



# ENGAGEMENT SIMULATION SYSTEMS PROGRAM MANUAL



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Office of Safeguards and Security Assessments  
Office of Enterprise Assessments  
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**ENGAGEMENT SIMULATION SYSTEMS  
PROGRAM MANUAL**

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## **Preface**

As part of the U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA), the Office of Safeguards and Security Assessments is responsible for conducting assessment activities at DOE and National Nuclear Security Administration (NNSA) sites that possess high-value security interests, as mandated in DOE Order 227.1A, *Independent Oversight Program*. To support this mandate, EA has established an engagement simulation systems (ESS) support program to provide ESS equipment and support for performance testing at DOE and NNSA sites.

This program manual describes the ESS support program and establishes roles and responsibilities for personnel implementing and overseeing the program. Although designed specifically for EA Federal and contractor personnel, this program manual may be useful to Federal field element and facility contractor personnel using ESS-type equipment to conduct performance testing.

EA anticipates making periodic revisions to this manual in response to changes in DOE program direction and guidance, insights gained from appraisal activities, and feedback from customers and stakeholders. The ESS Support Program Coordinator will facilitate an annual review of this manual and send recommended changes to the Federal ESS Support Program Manager. As part of the revision process, EA invites users of this manual to submit comments and recommendations.

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## Acronyms

CAT	Composite Adversary Team
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EA-20	Office of Safeguards and Security Assessments
ESS	Engagement Simulation Systems
FML	Firearms Modification List
MILES	Multiple Integrated Laser Engagement System
NNSA	National Nuclear Security Administration
NTC	National Training Center
SF	Standard Form

## Definitions

*Composite Adversary Team (CAT)* – Designated individuals who act the part of adversaries during performance tests.

*Engagement Simulation Systems (ESS)* – Non-lethal engagement systems that permit players to simulate combat conditions and provide an accurate assessment of the effects of weapons fire during simulated hostile engagements. Several forms of ESS are available, such as the Multiple Integrated Laser Engagement System (MILES), dye-marking cartridges, blank fire, or inert systems.

*Force-on-Force Exercise* – An exercise that uses protective force or other designated personnel in the role of an adversary force to simulate the actual engagement of protective forces.

*Limited-Scope Performance Test* – A performance test that evaluates specific skills, equipment, operations, or procedures. The events of the test may be interrupted to facilitate data collection and may be purposely directed by evaluators to achieve certain evaluation goals.

*Multiple Integrated Laser Engagement System (MILES)* – Equipment consisting of weapons-mounted laser transmitters and laser sensors that are mounted on potential targets (e.g., personnel, vehicles, buildings) to enable accurate assessment of the effects of weapons fire during simulated hostile engagements.

*National Training Center (NTC)* – A DOE organization consisting of multiple training academies and programs that support the development and implementation of centralized, standardized training, curriculum development, and other training-related services. The National Training Center provides the infrastructure in support of these academies and programs.

*Performance Test* – A test to evaluate the ability of an implemented and operating system element or total system to meet an established requirement.

## Section 1: Program Management

### General Information

As part of the U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA), the Office of Safeguards and Security Assessments (EA-20) provides feedback to internal and external stakeholders through independently evaluating the effectiveness of safeguards and security policies and programs throughout DOE and the National Nuclear Security Administration (NNSA). In support of this mission, EA-20 plans and conducts a variety of assessment activities that include performance testing, which incorporates a broad range of threats and scenarios to provide a complete and realistic evaluation of a site's safeguards and security system readiness to protect DOE assets. Performance testing often includes limited-scope performance tests and force-on-force tests using engagement simulation systems (ESS) equipment. This ESS support program manual establishes the management, operations, safety, and use of ESS equipment and personnel in support of EA appraisals and other sanctioned activities. This manual serves to promote consistency, ensure thoroughness, and enhance the quality of the ESS support program.

The ESS support program is a Federal program. It is required to comply with safety rules contained in DOE Order 473.2A, *Protective Force Operations*, and DOE Order 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*. These policies require ESS firearms users to establish safety policies and procedures for security operations; train personnel to ensure that proper accident prevention controls are in place; and conduct formal appraisals (firearms safety assessments) to specifically assess the implementation of those procedures, personnel responsibilities, and duty assignments.

