

# **3E453 – Pest Management Journeyman**

## **Module 5, Lesson 1, Task 1 (15.1.2) Unit Type Code (UTC) and Equipment Standard Listing (ESL)**

### **Slide 1.1 – Introductory Slide**

### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.1.2 Unit Type Code (UTC) and Equipment Standard Listing (ESL)

### **Slide 1.3 – Instructions**

Welcome to the UTC and ESL lesson.

- Upon completion of this lesson, you must be able to successfully identify the relationship of basic facts and state general principles relating to Unit Type Codes (UTCs) and Equipment Standard List (ESLs) with at least 75% accuracy.

### **Overview**

In this section, we will cover the following topics:

- Prime BEEF and RED HORSE Overview
- Unit Type Code (UTC) and Equipment Standard Listing (ESL) Considerations
- Equipment Overview

### **Slide 2.1 – Prime BEEF and RED HORSE Intro**

### **Slide 2.2 – Mission Requirements**

- Overview
  - Civil Engineer (CE) units worldwide are required to deploy and support missions around the world.
  - Depending on the type of deployment and whether supporting a Prime BEEF or RED HORSE team, you must ensure you have the right equipment to complete all aspects of Pest Management operations.
- Requirements
  - When deploying we are required to ensure we have the right equipment and material to do the job.
  - Equipment and Supplies Lists are generated to identify specific equipment and materials to support the UTC that is being supported in a deployed location.

- The types of deployable equipment and supplies we require during contingency operations fall into three categories:
  - Contingency Pest Management Equipment
  - PPE
  - Pesticides
- Civil Engineer commanders will equip their Prime BEEF and RED HORSE UTCs in accordance with the respective equipment and supplies listing (ESL).
- Prime BEEF equipment pallets are housed at Grissom ARB, IN and will be sent to a forward location prior to a Prime BEEF bed down team arriving.
- RED HORSE units house their own equipment pallets and will deploy with them.

### **Slide 2.3 – RED HORSE/PRIME BEEF**

- RED HORSE is a self-sufficient, mobile heavy construction unit capable of rapid response and independent operations in a Level I threat environment.
  - RED HORSE Squadrons are organized into “building block” Unit Type Codes to operate in a hub-and-spoke concept.
  - The concept is to deploy the squadron(s), including augmentees, to a single area of responsibility and forward deploy construction teams (spokes) from the hub.
  - The hub manages and supports multiple spoke operations.
  - A RED HORSE capability is generally comprised of 20 personnel and 24 equipment Unit Type Codes (UTCs).
  - AFI 10-209, Operations, RED HORSE PROGRAM outlines specific REDHORSE operations, deployment tasking’s, training, and equipment requirements.
- PRIME BEEF deployment teams support are designed to develop and maintain highly skilled civil engineer forces capable of:
  - Reacting rapidly to support Air and Space contingency and installation sustainment missions.
  - Supporting wartime mobility and mission requirements in accordance with designed operational capability statements.
  - Supporting in-place requirements in accordance with designed operational capability statements.
  - Supporting critical installation asset requirement by the designated installation mission.
  - AFI 10-210, Operations, PRIME BASE ENGINEER EMERGENCY FORCE (BEEF) PROGRAM outlines specific Prime BEEF operations, deployment tasking’s, training, and equipment requirements.

### **Slide 3.1 – UTC and ESL Considerations**

### **Slide 3.2 – UTC and ESL Considerations Video**

- Video Closed Captions

UTCs are specialized kits of specific itemized equipment pre-positioned on U.S. military bases for contingency use by civil engineer units during deployments. Equipment Standard Listing (ESL) identify specific equipment and materials to support the UTC that is being supported in a deployed location. For Prime BEEF units, the UTCs for pest management personnel are 4F9EE and 4FPAX (bed down) If assigned to a REDHORSE unit, you must use the 4F9RY UTC. Pest

Managers with an upcoming deployment can find their UTC and ESL from their home station Unit Deployment Manager. UTC and ESLs can also be found by reaching out to the 3E4X3 Force Development Manager. Make sure your unit maintains properly sized protective clothing for each Pest Management (AFSC 3E4X3) technician assigned to a Prime BEEF deployable UTC.

### **Slide 3.3 – Key Takeaways**

- UTCs are specialized kits of specific itemized equipment, pre-positioned on U.S. military bases for contingency use by Civil Engineer units during deployments.
- ESLs identify specific equipment and materials to support the UTC that is being supported in a deployed location.
- For Prime BEEF units, the UTCs for Pest Management personnel are 4F9EE and 4FPAX (beddown).
- If assigned to a RED HORSE unit, you must use the 4F9RY (Primary beddown & C2 Hub Eq) UTC.
- Pest Managers with an upcoming deployment can find their UTC and ESL from their home station Unit Deployment Manager.
- UTC and ESLs can also be found by reaching out to the 3E4X3 Force Development Manager.
- Make sure your unit maintains properly sized protective clothing for each Pest Management (AFSC 3E4X3) technician assigned to a Prime BEEF deployable UTC.

### **Slide 4.1 – Equipment Intro**

### **Slide 4.2 – Equipment**

- As a general reference, we use the AFPMB's Technical Guide (TG) 24, Contingency Pest Management Guide:
  - This publication provides a listing of pesticides approved for contingency operations.
  - It outlines the supply nomenclature, unit of issue, and national stock number. Use this information for ordering your pesticide needs.
  - It also includes safety equipment for pesticide applicators as well as PPE against disease vectors.
  - The approved equipment listing can be found on the AFPMB's website at <http://www.afpmb.org/content/dod-standard-pesticides-and-pest-control-equipment> under the DoD Pest Management Materiel Other Than Pesticides link recommendations for pesticide dispersal equipment

### **Slide 5.1 – Course Completion**

Congratulations, you have completed the unit type code (UTC) and equipment standard listing (ESL) lesson. Please click complete lesson to receive credit.

## **3E453 – Pest Management Journeyman**

### **Module 5, Lesson 2, Task 1 (15.2.1) Pest Management Field Facilities**

#### **Slide 1.1 – Introductory Slide**

#### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.2.1 Pest Management Field Facilities

#### **Slide 1.3 – Instructions**

Welcome to the Pest Management Field Facilities lesson.

- Upon completion, and without reference, you must be able to identify the relationship of basic facts and state general principles about Pest Management Field Facilities with at least an 75% accuracy.

#### **Overview**

In this section, we will cover the following topics:

- Facility Planning
- Location and Safety
- Design Layout Criteria
- Facility Needs

#### **Slide 2.1 – Overview Intro**

#### **Slide 2.2 – Overview Video**

- Video Closed Captions

We must follow strict safety standards whether at home station or deployed for a contingency mission. This need also extends to protecting those personnel who share our deployment and protecting the environment. When you're working at your home station, you more than likely work from a permanent facility. However, when you deploy, you will probably not have this luxury. In fact, you may have to contend with working out of tents with the resources you brought along. A facility well designed will support operations and provide for safe storage of pesticides, safeguard the health and safety of employees, prevent environmental contamination, contain spillage and be secure against theft and vandalism.

#### **Slide 2.3 – Key Takeaways: Overview**

- We must follow strict safety standards whether at home station or deployed for a contingency mission.

- A facility well designed will support operations and provide for safe storage of pesticides, safeguard the health and safety of employees, prevent environmental contamination, contain spillage and be secure against theft and vandalism.

## **Slide 2.4 – Overview**

- Facility Planning
- Location and Safety
- Design Layout Criteria
- Facility Needs

## **Slide 2.5 – Facility Planning**

- Intended Users
  - The primary users of Pest Management facilities are the installation personnel responsible for Pest Management operations.
  - At no time should a Pest Management facility ever be re-purposed.
- Functional Consideration
  - Facilities shall provide adequate space for personnel and equipment necessary to address installation pest problems, installations' integrated Pest Management plans.
  - In general, a small facility serves one to three workers or pest managers, a medium facility serves four to nine workers, and a large facility serves 10 or more workers.
- Multi-Purpose Facilities
  - If two pest control functions (e.g., public works and the golf course) require facilities that can be located at the same location, modify the design to include a common mixing room, separate storage areas. A shared office, laundry and toilet facilities.
  - For a single-use facility, the size should be a minimum of 1000 square feet (93 square meters) to include pesticide storage and equipment areas, mixing area, and a deluge shower and eyewash as a minimum.
  - Depending on the distance from other facilities, a small office, toilet and laundry area may also be required.
  - Include additional variations in the design to account for staffing and climatic differences and to comply with individual state or host country requirements for pesticide handling.
  - For further square footage requirements reference TG 17, Military handbook, Design of Pest Management Facilities.
- Facility Cost
  - Pest Management facilities are expensive to construct and unless they are designed economically, funding through the military construction program will be required.
  - This is attributable to the high square footage costs for utility connections, specialized ventilation, and safety requirements.

