



U.S. DEPARTMENT
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Office of Enterprise
Assessments

**OFFICE OF ENTERPRISE ASSESSMENTS
ENGAGEMENT SIMULATION SYSTEMS
SUPPORT PROGRAM MANUAL**



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**OFFICE OF ENTERPRISE ASSESSMENTS
ENGAGEMENT SIMULATION SYSTEMS SUPPORT
PROGRAM MANUAL**

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Acronyms

Acronym	Definition
CAT	Composite Adversary Team
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
ESS	Engagement Simulation Systems
F	Form
MILES	Multiple Integrated Laser Engagement System
ODFSA	Officially Designated Federal Security Authority

OFFICE OF ENTERPRISE ASSESSMENTS ENGAGEMENT SIMULATION SYSTEMS PROGRAM MANUAL

Section 1: Program Management

General Information

The Office of Enterprise Assessments (EA) evaluates the effectiveness of safeguards and security programs and policy implementation throughout the U.S. Department of Energy (DOE), including the National Nuclear Security Administration. In support of this mission, EA plans and conducts a variety of assessment activities to include performance testing using engagement simulation systems (ESS). EA has an ESS support program staffed with contractor subject matter experts trained in the use, modification, repair and maintenance of ESS equipment, to support realistic performance testing and training assessments.

This manual establishes management (i.e., maintenance, modification, storage, transportation), operations, safety, and use of the ESS equipment in support of EA authorized activities. EA complies with DOE Order 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*. EA also applies methodologies for handling and maintaining ESS equipment described in DOE-Standard-1231-2022, *Preparation and Conduct of Protective Force Performance Testing* (7. Safety) and DOE Order 473.2A, *Protective Force Operations*. These policies require safety procedures, accident prevention training, and regular appraisals to assess procedure implementation, responsibilities, and assignments for ESS firearms users.

Responsibilities

- **ESS Support Program Manager (Program Manager)** – EA Federal staff member responsible for the ESS program implementation, oversight, and scheduling.
- **ESS Support Program Coordinator (Program Coordinator)** – Technical staff member responsible for program execution and ESS support staff training and certifications. Responsibilities include maintaining a cadre of trained and qualified DOE armorers and ESS Support Program technicians, managing ESS support operations, and managing EA communication equipment (radios and repeaters) frequency.
- **Safety Officer** – Technical staff member that advises the EA Federal and contractor staff in safety considerations for the safe conduct of ESS support program activities.
- **Laser Safety Officer** – Occupational Safety and Health Administration-required position held by a technical staff member to ensure the safe use of lasers during ESS support program activities.
- **ESS Support Program Technicians** – Technical staff members that ensure ESS equipment, ammunition, pyrotechnics, and related equipment are available and in sufficient quantities to support EA sanctioned activities and ensure ESS equipment, ammunition, pyrotechnics, and equipment is maintained and transported to locations in good working order and in accordance with applicable regulations.

Section 2: Purpose and Capabilities

General Information

The ESS support program supports performance testing during EA appraisal activities, Composite Adversary Team (CAT) training, and other authorized activities. Capabilities include providing ESS equipment and firearms (permanently modified for blank ammunition), such as handguns and rifles; materials that simulate specialized adversary firearms and equipment, such as rocket propelled grenades and improvised explosive devices; support equipment, including controller/evaluator radios; and technicians/armors trained in the maintenance, set up, and issuance of all ESS equipment and firearms. The program offers short-term loans of equipment and access to skilled and qualified technicians who can support maintenance and repair services on a case-by-case basis.

EA Performance Testing

The Program Coordinator works with EA staff and applicable site representatives to identify the support required for assessment, training, and testing.

The Program Coordinator manages certified technicians to maintain ESS equipment and verify it is ready for deployment. The technicians also support comprehensive data collection from performance testing. For example, at the end of testing, technicians download a complete report of performance data for each Multiple Integrated Laser Engagement System (MILES) harness detailing the time and nature of firearms engagements between individual players and vehicles. This data helps EA performance testing personnel analyze and evaluate protective force performance during ESS performance testing activities.

CAT Training

EA emphasizes realistic testing/training for CAT members while maintaining a rigorous level of safety. To ensure the safe conduct of CAT training, the Program Coordinator works with the Program Manager, CAT Coordinator, Safety Officer, and Laser Safety Officer to ensure implementation of all Federal, contractor, and local safety requirements and controls. The availability and reliability of the ESS equipment before and during the training is key to supporting CAT training. The Program Coordinator manages scheduling conflicts and other activities to ensure resource availability and maintain and prepare ESS equipment for deployment in support of CAT training.

