

Introduction

- Objectives
 - Understand the importance of safety/security as it relates to the IST mission.
 - Identify safety and security issues that are common to Response operations.
 - Be more focused on safety and
 - security mitigation measures.

Introduction

- Objectives
 - Be more aware of the Safety Officers role and responsibilities as a member of the IST.
 - Be aware of the interactions and relationship between the IST and Task Force Safety officers.

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Phases

- Preparedness
 - Training
 - Exercise
- Deployment
- On-site operations
- Demobilization
- Return to state of readiness

A. INTRODUCTION TO SAFETY AND SECURITY ISSUES

Search and rescue is one of the most dangerous types of emergency response activities that can be performed. It exposes the team members to many hazards that they have little training and virtually no experience to combat. The most current US&R techniques and safe methods of operation are vital to the accomplishment of that mission.

- Safety and security is a very situation-dependent issue.
- Safety is most importantly an attitude. It becomes a balance between accomplishing the task in the shortest possible time and minimizing the risk associated with the task.
- Safety and security of team members has to be top priority during all phases of the US&R mission including preparedness through return to readiness.
- The most effective path is generally the one that expedites the operation AND provides accepted safety practices. This allows the victim to be located and rescued in a timely manner and the rescuers to return from the task unharmed. Keep in mind that when the team deploys, they will face the probability of many challenges and multiple rescues over extended periods of time. So, stay healthy, share lessons learned and be safe.



Risks & Hazards

- Dangerous
 Stress
 equipment
 Security
- Armed thieves and looters
 Safety equipment

Escape routes

Safety zones

Hvdration

Personal hygiene

- Fitness for duties
 Excessive fatigue,
- sleep ■ Food services
- Adverse weather
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B. MISSION RESPONSE OPERATIONS

- Risks and Hazards response team personnel conducting US&R and support activities are exposed to many risks and hazards including, but not limited to:
 - Damaged infrastructure
 - Air transportation
 - Secondary collapse from aftershock, vibration, and gravity, and explosions.
 - Unfamiliar surroundings
 - Fall or tripping hazards
 - Falling material or flying objects
 - Exposure to Haz Mat
 - Decontamination
 - Exposure to smoke, dust, etc.
 - Fire and explosion
 - Excessive noise
 - Electrical hazards
 - Contaminated air and water
 - Electrocution from damaged utilities
 - Dangerous equipment
 - Armed thieves and looters
 - Fitness for duty
 - Excessive fatigue and sleep depravation
 - Food services
 - Adverse weather
 - Stress
 - Security
 - Safety equipment
 - Escape routes
 - Safety zones
 - Personal hygiene
 - Hydration

Damaged Infrastructure

- Roadways
- Bridges/ Tunnels
- Subways
- Pipelines
- Railroads
- Airports
- Power lines

C. RISK HAZARD ANALYSIS

One of the primary responsibilities of the IST Safety Officer is to conduct an incident Risk Hazard Analysis and develop a Incident Safety Plan that will be attached to the IST Action Plan. Each task force will have a Safety Officer with them. However, most of these individuals will be better suited to serve as a work site Safety Officer. The IST Safety Officer should monitor overall Safety and Security of the US&R response organization.

- It is critical that there is a clear understanding between the IST and the Task Forces Leaders on the lines of authority for safety and security issues. Safety is a team effort. Therefore, it is essential that all personnel clearly understand and do their part to insure the health and safety of SAR resources and victims.
- Damaged infrastructure (infrastructure, including communications, roadways, bridges, railroads, air traffic control).
- Assume all infrastructure has been compromised even though prior intelligence may have stated otherwise. Although telephone and cell systems may have survived the disaster intact, they will soon be overloaded by responder and/or public demands.
- Traffic congestion will always occur following a disaster. The affected public will be evacuating the area as responders are moving toward the disaster.
- US&R vehicles must be clearly marked and warning lights should be used to facilitate arriving at target sites. Assessment vehicles must be equipped with four-wheel drive. Standard vehicles will have difficulty traversing terrain while getting to and around work sites. Consider using ATVs such as mules or quads.