- It is essential that installations design and construct minimum sized facilities to meet their mission requirements.
- Installations should also consider the future use of a Pest Management facility.
- Facility planners should consider all options, including pre-fabricated storage facilities in lieu of constructing an entire Pest Management facility as described in this document.
- The Pest Management Consultant can provide guidance on whether a prefabricated storage facility is appropriate for the installation's Pest Management operations.
- Environmental Concerns
  - Pesticide use is closely regulated by the U.S. Environmental Protection Agency (EPA) and state regulatory agencies.
  - Pest Management facilities are subject to Occupational Safety and Health Administration (OSHA) regulations as well as the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), DoD and military service instructions and criteria.
  - Facility planning shall include safety, public health and environmental protection issues.
  - The storage and use of pesticides is often regulated by state or local pollution abatement agencies.
  - The use of water to extinguish fires in facilities may generate hazardous liquid wastes that can readily contaminate materials, soil and ground water.
  - Another concern is for the proper disposal of wastes generated with normal operations.
  - Pesticide spills and cleanup procedures are addressed separately in the Armed Forces Pest Management Board (AFPMB) Technical Guide No.15.

## **Slide 2.6 – Location and Safety**

- Video Closed Captions

Pest management facilities contain toxic pesticides and related chemicals and may be required in emergencies for interim storage of pesticides classified as hazardous materials. Isolated single-purpose structures are essential if construction of a new facility is planned. Pesticide storage and mixing facilities that are integral parts of multiple-occupied buildings present actual and potential problems. Unless the pest management facility is tightly sealed off, noxious vapors will permeate nearby spaces. Pest control materials are highly pilferable and expensive; thus creating a security problem. When locating a pest management facility in a multiple-use building is the only alternative, the pest management facility shall be located on the end of the structure separated from the other areas by secure vapor impervious partitions. Because of the hazardous nature of various pesticides, stored and mixed in pest management facilities, it is essential that such materials are secured and available only to qualified individuals. Security fencing and security gates and other measures are essential. A climb resistant fence shall enclose the entire facility. If other security measures are taken such as security devices on the windows, fencing shall enclose the vehicle storage area and outside mixing areas. Design review shall include installation security requirements; see AFPMB Technical Guide #7 for more

information about pesticide security and use UFGS 32 31 13.00 40 Chain Link Fences and Gates (07-2007) for guidance on installing fences.

### **Slide 2.7 – Key Takeaways: Location and Safety**

- Because of the hazardous nature of various pesticides stored and mixed in pest management facilities, it is essential that such materials are secured and available only to qualified individuals.
- Security fencing and security gates and other measures are essential.
- A climb resistant fence shall enclose the entire fences.
- If other security measures are taken such as security devices on the windows, fencing shall enclose the vehicle storage area and outside mixing areas.
- Design review shall include installation security requirements; see AFPMB Technical Guide #7 for more details about pesticide security and use UFGS 32 31 13.00 40 Chain Link Fences and Gates (07-2007) for guidance on installing fences.

### **Slide 2.8 – Facility Needs**

- Access
  - Access must be provided to pest management facilities for vehicles carrying supplies or pulling trailer mounted dispersal equipment.
  - Facility must be accessible to vehicles and pedestrians on at least two sides.
- Parking
  - Parking must have adequate spacing to park all pesticide dispersal equipment inside the Pest Management area but out of the building and under cover.
  - Employee parking, if provided, shall be outside of the security fence or perimeter.
- Security
  - Security measures described in AFPMB TG 7 should be followed including the fencing.
  - Provide outdoor areas for medium and large Pest Management facilities consistent with provisions for the safe filling and mixing of pesticide equipment on vehicles and trailer-mounted equipment.
- Hardstand Areas
  - A covered outdoor hardstand and parking apron may be used for vehicles and equipment consisting of a concrete pad sufficiently large to park a truck and trailer.
  - Hardstands are recommended for use during cleaning and for filling truck/trailer mounted dispersal equipment.
  - Refer to TG 17 regarding hardstand sump pump and drainage requirements.
- Emergency Eye Wash, Deluge Shower and Drain
  - An eye wash and deluge shower is essential for emergency washing of individuals accidentally contaminated with pesticides, IAW 29 CFR 1910.151.
  - If the eye wash and deluge shower are located in the outdoor mixing area, they must be protected from freezing.
  - An emergency eye wash and deluge shower must be provided with manually-operated, delayed-closing valves located adjacent to the mixing counter.

- Site eye and deluge shower(s) must be accessible within 10 seconds from indoor and outdoor mixing areas.
- Mixing and Storage Areas
- Diluent Sources
  - In areas where diluent sources (water) are limited you may have to use plastic 55-gallon drums or larger capacity water storage containers as your sources of diluent.
  - When the situation warrants, you may have to request the placement of a water buffalo close to your mixing area.
  - Contact Utilities personnel at your given location for advice as to what type of water storage containers are available for placement in close proximity to your mixing area.
  - You may even request the installation of an electric water pump and spigot for filling your sprayers.

### **Slide 2.10 – Mixing and Storage Areas**

- Video Closed Captions

Provide a separate ventilation system for the mixing and storage areas. System shall be provided with roof mounted centrifugal fan selected for six air changes per hour (minimum). Fans shall discharge vertically. Replacement air shall be heated to 55 degrees Fahrenheit (13 degrees Celsius) Provide a motorized damper at the air intake louver and at the exhaust fan discharge. Damper shall close when the ventilation system is turned off. Provide a ventilation system control switch with light to indicate “ON” at the entrance to the pesticide handling areas, and a sign at the switch which reads, "VENTILATION SYSTEM SHOULD OPERATE CONTINUOUSLY. DO NOT ENTER UNLESS VENTILATION SYSTEM HAS OPERATED FOR AT LEAST TEN MINUTES."

### **Slide 2.12 – Key Takeaways: Mixing and Storage Areas**

- Provide a separate ventilation system for the mixing and storage areas.
- System shall be provided with roof mounted centrifugal fan selected for six air changes per hour (minimum). Fans shall discharge vertically.
- Replacement air shall be heated to 55 degrees Fahrenheit (13 degrees Celsius).
- Provide a separate ventilation system for the mixing and storage areas.
- System shall be provided with roof mounted centrifugal fan selected for six air changes per hour (minimum). Fans shall discharge vertically.
- Replacement air shall be heated to 55 degrees Fahrenheit (13 degrees Celsius).
- Provide a motorized damper at the air intake louver and at the exhaust fan discharge. Damper shall close when the ventilation system is turned off. Provide a ventilation system control switch with light to indicate “ON” at the entrance to the pesticide handling areas, and a sign at the switch which reads, ‘VENTILATION SYSTEM SHOULD OPERATE CONTINUOUSLY. DO NOT ENTER UNLESS VENTILATION SYSTEM HAS OPERATED FOR AT LEAST TEN MINUTES.’

### **Slide 2.9 – Design Layout Criteria - Overview**

- General Information



- The design of Pest Management facilities should be implemented to best suit the amount of people and the operations for the given location.
- Consider also the number of pest control functions required; even small shops may be providing the full range of operations involving three items of trailer mounted equipment, two vehicles, and an inventory of 40 or more pesticides and related chemicals.
- Arrangement
  - Arrangement of spaces and corridors shall allow workers to arrive in a clean area, dress for hazardous exposure in the change area, leave through a pesticide area doorway, and retrace that path at the end of the workday
  - Examples of Pest Management facilities can be found in TG 17
  - It is essential that the mixing room be located adjacent to the storage area and the equipment storage area (if indoors) and be accessible through the corridor to the shower and locker rooms and the exterior.
  - Pest Management facilities should be divided into the three areas; clean, transitional and pesticide.
  - Clean areas include an office, vestibule and airlock, and mechanical and electrical spaces.
  - Office space provides a space to perform office work.
  - Heating, ventilation and air conditioning is recommended for effective workplace habitability.
  - It is essential that there be no direct access between office and pesticide storage and mixing areas.

## **Slide 2.11 – Design Layout Criteria - Areas**

- EQUIPMENT STORAGE
  - Equipment Storage, Cabinets, and Lockers provides a separate storage space in the clean area to store clean personal protective gear (new gloves, respirator cartridges, etc.) that is located away from pesticides.
  - General Storage provides a storage closet for uniforms and other items not contaminated with pesticides.
  - General Purpose Room for medium and large facilities in remote sites where meeting space is not available, provide an area for personnel training, conferences and break room.
- TRANSITIONAL AREAS
  - Transitional areas; provide a dressing area for changing clothes, men's shower and lockers, toilet, laundry and cleaning gear room and additional women's shower and lockers, as needed.
  - The room serves as a transition area between clean and pesticide handling areas
  - It contains lockers for street clothing on one side, storage for work clothing (shoes, coveralls, caps, etc.) on the other side, and a third area for personal protective equipment (respirators, etc.).
  - The room shall be accessible to the showers and lockers, toilet and laundry and cleaning gear areas.