When preparing to deploy to a training facility designated EA staff and contractors may conduct a site survey at the designated training venue prior to deploying firearms and munitions to include other applicable support materials. This site survey allows the technicians to conduct necessary logistical planning to ensure adequate support. (see [EADR-ESS-04, ESS Deployment and Field Issue](#))

Site Assistance

DOE sites request ESS technical support and training in support of site performance testing. The Site Field Office Manager or designee, submits support requests to the Program Manager for approval. Requests for equipment are submitted to the Program Manager who also coordinates with the contracting officer representative for authorization. Equipment requests will include the intended use of the items on loan. Technicians may support the deployment of ESS firearms/equipment packages to

individual sites, where they prepare, issue, recover, and maintain the equipment and assist site personnel with ESS equipment-related matters. Additionally, technicians can provide ESS data downloads and a complete report for each MILES harness, detailing the time and nature of firearms engagements between individual players, to help the site improve its protective strategies and the associated response plans employed by the protective force. EA provides a memorandum to the Field Office Manager outlining the support provided and observations from the event.

Maintenance Support

DOE organizations may need maintenance support. To request ESS maintenance support, the field office Federal manager or designee of the requesting organization submits written requests to the Director, Office of National Security Assessments for approval. Once approved, the Program Manager incorporates the activity into the schedule to ensure there are no conflicts with other EA activities, and the Program Coordinator handles logistics. EA can provide labor on a case-by-case basis; however, the requestor provides parts and shipping.

Section 3: Training and Qualifications

General Information

The Program Coordinator verifies that all technicians are trained and qualified to perform their assigned duties.

Training/Qualifications

Technicians maintain the following training, qualifications, and recertifications at frequencies prescribed by DOE or industry standards.

- DOE and/or firearms manufacturer armorer certification for all firearms maintained in the ESS support program inventory
- Joint Industry Standard Institute for Printed Circuits -A-610 certification
- Hazardous material training per 49 Code of Federal Regulations (CFR) 100-185
- Certification for deployment of smoke and diversionary devices
- All-terrain vehicle operator license(s)
- Powered industrial truck operation and safety training, as applicable
- Laser Safety Officer training
 - Laser Safety Officer training (initial and re-certification every 4 years or when the ANSI Z136.1-6 standard is updated)
- Other training with a justifiable need as identified by the Program Manager through the Program Coordinator.

Section 4: Firearms, Munitions, and Equipment

General Information

The ESS support program maintains ESS firearms, and ancillary equipment, including most small arms used by DOE protective forces. The inventory includes but not limited to specialized adversary firearms/equipment such as rocket propelled grenades, AK-47 rifles, improvised explosive devices, blank ammunition, pyrotechnics, and simulated breaching devices. Other equipment supporting the program includes hand-held radios and repeaters; MILES harnesses for performance test participants and vehicles; small arms transmitters; generators; reactive pop-up targets; all-terrain vehicles; personal protective equipment, such as ear and eye protection and safety vests; and a customized transport trailer.

Acquisition

The Program Coordinator procures equipment as needed based on periodic reviews of mission needs. The Program Coordinator or designee conducts research, develops equipment recommendations, including vendors, types, sizes, quantities, and individual item cost, and justification, then presents recommendations to the Program Manager and coordinates through appropriate EA management for concurrence before submitting to the EA contracting officer representative for approval.

Inventory

The support service contractor maintains a tracking system of all accountable equipment, ammunition, and pyrotechnic devices as described in 48 CFR 970.5204-21, *Department of Energy Property*; using methods contained in DOE Guide 580.1-1A, *Department of Energy Personal Property*. The accountability/tracking system records when equipment leaves the support contractors facility for any reason, such as a loan or in support of performance testing and updated when returned. The Program Coordinator employs both manual and electronic accounting systems to manage equipment while deployed to a testing or training site.

The Program Coordinator reports unrecovered or damaged equipment to the Program Manager as soon as practical. Depending on the equipment's value and sensitivity, the Program Coordinator initiates an appropriate investigation and completes notifications and reporting requirements cited in the service support contractor's Officially Designated Federal Security Authority (ODFSA)-approved security plan.

The Program Coordinator conducts an ESS facility inventory for EA ESS equipment as described in [EADR-ESS-01, ESS Inventory, Storage, Accountability, and Safety](#). [EADR-ESS-04, ESS Equipment Deployment and Field Issue](#), describes ESS deployed inventory procedures.

Maintenance

EA maintenance and repair services include:

- Maintaining and inspecting ESS firearms to ensure functionality and prevent the use of live ammunition, in accordance with DOE Directive. Any signs or evidence of unauthorized

modification or attempted modification to any ESS firearm is immediately reported to the Program Coordinator.