Air Transportation

- Temperature Variations
- Noise Levels
- Restricted Movement
- Loading & Unloading Procedures
- Environmental Impacts
- Air Sickness
- Limited Hygiene Facilities

- In a complex disaster there is a lot of emergency response vehicles running code, especially in the early stages when live rescues are occurring. This can be very dangerous when there is heavy traffic congestion.
- Air transportation one method of travel frequently used by response teams is helicopter. A word of caution: be sure that all personnel receive a pre-flight safety briefing before boarding and follow instructions furnished by the pilot or loading supervisor.
 - Remember, following a disaster, unusual hazards may exist that the pilot may not be familiar with. Unsafe acts on the part of the pilot and crew can also be a problem.
 - Some of the issues to be concerned with include overloading, proper clearances for takeoff and landing, rotor wash, security around the helicopter, and adequate intercom capabilities so that team members can communicate during flight. Example: Philippines Assessment Flight. Also manifesting issue in Atlanta with TF Medical component.

Ground Transportation

- Transport concerns
- Safe seating
- Driving / navigating
- Security measures
- Maintenance checks
- Convoying

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Vehicle identification

- Ground Transportation response teams, in general have a long ways to go towards understanding and following good safety practices when utilizing ground transportation. Pay special attention to the following issues:
 - Never transport personnel and equipment together on a open vehicle.
 - Provide safe seating for all personnel.
 - Never drive and navigate at the same time.
 - Cover tools and equipment for security purposes.
 - Familiarize team with assigned vehicle.
 - Conduct maintenance checks each shift.
 - Maintain adequate fuel levels.
 - Travel in convoy when possible.
 - Properly identify vehicles.
 - Red tag unsafe vehicles.
 - Constant cleaning of vehicle windshields is a must.
- Secondary collapse from aftershock, vibration, gravity, and explosions.
- With the constant threat of terrorist attacks it is essential that response teams pay special attention to a very new and potentially deadly threat. Secondary explosion are becoming common techniques used to cause serious injury and possibly mass death for response teams.
- Everyone has to heighten their awareness to their surroundings. There are no second chances when explosions are used for this purpose. It is safe to assume that a secondary devise is involved, unless proven otherwise.

Earthquake Aftershocks

- Secondary Collapses
- Dust/Flying Material
- Mass Confusion
- Loss of Accountability

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Unfamiliar Surroundings

- No Street Signs
- No Traffic Control
- No Familiar Landmarks
- Blocked Access
- Downed Bridges
- Poor Maps

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- Earthquakes aftershocks severe after shocks following a major earthquake are common and can create additional injuries and fatalities.
 - Unstable structures including bridges, overpasses, high rises and water towers may suffer further collapse as a result of aftershocks.
 - First responders must be constantly aware that they may be affected by such events and take necessary precautions while conducting their operations.
 - Many injuries and deaths of first responders could be prevented if more precautions against additional shock waves were taken.
 - Ensure that RIT teams are assigned, in place.
- Unfamiliar surroundings
 - Traffic directional signs and other landmarks may not survive the disaster impact. Traditional road maps may not be valid following a major disaster. Extra care to avoid accidents must be taken because the "new" landscape is distracting and may be confusing.
 - Team members should not conduct assessments and drive a vehicle at the same time. A designated driver with no other responsibility must be assigned to provide transportation for the team.
 - Become familiar with your surroundings prior to committing resources to a tactical assignment.
- Unstable structures
 - Injuries to emergency responders, in many cases, are the result of falling debris and compromised surfaces. Team members must take extra precautions to minimize injuries by wearing the required safety gear when working in the affected area. An injury during the mission becomes a team liability, which may prevent the completion of the task or overall mission.