- Personnel locker space is essential. Provide a hot water shower for personnel to use at the end of the day for personal decontamination.
- Laundry and Clean Gear Room must be provided adjacent to or near the shower and locker rooms.
- PESTICIDE HANDLING AREAS
  - The pesticide handling area includes pesticide storage and mixing rooms.
  - This is the area of greatest pesticide exposure and hazard to applicator personnel from toxic materials.
- INDOOR STORAGE AREAS
  - Pesticides shall be stored in an area sealed or separated from clean areas, with direct access to the exterior.
  - All pesticides stored indoors shall be off the floor so that all labels are visible, with 3-foot lanes to provide effective access and inspection, and stored no more than eight feet (2.44 m) high.
  - Pesticides shall be stored in a dry room or building where temperatures are maintained above 50 degrees Fahrenheit (12 degrees Celsius) and below 100 degrees Fahrenheit (38 degrees Celsius).
  - Pesticide storage shall be separated from mixing areas, shower and locker room, offices, or any area where personnel work for prolonged periods (essential).
  - Pesticide concentrates shall not be stored in rooms containing a floor drain of any type; containment by curbing or sloped floors is required in the pesticide mixing and storage areas.
  - Provide open non-absorptive shelving for pesticides.
  - Do not provide floor drains in storage areas.
- VEHICLE EQUIPMENT ROOM
  - Provide storage space for one vehicle and one trailer-mounted equipment item in small facilities.
  - In larger facilities additional space, as required, shall be provided for parking vehicles and storing trailer-mounted application equipment.
  - Motor vehicles and any other gasoline engine (i.e. lawn mower) will not be stored in the same area as pesticides.
  - Whenever possible, motor vehicles shall be located outside or in a separate building from the pesticide storage or handling area.
  - They shall be separated from the pesticide area by a minimum of two-hour fire rated construction.
- PESTICIDE MIXING ROOM
  - Area used to mix concentrated pesticides into ready-to-use formulations.
  - Mixing rooms must have electricity and hot and cold water.
  - Open non-absorptive shelves should be situated near the pesticide storage racks, drum stands, exterior personnel door and in mixing areas.
  - Metal or plastic pallets to hold pesticides off the floor are essential; plastic is preferred.
  - Steel stands to keep drums off the floor are recommended.

- The work area shall contain a pesticide-resistant sink with a closeable drain, a contiguous self-draining drip-proof counter top at least 5 feet long, sideboards, a splash panel on back, and an adjacent shelf for holding measuring devices and concentrates.
- The drain should discharge into a container (not be connected to plumbing) to collect rinsate or any spilled pesticide.
- An additional unhooded deep sink for washing small equipment, gloves, etc., is recommended for medium and large facilities.
- Galvanized metal fixtures are acceptable. Additional nonabsorbent shelving, 12 inches (305 mm) deep, is recommended to store mixing equipment items.
- SITING
  - Pest Management facilities must be isolated and way from congested areas for health and safety, fire protection, environmental protection, and security reasons.
  - Site pest management facilities a minimum of 200 feet (61 m) from surface water, existing wells and cisterns, or 100-year flood plain levels.
  - Site pest management facilities downhill from any sensitive areas (e.g., wells, cisterns, etc.), or provide diking (essential) where space is limited.
  - Do not site facility downhill because of flood potential.
  - Consideration must also be given to prevailing wind conditions and the location of populated areas.
  - Facilities shall not be located uphill from potable water sources or continuously occupied structures.
  - Facilities should not be sited over aquifers (subsurface potable water supplies) unless the aquifer is adequately protected through containment measures.
  - Location and design of pest management facilities should be selected to avoid potential adverse impacts to threatened, endangered, and at-risk species.
  - Facilities shall be sited at least 100 feet (30.4 m) from other structures.
  - Siting shall be approved by an industrial hygienist, a sanitary engineer, and by a fire protection engineer.

### **Slide 3.1 – Course Completion**

Congratulations, you have completed the pest management field facilities lesson. Please click complete lesson to receive credit.

## **3E453 – Pest Management Journeyman**

### **Module 5, Lesson 2, Task 2 (15.4.1) Pesticide Storage Responsibilities**

#### **Slide 1.1 – Introductory Slide**

#### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.4.1 Pesticide Storage Responsibilities

#### **Slide 1.3 – Instructions**

Welcome to the Pesticide Storage Responsibilities lesson.

- Upon completion, and without reference, you must be able to identify the relationship of basic facts and state general principles about Pesticide Storage Responsibilities with at least a 75% accuracy.

#### **Overview**

In this section, we will cover the following topics:

- Storage Requirements
- TG-17
- PPE
- Dispersal Requirements

#### **Slide 2.1 – Overview Intro**

#### **Slide 2.2 – Overview**

- Programs & Policies
  - To meet FIFRA requirements, EPA and OSHA regulations, and to protect individuals and the environment from adverse effects of pesticides, DOD installations must establish programs and policies that implement proper storage and handling requirements.
- Responsibilities
  - All Pest Managers are responsible and held accountable for the safe use and handling of all pesticides and any applications.
- Safety
  - It is essential to establish safety and security practices for all pesticides, personal protective equipment and dispersal equipment.

- Although it may not be feasible in a deployed location, Pest Managers should try to follow as close as possible to ensure adequate safety, storage and security of Pest Management assets.

### **Slide 3.1 – Main Menu Intro**

### **Slide 3.2 – Main Menu Drag/Drop**

Pesticides should never be stored on the floor. Place the items in their proper location to continue to the menu.

### **Slide 3.3 – Main Menu**

- Storage Requirements
- TG-17
- PPE
- Dispersal Requirements

### **Slide 3.4 – Storage Requirements**

- Guidelines
  - Guidelines for storing pesticides in a field environment are necessarily different from those applied to permanent storage facilities.
  - Pest managers may arrange for temporary storage of highly or moderately toxic pesticides during the period immediately before a single application and only for the amount of pesticide needed for that application.
- Location
  - The area should be in an isolated site or facility where flooding is unlikely and provisions are made to prevent unauthorized entry.
  - It also needs to be separated from water systems and buildings to prevent contamination by runoff, percolation, or windblown particles or vapors.
  - If such a storage site is needed, select it with due regard to the amount, toxicity, and environmental hazard of pesticides and the number and sizes of containers to be handled.
  - When practical, locate the site where flooding is unlikely and where soil characteristics will prevent the contamination of any water system by runoff or percolation, percolation, or windblown particles or vapors.
  - Pesticide structure requirements include the facility and the area in which pesticides are stored.
- Identification Signs
  - You should provide visible identification signs such as DANGER, POISON, and PESTICIDE STORAGE to warn troops of the hazardous materials in the facility during a non-tactical contingency.
  - This is not recommended during actual combat contingencies, because the enemy can zero in on the facility and target it for destruction.
  - During actual combat, you should brief the troops to warn them of the hazardous materials in the facility.
- Safeguarding

- Use common sense and communicate with fellow Pest Control Managers to effectively provide the type of Pest Management services our troops in combat or contingencies require.
- You should develop expedient methods for safeguarding Pest Management assets.
- Store pesticides according to label instructions and keep them locked at all times in a contingency environment.
- CONEX boxes, with non-absorbent shelves built in, provide an excellent storage site for pesticides.
- Drum/pump locks are another method for securing pesticides

### **Slide 3.5 – TG-17**

- Store pesticides in a dry, well-ventilated building where temperature and humidity levels can be controlled.
- Maintain temperatures between 50° F and 100° F. Protect pesticides from both freezing and direct sunlight.
- It's essential that the area have adequate lighting, firefighting equipment, and exhaust systems to remove pesticide fumes from the building.
- Indoors, stack all pesticides off the floor on nonabsorbent shelves so labels are clearly visible.
- Never use structures or shelves made of wood to store pesticides.
- Keep aisles clear to provide easy access and inspections.
- Keep insecticides and herbicides in separate areas; use separate rooms if practical.
- Separate pesticide storage areas from any work areas where people work for extended periods.
- Don't let wall-mounted exhaust fans in the warehouse exhaust directly over sidewalks or other normally occupied places.
- Exterior walls of the warehouse must be either pre-engineered concrete or constructed of masonry blocks.
- The warehouse interior must have a four-inch concrete curb between the storage area and other sections of the warehouse to contain spills and facilitate clean-up operations.
- Secure windows on the warehouse with bars or mesh fencing if the building is not within a secure area protected by a security fence.
- For further pesticide storage requirements reference TG 17, Design of Pest Management Facilities.