The objective of the ESS support program is to support the performance testing of the Department's most critical protection systems. The program benefits EA as well as the individual field offices and contractor organizations. Based in Albuquerque, New Mexico, the program provides an in-house inventory of dedicated ESS firearms and equipment. Program activities include trip planning and preparation; ESS firearm modifications; transportation and secure storage of ESS firearms and blank ammunition; providing and maintaining communication equipment and licenses; inventory control; and administrative functions. The program inventory includes materials that replicate specialized firearms and equipment, such as rocket-propelled grenades and improvised explosive devices. Contractor personnel who are fully trained and certified on the use, modification, repair, and maintenance of the equipment support the program.

### Responsibilities

- *ESS Support Program Manager (Program Manager)* – Position held by an EA-20 Federal staff member responsible for the overall program. Duties include ensuring that all administrative, logistical, safety, and funding requirements pertaining to the ESS support program are met and that ESS support program personnel are properly trained, briefed, and prepared to safely provide the required EA performance testing support.
- *ESS Support Program Coordinator (Program Coordinator)* – Position held by a staff member of the support contractor responsible for the implementation and execution of the ESS support program. Responsibilities include maintaining a cadre of properly trained and qualified DOE armorers and ESS technicians; directing and overseeing the technicians and any ESS support personnel performing EA sanctioned activities; managing and overseeing day-to-day ESS training and operations; performing the role of frequency manager for use of EA communication



equipment (radios and repeaters); ensuring that personnel fully understand all details of their assigned tasks; and taking positive measures to ensure that those tasks are properly executed.

- *Safety Officer* – Position held by a staff member of the support contractor responsible for advising EA-20 Federal and contractor management and resolving issues necessary for the safe conduct of ESS support program activities and overseeing safety during activities that use ESS equipment.
- *Laser Safety Officer* – Position required by the Occupational Safety and Health Administration and held by a staff member of the support contractor responsible for ensuring the safe use of lasers during ESS support program activities.
- *ESS Support Program Technicians* – Personnel who augment the positions above and provide support to ensure that ESS equipment, ammunition, pyrotechnics, and related equipment are available and in sufficient quantities to support EA sanctioned activities. These individuals also ensure that ESS equipment, ammunition, pyrotechnics, and equipment are maintained and transported to locations in good working order and in accordance with applicable regulations. Moreover, as support personnel, these individuals are responsible for reading and being familiar with this manual and the requirements for the positions and tasks to which they are assigned.

### **Scheduling**

As part of developing the annual EA schedule of activities, the Program Manager coordinates with the Program Coordinator on actions necessary to support multi-topic assessments, force-on-force exercises, and EA Composite Adversary Team (CAT) training. Other EA activities approved by the EA-20 Director or Deputy Director, such as field assistance requests, are supported at the discretion of the Program Manager and are dependent on resources and schedule availability.

## Section 2: Services

### General Information

The ESS support program offers a range of services supporting performance testing during EA appraisal activities, CAT training, and other EA sanctioned activities. Services include providing an operational inventory of 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/armorers trained in the maintenance, set up, and issuance of all ESS equipment and firearms. From an equipment standpoint, for sites without their own ESS capability or with an insufficient or non-compatible ESS capability, the program can offer a short-term loan of a tailored package of well-maintained equipment on a case-by-case basis. For sites that have ESS equipment and have relied on factory service for equipment maintenance and repairs, the program provides access to skilled and qualified technicians who can support maintenance and repair services on a case-by-case basis.

### EA Performance Testing

As part of the scheduling process for EA appraisals, performance testing activities using ESS equipment and personnel are scheduled throughout the year. The Program Coordinator works with EA performance test directors/coordinators, the CAT Coordinator, and applicable site representatives to identify needed support for such testing. EA relies on the timely delivery and reliable availability of equipment during performance testing and training activities. The ESS support program staff provide assistance and support to resolve deployment, storage, and issue/retrieval problems that may arise before, during, or after deployment of equipment.

The ESS support program staff ensures that ESS equipment is properly maintained and ready for deployment to support performance testing and EA sanctioned activities. The program staff are also capable of supporting comprehensive data collection from performance testing. For example, the Multiple Integrated Laser Engagement System (MILES) harnesses used during performance testing exercises store a great deal of relevant data, and at the end of testing, program staff members download a complete report for each 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 the assessed protective strategy.