Trip Hazards

- Wires
- Cables
- Raised Concrete
- Debris/Rubble
- Holes

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Falling Material

- Wind/Rain
- Rotor wash
- Aftershocks
- Building Settling
- Debris Removal

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- Fall or tripping hazards trip hazards are a common cause of falls resulting in injuries. This problem or hazard is commonly found in the Base of Operations (BoO) and work site. In most cases these problems can easily be mitigated once identified. Some common trip hazards are:
 - Downed wire
 - Electrical cord
 - Holes
 - Uneven sidewalks/roads
 - Protruding rebar, etc.
 - Debris and litter
- Falling material or flying objects
 - Displaced material may be everywhere aftershocks or winds may cause displaced objects to become airborne.
 - Eye and head protection are essential. Eye injuries are especially painful and immediate treatment will be required to prevent further injury. Eye and head injuries are a liability to the team and may even require aerial medical evacuation.
 - Contact lens wearers are especially vulnerable. Responders with contact lenses should bring along a pair of glasses.

C. RISK HAZARD ANALYSIS (continued)

- Exposure to Haz Mat
 - There is a significant risk of exposure to hazardous material during the mission. There are two kinds of exposure to be considered prior to entering the impact area:
 - direct exposure from an area that has been contaminated.
 - indirect exposure from moving water or a cloud/vapor plume moving through or beyond the impact area.
 - Most facilities (major targets) such as hospitals, labs, universities, manufacturing plants and warehouses have a broad array of hazardous material on site. Other major sources of hazmats are underground pipeines, railroad cars, and trucking companies. Displaced power line transformers may also pose a significant risk to assessment teams.
- Decontamination
 - When initiating patient care or working around body fluids, use all proper protective equipment.
 - This includes at least gloves, mask, and eye protection.
 - The Team member should remove gloves carefully in order to prevent contamination.
 - All medical waste should be properly disposed of in devices such as sharps containers and bio-hazard bags.
 - If possible, wash hands thoroughly after each victim contact.
 - Clean all equipment not discarded as soon as possible. Ensure canine are decontaminated. Contaminated personnel and equipment should not be allowed to enter transport vehicles and or the BoO and ICP.

Haz Mat Exposure

- Direct / indirect exposures
- Target facilities
- Utilities
- Transportation systems
- Contaminated areas

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Decontamination

- Body fluids
- Protective clothing
- Medical waste
- Hygiene
- Equipment rehab
- Canine issues

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Dangerous Equipment

- Heavy lifting
- Rubble removal
- Lack of coordination
- Special safety precautions
- Special briefings

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- Electrical hazards response teams have to be especially aware of electrical hazards that are commonly found during disaster response operations. There are many electrical related fatalities associated with disaster response operations. Some of the things to consider are:
 - Re-energizing power grids
 - Improper electrical cord for current requirements
 - Jury-rigged connective boxes
 - No weather protection
 - Power line back feed (generators)
- Contaminated air, water, and fuel
 - Contamination of air, water and fuel sources following a disaster are likely. It is best to assume contamination has occurred until proven otherwise. Ensure that you have an adequate supply of water and fuel before entering the affected area. All response teams should have water purification units as part of their cache. (Refinery fire in Turkey)
- Dangerous equipment (i.e. cranes)
 - In the urban rescue environment there is always the presence of heavy lifting and rubble removal equipment such as large cranes, dump trucks, loaders, etc. Responders have to be especially aware of this kind of equipment.
 - Normally these kinds of resources work independently and do not understand the consequences of their uncoordinated actions when working around compromised structures.
 - The Safety Officer has to evaluate the operation to determine if special safety precautions need to be established to incorporate the heavy equipment operators into response team plan of action. (dump truck incident in Oklahoma City)

Fitness For Duty

- Heights
- Climbing
- Balance
- Lifting

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- Fitness for duty
 - Fitness for duty is a sometimes-sensitive subject, especially when there is no national standard for response teams.
 - The better physical and mental condition that a team member is in prior to deployment, the better the individual will be able to perform their duties during extended operations.
 - Many of our response team members return home after a mission run down and very ill. This problem can be minimized by improving our fitness level.
- Some disaster environmental issues to prepared for are:
 - Working at heights
 - Extensive climbing
 - Prolonged heavy lifting and bending
 - Confined space
 - Traversing on balanced objects
- A critical issue to remember is that the adverse effects of drugs and alcohol consumption will interfere with:
 - Motor skills
 - Hydration
 - Sleep
 - Decision-making

