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TEEX/ESTI Student Safety Manual

2007 Student Safety Manual

The Texas Engineering Extension Service (TEEX) is the world's premier emergency services training provider. This has been accomplished by using subject matter experts to develop curriculum, and design/construct realistic training props, as well as by incorporating safety into everything we do. The result of this is training that is both safe and of the highest quality.

To assist our students and guest instructors in understanding and complying with the TEEX safety requirements, this *TEEX/ESTI Student Safety Manual* was developed. This manual is applicable to all TEEX-sponsored training, whether conducted at Brayton Fire Training Field (BFTF), Cooperative Learning Centers (CLC), area schools, or client-owned facilities. It is the expectation of TEEX that all staff, students, and guest instructors comply with the requirements of this manual.

The lead instructor has full responsibility for the safety of his/her students and for ensuring all training is conducted in accordance with this manual. The lead instructor in consultation with, and the approval of, the TEEX safety manager can deviate from the policies contained in this manual if the requested deviation enhances the safety of the students. In no instance will the safety of students be degraded. Requests for deviations will be handled on a case-by-case basis.

Personal Protective Equipment (PPE) Requirements

To ensure the safety of our students and staff during training evolutions, the following PPE policy has been adopted by TEEX. The policy is based upon five levels of protection, with Level 0 as the lowest level of protection. This policy is to be followed by all students and staff during any TEEX-sponsored training activity regardless of location.

Level 0

This level consists of everyday, casual clothing suitable for an office environment. Level 0 is for courses which are completely classroom based with no hands-on training activities and where students remain in the classroom for the entire course. No PPE is required for Level 0.

Level 1

This is the lowest level of protection for training outside of the classroom. Level 1 is for courses where students are not directly involved with hands-on training but require a slightly higher level of protection based on the environment and surroundings. Examples include conducting field inspections or observing training scenarios or

hands-on demonstrations. This level is comprised of normal, everyday outdoor work attire:

- Full-length pants are required for all participants; shorts are strictly prohibited during hands-on training activities.
- Short sleeves are allowed, but sleeveless shirts are prohibited.
- Closed-toed shoes must be worn.

Level 2

This level of protection is the minimum requirement for any hands-on training activity and is comprised of all Level 1 requirements plus the following:

- National Fire Protection Association (NFPA) approved firefighter's helmet or American National Standards Institute (ANSI) Z.89-approved hardhat (non-live fire training activities)
- For Level 2 eye protection, see specific requirements under ["Use of Eye Protection Equipment"](#)
- NFPA-approved steel toe firefighter's boots or ANSI Z.41-approved steel toe safety boots (non-live fire training activities)
- NFPA-approved firefighter's gloves or suitable work gloves for non-live fire training activities
- Loose jewelry is prohibited

Level 3

This level of protection is the minimum requirement for any exterior, live-fire training activity where smoke inhalation does not occur or is incidental to the activity and is comprised of all Level 1 requirements plus the following:

- NFPA-approved structural firefighter's coat and pants:
 - Must meet all applicable NFPA standards
 - Must be in good condition with all NFPA approval tags in place
 - All closures are in place and in good working condition
 - No tears or holes in gear

- Must be a complete set (coat and pants with suspenders)
- Full-length pants are required to be worn in conjunction with bunker gear; shorts are strictly prohibited
- NFPA-approved firefighter's helmet with ear flaps
- NFPA-approved helmet with the Original Equipment Manufacturer (OEM) faceshield, or NFPA-approved goggles, or both. Goggles are not recommended for use during exterior fire training activities.
- Sunglasses or other eyewear worn in conjunction with an NFPA helmet and faceshield must meet ANSI standard Z.87.
- NFPA-approved fire fighting hood; "double hooding" is not allowed
- NFPA-approved steel toe firefighter's boots
- NFPA-approved firefighter's gloves

Level 4

This level of protection is the minimum requirement for any interior live-fire training activity and is comprised of all Level 3 requirements plus the use of an NFPA-approved Self-Contained Breathing Apparatus (SCBA) and Personal Alert Safety System (PASS) device. All SCBA and PASS devices used on BFTF will be provided by TEEX. All SCBA and PASS devices used at other locations must document compliance with NFPA 1981 for SCBA and NFPA 1982 for PASS devices.

Level 5

This level of protection defines the minimum requirements for specialized training activities.