### **Slide 3.6 – PPE**

- You must store PPE in a cool, protected, locked area to protect it against heat, windblown dust, and further contamination.
- Ideally, provide a separate storage space in the clean area to store personal protective gear (new gloves, respirator cartridges, etc.) away from pesticides.
- You can easily accomplish this requirement by using personal storage lockers.
- The locker must be equipped with two separate storage compartments.
- One compartment is used for storing work clothes and the other is for clean clothes (uniforms, etc.).

### **Slide 3.7 – Dispersal Requirements: Dispersal Equipment**

- Dispersal Equipment:
  - Store non-powered pesticide dispersal equipment on racks near the mixing area and position large, bulky pesticide dispersal equipment outside the facility.
  - Secure equipment kept outdoors to prevent tampering.
  - You should conduct monthly inventories to account for all of the assets you have on hand, consumed, and replaced.

### **Slide 3.8 – Dispersal Requirements: A Well-designed Pesticide Storage Site**

- A well-designed pesticide storage site:
  - Limits access
  - Permits better inventory control
  - Protects people from exposure
  - Reduces the chance of environmental contamination
  - Prevents damage to pesticides from temperature extremes and excess moisture
  - Safeguards pesticides from theft, vandalism, and unauthorized use.
  - Allows the fire department to know the location of products.

### **Slide 4.1 – Course Completion**

Congratulations, you have completed the pesticide storage responsibilities lesson. Please click complete lesson to receive credit.

# **3E453 – Pest Management Journeyman**

## **Module 5, Lesson 2, Task 3 (15.3.1) Pesticide Disposal**

### **Slide 1.1 – Introductory Slide**

### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.3.1 Pesticide Disposal

### **Slide 1.3 – Instructions**

Welcome to the Pest Management Pesticide Disposal Responsibilities lesson.

- Upon completion of this lesson, you must be able to successfully identify the relationship of basic facts and state general principles of Pesticide Disposal Responsibilities with at least 75% accuracy.

### **Overview**

In this section, we will cover the following topics:

- Overview
- Principles
- Pesticide Container Disposal
- Procedures
- Pesticide Residue Disposal

### **Slide 2.1 – Pesticide Disposal Responsibilities Intro**

### **Slide 2.2 – Pesticide Disposal Responsibilities**

- Overview
  - Pesticides are substances that must be properly stored, applied, handled, and discarded.
  - Federal laws and regulations mandate some of these procedures, while sound environmental management practices are the basis for others.
  - On exercises and non-tactical contingencies outside EPA jurisdiction, you must dispose of pesticides, rinse water, and containers by following the accepted standards and procedures of the host country or any host-tenant agreement between the US and that country.
  -



- The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and its implementing regulations govern the registration, use, handling, storage, and disposal of pesticides.
- If there are no such local standards or agreements, then you must follow EPA requirements or your own Service regulations; whichever are more stringent.
- All pesticide formulations no longer needed for their intended purposes are initially classified as solid waste.
- A “no longer needed or used” pesticide is classified as a hazardous waste if the Environmental Protection Agency (EPA) lists it (e.g., 40CFR261.33(e) & (f)) in 40 CFR, Part 261, or if it meets the definition of any of the four characteristics: (ignitability, corrosively, reactivity or toxicity) noted in 40 CFR, Parts 261.21-24.
- TG 21, Pesticide Disposal Guide for Pest Management Shops provides specific guidance on procedures for the minimization and disposition of excess pesticides, pesticide-related wastes, and pesticide containers.
- Principles
  - No pesticide, pesticide container, pesticide-related waste, or pesticide container residue should be stored or disposed of in a manner inconsistent with its label or labeling, or in a manner so as to cause or allow:
    - Open dumping
    - Open burning
    - Water dumping or ocean dumping; except in conformance with appropriate federal regulations
    - Direct exposure, which may result in contamination of food or feed supplies
    - Violations of any applicable federal, state, or local pollution control standard
    - Violation of FIFRA or regulations developed pursuant to that Act
    - EPA guidelines (which allow homeowner disposal of small amounts of pesticides in trash receptacles), do not apply to pest control shops
- Pesticide Container Disposal
  - (1) Read the pesticide label
  - (2) Triple rinse empty pesticide containers and add the rinse water to the sprayer as a diluent
    - NEVER DUMP RINSE LIQUID ON THE GROUND!
    - Rinse liquids should be added to spray mixtures or considered a pesticide-related waste and disposed of through Defense Logistics Agency (DLA) Disposition Services, formerly (but still commonly) known as Defense Reutilization Marketing Office (DRMO).
    - The first option is obviously more expeditious and cost effective. DLA's do not require triple rinsing as a condition for turn-in
    - Any pesticide container that can be rinsed should receive triple rinsing, especially if it contained a RCRA-designated hazardous material
    - Containers must be labeled with the words “Triple Rinsed”
  - (3) Crush or punch holes in the sides and bottoms of metal or plastic containers

- This should prevent troops in the field or local populations from reusing containers as cooking pots or water containers.
  - Additionally, puncturing rinsed metal containers facilitates drainage prior to transport to a facility for recycling as scrap metal or for disposal.
  - They may then be buried, if time permits, in a landfill or other designated area.
- (4) Empty pesticide containers are not really “empty”
  - They still contain small amounts of pesticides even after they have been properly triple rinsed
  - For the purpose of disposal through DLA, the following definitions of “empty” apply:
    - A container that previously contained a non-hazardous or hazardous pesticide is “empty” if it contains no more than one inch of residue on the bottom of the container or inner liner
    - A container that previously contained an acutely hazardous pesticide is considered “empty” only if it has been triple-rinsed with an appropriate solvent, cleaned by an equivalent method approved by the EPA Regional Administrator, or had the lining removed.
    - An empty 55-gallon drum makes a good storage container for smaller empty or broken containers.
- Procedures
  - Empty metal containers (drums) in good condition may be recycled through a registered drum re-conditioner or returned to the pesticide manufacturer for refilling with the same chemical class of pesticide.
  - The drum should be covered tightly. The primary idea is to minimize wastes; especially hazardous wastes. Installation pest management supervisors and the local Environmental Coordinator are encouraged to develop a plan to dispose of each type of pesticide container.
  - This plan should be made a part of the approved installation pest management plan and hazardous waste management plan.
- Pesticide Residue Disposal
  - When supporting tactical contingencies, such as combat operations in hostile territory or allied countries, you should still follow the principles of safe disposal of pesticides, rinse water, and pesticide containers.
  - Even in these situations, rinsing spray equipment after use is important for keeping it operational as well as for reducing the pesticide exposure hazard between uses.
  - Unused spray left in a sprayer even for a day or two can clog nozzles and deteriorate parts, which can cause the sprayer to not operate properly the next time you need it.
  - To minimize disposal problems, mix only as much pesticide spray as you know you are going to use.

- Usually, it is much easier and safer to mix a spray a second time than it is to dispose of full-strength spray left over because you mixed too much.
- If possible, take enough clean water to rinse the sprayer at the spray site
- The equipment's rinse water can then be released at the spray site
- A "no longer needed or used" pesticide is classified as a hazardous waste if the Environmental Protection Agency (EPA) lists it (e.g., 40CFR261.33(e) & (f)) in 40 CFR, Part 261, or if it meets the definition of any of the four characteristics: (ignitability, corrosively, reactivity or toxicity) noted in 40 CFR, Parts 261.21-24.
- TG 21, Pesticide Disposal Guide for Pest Management Shops provides specific guidance on procedures for the minimization and disposition of excess pesticides, pesticide-related wastes, and pesticide containers.

### **Slide 3.1 – Course Completion**

Congratulations, you have completed the pesticide disposal responsibilities lesson. Please click complete lesson to receive credit.

# **3E453 – Pest Management Journeyman**

## **Module 5, Lesson 2, Task 1 (15.6.1 & 15.6.2) Reverse Osmosis Water Purification Unit Fundamentals**

### **Slide 1.1 – Introductory Slide**

### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.6.1 & 15.6.2 Reverse Osmosis Water Purification Unit Fundamentals

### **Slide 1.3 – Instructions**

Welcome to the lesson on Reverse Osmosis Water Purification Unit (ROWPU) Fundamentals.

- Without reference, identify the relationship of basic facts and state general principles about Reverse Osmosis Water Purification Unit Fundamentals with at least 75% accuracy.