C. RISK HAZARD ANALYSIS (continued)

- Food Services
 - Response team members need to be aware of diets and food preparation in the disaster environment. Our ability to preserve and process food in the field is very basic.
 - Perishable foods need to be continuously monitored to ensure freshness. Spoilage in hot moist climates can happen surprisingly quickly.
 - Special precaution for monitoring food stock has to be followed. There is nothing more dangerous than a stale sandwich made using mayonnaise.
 - Consider using freeze-dried products whenever possible.
 - Civilians, with good intentions, will donate food to team members. Watch out! The consequences may be dysentery or food poisoning.
- Adverse weather
 - It is essential that you are prepared for any kind of weather change prior to leaving your point of departure. A weather change that the team is ill equipped to handle could jeopardize successful and timely completion of the mission.
 - Rain and cold weather gear, as well as appropriate amounts and types of clothing are required for all deployments. Wet and cold conditions could cause illness or injury among team members that could adversely affect continuity of operations.

Food Preparation

- Designated Cooking and Eating Areas
- No Canine in Food Service Area

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Adverse Weather

- High Winds
- Fog
- Heavy Rain
- Ice/Snow
- High Humidity
- Heat/Cold
- Standing Water
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Security Concerns

- Security of facilities (BoO)
- Weapons
- Armed thieves and looters
- Curfews
- Civil Disturbance
- Proper ID
- Controlled Site Access

- Security
 - Don't always count on a disaster area being secure. In many cases one may find civil disturbance is jeopardizing response initiatives, which further complicates the mission. These areas must be avoided until conditions are sufficiently safe for team members to perform their tasks.
 - Area security is a State/local government's Responsibility. In some cases, police escort may be necessary. Again, in these situations, uniformed personnel may be targeted by undesirables seeking to take advantage of the damaged infrastructure.
 - The work site may be a target of armed thieves and looters. Individuals may represent themselves as local rescue workers and blend into the operation. Watch for suspicious behavior.
 - Irate relatives may also be present. Emotions may be high and abnormal behavior can occur. Look out for potential hostile situations.
 - Respect the rules of engagement when curfews are in place.
 - Maintain close coordination with law enforcement when on site security procedures are initiated. (site access in Oklahoma City)

C. RISK HAZARD ANALYSIS (continued)

- Safety equipment
 - All response team members must take personal responsibility to ensure that when they are deployed they have appropriate safety equipment assigned to them.
 - You are responsible for the accountability of such property. The IST equipment cache may have additional equipment and supplies for expendable items. Note: Do not expect the deployed task forces to be your source of supply.
 - The following items, at a minimum, should be with the team member at all times:
 - Safety boots
 - Respirator
 - Helmet/Headlamp
 - Spare batteries
 - Ear and eye protection
 - Gloves
 - Protective clothing
 - Radio (optional)
- Personal hygiene
 - Good personal hygiene is critical during disaster response operations.
 - Adequate change of clothing is essential for maintaining good health practices.
 - Exposure to unhealthy situations is an inevitable part of disaster response but it is the team member's responsibility to take extra precautions to minimize the exposure.
 - Special consideration should be given to the following:
 - Feeding and hydration at the BoO and at the work site.
 - Keeping sleep and rehab areas free of unnecessary negative health exposures.
 - Hand wash stations where possible.
 - Canine relief and rehab areas established and enforced.

