# JOB HAZARD ASSESSMENT (206B)

## Dropbox: 2021- ITCS IPS Students Corner

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**TYPES OF SPACES – Size up of Potential Hazards**

**Autoclave** - A strong heated container used for chemical reactions and other processes using high pressures and temperatures, (steam sterilization)

**Boiler** - A fuel-burning apparatus or container for heating water. Chemical energy to heat energy.

**Clarifier** - Settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation.

**Cold Box** - Cryogenic air separation. Air enters the main heat exchanger where it is cooled in counter flow with the waste gas stream. Exiting the main heat exchanger, process air has a temperature of about –112°C and is partly liquefied. The complete liquefaction is achieved through evaporation of cooled liquid oxygen in the boiler. After passing a purity control valve process air enters on tip of the distillation column and flows down through the packing material.

**Fractionating Column** - Mass Separation or Mass Transfer used in the distillation of liquid mixtures to separate the mixture into its component parts, or fractions, based on the differences in volatilities.

**Compressor** - Uses pistons driven by a crankshaft to deliver gases at high-pressure.

**Cooling Tower** - A heat rejection device that rejects waste heat to the atmosphere through the cooling of a water stream to a lower temperature. They may either use the evaporation of water to remove process heat and cool the working fluid to near the wet-bulb air temperature or, in the case of closed-circuit dry cooling towers, rely solely on air to cool the working fluid to near the dry-bulb air temperature.

**Drum** – Could be an atmospheric storage container (like a 55-gallon drum) or a type of pressure vessel that uses heat and pressure to refine complex hydrocarbons into lighter, more useful, products, such as gasoline, diesel, and jet fuel (such as a Coking Drum).

**Excavation** - Any man-made cut, cavity, trench, or depression in the Earth's surface formed by earth removal.

- **Bridge Excavation - R**elated to the construction of bridges and centers on removing any materials that might impede the construction of the foundations, substructures, and so on required to support the bridge.

- **Borrow Excavation** - Materials like soil or gravel are taken from a “borrow” pit (sometimes called a sandbox) to be used in another location. These materials may be used for grading, fill, or mixing with other construction materials like concrete,

- **Channel Excavation** - Consists of removing materials from channels, drainage ditches, etc. for one of several purposes, but often to change the flow of water or increase capacity. This could help to alleviate flooding or alternately, stagnation and sediment buildup.

- **Drainage/Structure Excavation** - Related to carrying water away from areas and could include ditches, trenches, storm drains, agricultural drainage, drainage for runoff, and so on, as well as any structures related to such drainage. These ditches must be excavated to funnel water away from habitation, infrastructure, agriculture, and other areas that could be harmed.

- **Dredging** - Sediment deposits in waterways can build up over time, making them impassable. Dredging is a type of excavation that takes place underwater, generally in rivers or shallow ocean passages (or other waterways) for the purpose of removing sediment to other locations so that boat traffic can navigate without getting stuck.

- **Earth Excavation** - Centers on the material being excavated, rather than the purpose for excavation. As you can probably guess, it pertains to the removal of soil (located beneath topsoil) and it could apply to earth removal for the purposes of laying a structure foundation, digging a drainage ditch, or any number of other construction or engineering projects.

- **Footing Excavation** - Foundations structures used to support buildings, bridges, and other structures by spreading the load so that the heavy structure above doesn’t sink or collapse. Footing excavation occurs after a building site has been properly graded, at which point excavation can begin. This type of excavation may be somewhat more precise than other types as the concrete for footings will likely be poured and left to set.

- **Muck Excavation** - A combination of water and soil. Specifically, muck includes water and/or soil that is somehow undesirable, perhaps due to contamination of some sort, or maybe just because of the water content, which makes an area impassable. Excavation can be used to remove muck to another area, or to spread it out so that soil can dry.

- **Roadway Excavation** - Related to roadways can have a couple of different purposes. For example, excavated materials may be removed to another location to make way for road construction. However, excavated materials may also be used in the building of the roadway, such as to build embankments. In some cases, unsuitable slope materials will be excavated and removed, and other excavated materials will be brought in to replace them.

- **Rock Excavation** - Based on the removal of materials, generally due to rocky surfaces that impede construction or engineering projects. This type of excavation is often considered more challenging than other types and may require specialized equipment to break up and/or remove rocks before a project can proceed.

- **Stripping** - Revolves more around clearing a large area rather than digging a pit or a trench, for example. Before construction or engineering projects can begin, an area may need to be cleared of topsoil, gravel, sand, rocks, and so on and grading might need to be done. In such cases, excavation will consist of clearing away wide, shallow swaths of material.

- **Topsoil Excavation** - Often confused with stripping because stripping is the method of excavation used to remove topsoil. However, this type of excavation is specific to the material, topsoil, consisting of vegetation and the uppermost level of soil.

- **Underground Excavation** - Occur underground, rather than above ground, meaning that different tools, equipment, and techniques may be required to remove materials safely and effectively. In many cases, vertical or diagonal shafts and/or horizontal tunnels are excavated for the purposes of building roadways, subways, canals, sewage, or other underground passages, as well as for other purposes.

**Exchanger** – A system used to transfer heat between two or more fluids. Types: Shell and tube heat exchangers. Double pipe heat exchangers. Plate heat exchangers. Condensers, evaporators, and boilers. An Exchanger is heat energy from heat energy.

**Furnace** (Direct Fired Heater) - Used to provide heat for an industrial process, typically higher than 400ºC They are used to provide heat for a process or can serve as reactor which provides heats of reaction. Furnace designs vary as to its function, heating duty, type of fuel and method of introducing combustion air. Heat is generated by an industrial furnace by mixing fuel with air or oxygen. The residual heat will exit the furnace as flue gas.

**Mixer** - A container that is used to blend several components together. The material that a mixing tank is made of can range from plastic, glass or hard rubber to steel of all types.

**Reactor** - A vessel or stage which makes two or more substances react chemically with each other. Could be gas phase or liquid phase. Most reactors contain an additional chemical component

**Separator** (Gravity) - Separates gas and liquid components from the fluids extracted from an oil well. Oil, gas or water can be removed from the fluids.

**Splitter** – Distillation tower that provide a minimal level of processing to condensate, turning it into other products such as naptha.

**Sump** - Pit or reservoir serving as a drain or receptacle for liquids or chemicals.

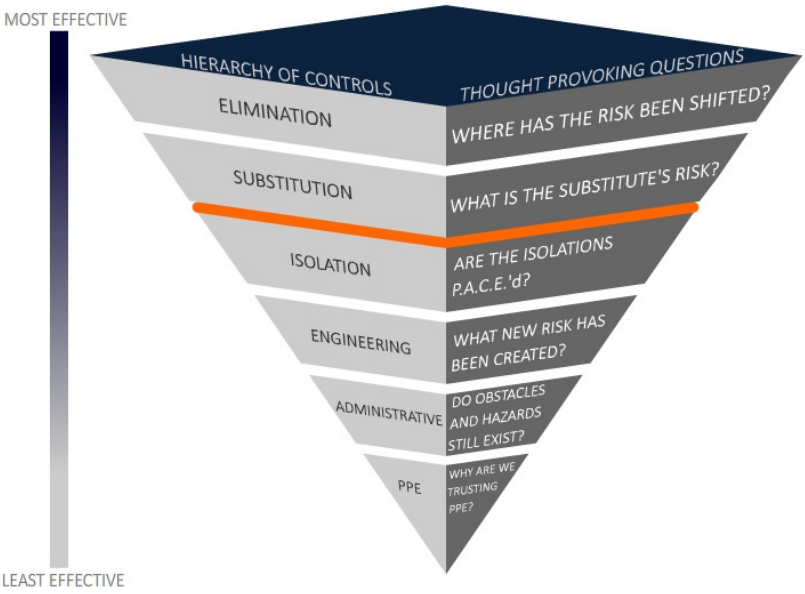
**Tank** - Large receptacle or storage chamber, especially for liquid or gas. Could be pressurized or non-pressurized.

**Tower** - A long vertical cylinder used in fractional distillation, in which internal reflux enables separation of high and low boiling fractions to take place.

