the WBGT Index by 10°F.
- Humid environments add 5°F.

The information in the following table is sufficient to estimate guidance for many different scenarios.

Heat Category	WBGT Index, °F	Easy Work (min)	Moderate Work		Hard Work		
			¹ Water Intake qt/hr	Work (min)	Water Intake Qt/hr	Work/ Water Intake Qt/hr	
1	78-81.9	² NL	1/2	NL	3/4	70	1
2 (Green)	82-84.9	NL	1/2	150	1	65	1-1/4
3 (Yellow)	85-87.9	NL	3/4	100	1	55	1-1/4
4 (Red)	88-89.9	NL	3/4	80	1-1/4	50	1-1/4
5 (Black)	>90	180	1	70	1-1/2	45	1-1/2

¹Fluid needs can vary based on individual differences (± 1/4 qt/hr) and exposure to full sun or full shade (± 1/4 qt/hr).

²NL can sustain work for at least 4 hours in the specified heat category.

- Participants will perform moderate or hard work interspersed with easy work activities. For example, although Force-on-Force exercises are stressful and include periods of hard work, such as the initial attack; there are also other activities in the exercise that will fall in the easy and/or moderate category (such as when participants are concealed or covered and remain motionless, or when riding in air-conditioned vehicles). Therefore, it is possible that an exercise may still be conducted within guidelines over a substantial duration.

Example: Force-on-Force Convoy Exercise – Heat Category 5			
Activity	Easy Work (min)	Moderate Work (min)	Hard Work (min)
OPFOR staging	30		15
Convoy rolling	30		
Initial attack			20
Defensive posture		20	
Recovery		20	

Given the above estimates, the activity duration is expected to be 2.5 hours; only 35 minutes considered hard work, 40 minutes are moderate, and 60 minutes is easy. Since the hard work duration is not consecutive (interspersed with easy work), and the exercise ends with moderate work, the activity is determined to fall within guidelines. When making this kind of determination the “worst case” exposure group (participants who perform the longest duration of the hardest level of work) should form the baseline.

It is likely that the temperature category will change during the 4-hour period and require a new determination. Experience and common sense are needed when determining the recommended work time. The Exercise Director/Lead Instructor is responsible for making the final determination of work and rest periods; the Safety Controller or Officer should analyze the situation and provide guidance to the Exercise Director/Lead Instructor in making this determination.

It is also assumed that participants performing continuous tasks/work shall not have incurred significant heat stress or dehydration immediately prior to this activity and will have extended (several hours) rest and adequate rehydration afterwards.

EXAMPLES OF WORK ACTIVITIES/CATEGORY

Easy Work	Moderate Work	Hard Work
Walking hard surface at 2.5 mph, < 31 lb. load.	Walking hard surface at 3.5 mph, < 41 lb. load.	Walking hard surface at 3.5 mph, > 41 lb. load.
Weapon Maintenance	Walking loose sand at 2.5 mph, no load.	Walking loose sand at 2.5 mph with load.
Manual of Arms	Calisthenics	Individual Movement Techniques, i.e. low crawl, high crawl.
Drill and Ceremony	Marksmanship Training	Defensive position construction
	Patrolling	Field Assaults

BASIC HEAT INJURY PREVENTION

1. Consider water a tactical weapon. Drink frequently (see water consumption table).
2. Don't skip meals.
3. Be aware that dark yellow colored, infrequent urination is a sign of dehydration. Increase water intake.
4. Perform heavy work in the cooler hours of the day, such as early morning or late evening, if possible.
5. Minimize heat stress by decreasing work pace and/or increasing rest periods (see water consumption table).
6. Be aware that full heat acclimatization takes 1-2 weeks.
7. Consider that personnel undergoing treatment for acute or chronic medical conditions may be at greater risk for heat injury.

HEAT CRAMPS

Symptoms
<ul style="list-style-type: none"> • Muscle Cramps of arms, legs and/or stomach. • Heavy sweating (wet skin) and extreme thirst may occur.

First Aid
<ul style="list-style-type: none"> • Move the individual to a shady area and loosen clothing. • Drink at least one canteen of water mixed with ¼ tsp of salt or sports drink. • Watch the individual and continue to give water if they accept it. • Get medical help if the cramps continue.

HEAT EXHAUSTION

Symptoms
<ul style="list-style-type: none"> • Heavy sweating with pale, moist, cool or hot skin; weakness, dizziness and/or fatigue. • Heat cramps, nausea (with or without vomiting/diarrhea), tunnel vision, chills (goose bumps), rapid breathing, confusion, and tingling of the hands and/or feet may occur.

First Aid
<ul style="list-style-type: none"> • Move the individual to a shady area and loosen/remove clothing. • Pour water on the individual and fan to permit a cooling affect. • Have the individual slowly drink at least one full canteen of water. • Elevate the legs. • GET MEDICAL HELP IF SYMTOMS CONTINUE (i.e. vomiting) • Watch the individual until the symptoms are gone or medical aid arrives.

EXERTIONAL HEAT ILLNESS AND EXERTIONAL RHABDOMYOLYSIS¹⁶

Exertional heat (injury) illness (EHI) represents a continuum intermediate in severity between heat exhaustion and heat stroke. There is no consensus on diagnostic criteria for distinguishing EHI from heat exhaustion or heat stroke; therefore, close monitoring of vital signs and serum chemistries is essential since during the first few hours, clinical symptoms may not reflect profound, underlying, abnormalities.

EHI patients show evidence of organ (for example, liver or renal) or tissue (for example, muscle) injury or dysfunction, but do not display sufficient neurological abnormalities to meet the usual criteria of heat stroke. Other manifestations may include, neurological symptoms, high core temperature, and metabolic acidosis. Patients demonstrating combativeness, delirium, or coma most likely have heat stroke rather than EHI.

Organ dysfunction or tissue damage may not be manifest in earlier EHI, so during the first hours of illness it may not be possible to distinguish EH from heat exhaustion by symptom complex alone. Therefore, all suspected EHI patients should be thoroughly evaluated for organ damage/dysfunction before release, with re-evaluation necessary on the following day.

Suspected EHI patients should be immediately and actively cooled to a core temperature of 101°F. Most EHI victims are sweating profusely and will cool spontaneously after removal from the stressful circumstances; however, in some their core temperatures may continue to rise. Delaying active cooling, to see whether a casualty can cool spontaneously, is not advised. It is important to prevent progression of the heat injury process. Persistent elevation of body temperature suggests the probability of more severe pathology. Occasionally, cooling leads to inappropriate shivering while the core temperature is still elevated. This might aggravate rhabdomyolysis, but it does not increase body heat storage.

HEAT STROKE

Symptoms	First Aid
<ul style="list-style-type: none"> • Hot, disorientated, delirious, or unconscious. • May have any of the symptoms of heat exhaustion. • Sweating may stop (red, flushed, hot dry skin). 	<p><u>HEAT STROKE IS A MEDICAL EMERGENCY - EVACUATE to a medical facility IMMEDIATELY.</u></p> <ul style="list-style-type: none"> • Reduce body temperature. • Move the individual to a shady area and loosen/remove clothing. • Start cooling the individual immediately. Immerse in water. • Fan to cooling. • Massage extremities and skin with cool water. • Elevate the legs. • If conscious, have the individual slowly drink at least one full canteen of water.

¹⁶ TB MED/507/AFPAM 48-152(1), March 7, 2003, Headquarters, Department of the Army and Air Force, *Heat Stress Control and Heat Casualty Management*