When preparing to deploy to a training facility for the first time, designated ESS support personnel may conduct a site survey at the designated training venue beforehand (approximately three months in advance) to deploy firearms, munitions, and other applicable support materials. This site survey allows the ESS support staff to conduct necessary logistical planning to ensure adequate support.

### CAT Training

EA emphasizes realistic testing/training for CAT members while maintaining a rigorous level of safety and concern for the environment. 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 that all Federal, contractor, and local site safety requirements and controls are effectively implemented. Scheduling of CAT training is considered when developing the EA-20 annual appraisal schedule. Key to supporting CAT training is the availability and reliability of the ESS equipment before and during the

training. The ESS support program staff must help manage scheduling conflicts and other activities so that resources are available when necessary. Training is typically held at Department of Defense facilities or other government agency installations. The program staff ensures that ESS equipment is properly maintained and ready for deployment in support of CAT training.

### **Field Assistance**

On occasion, a field office may request the equipment and/or ESS technical support for site-specific performance testing. These requests are routed through the Program Manager to the EA-20 Director or Deputy Director in writing from the responsible Federal manager of the requesting organization. Once approved, the request must be considered as part of the overall scheduling process to ensure no conflicts with other EA activities and that the sites receive dedicated, professional support. The request must include the intended use of the items on loan. ESS weapon and equipment packages or individual items can be loaned and shipped directly. If requested, ESS technicians are typically available to accompany the ESS firearms/equipment packages to individual sites, where the technicians prepare, issue, recover, and maintain the equipment and assist site personnel with ESS equipment-related matters. Additionally, program personnel can download and provide 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 Sanctioned Activities**

EA may request support from the ESS support program for providing equipment and technical support to the DOE National Training Center (NTC), modifying live firearms to function as ESS firearms in support of EA activities, and carrying out other activity requests from the Program Manager. These activities are scheduled as needed and are supported in accordance with available resources. (Note: ESS firearms modifications will be approved and conducted in accordance with DOE policy.)

## Section 3: Training and Qualifications

### General Information

The Program Coordinator is also responsible for ensuring that all ESS support program staff members are trained and qualified to perform their assigned duties.

### Training/Qualifications

Training requirements for individual staff members are specified at the discretion of the Program Coordinator and Program Manager; however, the ESS support program must maintain the following training and qualifications at prescribed frequencies or as established by the ESS support program requirements:

- DOE and/or firearms manufacturer armorer certification for all firearms maintained in the ESS support program inventory
- Joint Industry Standard Institute for Printed Circuits IPC-A-610
- Hazardous material training per 49 Code of Federal Regulations (CFR), *Transportation*, 100-185
- Certified in the deployment of smoke and diversionary devices
- All-terrain vehicle operator licenses
- Laser Safety Officer training
  - The Laser Safety Officer must attend training every four years or when American National Standards Institute Z136.1-6, *American National Standard for Safe Use of Lasers*, is updated
- DOE property management
- Other training at the discretion of the Program Manager or Program Coordinator.

### Powered Industrial Trucks

Due to terrain and or distance, the use of powered industrial trucks may be necessary to move heavy equipment, such as shipping containers or palletized items, to and from the ESS logistical trailer and the designated CAT rehearsal building/area. Employees who operate powered industrial trucks must be trained in basic operation and safety procedures. Initial operator training may be acquired at a commercial training facility or through in-house training by a qualified staff member. Employees who have had training through previous job experience may be credited with basic operator training if they produce evidence of training.

## Section 4: Firearms and Equipment

### General Information

The ESS support program maintains a full complement of ESS equipment, firearms, and ancillary equipment, including most small arms used by DOE protective forces. The inventory includes materials that replicate specialized firearms and equipment, such as rocket-propelled grenades; AK-47 assault rifles; improvised explosive device fire sets ranging from simulated anti-personnel devices to command-detonated, vehicle-borne devices; blank ammunition; pyrotechnics; and various types of simulated breaching devices. Other equipment supporting the program includes hand-held radios and repeaters; MILES harnesses for personnel 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.

### Purchase

Equipment purchases are typically accomplished on a two-year fiscal planning cycle and as directed by EA. The Program Coordinator or designee conducts research and recommends equipment to support operational needs. Recommendations include the vendors, types, sizes, quantities, individual item cost, and justification. These recommendations are presented to the Program Manager and coordinated through the EA-20 Director for concurrence before being submitted to the EA contracting officer representative for approval.