- Maintaining and adjusting laser transmitters, within manufacturers specifications, to ensure the accuracy and operability of ESS firearms.
- Manufacturing and implementing approved ESS modifications.
- Ensuring that personnel and vehicle MILES harnesses are functioning.
- Ensuring that the logistics trailer is operable and maintained in good working condition.
- Ensuring that EA radios are operating within FCC guidelines.

Maintenance for EA ESS firearms is conducted as described in [EADR-ESS-02, ESS Firearms Modification and Maintenance](#).

Firearms Modifications

DOE National Training Center -certified EA technicians are the only personnel authorized to conduct repairs and/or modifications to EA ESS firearms. The only authorized modifications to EA firearms are those cited in the Firearms Modification List as sanctioned by the DOE Armorers Policy Panel and approved by the DOE Office of Security Policy.

- The Program Coordinator must receive written approval from the ODFSA prior to modifying firearms.
- The ODFSA must approve the conversion of EA ESS firearms for live fire usage.
- The Program Coordinator prepares the written requests for the ODFSA to submit to the Office of Security for modifications not in the Firearms Modification List.

Transfer and Loan

When equipment is no longer needed to support EA activities, the excessed equipment is transferred for use by other agencies or DOE programs/sites (ref: DOE G 580.1-1A, Section IV, Chapter 4 DOE Personal Property). A General Services Administration [Standard Form \(SF\)-122, Transfer Order Excess Personal Property](#), is used to formalize the transfer of equipment. Upon notification that a site/program has agreed to possess any designated EA excess equipment, the Program Coordinator prepares the Standard Form-122 for EA authorization and facilitates the shipment and removal from the support contractor's inventory.

The EA ESS support program equipment may be provided to other DOE sites as a short-term loan to support site performance testing activities when requested by field offices. [DOE Form \(F\) 4420.2, Personal Property Loan Agreement](#), documents EA Federal approvals and formalizes the loan. The Program Coordinator communicates with the site to determine what equipment is needed, ensures that selected equipment is in good operational condition, and oversees packaging and shipment. On return of the equipment, the Program Coordinator oversees the inspection, repairs, or maintenance of each item as necessary. When equipment is on loan, the service support contractor's government property database records the loan dates and destination until each item is returned.

Destruction

The service support contractor manages unserviceable and unrepairable equipment using methodology described in DOE Guide 580.1-1A, Chg. 1 (LtdChg), *Personal Property*. The Program Coordinator identifies equipment for destruction on a contract modification list that is submitted to EA for approval. Upon approval, the Program Coordinator arranges to destroy firearms using approved methods described by the Alcohol, Tobacco, and Firearms and reports the final disposition to the Program Manager. All other equipment is destroyed using acceptable recycling or disposal methods. The Program Coordinator documents destruction of all GFE as directed in the service support contractor's government property program. A formal destruction certificate for the equipment includes signatures of EA or contractor personnel supervising the destruction, along with a list of each item destroyed and its description, manufacturer, model, and serial number.

Transportation

The service support contractor maintains the EA transport trailer to move large quantities of the ESS inventory. The trailer is a custom-built dual axle, enclosed vehicle transport style trailer with upper and lower decks. It is 8 feet 5 inches wide, 53 feet long, and 13 feet 6 inches high. The interior contains adequate worksurfaces for preparation, issuance, and maintenance of equipment, while also incorporating security features described in [ODFSA-approved Transportation Security Plan](#). The trailer has a lift gate in the rear of the vehicle that can be mechanically raised during loading and unloading of cargo.

The dedicated ESS logistics trailer reduces the wear and tear on government equipment by providing shelter from ambient weather and mitigating the need to frequently disassemble and package certain equipment. The ESS logistics trailer also provides secure storage and accountability for ESS firearms and sensitive items, as well as an efficient issue point for ESS firearms and equipment during EA assessments and CAT training.

The trailer is designed to store and maintain the type and quantity of ESS firearms, equipment, and ammunition necessary to support EA activities. The trailer safely and securely stores ESS firearms, blank ammunition, and other related equipment while in transit to and from performance testing/training locations and while located at approved mission support locations. Hazardous equipment is packaged and transported per Department of Transportation guidelines for hazardous materials, which include, for example, packaging/storage configuration, placarding of the trailer, and driver regulations. [EADR-ESS-01, ESS Inventory, Storage, Accountability and Safety](#) and [EADR-ESS-03, ESS Transport Trailer Operations](#), describe procedures to safely and securely transport ESS firearms and accessories.