### **Overview**

This lesson contains the following:

- Introduction
- Components
- Installation
- Pumps
- Troubleshooting

### **Slide 2.1 – Introduction Intro**

### **Slide 2.2 – Introduction Vid intro**

### **Slide 2.3 – Introduction Video**

- Video Closed Captions

The Air Force has several pre-selected sites throughout the world that are at its disposal in the event of contingency requirements. The only two prerequisites for these sites are that there is a suitable landing area and there is a water source within one mile. This water must be made potable in order to sustain the base's operation. The water purifier used most frequently on deployments is the reverse osmosis water purification unit (ROWPU). It produces 1,500 gallons of potable water each hour when operated on water with less than 1,000 parts per million (ppm) of total dissolved solids (TDS). If the raw water has more than 45,000 ppm TDS, its output

capabilities will be reduced to 1,200 gallons per hour. The product water will meet the Tri-Service Field Water Quality Standards for long term consumption. The 1,500 GPH ROWPU will operate in temperatures ranging from –25 to +140 °F. The 1,500 GPH ROWPU is operable either on the ground or mounted on a 5 ton trailer or a 5 ton truck. It is designed to be air, rail, and truck transportable and flexible in its application in the field to meet various requirements. It can be powered by a 35 kW generator or commercial power and has an easily accessible, useful control panel. The ROWPU's most outstanding feature is that it is designed to be compact, allowing for the packing of all the required hoses, bladders, pumps, tools, and test equipment within the structural confines of the unit itself. When shipped to your deployed location, this unit is literally designed to have everything you need to purify water. The unit should be sited upstream from camp and no more than 250 feet from the raw water source. The ROWPU unit is placed on firm ground that is level.

#### **Slide 2.4 – Key Takeaways: Introduction**

- The 1500 Reverse Osmosis Water Purification Unit (ROWPU) produces 1,500 gallons of potable water each hour when operated on water with less than 1,000 parts per million (ppm) of total dissolved solids (TDS). If the raw water has more than 45,000 ppm TDS, its output capabilities will be reduced to 1,200 gallons per hour. The product water will meet the Tri-Service Field Water Quality Standards for long term consumption. The 1,500 GPH R When shipped to your deployed location, this unit is literally designed to have everything you need to purify water.
- The unit should be sited upstream from camp and no more than 250 feet from the raw water source. The ROWPU unit is placed on firm ground that is level. ROWPU will operate in temperatures ranging from –25 to +140 °F.

#### **Slide 3.1 – Fundamentals Intro**

#### **Slide 3.2 – Fundamentals**

- Components
- Installation
- Pumps
- Troubleshooting

#### **Slide 3.3 – Components**

- Push Button Control Box
  - PUSH BUTTON CONTROL BOX
    - The push button control box is a major component located on the ROWPU control panel. This control panel component is important because this is where all the electrical components necessary to operate the ROWPU are controlled. The push button control box also has a push button to reset and test all indicator lamps.
- Push Light Enclosure
  - PILOT LIGHT ENCLOSURE
    - The pilot light enclosure contains all the indicator lights to indicate operation mode of all electrical components on the ROWPU. It also contains trouble indicator lights to warn you of potential trouble to the unit and components.

- Chemical Feed
  - CHEMICAL FEED PUMP CONTROLS
    - The chemical feed pumps dispense the four chemicals used when the unit operates. These chemical feed pumps are unique in that they separately feed the four different chemicals the ROWPU uses at the same time. The suction lines are at the bottom of each feed body while the feed lines are on top of the feeder body. Each feed body is designed to feed the chemicals polymer, sodium hex, citric acid, and chlorine.
- Pump Controls
  - PILOT LIGHT ENCLOSURE
    - The pilot light enclosure contains all the indicator lights to indicate operation mode of all electrical components on the ROWPU. It also contains trouble indicator lights to warn you of potential trouble to the unit and components.

### **Slide 3.4 – Pumps**

- REVERSE OSMOSIS PUMP
  - REVERSE OSMOSIS PUMP
    - The reverse osmosis pump is located under the electrical Junction Box. The motor that drives this pump is rated at 208VAC 3-Phase, 40 hp, and 99.5 amps. A switch on the control box labeled “R.O. PUMP” controls the motor control circuit.
- BOOSTER PUMP
  - BOOSTER PUMP
    - The booster pump is located to the left of the RO Pump as you view the ROWPU unit from the front. The motor that runs the pump is rated at 208VAC, 1 hp, and 3.4/1.6 amps. The switch on the control box that is labeled BOOSTER PUMP controls the circuit
- RAW WATER PUMP
  - RAW WATER PUMP
    - The ROWPU contains two raw water pumps. One or both of the pumps are placed between the raw water source and the ROWPU unit; use of 1 or 2 pumps depends on the installation scenario. The motor that drives each pump is rated at 208VAC, 3 hp, and 8.1 amps. The control box has two switches, labeled RAW WATER PUMP NO. 1 and RAW WATER PUMP NO. 2 which control each respective pump. The first pump is powered through receptacle J2-A on the junction box.
    - The second pump is powered from an electrical cannon plug on the first pump. As the pumps are controlled from the control box, the pump closer to the source acts as Pump No. 1 and Pump No. 2 is closer to the unit.
- BACKWASH PUMP FUNCTION
  - BACKWASH PUMP FUNCTION

- The raw water pumps can be operated as a backwash pump. This is done to clean out the ROWPU during maintenance operations performed by the WFMS personnel. There is a 2-way valve that must be turned prior to backflow operations.
- DISTRIBUTION PUMP
  - DISTRIBUTION PUMP
    - The distribution pump is located next to the potable water storage container. The motor is rated at 208/460 VAC, 1 hp, and 3.4/1.6 amps. The fourth switch from the left on the control box, which is labeled DISTRIBUTION PUMP, controls the circuit. The pump is fed through receptacle J5 and is protected by the three-phase, 15-amp CB5. The only installation requirement is the interconnection between the motor cable plug and junction box
- BOOSTER PUMP
  - BOOSTER PUMP
    - The booster pump is located on the trailer. The motor that runs the pump is rated at 208/460 VAC, 1 hp, and 3.4/1.6 amps. The switch on the control box that is labeled BOOSTER PUMP controls the circuit. The pump is fed through a cannon plug connection on the bottom of the circuit breaker box and is protected by the three-phase, 15-amp CB6. The only installation requirement is the inter-connection between the motor cable plug and the receptacle on the breaker box.
- CHEMICAL FEED PUMP
  - CHEMICAL FEED PUMP
    - The chemical feed pumps are located in the unit, to the left of the control box. The pumps are low amperage diaphragm pumps that only move 2.67 gallons per hour. They are responsible for injecting chemicals required for the water treatment process.

### **Slide 3.5 – Installation**

- PLC
  - PROGRAMMABLE LOGIC CONTROLLER
    - A programmable logic controller (PLC) is a digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or lighting fixtures. PLCs are used in many industries and machines. Unlike general-purpose computers, the PLC is designed for multiple inputs and output (I/O) arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact. Programs to control machine operation are typically stored in battery-backed or non-volatile memory. A PLC is an example of a real time system since output results must be produced in response to input conditions within a bounded time, otherwise unintended operation will result.
- DATA FLOW

- DATA FLOW
  - The ROWPU uses information from various input sensors and makes decisions based on the input information. Output signals from the PLC are used to control the overall water purification process.
- JUNCTION BOX
  - JUNCTION BOX
    - The junction box is located immediately to the right of the control panel. It contains the main system disconnect, circuit breakers, control relays, motor starters, as well as an I/O module.
- GROUND CONNECTION
  - GROUND CONNECTION
    - Due to the possibility of electrical shock, you must ground the ROWPU using a ground rod, grounding conductor, and proper connections before it can be used. The unit comes equipped with a three-piece ground rod, which is stored on the control panel. To install the ground rod, drive each section in one at a time. Insert the rod-driving bolt into the coupler of the first section to be installed. This bolt is designed to protect the coupler and rod while they are being hammered into the ground.
    - Drive the rod section into the ground until about 6 inches of the rod remains exposed. Remove the driving bolt and insert the next section of rod into the threaded coupler. Repeat this process until all ground rod sections are installed. Then secure the grounding conductor between the ROWPU and the ground rod. After you install the rod, check the security of the connections and make sure the maximum ground resistance does not exceed 25 ohms ( $\Omega$ ).
- NOTE
  - The electrical requirements for the ROWPU consists of power for the ROWPU unit itself as well as the various pumps that are required to move large amounts of raw and treated water. Primary power requirements for this unit are 208 VAC, 104 amps (max), three-phase power. The electrical supply can be provided from any 208 volt power source, using a 200 amp BEAR power cable

### **Slide 3.6 – Troubleshooting**

- Troubleshooting procedures for the ROWPU are not much different from those used for other pieces of electrical equipment. The system contains several motor control and relay circuits as well as digital control software to operate the PLC. Reference TO 40W4–20–1 for specific steps on troubleshooting.
- **WARNING:** ROWPU piping and equipment can contain extremely high pressure during and after operation. If this pressure is not relieved before working on these pipes or equipment, serious injury or death may result. Be sure to open all drains and vents before beginning any disassembly

### **Slide 4.1 – Course Completion**

Congratulations, you have completed the reverse osmosis water purification unit fundamentals lesson. Please click complete lesson to receive credit.