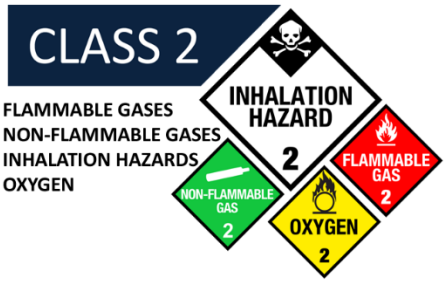
**Trench** - A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet.

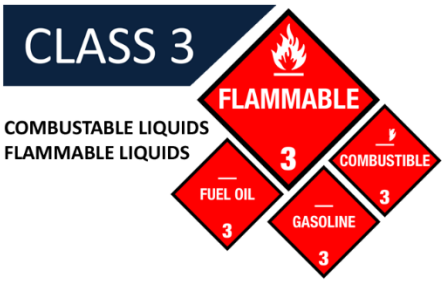
**Vacuum Chamber** - A rigid enclosure from which air and other gases are removed by a vacuum pump. This results in a low-pressure environment within the chamber, is commonly referred to as a vacuum.

## Size up of Potential Hazards (continued)

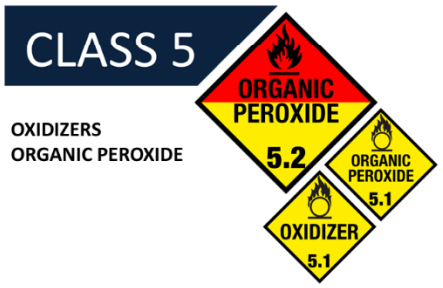



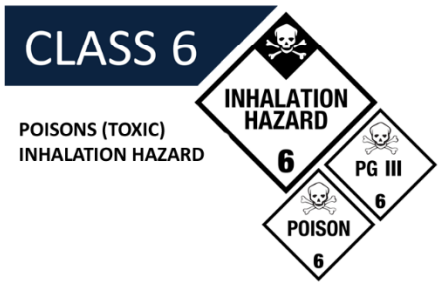

# D.O.T. HAZARDOUS MATERIAL PLACARDS

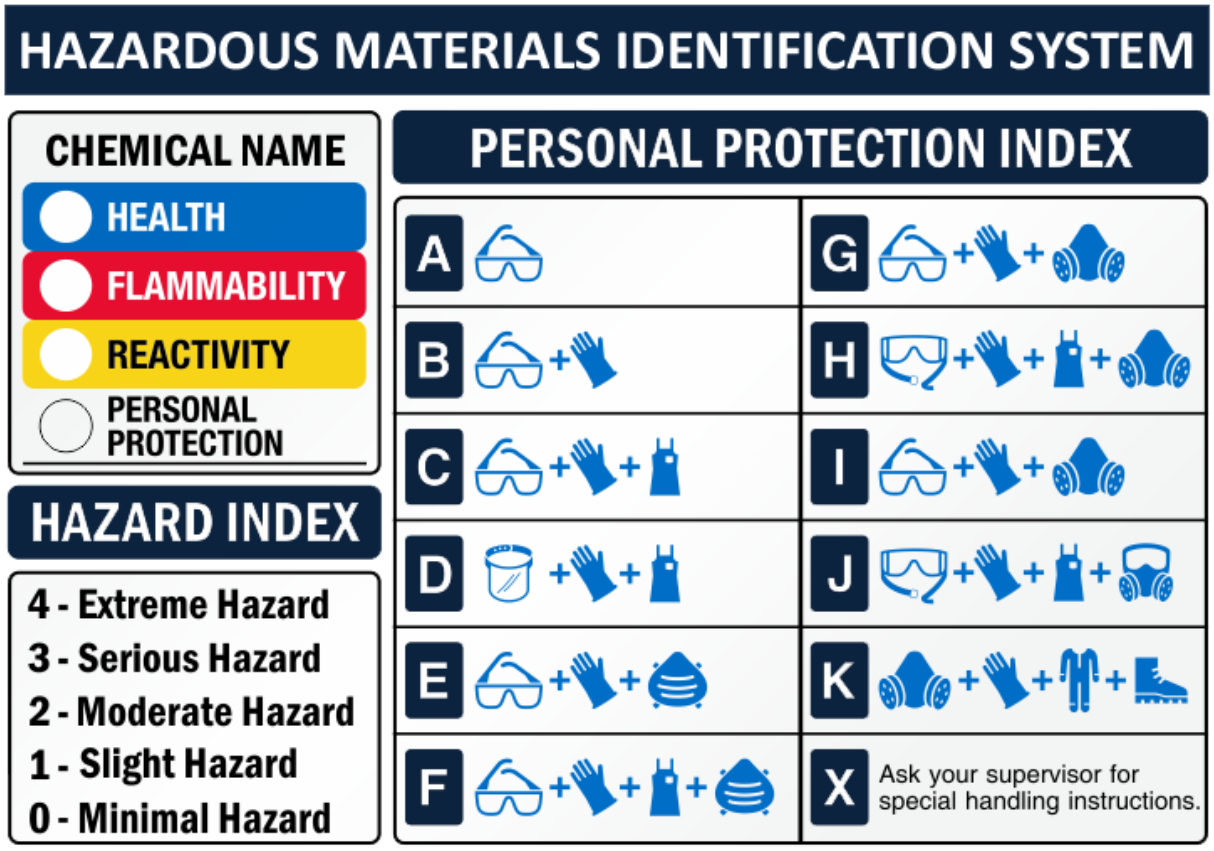









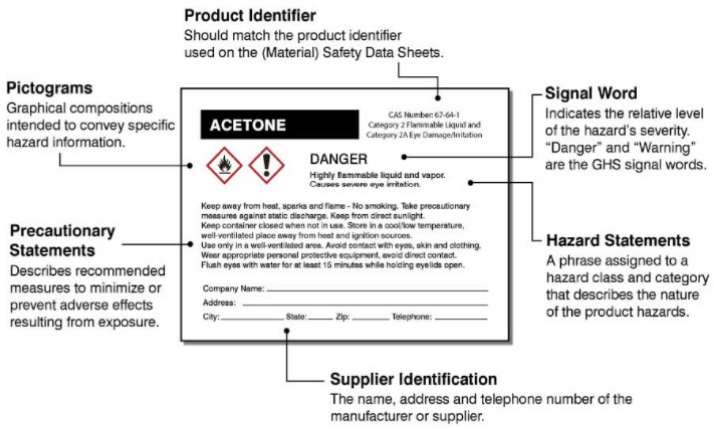


HAZARDOUS MATERIALS IDENTIFICATION SYSTEM
CHEMICAL NAME
HEALTH
FLAMMABILITY
REACTIVITY
PERSONAL PROTECTION
HAZARD INDEX
4 - Extreme Hazard
3 - Serious Hazard
2 - Moderate Hazard
1 - Slight Hazard
0 - Minimal Hazard
PERSONAL PROTECTION INDEX
A
B
C
D
E
F
G
H
I
J
K
X
Ask your supervisor for special handling instructions.


MANDATORY SAFETY SIGNS
WEAR SAFETY HELMET
WEAR EYE PROTECTION
WEAR HEARING PROTECTION
WEAR PROTECTIVE GLOVES
WEAR PROTECTIVE FOOTWEAR
WEAR PROTECTIVE CLOTHING
WEAR RESPIRATOR
WEAR FACE SHIELD
WEAR FACE MASK
WEAR WELDING MASK
WEAR ANTI-STATIC FOOTWEAR
USE SELF-CONTAINED BREATHING APPARATUS
WEAR HI-VISIBILITY CLOTHING
HIGH VISIBILITY VEST
WEAR HAIRNET
WEAR SAFETY HARNESS
WEAR PROTECTIVE APRON
WEAR PROTECTIVE EQUIPMENT
WEAR LIFE JACKET
PROTECT INFANTS EYES WITH OPAQUE EYE PROTECTION
WASH YOUR HANDS
USE BARRIER CREAM
USE HANDRAIL
USE FOOTBRIDGE
USE PEDESTRIAN WALKWAY
PUT ALL LITTER IN BINS PROVIDED
REFER TO INSTRUCTION MANUAL BEFORE USING
SOUND HORN
USE ADJUSTABLE GUARD FOR TABLE SAW
USE PROTECTIVE GUARDS
DISCONNECT BEFORE MAINTENANCE
DISCONNECT BEFORE OPENING
WEAR SAFETY BELT
KEEP LOCKED
LOCK OUT DE-ENERGIZED STATE
LOCK OUT ELECTRICAL POWER
LOCK OUT
USE GAS DETECTOR
SECURE GAS CYLINDERS
LIFT POINT
CONNECT AN EARTH TERMINAL TO THE GROUND
GENERAL MANDATORY ACTION

# GLOBALLY HARMONIZED SYSTEM (GHS)

## GHS Labels

The illustration below identifies the components of a GHS label. Actual label design and layout may vary and are subject to the discretion of the competent authority.




