

Egg Harbor Fire Department and First Responders Standard Operating Guideline

Subject: Machinery Extrication

SOG 809

Purpose: This guideline applies to all emergency incidents where a person is trapped, pinned, or caught in a device with moving parts. It defines size-up, response modes, and the command structures that may be appropriate for machinery extrication operations. It also describes hazards that may be encountered on such operations, and the protective measures that should be employed to ensure responder safety. It is the responsibility of Command and all Officers to be familiar with the employment of this operational guide.

Scope: This procedure applies to all members of the Egg Harbor Fire Department.

Guideline:

It is the direction of the Egg Harbor Fire Department to establish the operational methods for maximizing effective patient extrication from machinery or other devices with moving parts, while ensuring rescuer safety. The basis of this guideline is NFPA 1670: Standard on Operations and Training for Technical Search and Rescue Incidents.

Operational Guidance:

I. Definitions

A. Incidents requiring the need for extrication operations are varied, but may include the following:

1. Agricultural implements.
2. Industrial machinery.
3. Construction equipment.
4. Elevators and/or escalators.
5. Vehicles with Power Take Offs (PTOs)
6. Drive shafts, gears, and drive belts.

II. Scene size-up

A. Upon arrival, the first-arriving company officer will assume command, provide an appropriate size-up, and initiate specific measures that include the following.

1. Determine the scope and magnitude of the incident.
2. Request Mutual Aid as needed.
3. Conduct a risk/benefit analysis.
4. Evaluate the integrity and stability of the affected machinery.

5. Determine the number of victims.
6. Determine the best access to the area where the patient is located.
7. Determine the patient's condition, and begin appropriate treatment - if conditions allow.
8. Determine the need for additional resources.
 - a. May require expertise beyond our own capabilities.
 - b. Consider the recall of off-duty equipment technicians and/or equipment dealers.
 - c. If extrication attempts have failed, and as a last resort, a surgeon may be needed to perform a surgical amputation.

III. Hazard Identification

A. The Incident Commander should identify as many potential hazards as may be found within the incident, and ensure that responders take preventive measures to guard against injury. Common hazards that may be encountered during an extrication operation include the following:

1. Determine the presence of utilities and evaluate if utilities are disrupted or exposed.
 - a. Affected utilities may include electrical, petroleum fuel products, water, sanitary, communications, or industrial gases, among others.
2. Determine the potential for product release and victim engulfment potential.
3. Evaluate the presence of specific hazards.
 - a. Mechanical hazards, such as moving parts.
 - b. Hazardous materials.
 - c. Energized electrical equipment.
 - d. Physical hazards, such as trip hazards, fall hazards, or sharp edges.
 - e. High pressure steam, hydraulic, or gas lines.
4. Identify primary and secondary access points.
5. Determine how the patient is trapped, pinned, or caught.

IV. Rescue operations

A. Establish hazard zones and entry control. Restrict entry to only those who have a need to be within the general area.

1. Prevent unexpected machine movement. Remember that **“for every action there is an equal and opposite reaction”**
2. Develop and communicate the Incident Action Plan (IAP).
3. Make the area safe for rescue operations.
4. Isolate (lockout/tagout) the machine or device to prevent machine operation.

- a. Ensure that all energy sources are brought to a zero mechanical state.
 - b. All electrical and mechanical equipment shall be secured using appropriate lockout/tag out procedures per OSHA 29 CFR 1910.147.
5. Stabilize the machinery – using cribbing, chocks, or wedges - to eliminate the potential movement of machinery components.
 6. Protect the patient from further harm using canvas covers or blankets.
 7. Stabilize patient's medical condition while performing the extrication, if appropriate.
 8. Consider the need for fire protection.
 9. Support utilities, if necessary.

V. Extrication options and conventions

- A. Disassemble and/or remove machine components.
- B. If cutting off machine components:
 1. Consider the risk of heat conduction to the patient.
 2. Take appropriate precautions.
- C. Displace machine components.
- D. Manually reverse the machine's moving parts.

VI. Tools of the trade

- A. Suggested hand tools may include the following:
 1. Hammers, pry bars, saws, or punches.
 2. Cable cutters, come-a-longs, chains, wrenches, or socket sets.
- B. Simple machines include inclined planes (wedges) or levers (pry bars).
- C. Pneumatic devices include airbags, pneumatic chisels or airguns.
- D. Power tools include drills or hydraulic tools.
- E. Cutting tools include saws, torches, or grinders.

VII. Termination of operations

- A. Upon determining the termination of operations, the Incident Commander should obtain a personal accountability report (PAR) from all sectors.