# **3E453 – Pest Management Journeyman**

## **Module 5, Lesson 4, Task 1 (15.8.1 & 15.8.2) Small Shelter System Purpose**

### **Slide 1.1 – Introductory Slide**

### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.8.1 & 15.8.2 Small Shelter System Purpose

### **Slide 1.3 – Instructions**

Welcome to the Small Shelter System (SSS) Purpose lesson.

- Without reference, determine basic facts and state general principles about the small shelter system purpose with at least 75 percent accuracy.

### **Overview**

In this section, we will cover the following topics:

- SSS Dimensions
- SSS vs. Temper Tent
- SSS Aspects
- SSS Versions

### **Slide 2.1 – Small Shelter System vs. Temper Tent Intro**

### **Slide 2.2 – SSS vs. Temper Tent**

Small Shelter Systems were designed as an alternative to the Temper Tent. Click each of the shelters to identify the differences in the Temper Tent and SSS:

- Temper Tent
- Small Shelter System

### **Slide 2.3 – Temper Tent**

- Looser and less vector proof
- Requires more day-to-day maintenance after being erected
- Fabric is harder to repair
- Less energy efficient

### **Slide 2.4 – Small Shelter System**

- Slightly lighter
- Tighter and more vector proof

- Requires less day-to-day maintenance after being erected
- Fabric is easier to repair
- 6 people can safely assemble the shelter in 1.5 hours instead of 12 people over 2 hours for the temper tent
- Multiple shelters can easily be interconnected
- Weighs only 1400 pounds
- More energy efficient

### **Slide 3.1 – Small Shelter System Aspects Intro**

### **Slide 3.2 – Tent Spin**

### **Slide 3.3 – Small Shelter System Aspects**

- KEY PURPOSE
  - SSS's are utilized as expeditionary shelter systems until more permanent facilities can be constructed.
- Size
  - 650 Square Feet of interior space
  - 10 Feet High
  - 20 Feet Wide
  - 32.5 Feet Long
- CONFIGURATIONS
  - Billeting
  - Work areas
  - Latrines
  - Showers
  - Storage
  - Laundry Facilities
  - Field Mortuary
  - Many Others

### **Slide 3.4 – Lifespan**

- LIFESPAN
  - 10-years when erected for longer periods of time. 20-year shelf life. Supports sustained operations until more permanent facilities can be developed.

### **Slide 3.5 – Function**

- FUNCTION
  - SSS provide protection for both personnel and equipment/supplies.

### **Slide 3.6 - Environment**

- ENVIRONMENT
  - SSS are used in all types of climate and terrain including extreme cold and extreme heat. They are also used in any environment of bare base missions with only normal organic support provided.

### **Slide 3.7 – Colors**

- COLORS

- The colors are made to match the terrain that personnel are working in or around. These colors are generally either tan or green.

### **Slide 4.1 – Versions Intro**

### **Slide 4.2 – Versions**

- Alaska Small Shelter / Alaska Alternative Shelter
  - The Alaska Small Shelter has no windows on the main cover.
- Alaska Small Shelter Version 2
  - The Alaska Small Shelter Version comes with 10 windows on the main cover 5 down each side . The liners also have windows in them.

### **Slide 5.1 – Course Completion**

Congratulations, you have completed the small shelter system purpose lesson. Please click complete lesson to receive credit.

# **3E453 – Pest Management Journeyman**

## **Module 5, Lesson 5, Task 1 (15.7.3) Constructing Field Latrines**

### **Slide 1.1 – Introductory Slide**

### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.7.3) Constructing Field Latrines

### **Slide 1.3 – Instructions**

Welcome to the lesson on Constructing Field Latrines

- Without reference, determine step by step procedures for constructing field latrines with at least 75% accuracy.

### **Overview**

In this section, we will cover the proper location parameters and latrine types.

- Different types of latrines.
- The construction of latrines.
- How many latrines are necessary.

### **Slide 2.1 – Latrine Site Selection**

- Select a site that's located 100 yards from water supply/mess facilities.
- Locate a site where the ground is not sloping.
- Ensure the location is never uphill from campsites or water supplies to prevent water contamination.

### **Slide 2.2 – Latrine Types**

- Cat Hole
- Straddle Trench Latrine
- Burnout Latrine
- Pail Latrine
- Trough Urinal
- Pit Latrine

### **Slide 2.3 – Cat Hole**

- Cat Holes are one of the simplest and most expeditionary types of latrines - essentially just a hole in the ground for disposing of waste.
- They are typically used only as a temporary measure until a more permanent latrine can be installed.
  1. The first step is to dig a hole 1 foot deep.
  2. Then, use the hole as a toilet.
  3. Lastly, cover the ground completely after use.

#### **Slide 2.4 – Straddle Trench Latrine: Overview**

- Straddle Trench Latrines requires 2 trenches per 100 males and 3 trenches per 100 females. They should be assembled ASAP.
- Note: this style latrine does not require a seat and, may have boards placed along the sides to provide a better footing.

#### **Slide 2.5 – Straddle Trench Latrines: Construction**

- Step 1
  - Dig a hole 1 foot wide, two feet 6 inches deep, and a length of 4 feet long.
- Step 2
  - Before digging another hole, mark out 2 feet between trenches to act as footing.
- Step 3
  - Provide additional dirt and a shovel on the side of the latrine to allow each person to cover their own waste.
- Closing Procedures
  - The latrine is full when its waste is within 1 foot of ground level.
  - Spray the pit, sides, and 2 feet around the pit with diesel fuel or insecticides.
  - Fill with 3-inch layers of dirt, then mound the pit with 1 foot of dirt and spray with fuel or insecticides again.
  - When there is a possibility of other personnel using the same area, mark the pit closed with a sign stating "Latrine Closed and the date."

#### **Slide 2.6 – Burnout Latrine**

- Overview
  - Burnout Latrines utilize removable barrels. Waste is disposed of at another location.
  - Waste can be cut with lime or burned with diesel fuel.
- Step 1
  - First, locate a 55-gallon drum with lids on both sides.
- Step 2
  - Measure up from the bottom and mark 16 inches all the way around at this dimension. Then measure down from the top 16 inches and mark all the way around at this dimension.
- Step 3
  - Cut on both lines all the way around. Discard the middle section of the barrel. Deburr or bend over the cut side of the barrel to prevent injuries.
- Step 4

- A wooden seat with a fly proof, self-closing lid is placed on top of the drum.
- Step 5
  - Sanitation crews then remove the barrel and burn the contents daily using a solution of 1 quart gasoline and 4 quarts of diesel or JP8. If the initial burning does not remove the odor a second burning is required.

## **Slide 2.7 – Pail Latrine**

- Overview
  - Pail Latrines are used in buildings where no adequate plumbing facilities are present
  - Pail Latrines utilize a chair with a bucket underneath
- Step 1
  - Use a standard latrine box that is modified to allow a hinge door on the rear for access underneath that allows for a pail to be placed underneath the box.
- Step 2
  - The floor where the latrine box is setup should be made of impervious material such as concrete that slopes to the rear to ensure that any waste spill flows back away from the occupant's feet.
- Step 3
  - The pail should be lined with plastic to prevent spillage during removal. Remove the pails daily and replace them. Pails should have at least 1 inch of 2 percent cresol solution or some slacked lime.
- Step 4
  - The contents of the pail may be burned, buried, or placed in fly proof concrete tanks where it decomposes.

## **Slide 2.8 – Trough Urinal**

- Overview
  - Trough Urinal is built as part of a latrine setup.
  - It is constructed when the team will be in one area for a long period of time.
- Usage
  - Trough Urinal is made from tin, galvanized iron, or wood. The material is shaped into a V or U shape and lined with tarpaper.
  - It is raised with X shaped legs and slopes downward at one end.
- Usage
  - It empties into a drainpipe.
  - The drainpipe is fitted with a fine mesh fly screen that extends into a urine soakage pit.
  - Sometimes the pipe is omitted, and the trough extends into the pit.