**1.4.10.5.4.1 Location of GHS information on the label**

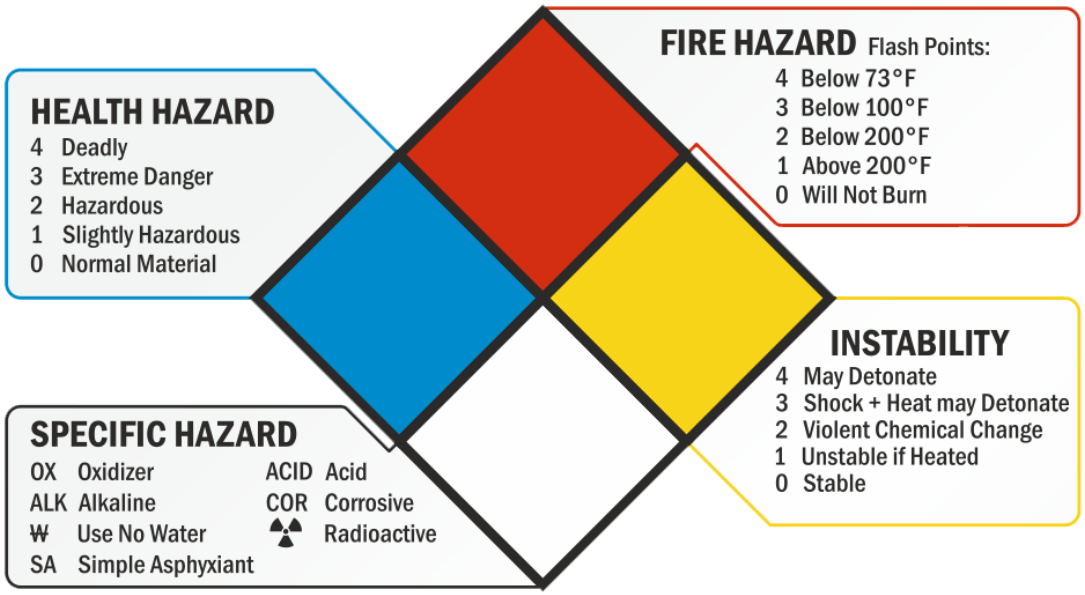
"The GHS hazard pictograms, signal word and hazard statements should be located together on the label. The competent authority may choose to provide a specified layout for the presentation of these and for the presentation of precautionary information, or allow supplier discretion."

For more information, please consult the United Nations Economic Commission for Europe (UNECE) and the Occupational Safety & Health Administration (OSHA).

## GHS Pictograms


Pictured are the standard hazard symbols used in the GHS. Symbols can be used individually and in combinations to define the specific hazard(s) of the chemical.

## NFPA HAZARDOUS MATERIAL CLASSIFICATION




***CONSULT SDS FOR FURTHER INSTRUCTIONS***

## RATING EXPLANATION GUIDE

| HEALTH | | FLAMMABLE | | INSTABILITY | |
|---|---|---|---|---|---|
| **Recommended Protection** | | **Susceptibility to Burning** | | **Susceptibility to Energy Release** | |
| 4 | Special full protective suit and breathing apparatus must be worn. | 4 | Very flammable. | 4 | May detonate under normal conditions. |
| 3 | Full protective suit and breathing apparatus should be worn. | 3 | Ignites under normal temperature conditions. | 3 | May detonate with shock or heat. |
| 2 | Breathing apparatus with full face mask should be worn. | 2 | Ignites with moderate heating. | 2 | Violent chemical change but does not detonate. |
| 1 | Breathing apparatus may be worn. | 1 | Ignites when preheated. | 1 | Not stable if heated use precautions. |
| 0 | No precautions necessary. | 0 | Will not ignite. | 0 | Normally stable. |

# COMPARISON OF NFPA AND HAZCOM LABELS

| |  **NFPA 704** |  **HazCom 2012** |
|---|---|---|
| **Purpose** | Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response. | Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies. |
| **Number System: NFPA Rating and OSHA's Classification System** | 0-4<br>0-least hazardous<br>4-most hazardous | 1-4<br>1-most severe hazard<br>4-least severe hazard<br>• The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2.<br>• Numbers are used to CLASSIFY hazards to determine what label information is required. |
| **Information Provided on Label** | • Health-Blue<br>• Flammability-Red<br>• Instability-Yellow<br>• Special Hazards*-White<br>* OX Oxidizers<br>W Water Reactives<br>SA Simple Asphyxiants | • Product Identifier<br>• Signal Word<br>• Hazard Statement(s)<br>• Pictogram(s)<br>• Precautionary statement(s); and<br>• Name address and phone number of responsible party. |
| **Health Hazards on Label** | Acute (short term) health hazards ONLY.<br>Acute hazards are more typical for emergency response applications.<br>Chronic health effects are not covered by NFPA 704. | Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens. |
| **Flammability/ Physical Hazards on Label** | NFPA divides flammability and instability hazards into two separate numbers on the label.<br>Flammability in red section<br>Instability in yellow section | A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics,combustible dusts and corrosives. |
| **Where to get information to place on label** | Rating system found in NFPA Fire Protection Guide to Hazardous Materials **OR** NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition. Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704 | OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012).<br>1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards)<br>2) Label using Appendix C |
| **Other** | The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond. | Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use. |

## 10. Monitoring

Conversion Formula for ppm : mg/m3  Y mg/m3 = (X ppm)(molecular weight) / 24.45  Solve for Y or X

## 11. Ventilation

| Vessel Details | | | |
|---|---|---|---|
| Vessel Shape (from chart below) | Vessel Volume Formula | Dimensions (ft) | Vessel Volume (ft^3) |
| | | | |
| Total Forced Air Ventilation (cfm) | Air Exchanges (in min) | Air Exchanges (in hours) | Hours Needed |
| | | | |
| Cube | Rectangular Box / Cuboid | Sphere | Cylinder |
| L X W X H | L X W X H | V = 4 π r^3 / 3 | V = π r^2 h |
| Cone | Triangular Based Pyramid | Square Based Pyramid | Triangular Prism |
| V = π r^2 h / 3 | V = B X H / 3 (B =(b X h / 2 ) base area) | V = L X W X H / 3 | V = 1/2 h*w*d |

| Initial Ventilation Recommendations | | | | | |
|---|---|---|---|---|---|
| Bombproof 20:1 | | Questionable 10:1 | | Marginal 5:1 | |