Vehicle Extrication

Extrication clothing may be worn in lieu of bunker gear, a fire fighting hood is not required, and suitable work gloves may be worn in lieu of firefighter's gloves. All other Level 3 requirements remain in place.

Airport Rescue Fire Fighting (ARFF)

The use of NFPA-compliant proximity suits is allowable as Level 3 bunker gear (exterior evolutions) and as Level 4 bunker gear (interior/cabin evolutions).

Rescue

Students participating in confined space, high angle, and wilderness rescue courses are required to meet the Level 2 PPE requirements.

Use of Eye Protection Equipment

Live-Fire Training Activities (Levels 3 and 4)

Each individual engaged in live-fire training activities must incorporate eye protection measures. Eye protection must consist of the following:

- NFPA-approved helmet with:
 - OEM faceshield
 - or*
 - NFPA-approved goggles
 - or*
 - Both

Goggles are not recommended for use during exterior fire training activities. Sunglasses or other eye wear worn in conjunction with an NFPA helmet and faceshield must meet ANSI standard Z.87.

Note: ANSI-compliant eye wear will have Z.87 stamped on either the frame or the lens.

Non-Live Fire Training Activities (Level 2)

Each individual engaged in “non-live fire” training activities (i.e., hands-on) are to incorporate eye protection measures. Eye protection must consist of one of the following:

- NFPA approved helmet with:
 - The OEM faceshield
 - or*
 - NFPA-approved goggles
- Sunglasses or other eyewear worn in conjunction with an NFPA helmet and faceshield must meet ANSI standard Z.87.

- ANSI Z.89-approved hardhat with:
 - NFPA-approved goggles
 - or*
 - ANSI Z.87-approved protective eye equipment

Note: ANSI-compliant eyewear will have Z.87 stamped on either the frame or the lens.

Respiratory Protection

Students required to wear respiratory protection during training exercises should have received prior training, fit testing, and a medical survey by their employer or department prior to enrolling in a TEEEX course. By enrolling in a course which requires the use of respiratory protection, the student implies these requirements have been met by his/her employer or department. TEEEX prefers a written statement from the employer/department training coordinator that each student meets these requirements. The following guidelines will be followed for the use of respiratory equipment.

Self-Contained Breathing Apparatus (SCBA) Use

- Only TEEEX-supplied SCBA and PASS devices will be used during training exercises at BFTF. All SCBA and PASS devices used at other locations must document compliance with NFPA 1981 for SCBA and NFPA 1982 for PASS devices.
- SCBAs will be used by all students, guest instructors, and TEEEX staff (instructors and adjuncts) during training evolutions involving:
 - Interior fire structures
 - Project 67: Pump Seal Project
- When wearing an SCBA, there should be no facial hair in the seal area of the facepiece. The Occupational Safety and Health Administration (OSHA) and NFPA allow no more than a one-day growth of facial hair. Your TEEEX instructor will approve or disapprove your use of respiratory equipment.

- Students will be required to clean and sanitize SCBA components with solution provided by TEEEX prior to returning the SCBA to the trailer. TEEEX instructors will inform students of the proper sanitation procedures for the brand of SCBA used during training. ***Students should notify TEEEX if they are allergic to iodine prior to wearing/cleaning their facepiece.***

Supplied Air Respirator (SAR) Use

Requirements for the use of SARs will be the same as that for SCBA.

Requirements for Exterior PPE Use: Once an exterior project has been ignited, anyone (staff and students) entering the hot zone must be in full PPE as defined by Level 3. The hot zone for exterior projects is defined by crossing the fire water main and/or walking onto the project pad.

Requirements for Interior PPE Use: Once an interior project has been ignited, anyone (staff and students) entering the hot zone must be in full PPE as defined by Level 4, with the SCBA in operation. The hot zone for interior projects is defined as any area inside (structure side) the red line painted on the project slab.

Special Requirements for Project/Pump Seal Fires: All students and staff must use an SCBA during all training evolutions on this project.

Personal Protective Equipment (PPE) Use During Project Ignition

A TEEEX staff member or guest instructor will serve as the ignition officer for all projects. To ensure the safety of the ignition officer and students, the following guidelines will be followed:

- Be aware of wind direction and ignite the project from the upwind side.
- Use only the TEEEX provided propane torch to ignite projects:
 - When project # 66 is used for vapor dispersion evolutions, ignition of the project will only be made by a TEEEX-authorized individual using a TEEEX-provided flare gun.
 - When project # 88 (Liquefied Natural Gas [LNG]) is used for fire suppression evolutions, ignition of the project will only be made by a TEEEX-authorized individual using a TEEEX-provided flare lighting device or flare gun.
- All propane torches are to be turned off at the completion of the training evolution(s) prior to exiting the project.

