Confined Space Rescue

Info Sheet 10 a

Both the Building Code and Fire Code require us to have a suitable emergency response plan to get our workers to safety. The confined space legislation puts confined space rescue squarely on the shoulders of the employer. Relying only on your local emergency services is not an option. A poor Rescue Plan may get the job shutdown by an inspector and possible prosecution under the confined space legislation. However a Rescue Plan that fails will bring additional charges against you under the Occupational Health and Safety Act. In addition, you may also see charges laid under the Criminal Code for gross negligence causing death.

Confined Space Rescue Plans are based on the following three scenarios:

- Self Rescue - an alarm goes off and the worker exits on their own accord
- Non Entry Rescue - the worker is pulled straight out of the area from the outside
- Entry Rescue - because of injuries, the design, or other possible complications a rescuer must enter the area to get the worker out.

Each scenario makes certain assumptions. For example, for Self Rescue to occur, all hazard control systems must be in place and functioning to provide the entrant with sufficient time to escape should something occur. In some cases one or more scenarios may not be an option (eg. Pulling someone more than 3m may cause additional injuries so non entry rescue may not be an option in a long tunnel job).

The Rescue Plan developed must work in any situation. A Rescue Plan is not a guide. The Plan is a sequential listing of all the steps necessary to complete the rescue. To achieve this you must identify:

- what types of injuries that may occur (based on the hazards found when uncontrolled)
- obstacles that are in the space that may complicate the situation, examples include:

- IDLH Atmospheres
- Ceiling height less than .9m (35")
- Passageways width less than .66m (24")
- Elevation changes in passageways more than .3m (12")
- Corners with turning radius of less than .66m (24")

Once armed with this information, you can make decisions regarding:

- the tools that will be needed to effect the rescue, and
- the people or groups of people to carry out the tasks required.

Life Over Limb

Often, most rescue plans consist of a simple thought - get them out no matter what. The CSA

Z1006, Clause 6.6.2(d) states that an IDLH entry rescue is the ONLY rescue scenario where the principle of "life over limb" is allowed. "Life over limb" involves quickly moving a patient without stabilization in situations where there is immediate danger to the patient. Determining "life over limb" situations is a subjective exercise, but generally involves the following:

a. an atmosphere that contains contaminants that are of sufficient quantity to cause workers to become disoriented, develop an acute respiratory impairment, or die

b. an unknown atmosphere with contaminates that could cause respiratory impairment or death

c. fire is present or the likelihood of fire is high

d. explosives are present or there is an imminent danger of explosion

e. the work area contains hazards (chemical, biological, or physical) other than those specified in Items (a) to (d) that could cause immediately life-threatening injuries (e.g., crush injuries, burns, engulfment, or suffocation)

f. an inability to gain access to workers who need life-saving care

g. an inability to render life-saving care because of an injured worker's location or position. In "life over limb" situations, an injured worker should be moved a reasonable distance from the hazard, i.e., out of danger, but no farther. The injured worker should then be stabilized before being moved again.

Once all this information is readied you can draft a plan for each scenario that you are going to have for your operation. Each plan becomes a script like the screen play or a script of a great movie or play. The words in the script should enable the actors to convey emotion, character background, positioning, and tell the story in such a way that the audience gets it. Your Rescue Plan needs to direct your team so they know what comes first, second and third. It also must detail what tools they need, possible complications and a potential plan B. The more detailed the plan, the better the outcome. The final step, once all the details are developed, is to merge the different scenario plans into one seamless Rescue Plan.

Now that the Plan is developed, it is critical that you test the plan. During the testing don't sweat the mistakes as you will find some. That's the rationale for testing - debugging. Fix the problems as you find them. It is recommended that plans be tested annually and updated (debugged) as required.