### Inventory

The Program Coordinator maintains an accountability/tracking system of all equipment, ammunition, and pyrotechnic devices following DOE Order 473.2A; 41 CFR 101, *Federal Property Management Regulations*; 41 CFR 102, *Federal Management Regulation*; 48 CFR 970.5204-21, *Department of Energy Property*; and DOE Guide 580.1-1A, *Personal Property*, and ensures that inventory levels are sufficient to support operational needs. The electronic inventory system must be updated to reflect when equipment leaves the support contractor's facility for any reason, such as a loan or in support of performance testing and must be updated when equipment is returned. When equipment is used in the field for direct support, such as performance testing or CAT training, a second personal equipment inventory must also be maintained to track the individual issuance of firearms and other sensitive items from the transport trailer and their return. When performance testing or CAT training activities have are complete, ESS technicians will properly accounted for weapons, ammunition, munitions, and sensitive items.

Unrecovered or damaged equipment must be reported to the Program Manager as soon as practical. Depending on the value and sensitivity of the equipment, an appropriate investigation will be initiated, and notifications and reporting requirements cited in the appropriate DOE directives will be completed.

### Maintenance

EA maintenance and repair services include:

- Ensuring that ESS firearms are maintained and functioning and have been modified to inhibit the introduction of live ammunition. All firearms are maintained and inspected in accordance with

DOE Order 473.2A. 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 manufacturer's specifications, to ensure the accuracy and operability of ESS firearms.
- Manufacturing and implementing approved ESS modifications.
- Ensuring that the MILES harnesses for personnel and vehicles are functioning.
- Ensuring that the logistics trailer is operable and maintained in good working condition.
- Ensuring that EA radios are operating within Federal Communication Commission guidelines.

A field office may request ESS maintenance support. These requests are routed through the Program Manager to the EA-20 Director or Deputy Director in writing from the responsible Federal manager of the requesting organization. Once approved, the request must be considered as part of the overall scheduling process to ensure that there are no conflicts with other EA activities. On a case-by-case determination, EA can supply labor; however, the requestor provides parts and shipping. Logistics are accomplished through coordination with the Program Coordinator.

### **Firearms Modifications**

Armorsers certified by the DOE NTC 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 (FML) as sanctioned by the DOE Armorsers Policy Panel and approved by the DOE Office of Security Policy. The following protocols are in place for firearms modification:

- The Program Coordinator must receive written approval from the Officially Designated Federal Security Authority prior to modifying firearms.
- EA firearms that are converted for ESS use will not be reactivated for live fire usage without the approval of the Officially Designated Federal Security Authority.
- Requests for modifications not on the FML must be submitted in writing to the Office of Security per the FML.

### **Transfer and Loan**

When equipment is no longer needed to support EA activities, it may be excessed or transferred for use by other DOE programs or sites (ref: DOE Guide 580.1-1A, Section IV, Chapter 4). A General Services Administration Standard Form (SF)-122, *Transfer Order Excess Personal Property*, is used to formalize the transfer of equipment (see Appendix 1). Upon notification that a site or program has requested to possess any designated EA excess equipment, it will be prepared for shipment and removed from inventory. The ESS support program also facilitates the short-term transfer of ESS equipment based on field office requests for support during site testing activities. DOE Form 4420.2, *Personal Property Loan Agreement*, documents EA Federal approvals and formalizes the loan (see Appendix 2). EA program personnel coordinate with the site to determine the equipment that is needed, ensure that it is in good operational condition, and prepare it for shipping. On return of the equipment, EA program personnel inspect each item and make repairs and/or conduct maintenance as necessary. When equipment is on loan, the destination and date are annotated in the ESS inventory system until each item is returned.

## **Destruction**

When equipment is unserviceable/unrepairable, according to DOE Guide 580.1-1A, it can be destroyed under the supervision of at least one contractor employee and a DOE Federal employee. Signatures of personnel supervising the destruction, along with a list of each item destroyed and its description, manufacturer, model, and serial number, are documented on a formal destruction certificate (see Appendix 3, *Destruction Certification Example*).

## **Transportation**

Large quantities of the ESS inventory are transported using a trailer, which is designed to support the type and quantity of ESS firearms, equipment, and ammunition necessary to support EA activities (see Appendix 5, *ESS Trailer Description*). 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. Some of this equipment is considered hazardous and must be transported per U.S. Department of Transportation guidelines for hazardous materials, which include, for example, packaging/storage configuration, placarding of the trailer, and driver regulations.