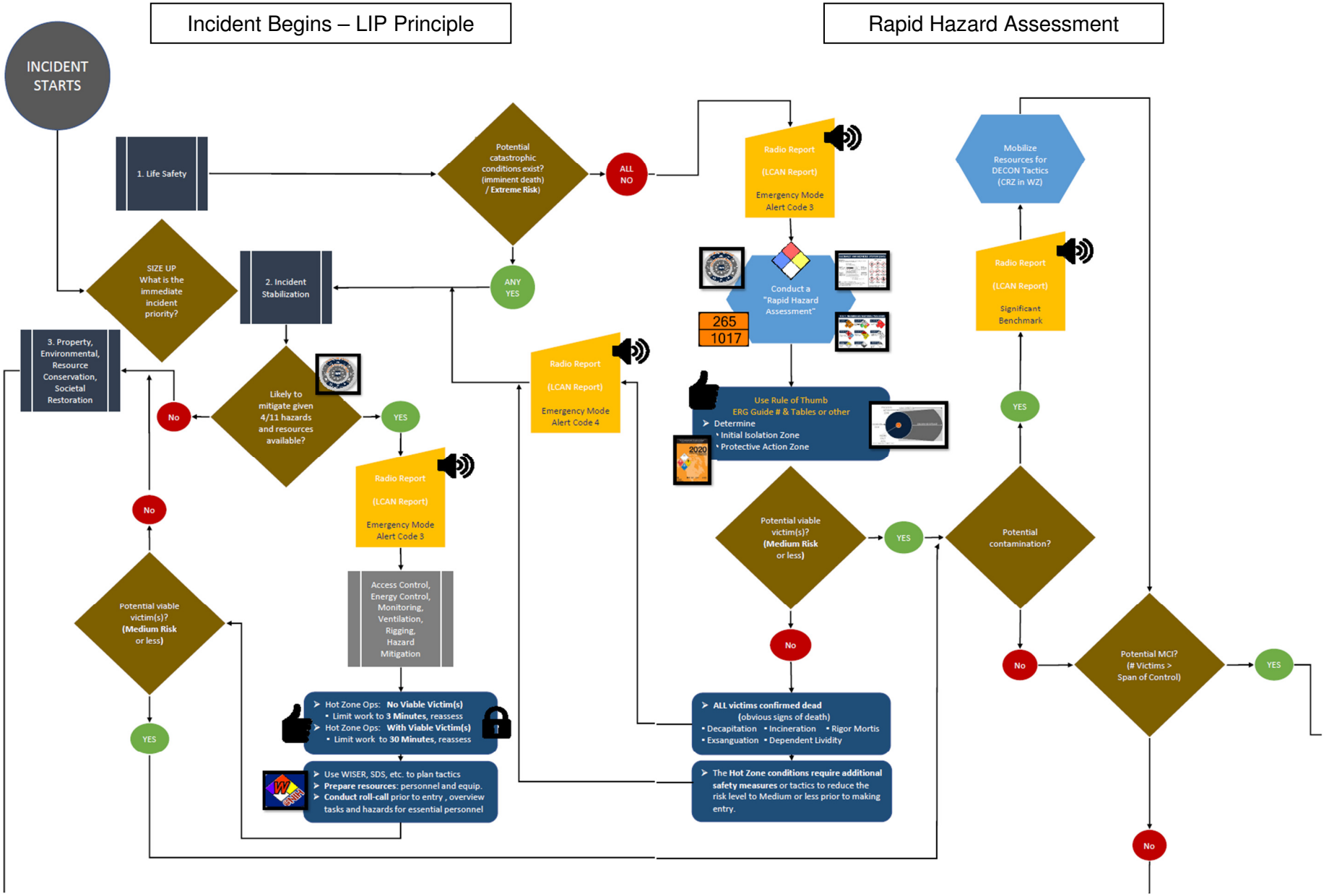
| Continuous Ventilation Recommendations | | | | | |
|---|---|---|---|---|---|
| Bombproof 10:1 | | Questionable 5:1 | | Marginal 3:1 | |