Exterior Projects

- The ignition officer is to be in Level 3 PPE during project ignition.
- Verify with the technician where the best ignition location is on the upwind side of the project.
- Charged hose lines are to be in place and manned to protect the ignition officer.
- A monitor and spotter can be used in lieu of hose lines to protect the ignition officer.
- After ignition, the propane torch is to be placed in a safe location (uphill and upwind) at the outer edge of the project pad.
- All fixed and portable master streams must be manned during tactical operations when discharging water.

Interior Projects

- The instructor-in-charge, in coordination with the safety officer, will direct the actions of the ignition officer.
- The ignition officer is required to be in Level 4 PPE during the ignition of the project.
- Charged hose lines are to be in place and manned to protect the ignition officer.
- Propane torches are to be removed from the project's interior after ignition and placed in a safe location at the outer perimeter of the operations area (outside the red line on the project slab).
- Once the project is ignited, anyone crossing the red line on the project pad is required to be in Level 4 PPE with SCBA in operation.

Personal Protective Equipment (PPE) Use When Racking Fire Hose

Fire hose will only be racked upon command of the lead instructor after all fire has been extinguished and project valves have been reopened. NFPA-approved helmet, gloves, and boots will be worn while racking hose.

Heat Stress

Heat stress is one of the greatest concerns for individuals involved in hands-on training activities. While heat stress is most prevalent during the warmer months of the year, students and staff should be monitored for signs of heat stress throughout the year. To prevent heat stress, students and staff should remove their helmet, hood, coat, and gloves during all critiques, breaks, and when moving from project to project. Increased cool down periods, shortened burn evolutions, and regular re-hydration will also help prevent heat stress. The following hydration guidelines should be followed to reduce the risk of heat stress:

- Drink ample of water throughout the day:
 - Drink a cup of water before and after each training evolution.
 - Limit the electrolyte consumption (too much could cause nausea).
- Do not drink the fire water being used in training; potable water will be provided under the project shelters.
- Limit alcohol consumption at night.
- Do not eat a large lunch.
- Notify your instructor of the first signs of heat stress.
- Each shelter has a sign listing heat-related symptoms

Anyone exhibiting the signs/symptoms of heat stress should be removed immediately from the training activity and taken to a shaded location for cool down. Heat stress is a true medical emergency and can progress rapidly to heat stroke. Therefore, a field medic will be called to evaluate the individual's condition at the first signs of heat stress. Students and staff should closely monitor each other for the following signs/symptoms of heat stress.

Heat Cramps

- Muscle cramps in the extremities and abdomen
- Respiration rate increase
- Pale and moist skin

- Normal body temperature
- General weakness

Heat Exhaustion

- Heavy/Profuse sweating
- Rapid and weak pulse rate
- Rapid and shallow respiratory rate
- Pale and clammy skin
- Normal or decreased body temperature
- Irritability and restlessness

Heat Stroke

- Hot, dry, flushed skin
- Strong and pounding pulse
- Headache, dizziness, and dry mouth
- Seizure and coma
- Loss of consciousness and airway problems can occur

Facilities

The following guidelines apply to all training activities at BFTF. It is the expectation of TEEX that CLCs or other locations hosting TEEX-sponsored training events comply with these guidelines where applicable, and implement equivalent safety guidelines for those items that are BFTF-specific.

Injuries

It is the goal of TEEX that all students have an enjoyable, informative, and injury-free training experience. Should a student receive an injury of any type, the instructor or technician working with the class is to be notified immediately. All injuries will be evaluated by TEEX field paramedics. The attending medic will advise the instructor if the injuries warrant the student being removed from the hands-on training evolutions.