## **Slide 2.9 – Pit Latrine**

- Pit Latrines are more permanent than the previously covered latrines and should be assembled ASAP.

## **Slide 2.10 – Pit Latrine Usage**

- Video Closed Captions

Pit latrines should be dug 20 to 30 feet deep when the ground permits. The width and length of the hole should be either 2 feet wide by 7 1/2 feet long for single kits with 4 holes or 3 feet by 7 feet for double kits with 8 holes. Then excavate a 4 inch wide margin around the pit to a six inch depth. Lay a layer of oil soaked burlap in the excavated margin. Then soak the excavated earth with oil and replace it tamping it down to keep surface water out. After that, place the single 4 hole or double 8 hole member over the actual rough opening. Ensure the sides are straight and have no ledges that may catch feces. This can be done by lining the boxes with tar paper from top to bottom. Ensure there is a metal or tar paper urine deflector which also forms into a trough under the front of the seat directing urine to one side. Construction of the trough should ensure urine flows to one side into a pipe that takes the urine to an outside seepage pit. Ensure all cracks and gaps in the wood are filled and pack dirt tightly around them to prevent flies from getting in or out. Urinal soakage pits should be built in areas that absorb liquid poorly they should be a 4 by 4 square 4 feet deep filled with rocks or stones to within one foot of the top. Place oiled burlap over the rocks and cover it with sand and earth. Vents can be inserted at the top with fine mesh screens to reduce odor.

### **Slide 2.11 – Key Takeaways**

- Pit latrines should be dug 20-30 feet deep when the ground permits.
  - Single kits with 4 holes: 2 ft W x 7.5 ft L
  - Double kits with 8 holes: 3 ft W x 7 ft
- Excavate a 4 inch wide margin around the pit to a 6 inch depth. Lay a layer of oil-soaked burlap in the excavated margin
- Soak the excavated earth with oil and replace it, tamping it down to keep surface water out.
- Place the single 4 hole or double 8 hole member over the actual rough opening. Ensure the sides are straight and have no ledges that may catch feces. This can be done by lining the boxes with tarpaper from top to bottom. Ensure there is a metal or tar paper urine deflector which also forms into a trough under the front of the seat directing urine to one side.
- Construction of the trough should ensure urine flows to one side into a pipe that takes the urine to an outside seepage pit. Ensure all cracks and gaps in the wood are filled and pack dirt tightly around them to prevent flies from getting in or out.
- Urinal soakage pits should be built in areas that absorbs liquid poorly. They should be a 4 x 4 square 4 feet deep filled with rocks or stones to within 1 foot of the top. Place oiled burlap over the rocks and cover it with sand and earth. Vents can be inserted at the top with fine mesh screens to reduce odor.

### **Slide 3.1 – Course Completion**

Congratulations, you have completed the constructing field latrines lesson. Please click complete lesson to receive credit.

# **3E453 – Pest Management Journeyman**

## **Module 5, Lesson 6, Task 1 & 2 (15.9.1 & 15.9.2) Rapid Airfield Damage Repair and AFSC Specific Responsibilities**

### **Slide 1.1 – Introductory Slide**

### **Slide 1.2 – Lesson Title Slide**

3E4X3 Career Development Course

15.9.1 & 15.9.2 Rapid Airfield Damage Repair and AFSC Specific Responsibilities

### **Slide 1.3 – Instructions**

Welcome to the lesson on Rapid Airfield Damage Repair (RADR) and AFSC Specific Responsibilities

- Without reference, identify the relationship of basic facts and state general principles about RADR and AFSC specific responsibilities with at least 75% accuracy.

### **Slide 1.4 – Overview**

In this section, we will cover the following topics:

- Purpose
- RADR Philosophy
- Pest Management Specific Responsibilities

### **Slide 2.1 – Purpose**

- Video Closed Captions

The Purpose of the Rapid Airfield Damage Repair (RADR), is to rapidly repair aircraft operating surfaces and localized infrastructure in order to recover operations at an airfield after an attack. and localized infrastructure in order to recover operations at an airfield after an attack. and the continuation of airfield operations to ensure the rapid projection and application of US military power around the globe. RADR is a subset of Airfield Damage Repair (ADR). Refer to AFPAM 10-219v4, Airfield Damage Repair Operations, for a complete overview of the ADR program. This provides the complete airfield recovery manning requirements for various RADR capabilities. The scope of rapid crater repair will vary proportionally to the intensity of the attack. RADR can establish Minimum Airfield Operating Surface (MAOS) up to 150 feet by 10K thousand feet, associated taxiways, ramps, access routes, and critical infrastructure. Rapid crater repair is a modular and scalable team-based process that can support thousands of combat sorties for all



airframes, provide temporary to semi-permanent repair options in all pavement conditions, and support employ-in-place and expeditionary capabilities.

### **Slide 2.2 – Key Takeaways: Harmonic Overview**

- The Purpose of the Rapid Airfield Damage Repair (RADR) is to rapidly repair aircraft operating surfaces and localized infrastructure in order to recover operations at an airfield after an attack. It is the essential element of enabling air base resiliency and the continuation of airfield operations to ensure the rapid projection and application of US military power around the globe.
- RADR is a subset of Airfield Damage Repair (ADR).
- Refer to AFPAM 10-219v4, Airfield Damage Repair Operations, for a complete overview of the ADR program. This provides the complete airfield recovery manning requirements for various RADR capabilities.
- The scope of rapid crater repair will vary proportionally to the intensity of the attack.
- RADR is capable of establishing Minimum Airfield Operating Surface (MAOS) up to 150 feet by 10K feet, associated taxiways, ramps, access routes, and critical infrastructure.
- Rapid crater repair is a modular and scalable team-based process that can support thousands of combat sorties for all airframes, provide temporary to semi-permanent repair options in all pavement conditions, and support employ-in-place and expeditionary capabilities.

### **Slide 3.1 – RADR Philosophy**

- EQUIPMENT USED
  - RAPID DAMAGE ASSESSMENT (RDA)
  - RAPID EXPLOSIVE HAZARD MITIGATION (REHM)
  - RAPID DAMAGE REPAIR (RDR)

### **Slide 3.2 – Rapid Damage Assessment (RDA)**

- Overview
  - The purpose of Rapid Damage Assessment (RDA) is to identify and characterize the damage and hazards.
  - This process focuses on collecting and analyzing data to determine the presence of hazards and overall airfield condition to include the number, location and types of craters, Unexploded Ordnance (UXO), and other damage characteristics.
- Camouflets and Spalls
  - A spall is surface damage which does not penetrate the pavement base course.
  - Camouflets are cavities formed from a deep underground burst with minimal surface rupture

### **Slide 3.3 – Rapid Damage Repair (RDR)**

- Overview
  - Rapid Damage Repair (RDR) is the process used to repair selected pavement damage and establish the MAOS. RDR teams begin repairing craters, camouflets, spalls, and other damage impeding flying operations on the MAOS once the explosive hazard threat has been sufficiently mitigated in a repair zone.
  - This process is based on an assembly line concept where the assembly line (repair crews) moves from crater to crater. It's optimized techniques and

advanced, rapid-setting materials are used to minimize the Mean Time to Repair (MTR) for both asphalt-concrete (AC) and Portland Cement Concrete (PCC) surfaces. Materials and procedures provide pavement repair supporting the range and intensity of joint aircraft traffic required to meet airpower objectives. Refer to AFTTP 3-32.17, Rapid Airfield Crater and Spall Repair, for more detailed descriptions of the damage repair process.

- Debris Removal
  - Crater repair is comprised of 6 steps; debris removal, upheaval marking, pavement cutting, pavement breaking and excavation, backfilling, and capping. Each step has a dedicated crew that performs the same repair step until the step has been completed on all craters in the identified repair zone.
  - Debris Removal begins immediately after PAR sweep has proceeded at least 250 feet beyond the first crater to be repaired. This process clears debris at least 15 feet from around each crater to allow subsequent processes to proceed. After debris is removed from around each crater, it is then pushed at least 30 feet from the edge of the MAOS. The debris removal team must stay ahead of the upheaval marking crew. Electricians may be used to operate a loader with a multi-purpose bucket for debris removal.
- Upheaval Markings
  - Upheaval Marking begins immediately after the first crater is cleared by the debris removal crew. Upheaved pavement is not always visible to the eye. The explosion from munitions hitting the runway creates upheaved pavement around the crater.
  - Upheaval determination is accomplished through crater profile measurements (CPM) to ensure all damaged pavement is identified and removed. Un-removed upheaval will most likely fail under traffic and create foreign object debris (FOD) hazards.
  - Reference AFTTP 3-32.17 for more information of the procedures when apparent crater size is less than 20 feet in diameter and T.O. 35E2-5-1 for craters with an apparent size of 20 feet in diameter or larger.
- Pavement Cutting
  - Pavement Cutting is the most critical step in the repair process in regard to meeting timelines, it impacts the efficiency of excavation and capping process. Removing more pavement than necessary may increase the time to complete the repair and could enlarge repairs and exhaust materials. Two compact track loaders with wheel saw attachments cut pavement around craters by following the marks created during the upheaval marking process.
  - The conventional walk behind concrete saw may be required in conjunction with the wheel saws when dowels or rebar are in the saw path. Electricians may be used as a spotter for this processes. Use a shovel, pavement cutting alignment aid, and a dust mask.
  - You will ground target stands to guide the operators to position cutting wheels appropriately, remove debris from the vehicle's shroud and track path, and

inspect saw bits and saw wearing shoes after each side of a repair cut to determine if replacement is needed.