Confined Space Ventilation Safety Tips

Venturi Style Blowers (Air Horns or Eductors) Hazardous Locations

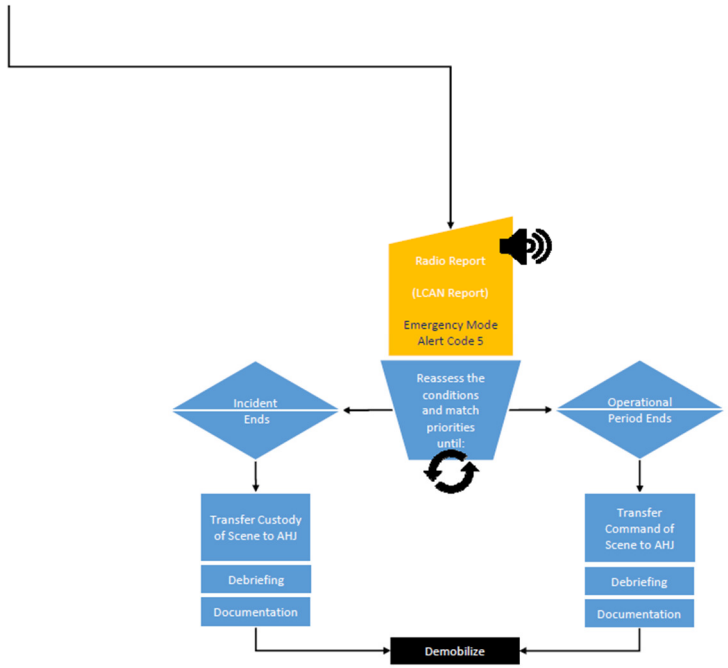
Compact Explosion-Proof Axial Blower

## 12. Incident Action Plan (Decision Tree)

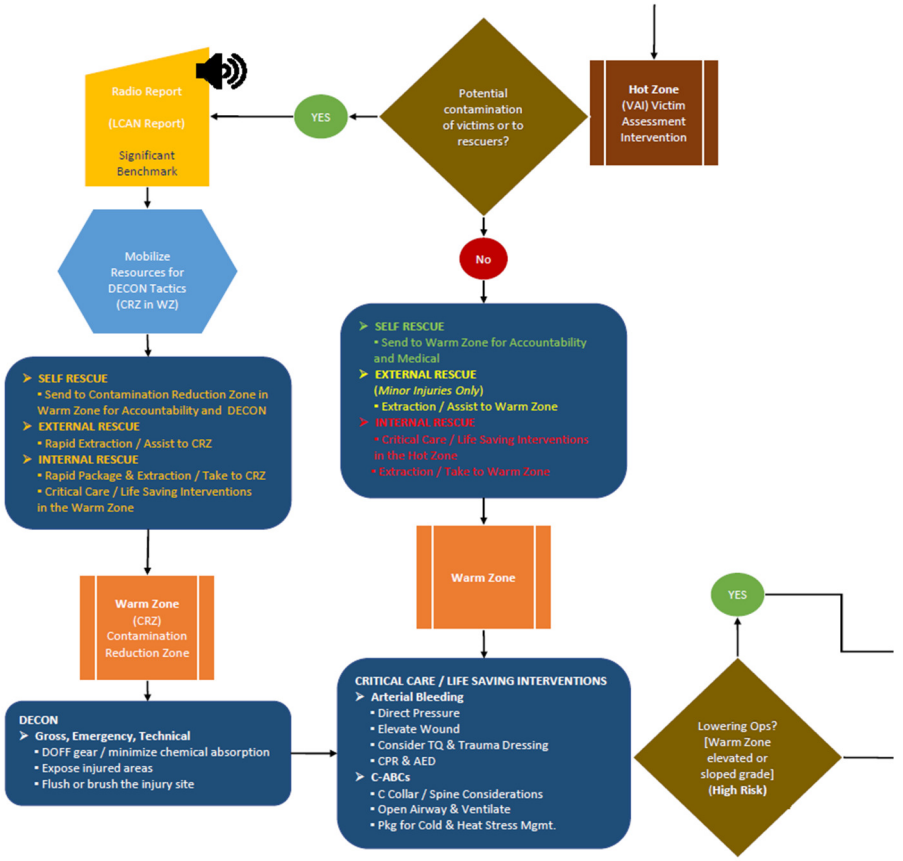


## 12. Incident Action Plan [(Decision Tree) continued]

LIP – Property Conservation → Terminate



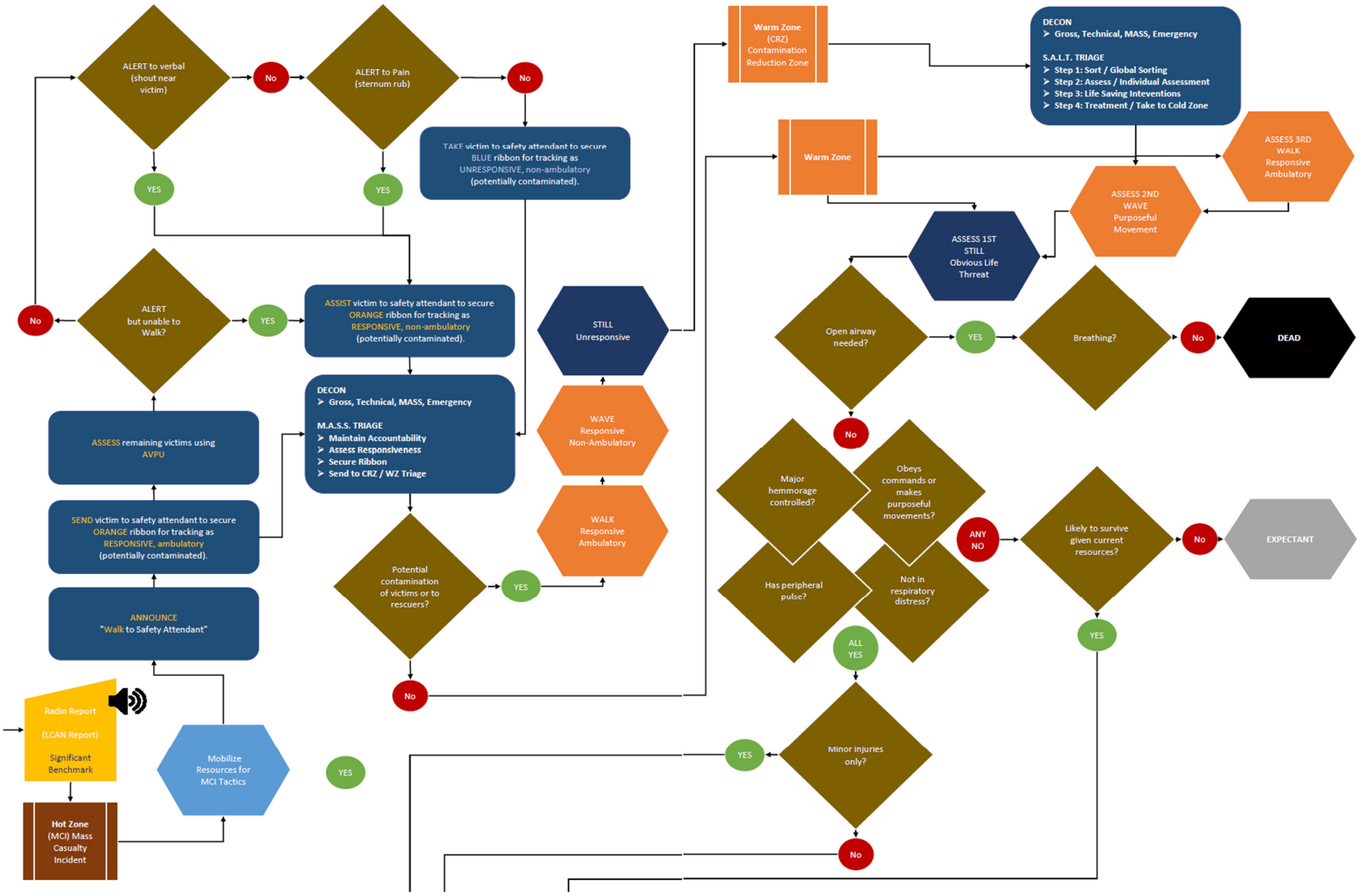

VAI – HZ & WZ (CRZ) Ops



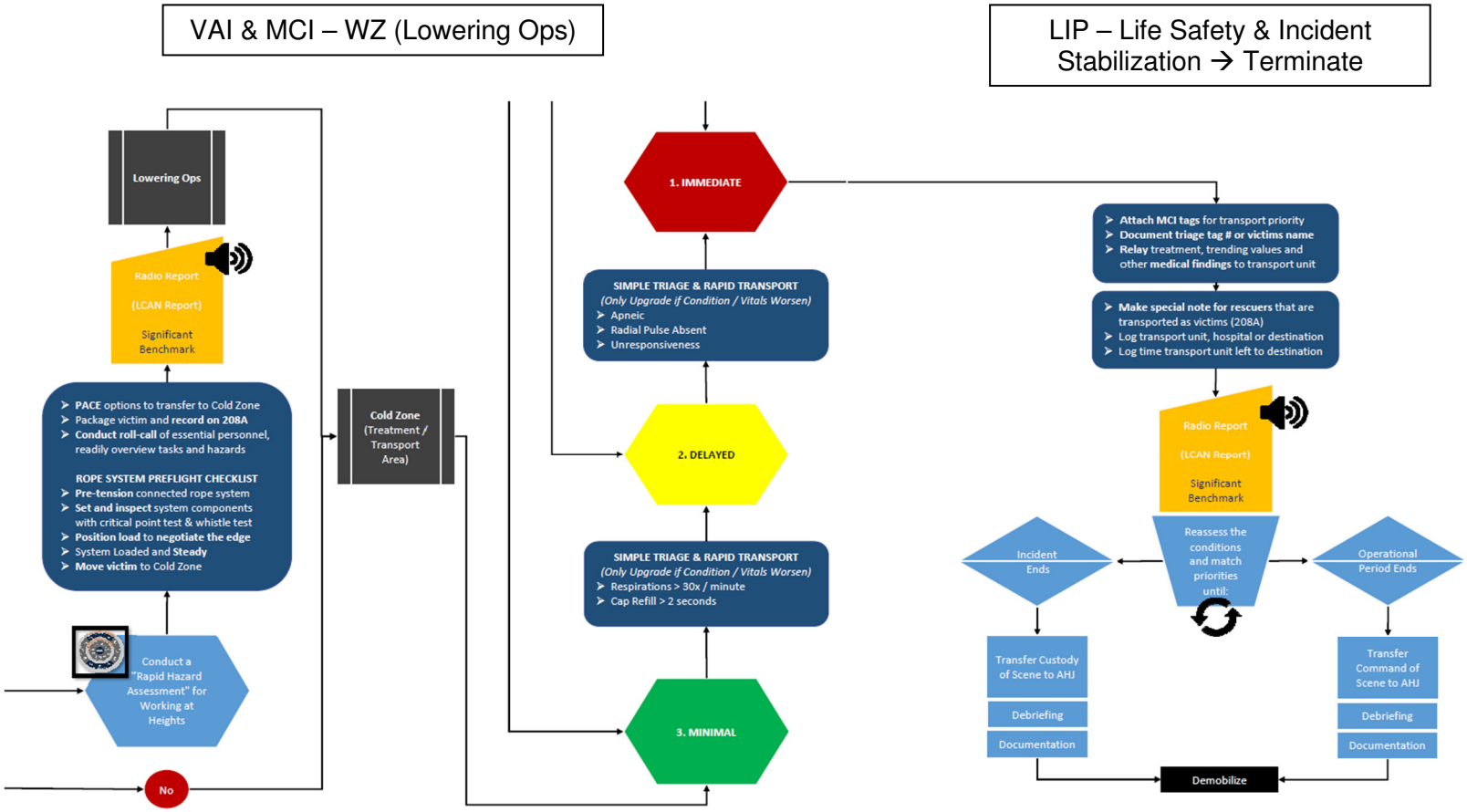
MCI – HZ

## 12. Incident Action Plan [(Decision Tree) continued]

MCI – WZ (CRZ)



## 12. Incident Action Plan [(Decision Tree) continued]



## 13. Rigging Plan

OPERATIONAL SAFEGUARDS & RULES OF ENGAGEMENT

- Only use equipment that has been checked and or inspected for operational readiness.
- Manipulate the haul field to minimize resets and expedite raising of the load.
- Extraction & transfer within footprint, bisecting legs & guying system to prevent toppling AHD.
- Multipoint anchor span ≤ 2x resultant distance; interior angle 90° or less (71% of load share).
- If multipoint anchor vectors are > 18”
  - Attempt to make BELAY rope load in line with MAIN rope’s projected resultant.
  - Use a locking hitch at multi point anchor carabiners to prevent dynamic load shift → catastrophic failure.
- Projected loaded line is free from excessive friction and edge protection in place.
- Pre and post tension system & verify resultant each time.
- Slow, static loading of the system; no sway; minimize the dynamic forces.
- Inspect pre-rigging with a **touch test**, verbalizing each component, purpose and safeguard or rule prior to roll call

| Rapid Hazard Assessment | *Roll Call* | *Preflight Checklist* |
|---|---|---|
| ➢ Accountability<br>➢ # Victims 1:1 & < 4<br>➢ Fire or LELs<br>➢ Toxic / Contamination<br>➢ Energy / Pressure / Fall<br>➢ Instability / Incompatibles<br>➢ Safety Measures Create Hazards? | ➢ Safety Ready?<br>➢ Belay Ready?<br>➢ Main Ready?<br>➢ Edge Ready?<br>➢ Tag Ready?<br>➢ (Entrant) Belay Line On?<br>➢ (Entrant) Main Line On? | • **Pre-tension** connected rope system<br>• **Set** and inspect system components with **critical point** test & **whistle test**<br>• **Position load** to negotiate the edge<br>• **System Loaded** (post-tension); **Steady**<br>• Move (**haul** / **lower**) victim to Cold Zone |