Figure 1. Transport Trailer

Frequency Management

Included in the inventory of ESS program equipment are hand-held radios and repeaters. Before the use of this equipment at various locations (e.g., EA Performance Testing and CAT Training), the operating frequency must be identified and approved in accordance with the *U.S. Department of Commerce National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management*. The Program Coordinator provides the interface to the DOE Frequency Spectrum Manager and the points of contact for radio and frequency usage at DOE sites and other training locations. When frequency usage is requested, the Program Coordinator must submit a request to the appropriate site authority using that site's procedures.

Section 5: Safety

General Information

A fundamental principle of the ESS program is that all participants, regardless of the activity, prioritize their safety and the safety of others. The ESS Program follows DOE Order 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*, and 10 CFR 851, *Worker Safety and Health*. The Safety Officer collaborates with the Program Coordinator to evaluate all working environments for potential hazards and eliminates or mitigates them to a reasonable level. The Safety Officer maintains a consolidated [Job Hazard Analysis Matrix](#) and safety risk assessments for all CAT and ESS operations which the Program Manager approves.

During EA sanctioned activities, EA employees adhere to the rules, regulations, and procedures of the site/organization being supported. All EA employees participating in the activities receive mission-specific safety briefs based on the site or organization's safety and health program.

ESS support program desktop references describe additional safety controls applicable to the various activities conducted by the ESS support program.

ESS Firearms and Equipment

The Safety Officer, with input from the Program Coordinator, develops and maintains hazard and control measures associated with ESS support program firearms and equipment. The Safety Officer uses past accidents, occupational injury experience, procedure review, and similar items to determine the consequence and probability of injury associated with the use of this equipment. The following controls are necessary to ensure safe operations of ESS firearms:

- Certified armorers inspect and maintain all firearms.
- Only National Training Center -trained or manufacturer-certified technicians modify firearms and weapons used in ESS activities.
- All ESS firearms and magazines must be clearly marked.
- All ESS blank-fire firearms must be equipped with live round inhibiting devices or ported chambers, as well as one or more additional engineered layers of safety to prevent the accidental introduction of live rounds. Additionally, with the exception of single shot grenade launchers, blank-fire firearms must be equipped with approved blank fire adapters or blast deflectors (see also [EADR-ESS-02, ESS Firearms Modification and Maintenance](#)).
- ESS equipment includes MILES gear that operates by firing and detecting specially encoded Class 3a/3r and Class 1 laser signals. The lasers must meet the U.S. Food and Drug Administration eye safety requirements (i.e., 21 CFR 1040.10 and 11 and American National Standards Institute Z136.1&6) and do not present an undue hazard to the eyes during normal operations. Special eye protection is not always required; however, all personnel should be cautioned not to stare into the beam when within 10 meters (33 feet) of the laser, and not to view with the aided eye, such as with magnifying optics, when within 50 meters (164 feet), with a 50mm objective lens (see also [EADR-ESS-05, ESS Safe Use of Lasers](#)).

- Transmitters of all laser engagement systems must carry caution stickers that are visible to persons in the vicinity of the transmitter and that contain the words, “INVISIBLE LASER RADIATION” (see also [EADR-ESS-05, ESS Safe Use of Lasers](#)).

Pyrotechnics

DOE Order 473.2A and DOE-Standard-1212-2019, *Explosives Safety* have specific requirements for use, handling, and storage of pyrotechnics. The Program Manager and Program Coordinator implements the following controls to ensure safe operations of pyrotechnics and other explosives used as part of the ESS support program and to align with DOE requirements:

- EA personnel who work with explosives must be trained and qualified in the tasks to be performed and must understand all safety standards, requirements, and precautions that apply to their work.
- All operations are to be conducted in a manner that exposes the minimum number of people to the smallest quantity of explosives for the shortest period, consistent with the activities being conducted.
- Transportation for all approved munitions is to be conducted in accordance with the U.S. Department of Transportation regulations. When applicable, the ESS trailer has the required Department of Transportation placards affixed. Explosive devices must not be carried on commercial airline flights or in privately owned vehicles (see also [EADR-ESS-03, ESS Transport Trailer Operations](#)).
- Munitions shall be protected from abnormal stimuli or environments, such as impact, shock, high temperatures, and open flames. Smoking is prohibited within 50 feet of areas where munitions are being handled, transported, or stored.
- Live-fire firearms and live ammunition are not allowed in ESS support program work areas, except for firearms that are scheduled for ESS modification. Any live firearms will be physically segregated, as required, from ESS firearms until appropriately modified.
- Cartridges for shoulder-fired rocket signature simulator sleeves ignite at the rear of the weapon; common names for shoulder-fired rockets include light anti-armor weapon, Viper, and rocket propelled grenade. Anyone test-firing or conducting maintenance on a shoulder-fired rocket simulator must verify that the danger zone is clear (i.e., 30 feet to the rear and 5 feet to all sides of the shoulder-fired rocket simulator).