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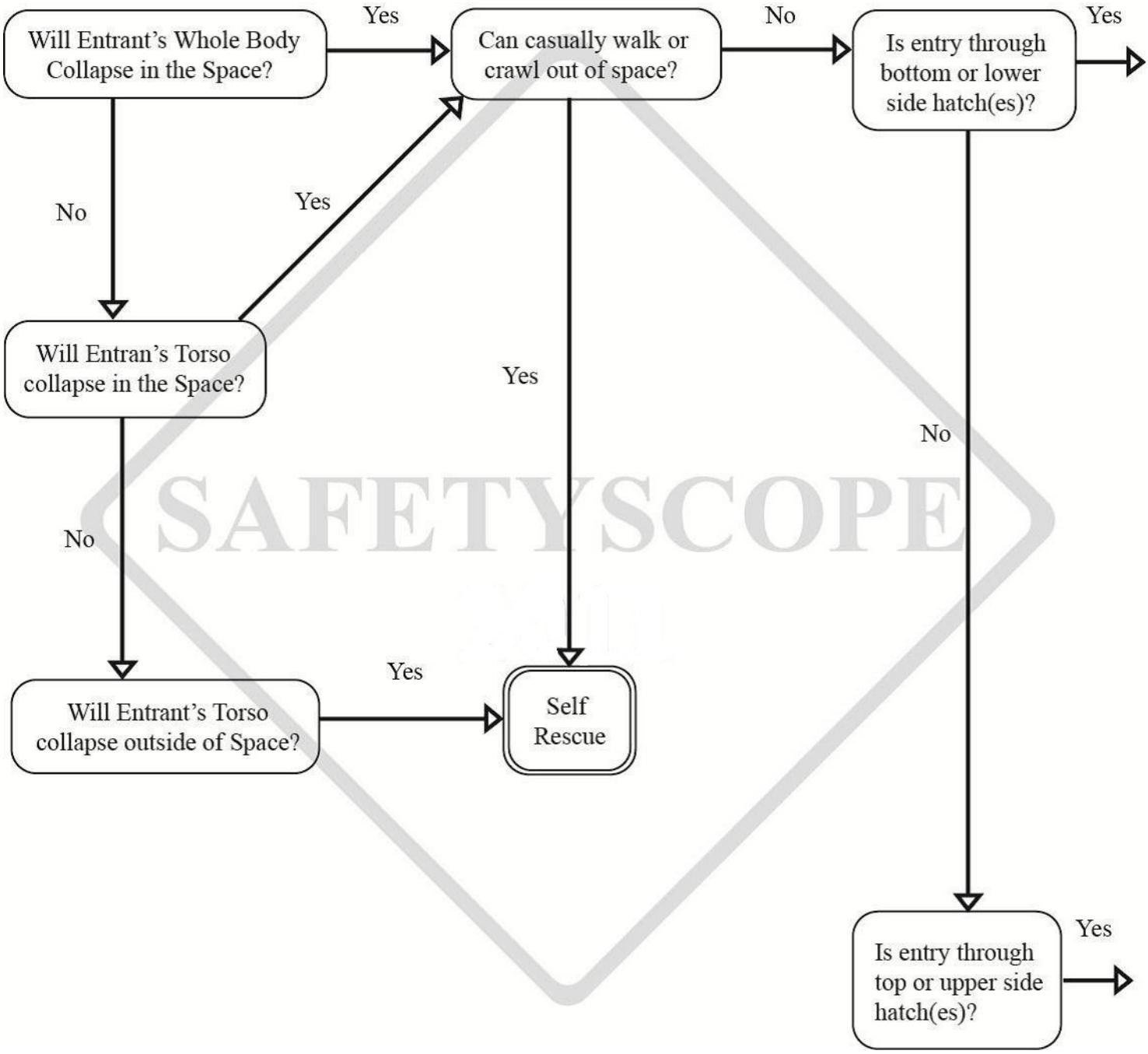
Self Rescue	Non Entry Rescue	Entry Rescue	
People Needed	Attendant Dispatcher First Aider	Attendant Dispatcher Retrieval System Operator(s)	Attendant Dispatcher Retrieval System Operator(s)
Action Plan	1. Hazard found (e.g. monitor goes off) 2. Worker(s) notified 3. Worker(s) leave	1. Incident occurs 2. Communicate with worker(s) to determine extent of problem 3. Call out first aid personnel 4. Use retrieval system to remove casualty from space	1 Incident occurs 2 Communicate with worker(s) to determine extent of problem 3 Call out additional personnel 4 Retrieval team dons PPE & enters 5 Patient is located, assessed and packaged 6 Use retrieval system with the aid of the Retrieval Team to remove casualty from space
Tools	Clear path (e.g. ladder) Communication System	Clear path Communication System Full Body Harness Y Lanyard with spreader bar Retrieval System with mechanical advantage	Clear path Communication System Full Body Harness Rescuer Lockout/Tagout Y Lanyard with spreader bar Retrieval System with mechanical advantage Packaging Device Supplied Air System (if needed) Assisting Devices (e.g. Creeper)
Health Care Issues	No or Minor Injury First aid performed outside space	Variety of Injuries Ensure entire body (especially the head) is not “hooked” on an obstruction (e.g. entry point doorway) First aid performed outside space	Variety of injuries Must be protected when moving First aid performed when moving First aid inside limited to airway kept open, gross bleeding controlled & prevent dust getting into patients eyes All other first aid performed outside of space