## **Frequency Management**

Included in the inventory of program equipment are hand-held radios and repeaters. Before this equipment is used at various locations (e.g., for 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 is the frequency manager for EA communication equipment and provides the interface to the DOE Spectrum Management Office and the points of contact for radio and frequency usage at DOE and NNSA sites and other training locations. When frequency usage is requested, the *Frequency Usage Request Form* (see Appendix 4) must be submitted to the DOE Spectrum Management Office for approval.



## Section 5: Safety

### General Information

The ESS support program must ensure that all firearms and equipment successfully support the safe conduct of testing and training. Per 10 CFR 851, *Worker Safety and Health*, employers are required to evaluate the working environment for potential hazards and eliminate or mitigate them to a reasonable level. The Program Coordinator ensures that program activities are safe and adhere to established procedures, and that personnel under their cognizance adhere to the rules, regulations, and procedures of the site/organization.

### ESS Firearms and Equipment

Hazards and control measures associated with ESS support program firearms and equipment are documented in a risk assessment developed by the Safety Officer and maintained by the Program Coordinator. Past accidents, occupational injury experience, procedure review, and similar items are used 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:

- Equipment must not be removed from the ESS support program workspace or vehicles without the knowledge and authorization of the Program Coordinator or designated representative. All firearms are inspected and maintained by NTC-certified armorers, and all deployed ESS equipment is accounted for before participants are released.
- All firearms and weapons used in ESS activities must be modified by an NTC Live Fire Range Armory gunsmith or an organization approved by DOE, dedicated for ESS use only, and clearly marked.
- All ESS 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, except for single shot grenade launchers, blank-fire firearms must be equipped with approved blank-fire adapters or blast deflectors.
- ESS equipment includes MILES gear that operates by firing and detecting specially encoded Class 3a/3r and Class 1 laser signals. The lasers meet the U.S. Food and Drug Administration eye safety requirements (i.e., 21 CFR 1040.10, *Laser Products*, and 1040.11, *Specific Purpose Laser Products*, and American National Standards Institute Z136.1-6) and do not present an undue hazard to the eyes during normal operations. No special eye protection is required; however, 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).
- 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."



## **Pyrotechnics**

The following controls are necessary to ensure safe operations of pyrotechnics and other explosives used as part of the ESS support program:

- 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 U.S. Department of Transportation regulations. When applicable, the ESS trailer has the required U.S. Department of Transportation placards affixed. Explosive devices must not be carried on commercial airline flights or in privately owned vehicles.
- 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 emergencies and accidents/injuries that may occur during training activities and while supporting performance testing, including official government travel, and/or in conjunction with EA work-related activities at the Albuquerque ESS Facility. A copy of this manual will be readily available at the Albuquerque ESS Facility and during all training iterations. All emergencies and accidents/injuries must be reported immediately. Examples of emergencies and accidents/injuries include slips, trips, or falls; back, shoulder, neck, or other muscle strains; exposure to chemical fumes or radiation; cuts, broken bones, or bruises; motor vehicle accidents; food poisoning; occupational illnesses, including infectious diseases, if exposed while at work or on official travel; and hospitalizations for a work-related accident, injury, or illness. Personnel who are present during an emergency or injury should provide the appropriate level of medical treatment as necessary – i.e., first aid, transport to the nearest medical facility, or notifying 911 or the appropriate emergency contact at the location. Accidents should be reported even if they do not result in an injury.

Emergencies and accidents/injuries must be reported immediately to the Program Coordinator or Safety Officer. The Program Coordinator or Safety Officer will notify the Program Manager, who will notify the EA-20 Director, the support service contract task manager, and (where appropriate and as approved by the EA-20 Director) the sponsoring organization of the individual's injury/illness/accident.

All emergencies and accidents/injuries must be investigated by the Program Manager and Program Coordinator with assistance from the Safety Officer. The injured employee, with assistance from the

Program Coordinator and/or Safety Officer, completes the necessary paperwork, including DOE Form 5484.3, *Individual Accident/Incident Report*. The Program Coordinator and Safety Officer must maintain the availability of blank forms. If the employee is unable to complete the necessary paperwork, he or she may designate an individual to act on his or her behalf. The Program Coordinator or Safety Officer completes Sections 38, 39, and 41, in accordance with DOE Order 440.1B, and based on this information, determines whether the injury resulted from a work-related activity and whether other factors contributed to the cause. (Note: Once a form is completed, it becomes Official Use Only. All necessary precautions shall be taken to protect the personally identifiable information provided on the form.)