Critical Point Test

- Assess strain on components for acceptable safety factor standards
- Utilize redundancy as risk level increases
- Start at Load
- Use known load in lbs. OR estimated load
  - NFPA standard 1 person load = 300 lbs
  - 2-person load = 600 lbs.
  - 1000 lbs. represent a heavy 2-person load or additional rescue adjunct with litter attendant and factors in potential dynamic forces during operation
- For each component of the rope system, express rated tensile strength to system load as a safety factor ratio
- Use chart “Calculating Critical Angles” to find applied force to each anchor
  - Hardware
    - Carabiners are locked down (according to system design, anchors, and load)
    - No hard linking
  - Software
    - Suitability/selection
    - Knot and safety (if applicable) dressed, no excessive acute bends
  - Auxiliary Equipment
    - Stabilized and secured
    - Equipment is hobbled, pinned, and leveled
  - Projected loaded line is free from excessive friction points
    - Pad where necessary; ensure edge protectors/rollers are in place

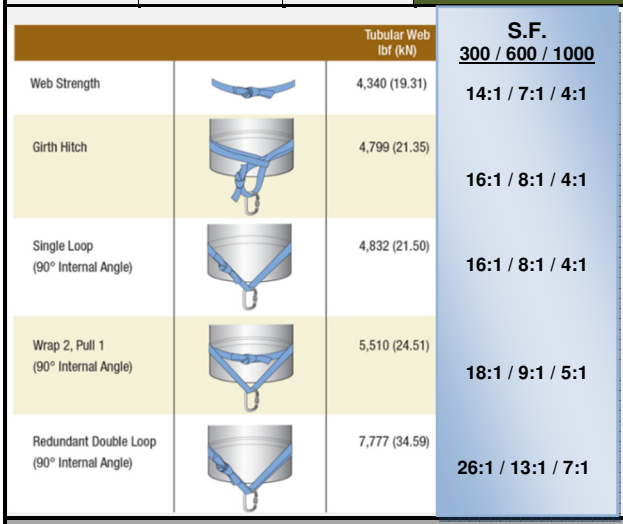
Whistle Test

- Ensure system arrests without personnel hands on rope or on equipment
- Pre-tension system to view projected load lines
- Load the line slowly, only raising a short height above ground
- Determine if critical angle is between spanning anchors or a within a directional anchor

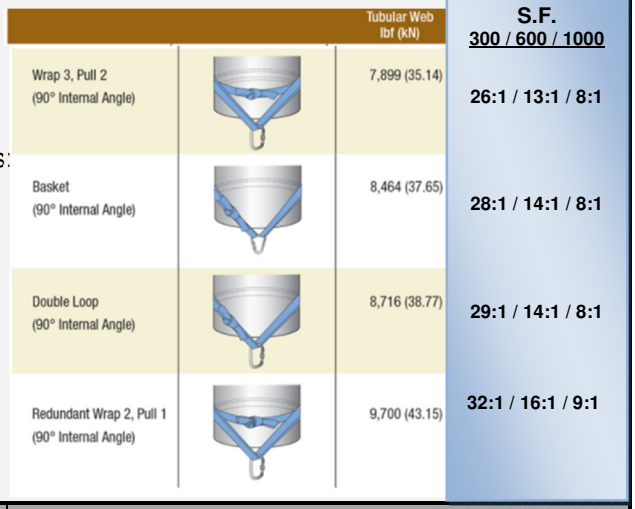
## 13. Rigging Plan (continued)

### Calculating Critical Angles

| Spanning (Shared) Anchors | | | | | Directional Anchors | | | |
|---|---|---|---|---|---|---|---|---|
| 1 person 300 lbs. | 2 person 600 lbs. | 1000 lbs. | ***Applied Force*** | Critical Angle | ***Applied Force*** | 1 person 300 lbs. | 2 person 600 lbs. | 1000 lbs. |
| - | - | - | **575x Load** | 180° | **0%** | - | - | - |
| 3,300 | 6,600 | - | **11x Load** | 175° | **8%** | 24 | 48 | 80 |
| 600 | 1,200 | 2,000 | **2x Load** | 150° | **52%** | 156 | 312 | 520 |
| 300 | 600 | 1,000 | **1x** | 120° | **100%** | 300 | 600 | 1,000 |
| 213 | 426 | 710 | **71%** | 90° | **141%** | 423 | 846 | 1,410 |
| 174 | 348 | 580 | **58%** | 60° | **173%** | 519 | 1,038 | 1,730 |
| 162 | 324 | 540 | **54%** | 45° | **185%** | 555 | 1,110 | 1,850 |
| 153 | 306 | 510 | **51%** | 30° | **193%** | 579 | 1,158 | 1,930 |
| 150 | 300 | 500 | **50%** | 0° | **200%** | 600 | 1,200 | 2,000 |




Webbing Anchors: *MBS Strength of Common Configurations*




| MBS (tensile strength) / SF = WLL | | | MBS / Load = SSSF | | | | | |
|---|---|---|---|---|---|---|---|---|
| Rescue Knots [LTE] | MBS | | Static System Safety Factor | | | | | |
| | | | **300 lbs Load** | | **600 lbs Load** | | **1000 lbs Load** | |
| **½" Life Safety Rope** | **45 kN → 10116 lbs.** | | **34:1** | | **17:1** | | **10:1** | |
| ½" Utility Rope | | [41.3 kN → 9284 lbs.] | | 31:1 | | 15:1 | | 9:1 |
| Tensionless Hitch | **10116 lbs** | [9284 lbs] | **34:1** | 31:1 | **17:1** | 15:1 | **10:1** | 9:1 |
| Figure 9 | 90% → **9104 lbs** | [8356 lbs] | **30:1** | 28:1 | **15:1** | 14:1 | **9:1** | 8:1 |
| Scaffold | 81% → **8193 lbs** | [7520 lbs] | **27:1** | 25:1 | **13:1** | 12:1 | **8:1** | 7:1 |
| Double Figure 8 | 82% → **8295 lbs** | [7613 lbs] | **27:1** | 25:1 | **14:1** | 12:1 | **8:1** | 7:1 |
| Figure 8 | 80% → **8092 lbs** | [7427 lbs] | **27:1** | 25:1 | **13:1** | 12:1 | **8:1** | 7:1 |
| Butterfly (ETE) | 77% (66%) → **7789 (7149)** | [7148 (6127)] | **26:1** [24:1 | **(24:1)** (20:1)] | **13:1** [12:1 | **(12:1)** (10:1)] | **8:1** [7:1 | **(7:1)** (6:1)] |
| Directional 8 (ETE) | 73% (51%) →**7384 (5159)** | [6777 (4735)] | **24:1** [22:1 | **(17:1)** (15:1)] | **12:1** [11:1 | **(8:1)** (7:1)] | **7:1** [6:1 | **(5:1)** (4:1)] |
| Bowline Loop (ETE) | 73% (51%) → **7385 (5159)** | [6777 (4735)] | **24:1** [22:1 | **(17:1)** (15:1)] | **12:1** [11:1 | **(8:1)** (7:1)] | **7:1** [6:1 | **(5:1)** (4:1)] |
| Water Knot | 64% → **6474 lbs** | [5942 lbs] | **21:1** | 19:1 | **11:1** | 10:1 | **6:1** | 5:1 |
| Clove Hitch | 60% → **6070 lbs** | [5570 lbs] | **20:1** | 18:1 | **10:1** | 9:1 | **6:1** | 5:1 |
| Triple Wrap Prusik | Creep @ 1000 lbs → Slip @ 3400 lbs | | **11:1** | | **5:1** | | **3:1** | |
| Other / Unknown | 50% → **5000 lbs** | [4500lbs] | **16:1** | 15:1 | **8:1** | 7:1 | **5:1** | 4:1 |