- Pavement Breaking
  - Pavement Breaking and Excavation is the process of breaking the damaged pavement within the cut lines with an excavator and hammer attachment and removing the disturbed subsurface material from the repair using a separate excavator with a bucket attachment. Pavement Breaking and Excavation should begin as soon as pavement cutting is complete on the first crater.
  - The debris removal crew assists with removing the excavated debris from the MAOS. Electricians may be used as spotter for this processes. The equipment used will be a shovel, tape measure, and marking paint. Spotters will clean corners and vertical faces as necessary and level the bottom of the excavation with a shovel. Measure the full depth of the repair and report the measurements and mark the backfill depth on the walls of the excavated repair with marking spray paint.
- Backfilling
  - Backfilling utilizes a flowable-fill product in place of traditional crushed stone. It is a medium strength, high viscosity, excavatable, rapid-setting, cementitious backfill material.
  - The repair is backfilled with flowable-fill using the dry placement technique commonly known as “slash and splash”. This is accomplished by suspending a 3-thousand-pound super sack of flowable fill over the excavated area, slashing the bottom of the sack to release the material into the repair, and then splashing the backfill with 50 gallons of water until reaching the prescribed depth. The process from backfilling beneath an asphalt cap is accomplished with the same flowable fill material but mixed with a volumetric mixer and uses a wet placement technique.
  - Crushed stone may be used in lieu of flowable fill. Additional time, equipment, and personnel may be required to haul, place, and compact the stone. Electricians may be used as a helper. The equipment used are a utility knife, rake, and/or a shovel.
- Capping Repair
  - Capping Repair should match the existing material. Mix-matching capping material and existing material is allowable when material is short or when a team is repairing craters in both existing PCC and AC but the life expectancy of the repairs may be diminished. A concrete cap is placed using the volumetric mixer and a rapid-setting concrete mix provided in 3-thousand-pound super sacks. The asphalt cap is placed with asphalt produced by the asphalt recyclers and compacted with rollers.
  - Alternate materials as caps may require additional monitoring, maintenance, and backfill materials. AM-2 matting may be used as a cap on aprons and taxiways, with exception of high-speed taxiways and intersections. Fiber-reinforced Polymer (FRP) mat panels may be used as a cap depending on the aircraft type, operations, and location on the airfield. Neither of these are as durable as

asphalt or concrete caps. Electricians may be used as a helper and/or vehicle operator for the front-end loader, CTL, steel roller, and the pneumatic roller for this portion of the processes. Equipment used will be a lute, shovel, screed, bucket and hand trowels, rake, and shovel.

- Spall Repair
  - Spalls are pavement damage that do not penetrate the full pavement thickness to the underlying base course, not larger than five feet in diameter, and does not cause upheaval in surrounding pavements.
  - Thousands of spall with be expected after an attack with possibly hundreds requiring repairs. Spalls are expediently repaired by removing debris and loose material from in and around them and placing rapid setting repair material in the spalls ensuring the final repair is level with the surrounding pavement.
- FOD Removal
  - FOD removal teams follow behind the RDR teams. FOD is removed from the MAOS by scraping, sweeping, and vacuuming all surfaces until it is accepted by Airfield Operations.
  - Marking and stripping crews identify and mark the installation locations for the aircraft arresting system (AAS) and Emergency Airfield Lighting System (EALS).
  - These teams work simultaneously to restore required capability.

### **Slide 3.4 – Rapid Explosive Hazard Mitigation (REHM)**

- Overview
  - The Rapid Explosive Hazard Mitigation (REHM) process is used to neutralize Unexploded Ordnance (UXO) within and near repair zones.
  - A family of UXO assessment and mitigation tools, platforms, and systems provide EOD technicians the capability to safely and rapidly mitigate the UXO threat
- Operation
  - Platforms and systems operated (or supervised) by EOD personnel allow surface and subsurface UXO positive identification, neutralization, collection, removal, and ultimate disposal on and off the airfield operating surfaces, access routes, and equipment and material staging area.
- Resources
  - Refer to AFTTP 3-32.5v6, Explosive Ordnance Disposal (EOD) UXO Operations, for general guidance on planning, training, equipping, and developing policy for RADR and recovery of airbase denied by ordnance (RADBO) directed energy operations.

### **Slide 4.1 – Rapid Airfield Damage Recovery Divider**

#### **Slide 5.1 – RADR Purpose**

- In times of RADR operations, the repair of the airfield is the number one priority in order to get aircraft back up in the air and to carry out their missions.
- 3E4X3, Pest Management personnel are called on to help with getting the airfield back up and running.
- Pest Managers serve in two vital roles within RADR:
  - Crater Repair

- FOD Removal

### **Slide 6.1 – Equipment Used**

- Front End Loader
- Industrial Tractor with Kick Broom
- Water Truck

### **Slide 6.2 – Front End Loader**

- FRONT END LOADER
  - Equipment with a bucket or blade to remove debris from crater and surrounding areas

### **Slide 6.3 – Water Truck**

- WATER TRUCK
  - Used to transport water to and from specific locations.

### **Slide 6.4 – Industrial Tractor with Kick Broom**

- INDUSTRIAL TRACTOR WITH KICK BROOM
  - Used to sweep a given area of debris and move it off the

### **Slide 7.1 – FOD Removal Team**

#### **Debris Removal**

- Begins immediately after PAR sweep has proceeded at least 250 feet beyond the first crater to be repaired.
- This process clears debris at least 15 feet from around each crater to allow subsequent processes to proceed.
- After debris is removed from around each crater, it is then pushed at least 30 feet from the edge of the MAOS.
- Must stay ahead of the upheaval marking crew.
- 3E4X3 may be used to operate a loader with multi-purpose bucket for debris removal.

### **Slide 8.1 – Crater Repair Team**

- Backfilling
  - Utilizes a flowable-fill product in place of traditional crushed stone.
  - Medium strength, high viscosity, excavatable, rapid-setting, cementitious backfill material.
  - The repair is backfilled with flowable-fill using the dry placement technique commonly known as “slash and splash.”
  - Accomplished by suspending a 3K pound super sack of flowable fill over the excavated area, slashing the bottom of the sack to release the material into the repair, and then splashing the backfill with 50 gallons of water until reaching the prescribed depth.
  - The process from backfilling beneath an asphalt cap is accomplished with the same flowable fill material, but mixed with a volumetric mixer and using a wet placement technique.
  - Crushed stone may be used in lieu of flowable fill.
  - Additional time, equipment, and personnel may be required to haul, place, and compact the stone.

- 3E4X3 may be used as a helper.
- Equipment used will be a utility knife and rake/shovel.
- **Capping Repair**
  - Should match the existing material.
  - Mix-matching capping material and existing material is allowable when material is short or when a team is repairing craters in both existing PCC and AC.
  - Life expectancy of the repairs may be diminished.
  - A concrete cap is placed using the volumetric mixer and a rapid-setting concrete mix provided in 3K pound super sacks.
  - The asphalt cap is placed with asphalt produced by the asphalt recyclers and compacted with rollers.
  - Use of alternate materials as caps may require additional monitoring and maintenance and will also require additional backfill materials.
  - AM-2 may be used as a cap on aprons and taxiways, with exception of high-speed taxiways and intersections.
  - Fiber-reinforced Polymer (FRP) mat panels may be used as a cap depending on the aircraft type, operations, and location on the airfield.
  - Not as durable as asphalt or concrete caps.
  - 3E4X3 may be used as a helper and/or vehicle operator for the front-end loader.
  - Equipment used will be lute, shovel, screed, bucket and hand trowels, rake, and shovel.

### **Slide 9.1 – Course Completion**

Congratulations, you have completed the rapid airfield damage repair and AFSC specific responsibilities lesson. Please click complete lesson to receive credit.