Once complete, all forms are forwarded to the Program Manager for review and submission. The Program Manager may choose to provide courtesy copies of the forms to the home organization of DOE contractor personnel for purposes of workers' compensation. The Program Manager will work with appropriate DOE personnel to determine whether additional reporting is required. If so, appropriate reports will be disseminated through appropriate reporting channels, such as the Occurrence Reporting Processing System, the Computerized Accident/Incident Reporting System, 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.

**Section 6: Appendices**

Appendix 1 SF-122, Transfer Order Excess Personal Property ..... Appendix 1-1  
Appendix 2 DOE Form 4420.2, *Personal Property Loan Agreement* ..... Appendix 2-1  
Appendix 3 Destruction Certification Example ..... Appendix 3-1  
Appendix 4 Frequency Usage Request Form ..... Appendix 4-1  
Appendix 5 ESS Trailer Description..... Appendix 5-1

# Appendix 1: SF-122, Transfer Order Excess Personal Property

**1.0**

STANDARD FORM 122 SEPTEMBER 1974 GENERAL SERVICES ADMINISTRATION FPMR (41 CFR) 101-32.306 FPMR (41 CFR) 101-43.315	TRANSFER ORDER EXCESS PERSONAL PROPERTY	1. ORDER NO.  2. DATE					
3. TO: General Services Administration*		4. ORDERING AGENCY (Full name and address)*					
5. HOLDING AGENCY (Name and address)*		6. SHIP TO (Consignee and destination)*					
7. LOCATION OF PROPERTY		8. SHIPPING INSTRUCTIONS					
9. ORDERING AGENCY APPROVAL		10. APPROPRIATION SYMBOL AND TITLE					
a. SIGNATURE	b. DATE						
c. TITLE							
13. PROPERTY ORDERED							
GSA AND HOLDING AGENCY NOS. (a)	ITEM NO. (b)	DESCRIPTION (Include noun name FSC Group and Class, Condition code and, if available, National Stock Number) (c)	UNIT (d)	QUANTITY (e)	ACQUISITION COST		
					UNIT (f)	TOTAL (g)	
14. GSA APPROVAL		a. SIGNATURE	b. TITLE			c. DATE	
FOR GSA USE ONLY	AGENCY AND LOCATION				FSC	CONDITION	SOURCE CODE
	AGENCY	STATE					

\*Include ZIP Code

# Appendix 2: DOE Form 4420.2, Personal Property Loan Agreement

DOE F 4420.2  
(11-01)

OMB Control No. 1910-1000

All Other Editions Are Obsolete

## U.S. Department of Energy Personal Property Loan Agreement OMB Burden Disclosure Statement

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Records Management Division, IM-11 GTN, Paperwork Reduction Project (1910-1000), U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget (OMB), Paperwork Reduction Project (1910-1000), Washington, DC 20503.

DOE-PMR 109-1.5 103		1. CONTROL NUMBER	2. LOAN DATE	3. EXPIRATION DATE	4. PAGE 1 OF
5. NAME-ADDRESS-TELEPHONE NO./FAX/EMAIL (LENDER)			6. NAME-ADDRESS-TELEPHONE NO./FAX/EMAIL (BORROWER)		
7. PURPOSE OF LOAN AND LOCATION WHERE PROPERTY WILL BE USED					
8. REFERENCE/CONTRACTUAL DOCUMENTATION/SHIPPING INFORMATION					
9. ITEM NO.	QUANTITY	PROPERTY NO.	SERIAL NO.	PERSONAL PROPERTY DESCRIPTION	ACQUISITION COST
(If additional space is necessary, attach a separate sheet.)					