Rescue Scenario Decision Logic Tree



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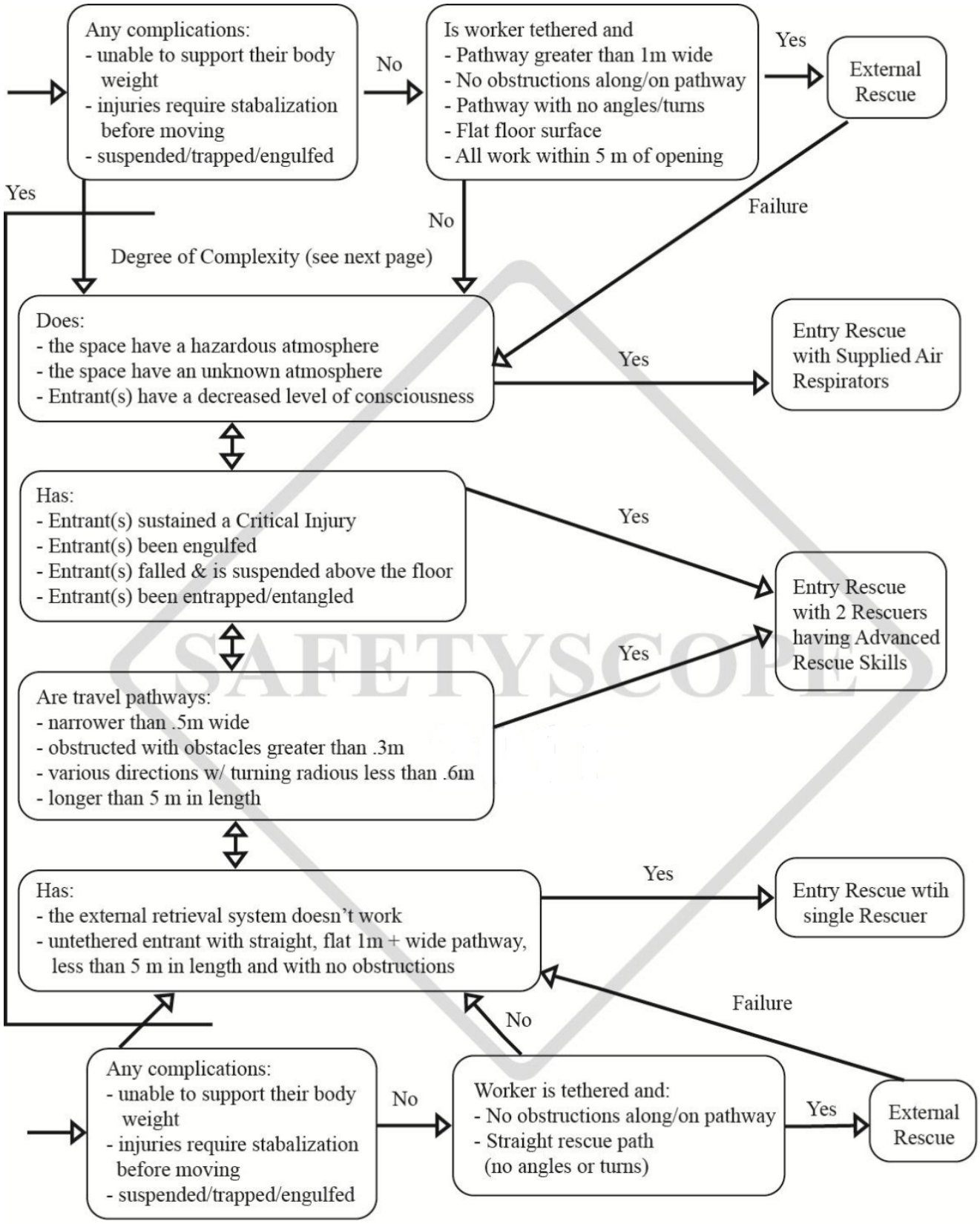

Note: If after going through the process and you are still unsure, please contact a competent person to conduct an assessment and render a decision.

Degree of Complexity Failure (from flowchart on previous page)

If the space has any of the following issues, Entry R

Issue	Action
Hazardous or unknown atmosphere or Entrant has a decreased level of Consciousness	Rescuer(s) wear respiratory protection
Travel Distances (over 5 m)	More than 1 Rescuer
Uneven or obstacles along the travel path (less than 1.2m high or .9 m wide)	More than 1 Rescuer plus increase in lifting skills or abilities required
Height and width of travel path (less than 1.2m high or .9 m wide)	More than 1 Rescuer and rescuers need to be smaller in stature
Changes in travel path direction (slopes, turning radius less than .6m)	More than 1 Rescuer, patient packaging devices need to be short & lifting skills/abilities required
Entanglement or entrapment issues (off set openings, engulfment, elevated entry points, etc.)	More than 1 Rescuer with extraction skills and tools required

Suggested Intervention Times

Intervention time means the time from the onset of symptoms to when the Rescuer would reach the casualty.

Type of Injury/Illness	Examples	Suggested Intervention Times & Rational
Life Threatening	Cardiac/Respiratory Arrest Anaphylactic Shock	4 to 6 minutes – brain tissue without Oxygen begins dying at a rapid rate at this time
Critical Injury/Illness	Cardiac/Respirator Distress, Full thickness burns, severe bleeding, unconsciousness, Femur or Pelvis Fractures, crush injuries and amputations	10 minutes – based on the Golden Hour or Trauma, (if someone reaches medical care before 60 minutes, patients survival is greatly enhanced).
Minor Injury/Illness	Fractures (except femur & pelvis), loss of eyesight, less than 30% of the body covered with Superficial and/or partial thickness burns, early onset of most medical conditions, small wounds	30 to 60 minutes – these types of injuries although they may be painful, would generally not cause death even if they reached medical care outside the Golden Hour of Trauma