Safety Equipment

- Boots
- Respirator
- Helmet/Headlamp
- Ear/Eye Protection
- Gloves
- Radio
- Protective Clothing

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Personal Hygiene

- Change of clothing
- Feeding / hydration
- Sleeping / rehab
- Hand-washing
- Canine considerations

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Hydration

- Readily available for personnel and canines
- Increase water intake
- Avoid sodas and coffee

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Health Assessment

- Immunizations
- Current Medications
- Blood Pressure
- Temperature
- Respiratory
- ∠ Critters

Rest Facilities

- Snoring
- Barking Dogs
- Bathroom Trips
- Buddy Chatter
- Generators
- Radio Traffic
- Pagers/Cell Phones
- Aircraft Overflight

- Hydration
 - Ensure all team members are following appropriate hydration practices.
 - An ample amount of fluids should be readily available at all facilities including:
 - BoO
 - Work site
 - Command Post
 - Rehab area
 - Transport vehicles (including air craft)
 - Avoid the use of carbonated drinks. Stay with water and juices if possible.
- Safety concerns for team personnel during mobilization include:
 - Assessment of their current physical fitness.
 - Successful completion of a current physical examination.
 - Current health assessment
 - Proper inoculations.
 - Appropriate personal safety equipment on hand.
 - Adequate prescription drugs.
 - Spare pair of corrective lenses.
- Response Team Welfare Concerns a long hour, multiple day operation soon leads to fatigue and increases the chances of injury to team members. Proper shift length needs to be enforced and appropriate rehab facilities should be provided if possible. These facilities (i.e. tents, bldgs) should be inspected to ensure quality rest can be obtained. Some things to consider are:
 - Individual sleep habits (snoring or talking in sleep)
 - Barking canine
 - Pagers/cell phones
 - Aircraft overflights
 - PA systems
 - Noise from generators
 - Excessive chatter by team members



- L Lookouts
- C Communications
- E Escape Routes
- S Safe Zones

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Lookouts

- Overall Safety Officer
- Site-specific Safety Officer
- Work from position of safety
- Must not become involved in operation

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D. SAFETY PLANNING

The multi-hazard safety plan is a guide to the basic elements of safety for a variety of incidents. The acronym is LCES, which stands for Lookouts, Communications, Escape routes, and Safe zones. In any operations scenario these areas must be addressed to insure the safety and accountability of all response team members.

- L Lookouts
 - This is normally the function of a dedicated Safety Officer. That person is the objective observer not involved in the "hands-on" portion of the operation. They are free to watch over the entire operation identifying potentially dangerous situations and mitigating them before they become disastrous.
 - Several categories of Safety Officer exist.
 - One is the overall Safety Officer for the response team.
 - A second is a site-specific Safety Officer who may be an individual assigned to a single location to monitor the existence of a special hazard.
 - Some examples of the latter might be one person designated to stand guard over an electrical box while rescue workers operate in a confined space; or a two-person team tasked with hiking up slope to serve as early warning for rescuers working below a dam during earthquake aftershocks.

Communications

- Comm Plan development
- Emergency Alerting
 - Evacuate 3 short
 - Cease Operations 1 long
 - Resume 1 long / 1 short

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D. SAFETY PLANNING (continued)

- Safety Officers or Lookouts work from a position of safety and clear visual access just outside of the direct work area.
 - They should not become involved with the actual "hands-on" portion of the operation. To do so would possibly limit their ability to be that objective observer capable of identifying hazards.
 - They should be readily identifiable to all by their radio designation and by wearing a Safety Officer vest or in a small group identified during the safety briefing.
- Team members tasked with this responsibility must resist the temptation to become involved in the tactical operations itself. This requires extreme self-discipline. Remember though that the direct success of the mission depends upon the teams ability to counteract hazards before they become problems.
- C Communication
 - The formal communications plan will be developed by the Communications Unit Leader. This plan will identify the Command, Tactical, and Special radio channels. These are the operations personnel's lifeline to the outside for resources, support, and safety. This plan will be provided as part of the Response Team Action Plan.
 - The following Emergency Alerting System is to be used in the event of problems at the work site:
 - Evacuate 3 short blasts (1 second each)
 - Cease Operations 1 long blast (3 seconds duration)
 - Resume Operations 1 long and 1 short blast