| 13. Rigging Plan (continued) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBS (tensile strength) / SF = WLL | | | | | MBS / Load = SSSF | | | | | | | |
| Item | MBS | | | | Static System Safety Factor | | | | | | | |
| | | | | | 300 lbs Load | | | 600 lbs Load | | | 1000 lbs Load | |
| ½" Life Safety Rope | 45 kN (10116 lbs) | | | | 34:1 | | | 17:1 | | | 10:1 | |
| ½" Utility Rope | 41.3 kN (9284 lbs) | | | | 31:1 | | | 15:1 | | | 9:1 | |
| Rigging Plate | 36 kN (8100 lbs) | | | | 27:1 | | | 13:1 | | | 8:1 | |
| Maestro | **36kN (8100 lbs)** [22kN becket (4950 lbs)] | | | | **27:1** [16:1] | | | **13:1** [8:1] | | | **8:1** [5:1] | |
| Petzl ID | 24 kN (5510 lbs) | | | | 18:1 | | | 9:1 | | | 5:1 | |
| ASAP Lock | 24 kN (5510 lbs) | | | | 18:1 | | | 9:1 | | | 5:1 | |
| Asap'sorber | 24 kN (5510 lbs) | | | | 18:1 | | | 9:1 | | | 5:1 | |
| Rescue Rack | 22 kN (4950 lbs) | | | | 16:1 | | | 8:1 | | | 5:1 | |
| Rescue 8 | 22 kN (4950 lbs) | | | | 16:1 | | | 8:1 | | | 5:1 | |
| Omni Block 1.5' DP | 10kN -> 40 kN [9000 lbs] | | | | 30:1 | | | 15:1 | | | 9:1 | |
| Double Pulley | **46 kN (10341 lbs)** [23 kN becket (5170 lbs)] | | | | **34:1** [17:1] | | | **17:1** [9:1] | | | **4:1** [2:1] | |
| Single Pulley | 18 kN - > 36 kN [8100 lbs] | | | | 27:1 | | | 13:1 | | | 8:1 | |
| Swivel | 36 kN (8100 lbs) | | | | 27:1 | | | 13:1 | | | 8:1 | |
| Rope Grab Ascender | 5 kN (1000 lbs) | | | | 3:1 | | | 1.5:1 | | | 1:1 | |
| Hand Ascender | **140 kg. (Black) 125 kg. (Gold) → (3008 lbs & 2750 lbs);** [Carabiner 40 kN (9000 lbs)] | | | | **10:1 9:1** [30:1] | | | **50:1 4:1** [15:1] | | | **3:1 3:1** [9:1] | |
| Carabiner XXL | 41 kN (9217 lbs) | | | | 31:1 | | | 15:1 | | | 9:1 | |
| Carabiner XL | 54 kN (12139 lbs) | | | | 40:1 | | | 20:1 | | | 12:1 | |
| Carabiner L | 45 kN (10116 lbs) | | | | 34:1 | | | 17:1 | | | 10:1 | |
| Carabiner DNA | 40 kN (9000 lbs) | | | | 30:1 | | | 15:1 | | | 9:1 | |
| Tri-Link 12mm | 55 kN (12364 lbs) | | | | 41:1 | | | 20:1 | | | 12:1 | |
| Tri-Link 10mm | 45 kN (10116 lbs) | | | | 34:1 | | | 17:1 | | | 10:1 | |
| 1' Tubular Webbing | 4000 lbs | E2E | Basket | Choked | 13:1 | **28:1** | 16:1 | 6:1 | **14:1** | 8:1 | 4:1 | **8:1** 4:1 |
| 2' Tubular Webbing | 6000 lbs | E2E | Basket | Choked | 26:1 | **56:1** | 32:1 | 13:1 | **28:1** | 16:1 | 8:1 | **6:1** 7:1 |
| 8mm Prusik | 3000 lbs | E2E | Basket | Choked | 10:1 | **20:1** | 12:1 | 5:1 | **10:1** | 6:1 | 3:1 | **4:1** 3:1 |
| 6mm Prusik | 2800 lbs | E2E | Basket | Choked | 9:1 | **18:1** | 11:1 | 4:1 | **9:1** | 4:1 | 3:1 | **5:1** 2:1 |
| 48" / 96" Anchor Sling | 10000 lbs | E2E | Basket | Choked | 33:1 | **66:1** | 26:1 | 12:1 | **26:1** | 13:1 | 7:1 | **16:1** 8:1 |
| 1'-10' Adj. Strap | 6000 lbs | E2E | Basket | | 20:1 | **40:1** | | 10:1 | **20:1** | | 6:1 | **12:1** |
| Pick Off Strap | 13.34 kN (3000 lbs) | | | | 10:1 | | | 5:1 | | | 3:1 | |
| Load Release Strap | 28 kN (6300 lbs) | | | | 21:1 | | | 10:1 | | | 6:1 | |
| Improvised Lifting Bridle | ~10,000 lbs per leg<br>~7000 lbs | | F8 and prusik<br>Butterfly | | 36:1<br>25:1 | | | 18:1<br>12:1 | | | 11:1<br>7:1 | |
| AZTEK kit | **9 kN -> 36 kN (8100 lbs)** [Carabiners → 40 kN (9000 lbs) & 28 kN [6294 lbs)] | | | | **26:1** [30:1 & 21:1] | | | **13:1** [15:1 & 10:1] | | | **8:1** [9:1 & 6:1] | |
| Stokes kit | 30kN (6744 lbs)<br>14kN (3147 lbs) | | Vertical<br>Horizontal | | 22:1<br>10:1 | | | 11:1<br>5:1 | | | 6:1<br>3:1 | |
| Yates SPEC PAK kit | 17.8 kN (4000 lbs) | | | | 13:1 | | | 6:1 | | | 4:1 | |
| SKED kit | 40 kN (9000 lbs) | | Lift Strap | | 30:1 | | | 15:1 | | | 9:1 | |
| Skedco Tripod | 5280 lbs ←→ 9500 lbs | | | | 17:1 ←→ 31:1 | | | 8:1 ←→ 15 | | | 5:1 ←→ 9:1 | |
| TerrAdaptor | 36 kN [8100 lbs.] | | | | 26:1 | | | 13:1 | | | 8:1 | |

## 14. Hazard Mitigation Plan

ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
(**A**ccord Europeen relatif au transport international des marchandises **D**angereuses par **R**oute)

UN # Unique Identifier

| **HIN**<br>Hazard Index Number is two to three characters | | |
|---|---|---|
| 2 | Emissions of gas due to pressure or to chemical reaction | |
| 3 | Flammability of liquids (vapors) and gases or self heating liquids | |
| 4 | Flammability of solids or self heating solids | |
| 5 | Oxidizing (fire intensifying) effect | |
| 6 | Toxicity (or risk of infection) | |
| 7 | Radioactivity | |
| 8 | Corrosivity | |
| 9 | Risk of spontaneous, violent reaction | |

*Doubling of a figure indicates an intensification of that particular hazard

**Where the hazard associated with a substance can be adequately indicated by a single figure, this is followed by a zero.