Emergencies and Accident/Injury Reporting

This section applies to ESS support program-related emergencies and accidents/injuries that may occur during training activities and while supporting performance testing, including official government travel, and/or in conjunction with ESS support program work-related activities at the service support contractor ESS Facility. A copy of this manual will be readily available at the service support contractor ESS Facility and at all workplaces where ESS support program work is being performed. All emergencies and accidents/injuries must be reported immediately, including:

- Slips, trips, or falls
- Muscle strains

- Chemical or radiation exposure
- Cuts, broken bones, or bruises
- Motor vehicle accidents
- Food poisoning
- Occupational illnesses
- hospitalizations for a work-related accident, injury, or illness.

When participating in DOE field site activities, EA personnel follow the site accident, illness, and injury reporting requirements. When participating in EA training activities at other agency sites, the EA procedures for reporting accidents, illnesses, and injuries will be followed. Personnel who are present during an emergency or injury should provide the appropriate level of medical treatment within their training and ability as necessary (i.e., first aid, transport to the nearest medical facility, or notifying 911 or the appropriate emergency contact at the location). Personnel should immediately report emergencies and accidents/injuries to the Program Coordinator or Safety Officer, who then notifies the Program Manager. All accidents are reported even if they do not result in an injury. When professional medical evaluation is determined necessary, the injured individual is accompanied by a person designated by the Program Coordinator. The injured individual and escort are instructed to obtain copies of discharge papers (to include diagnosis, treatment plan, medications, follow-up appointment instructions, restrictions, etc.) for use in injury reporting.

The Program Coordinator and Safety Officer maintain blank [DOE F 5484.3, Individual Accident/Incident Report](#) while at any EA work location. An injured employee, with assistance from the Program Coordinator and/or Safety Officer, must complete this form and site-specific paperwork (if any). If the injured employee is unable to complete the necessary paperwork, they may designate an individual to act on their behalf.

- Both EA Federal and support service contractor work related injuries or illnesses are recorded on DOE F 5484.3 for input by the Safety Officer into the DOE [Computerized Accident/Incident Reporting System \(CAIRS\)](#). EA service support contractors may need to complete additional Occupational Safety and Health Administration forms or steps as directed by their management.
- Work-related injuries or illnesses occurring to EA observers or augmentees (Federal or contractor) from other DOE organizations or agencies are recorded on DOE F 5484.3 and forwarded to their sponsoring or home organization (supervisors) for input into CAIRS or their injury or illness database.
- Injured Federal employees (EA, other DOE organizations, other agencies) seeking emergency medical treatment request supervisor authorization for medical treatment (when time is of the essence) and follow up with submitting U.S. Department of Labor form CA-16, *Authorization for Examination and/or Treatment* (obtain a copy from the workers compensation division) and take the form with them during treatment.

The Program Manager and Program Coordinator, with assistance from the Safety Officer, must investigate all ESS support program-related emergencies and accidents/injuries. The Program Coordinator or Safety Officer completes DOE F 5484.3 sections 38, 39, and 41, in accordance with DOE Order 440.1B. The designated accident injury investigator collects completed DOE F 5484.3, a written statement from the injured employees, written witness statements, safety risk assessment, lesson plan(s), and scenario plan(s), and conducts in person interviews. All collected data are analyzed to

determine whether the injury resulted from a work-related activity and whether other factors contributed to the cause and a summary report is developed.

The investigation summary report and supporting investigation documentation is provided to the Program Manager for record. Completed summary reports, DOE F 5484.3, and supporting site-specific paperwork are marked and protected as Controlled Unclassified Information-Personally Identifiable Information (CUI//PRVCY). As such, they will remain in custody of the Program Manager or Safety Officer until they can be securely transmitted (e.g. encryption).

The Program Manager reviews and authorizes the Safety Officer to proceed with internal and external processing. The Program Manager and the Safety Officer work with appropriate DOE personnel to determine whether additional reporting is required. If so, reports are disseminated through appropriate reporting channels, such as the [Occurrence Reporting Processing System](#), the [CAIRS](#), and lessons learned.

After the investigation, the Program Coordinator and Safety Officer must identify and implement corrective actions, or compensatory corrective actions, as necessary to prevent a recurrence of the injury or illness.