### TERMS AND CONDITIONS OF LOAN

1. The borrower shall:
  - a. return the loan item(s) in like condition as received from Lender, normal wear and tear excepted, and free of contamination, on or before the expiration date, unless the loan period is formally extended or the loan is terminated before the due date.
  - b. in case of loss or damage of the property loaned, reimburse the Lender at the current price of replacement or repair.
  - c. assume all costs involved in preparation, handling, loaning, disconnecting, and transportation from and to the Lender.
  - d. agree to indemnify and hold harmless the Lender and the Department of Energy against any and all liability, loss, damages, claims and costs incidental hereto as a result of Borrower's use or possession of the loaned property.
  - e. use the loan property only for the purposes specified in this loan agreement.
2. The above property shall not be modified, loaned, or transferred to a third party without the written permission of the Lender.
3. The Borrower shall account for, or permit inspection of, the loaned property by the Lender after proper notification.
4. This is U.S. government property. Title to the property is vested in and will remain with the U.S. and the property shall be used only for official purposes. The Lender reserves the right to cancel the loan or to recall the loaned property upon 30 days' notice.

Accepted By:

	Borrowing Agency/Organization Approval	Title		Date
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Approved By:

	Signature of Authorized Lender	Title		Date
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Approved By:

	Department of Energy Official	Title		Date
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DOE F 4420.2

OMB Control No. (11-01) 1910-1000

All Other Editions Are Obsolete

**INSTRUCTIONS FOR DOE FORM 4420.2**

This form is used by U.S. Department of Energy (DOE) offices and DOE management and operating contractors to loan property which is not excess for short durations to other DOE offices and contractors, other Federal agencies, foreign government and foreign organizations, and others for official purposes in support of DOE, in accordance with DOE-PMR 109-1.5104.

- Block 1: Self-explanatory. Assigned by lender.
- Blocks 2 and 3: Enter effective and completion dates after DOE Headquarters approval.
- Block 4: Enter total number of pages in space provided.
- Block 5: Enter name, address, and telephone number of DOE office or DOE management and operating contractor.
- Block 6: Enter name of organization or agency. May include attention line with name of point of contact.
- Block 7: Must be provided. Should refer to the experiment and/or research involved.  
(If additional space is necessary, attach separate sheet.)
- Block 8: Enter applicable support agreement and export license information.
- Block 9: Provide all pertinent information.

Signatory Information:

- Accepted By: Type or print name and title of borrower. Provide signature and date.
- Approved By: Type or print name and title of DOE or DOE management and operating contractor official.  
Provide signature and date.
- Approved By: Self-explanatory

**Appendix 3: Destruction Certification Example**



**Destruction Certificate EA-20-YY-000**  
**U.S. Government Excess Firearms**

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The firearms and equipment listed on the attached listing were destroyed on this day, [Month Day, 20XX], at the [Location] under the supervision of a Department of Energy (DOE) Federal employee and at least one DOE Office of Enterprise Assessments, Office of Safeguards and Security Assessments (EA-20) contractor employee. This procedure is in accordance with DOE Guide 580.1-1A, *Personal Property*. The firearms were deemed to be unserviceable/unrepairable. Under the direction and approval of the Government Services Administration, the EA Contracting Officer Representative for the EA support contract, the DOE's Headquarters' Organizational Property Management Officer, and under the authority of the Federal Management Regulation (FMR) 102-36.330(b), public notice of this destruction was not given in the interest of public safety. The firearms were demilitarized in accordance with the FMR 102-36 following guidance in Department of Defense Manual 4160.21-M-1, *Defense Materiel Disposition*.