Lightning Procedure

A lightning prediction system is used to alert students and staff of the potential for lightning strikes at BFTF. The lightning alarm will sound when there is a 30 percent probability of a lightning strike within 2.5 miles of BFTF. The field will remain closed until the threat of severe weather has passed and the “All Clear” is sounded. The following procedure will be used when there is a threat of severe weather at BFTF:

- *Alarm*—A 15-second continuous blast of the alarm (air horn) closes the field to all training/maintenance activity. An orange strobe light on the alarm towers will be active throughout the duration of the field closure. Alarm towers are located on the roofs of buildings 87, 18, 54, and 109.
 - All students, instructors, and staff are to seek shelter immediately at the nearest safe haven (shelter, classroom, or building).
- *All Clear*—The field will remain closed until the “All Clear” alarm sounds, which consists of three, 5-second blasts of the air horns.
- If radar indicates the severe weather will persist for an extended period of time, buses will be used to transport students, instructors, and staff to classrooms or the fire station.
- If the field closure occurs at or near the end of a training day, and radar indicates the storm will persist for an extended period of time, the decision can be made to have the busses deliver students/instructors to their vehicle or hotels/dorms as needed.
- If radar indicates the storm is moving away from the field so that no threat remains to students/staff, a member of the TEEX Senior Management Team (SMT) can make the determination to re-open the field.
- If radar indicates a storm system is approaching and/or visual lightning is observed in close proximity to the field, any TEEX staff member can make the determination to close the field prior to the activation of the alarm system.

Smoking Policy

Smoking is not allowed (1) inside any buildings at any time; (2) under project shelters during lectures/presentations; (3) any location where classes/lectures are being conducted; or (4) inside TEEX vehicles. Smoking will be permitted only on perimeter roadways or at project

shelters during authorized class breaks. All cigarette butts are to be extinguished and properly disposed of in the receptacles provided.

Pedestrian Safety

Due to the large volume of automobile and heavy equipment traffic on the field, all pedestrians are to comply with the following guidelines:

- On roadways:
 - Watch for vehicular traffic.
 - Watch for uneven surfaces.
 - Walk along the side of roadways so as not to impede vehicular traffic.
- On projects:
 - Watch for uneven surfaces (rocks, curbs, piping, etc.).
 - Be aware of fire hose layout.
 - Watch for slippery areas.
 - Never walk across a project pad while moving to the next project unless instructed to do so by your TEEX instructor.

Vehicle Safety

Due to the large volume of automobiles, pedestrians, and heavy equipment traffic, anyone operating a vehicle on the field will comply with the following guidelines:

- The field speed limit is 10 m.p.h. for all vehicular and equipment traffic.
- Drivers and passengers will use seatbelts at all times when riding in TEEX vehicles or equipment.
- Passengers are not allowed to ride in the bed of TEEX utility vehicles.
- TEEX utility vehicles will only be operated by TEEX personnel.
- When riding in truck beds, passengers are to sit on the bed floor, completely inside the bed area with the tailgate closed.

- Passengers are not allowed to ride on truck bed rails, tool boxes, tailgates, or bumpers.
- Passengers are only allowed to ride in the passenger compartment or automobiles, vans, and sport utility vehicles.

Project-Specific Safety Items

Prior to conducting hands-on training, the instructor or his/her designee shall review the most recent Project Safety Analysis (PSA) to ensure any unsafe conditions have been addressed prior to the start of training. Additionally, the instructor or his/her designees shall inspect the shelter, project, fueling station, and hose racks for any type of environmental hazards such as:

- Wasps, hornets, yellow jackets, etc. (wasp spray available through the technician staff)
- Spiders
- Snakes
- Algae build up on walking surfaces (slip hazard)

Classroom Safety

While the majority of this manual has focused on conducting safe hands-on training, the importance of safety in the classroom cannot be overlooked. Prior to the start of any class at BFTF, the instructor shall review the most recent PSA for the classroom to ensure any unsafe conditions have been addressed prior to the start of training. For training conducted at locations away from BFTF, the instructor will conduct a safety inspection of the classroom prior to the start of training. In addition, the following safety items are to be reviewed with the students prior to the start of any classroom session at all TEEX-sponsored training events:

- Review lightning procedure (BFTF classes)
- Location of emergency exits
- Classroom and/or building evacuation plan
- Rally points in the event of an evacuation

- Procedures for activating alarm and/or evacuation plan as applicable:
 - Fire alarm pull boxes
 - Emergency contact numbers and/or radio channels
 - Smoke or Carbon Monoxide (CO) alarm locations
- Location of fire extinguishers
- Identity of any potential slip/trip hazards and how hazard has been mitigated
- Identity of any overhead hazards (low ceiling, low entrance way, etc.)
- Housekeeping:
 - How spills are to be reported to prevent slip hazards
 - Proper disposal of trash
 - Extinguishment and disposal of cigarette butts in receptacles provided in outdoor smoking areas
- Ensure coffee pot and other electrical appliances are turned off or unplugged at the end of the day