■ Flares

Escape Routes

- Must be pre-established
- Safety route may not be most direct
- Remain in place?
- Reassess plan frequently
- Apprise personnel

D. SAFETY PLANNING (continued)

- The method of delivery may vary depending upon the device available. As an example, by placing two radios together, speaker to microphone, and depressing the transmit buttons a loud tone is heard on all other radios tuned to that frequency.
- Air horns, car horns, whistles, the P.A.S.S. device and clear text over the radio are all excellent methods for signaling. The point is that during the safety briefing, before beginning to work, identify the specific methods of signaling that will be used at the work site should a problem arise during that operational period.
- E Escape Routes
 - An escape route is a pre-established path to an area of safe refuge.
 - The safest method of exiting an area may not be the most direct route.
 - As an example, after an earthquake structural columns may still be standing but subject to collapse during an aftershock.
 - The most direct route to safe refuge may lay directly in the collapse path of the column. The route giving the column a wide berth will be the safest.
 - Another consideration is to remain in place. If the working area has been shored and leaving this area exposes the rescuer to a variety of hazards, stay put.
 - The rescue situation is often dynamic, constantly changing. This can occur as a result of external forces or as a result of the rescuer's action. The escape plan should be constantly updated to reflect changes in situation.
 - As a new plan is developed, each team member must be made aware of the change in operation. An acknowledgement of understanding must also be received from each team member.

Safety Zones

- Must be pre-established
- Designate outside the Collapse/ Hazard Zone
- Take a head count
- Communicate results

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D. SAFETY PLANNING (continued)

• If the order is not repeated, the new plan is probably not clear to each member of the team. The result can be injury or death.

S — Safe Zones

- Safe zones, also referred to as "safe havens" are the pre-established area of safe refuge, safe from hazards. This could be a designated area outside the Colllapse/Hazard Zone or agreed upon safe areas within the Colllapse/Hazard Zone. If the safe zone is within the Colllapse/Hazard Zone, rescuers may have to construct that area around the victim and for rescuers themselves.
- An example of this is when a victim is trapped inside a collapsed structure and rescuers crib and shore the immediate area. In this case, the proper response for rescuers would be to hold their position during an aftershock.
- Part of the Safety Plan should provide for a designated Safe Zone where a team "head count" is taken. This count should be immediately communicated to the next in the chain-of-command to provide for 100% accountability in the event of an emergency.
- Chain-of-Command
 - Consult the Response Team Organization chart for chain-of-command. This chart will list the entire team and who reports to who.

Safety Briefing

- Chain of command
- ID Safety Officer
- Safety Plan
- Communications Plan
- Medical Plan
- Rehabilitation Plan
- Special hazards

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Ops Briefing Considerations

- Emergency Communication Issues
- Personal Accountability
- Medevac Procedures
- Roles and Responsibility
- Stress/Fatigue
- Reporting & Documentation Injuries

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D. SAFETY PLANNING (continued)

- Identify the Safety Officer
 - The Safety Officer for the operational period will also be identified. This will leave no doubt as to who is filling that position.
 - The Safety Officer will also pass on information from the previous operational period. This would result from the information they received from the Safety Officer being relieved (individual transition briefing).
- Safety Plan (LCES)
 - This portion of the Safety Briefing will cover Lookouts (or Safety Officer), Communications, Escape Routes, and Safe Zones. This information will be developed by advance recon of the work site by Team Managers or will be passed on from the previous teams operation.
 - As this is a dynamic process, once the response team has arrived at the site, another assessment should be made.
 - If there are any changes to the Safety Plan, it should be modified then and all team members must acknowledge those changes. Those changes effecting the entire operation should be communicated up the chain-of-command immediately; those that are site specific can be passed on to the next operational team.
 - The Safety Plan will review the signal for immediate evacuation, cease operations, and resume operations. It will also identify that area designated for the head count in case of emergency evacuation.