**Attester's Signatures**

**EA-20 Contractor Employee Witness**

**DOE Federal Employee Witness**

(Signature) \_\_\_\_\_

Roy A. Neal,  
EA-20 ESS Support Program Coordinator

(Signature) \_\_\_\_\_

Anthony R. Taylor,  
EA-20 ESS Support Program Manager  
U.S. DOE Headquarters

(Signature) \_\_\_\_\_





**Destruction Certificate EA-20-YY-000 Asset Listing**

Asset Description	Manufacturer ID	Model	Serial Number	✓

**Attester's Signatures**

**EA-20 Contractor Employee Witness**

**DOE Federal Employee Witness**

(Signature) \_\_\_\_\_

(Signature) \_\_\_\_\_

Roy A. Neal,  
EA-20 ESS Support Program Coordinator

Anthony R. Taylor,  
EA-20 ESS Support Program Manager  
U.S. DOE Headquarters

(Signature) \_\_\_\_\_

# Appendix 4: Frequency Usage Request Form

Company Form FRM-0000	<b>FREQUENCY COORDINATION (FC) INFORMATION FORM</b> <i>(Required for All Exercises)</i>	04/08/19 Rev. 01
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Exercise Information			
Exercise/Project Name		Organization	
Operations Start Date	Operations Stop Date	Testing Times (if applicable)	DOE Serial Number
From	To		
Point of Contact(s) PRIMARY		Email	Phone
ALTERNATE		Email	Phone
Location: Latitude	Longitude	City/State OR Area, Bldg Number	
Frequency Required (include preferred frequencies)			
Radius of Operations From Center Point		Peak Power To Be Used	
Station Class/Type		Emissions (Occupied Bandwidth)	
Ground or Air Operations (if Air add altitude range or highest)		Manufacturer & Model of Equipment (provide specification sheets if possible)	
Brief description of how the Radio Frequency will be used:			
Authorization			
<p>After approval of your request for frequency clearance, you will be issued a control number by the Spectrum Management Office (SMO) indicating you have been cleared for your exercise. If you have any questions or need assistance, please contact the Spectrum Management Office at 702-295-4766/ 702-295-5098 or <a href="mailto:SpectrumManagement@nv.doe.gov">SpectrumManagement@nv.doe.gov</a></p>			
REVIEWED BY SMO		DATE	
CONTROL NUMBER			

**Appendix 5: ESS Trailer Description**

## ESS Trailer Description

### General Description

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) maintains the capability to conduct engagement simulation systems (ESS) force-on-force performance tests during appraisal activities and when requested to support DOE or National Nuclear Security Administration sites. This support is accomplished in part through the ESS support program, which provides an in-house inventory of ESS firearms and equipment. The inventory includes materials that replicate specialized adversary weapons and equipment, such as rocket-propelled grenades and improvised explosive devices.

### Trailer

A dedicated ESS logistics trailer reduces the wear and tear on high-value government equipment by providing shelter from ambient weather and mitigating the need to frequently load/unload equipment (i.e., some equipment items remain on the trailer between deployments). More, a dedicated ESS logistics trailer also provides enhanced security and accountability for ESS firearms and sensitive items, as well as a more efficient issue point for ESS firearms and equipment during EA assessments and Composite Adversary Team training (see Figure 1).



Figure 1. Transport Trailer

The trailer is dual axle, with upper and lower decks, and adheres to U.S. Department of Transportation regulations. It is custom built to support the DOE EA mission and is 8 feet 5 inches wide x 53 feet long x 13 feet 6 inches high. Furthermore, the trailer is equipped with adequate workspace for preparation, issuance, and maintenance of equipment, while also incorporating identified security features described in this section.

The trailer is equipped with a liftgate in the rear of the vehicle that can be mechanically raised during loading and unloading of cargo. During transit, the liftgate is in the closed position and the exterior control panel power source is disengaged. When the trailer is disconnected from the tractor and deployed in a support configuration, the liftgate may be stowed in the open or closed position when the trailer intrusion detection system (IDS) is set to secure mode (i.e., the rear rollup door is considered the primary security barrier at the back of the trailer).

## Access Controls

When deployed at an approved mission location, or parked at the ESS Support Facility, the tractor is disconnected from the trailer and a kingpin lock shroud (see Figure 2) is installed on the trailer kingpin to reduce the potential for unauthorized removal.

When the trailer is unattended, the curbside pedestrian door is secured by turning the deadbolt to the locked position (see Figure 3).

The rear rollup cargo door is the primary security barrier at the rear of the trailer. When the trailer is unattended, the rear door is secured with a high security lock shroud (see Figure 4). Additionally, the side vending window is secured by closing the window and ensuring that the spring-loaded latches are fully seated in the locked position.



Figure 4. Rear Rollup Door and Lock Shroud



Figure 2. Kingpin Lock Shroud



Figure 3. Curbside Pedestrian Door Deadbolt Lock

## ESS Firearms Enclosures

During transport and while in storage, ESS firearms are secured in specially designed storage enclosures within the trailer. The enclosures are constructed of 10-gauge steel, welded to the trailer chassis, and configured with modular storage racks and locking accordion-style gates to provide safe and secure firearms storage. Approximate dimensions of the storage enclosures are:

- Roadside enclosure: 78 inches high x 200 inches wide x 15 inches deep.
- Curbside enclosure: 78 inches high x 100 inches wide x 25 inches deep.





**Figures 5-7.  
ESS Firearms Storage Enclosures**