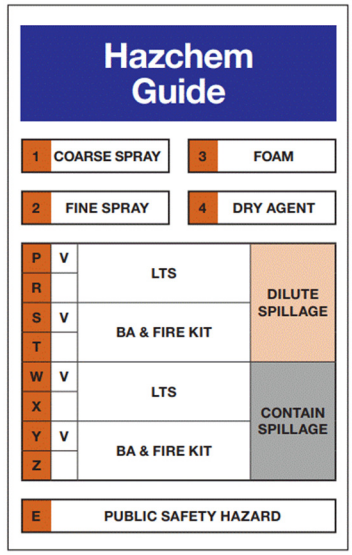
Guidance | NFCC CPO (ukfrs.com)

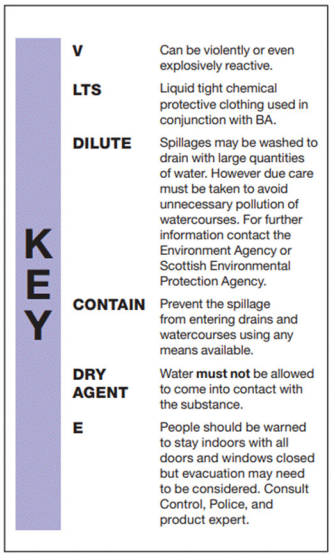
**Dangerous Goods: Emergency Action Code List**

Organized by UN # on pages 31-142
Organized by alphabetical order on pages 143 – 199

OR

Use “Dangerous Goods” app, downloadable on Android and iPhone

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## 14. Hazard Mitigation Plan (continued)

<table>
<tr><th colspan="3">Emergency Action Code – HazChem Guide</th></tr>
<tr><td>1st Character<br>Extinguishing Media</td><td>2nd Character<br>(P - Z) (V) : Violent / Explosively Reactive</td><td>3rd Character<br>(if applicable)</td></tr>
<tr><td>1 Smooth or Straight Stream<br><br>2 Fog Stream (*2 denotes alcohol resistant foam if available, if not then a fog stream can be used)<br><br>3 Normal Foam, Not alcohol Resistant (*3 denotes alcohol resistant foam if available, if not then normal foam)<br><br>4 Dry Agent. Do not use water; Reactivity Hazard<br><br>NOTE: Any higher number than the one shown can be used but a lower number must not be used</td><td>Spill Control -> DILUTE<br>P (V) Level B<br>R Level B<br>S (V) Structural<br>T Structural<br><br>Spill Control - > CONTAIN<br>W (V) Level B<br>X Level B<br>Y (V) Structural<br>Z Structural</td><td>E People should be warned to remain indoors with all doors and windows closed but evacuation may need to be considered. Consult a product expert and notify police and other appropriate emergency response personnel to assist.<br><br>Dangerous Goods Packaging Group</td></tr>
<tr><td colspan="3">APP = Additional Personal Protection<br>(CPC Upgrade from Minimum Required level B due to specific / special hazard)</td></tr>
<tr><td colspan="2">A – requires structural gear or gas tight CPC / Level A with FR /thermal protection due to the following potential hazards:<br>• (c) liquefied gas with a boiling point below -20* C<br>• (fg) flammable gas<br>• (fl) flammable liquid<br>• (cf) liquefied flammable gas with a boiling point below -20* C<br>• (h) the substance may be carried above 100* C<br>• (co) oxidizing gas with a boiling point below -20* C<br>• (!) The substance may have a particularly deleterious effect on chemical protective clothing</td><td>B – requires gas tight CPC along with SCBA or level A</td></tr>
</table>

| Table 23: Hazard Identification Number Meanings | | | |
|---|---|---|---|
| 20 | Asphyxiant gas or gas with no subsidiary risk | 556 | Strongly oxidizing (fire-intensifying) substance, toxic |
| 22 | Refrigerated liquefied gas, asphyxiant | 558 | Strongly oxidizing (fire-intensifying) substance, corrosive |
| 223 | Refrigerated liquefied gas, flammable | 559 | Strongly oxidizing (fire-intensifying) substance, which car spontaneously lead to violent reaction |
| 225 | Refrigerated liquefied gas, oxidizing (fire intensifying) | 56 | Oxidizing substance (fire-intensifying), toxic |
| 23 | Flammable gas | 568 | Oxidizing substance (fire-intensifying), toxic, corrosive |
| 238 | Gas, flammable corrosive | 58 | Oxidizing substance (fire-intensifying), corrosive |
| 239 | Flammable gas, which can spontaneously lead to violent reaction | 59 | Oxidizing substance (fire-intensifying) that car spontaneously lead to violent reaction |
| 25 | Oxidizing (fire-intensifying) gas | 60 | Toxic or slightly toxic substance |
| 26 | Toxic gas | 606 | Infectious substance |
| 263 | Toxic gas, flammable | 623 | Toxic liquid, which reacts with water, emitting flammable gases |
| 265 | Toxic gas, oxidizing (fire-intensifying) | 63 | Toxic substance, flammable (flash point between 23°C and 60°C inclusive) |
| 268 | Toxic gas, corrosive | 638 | Toxic substance, flammable (flash point between 23°C and 60°C inclusive), corrosive |
| 28 | Gas, corrosive | 639 | Toxic substance, flammable (flash point not above 60°C inclusive), which can spontaneously lead to violent reaction |
| 285 | Gas, corrosive, oxidizing Flammable liquid that reacts with water, emitting 30flammable gases | 64 | Toxic solid, flammable, or self-heating |
| 30 | Flammable liquid (flashpoint between 23°C and 60°C inclusive) or flammable liquid or solid in the molten state with a flash point above 60°C, heated to a temperature equal to or above its flash point, or self-heating liquid | 642 | Toxic solid, which reacts with water, emitting flammable gases |
| 323 | Flammable liquid that reacts with water, emitting flammable gases | 65 | Toxic substance, oxidizing (fire-intensifying) |
| X323 | Flammable liquid that reacts dangerously with water, emitting flammable gases | 66 | Highly toxic substance |
| 33 | Highly flammable liquid (flash point below 23°C) | 663 | Highly toxic substance, flammable (flashpoint not above 60°C inclusive) |
| 333 | Pyrophoric liquid | 664 | Highly toxic substance, flammable, or self-heating |
| X333 | Pyrophoric liquid, which reacts dangerously with water* | 665 | Highly toxic substance, oxidizing (fire-intensifying) |
| 336 | Highly flammable liquid, toxic | 668 | Highly toxic substance, corrosive |
| 338 | Highly flammable liquid, corrosive | 669 | Highly toxic substance that can spontaneously lead to a violent reaction |
| X338 | Highly flammable liquid, corrosive, which reacts dangerously with water* | 68 | Toxic substance, corrosive |
| 339 | Highly flammable liquid that can spontaneously lead to violent reaction | 69 | Toxic or slightly toxic substance, which can spontaneously lead to a violent reaction |

# 14. Hazard Mitigation Plan (continued)

| Table 23: Hazard Identification Number Meanings (continued) | | | |
|---|---|---|---|
| 36 | Flammable liquid (flash point between 23°C and 60°C inclusive), slightly toxic or self-heating liquid toxic | 70 | Radioactive material |
| 362 | Flammable liquid, toxic, which reacts with water, emitting flammable gases | 78 | Radioactive material, corrosive |
| X362 | Flammable liquid, toxic, which reacts dangerously with water, emitting flammable gases* | 80 | Corrosive or slightly corrosive substance |
| 368 | Flammable liquid, toxic, corrosive | X80 | Corrosive or slightly corrosive substance, which reacts dangerously with water* |
| 38 | Flammable liquid (flash point between 23°C and 60°C inclusive), slightly corrosive or self-heating liquid, corrosive | 823 | Corrosive liquid which reacts with water, emitting flammable gases |
| 382 | Flammable liquid, corrosive, which reacts with water, emitting flammable gases | 83 | Corrosive or slightly corrosive substance, flammable (flash point between 23°C and 60°C inclusive) |
| X382 | Flammable liquid, corrosive, which reacts dangerously with water, emitting flammable gases* | X83 | Corrosive or slightly corrosive substance, flammable (flash point between 23°C and 60°C inclusive), which reacts dangerously with water* |
| 39 | Flammable liquid, which can spontaneously lead to violent reaction | 839 | Corrosive or slightly corrosive substance, flammable (flash point between 23°C and 60°C inclusive), which can spontaneously lead to violent reaction |
| 40 | Flammable solid, or self-reactive substance, or self-heating substance | X839 | Corrosive or slightly corrosive substance, flammable (flash point between 23°C and 60°C inclusive), which can spontaneously lead to violent reaction, and which reacts dangerously with water* |
| 423 | Solid that reacts with water, emitting flammable gas, or flammable solid which reacts with water, emitting flammable gases or self-heating solid which reacts with water, emitting flammable gases* | 84 | Corrosive solid, flammable, or self-heating |
| X423 | Solid that reacts dangerously with water, emitting flammable gases, or flammable solid that reacts dangerously with water, emitting flammable gases, or self-heating solid that reacts dangerously with water, emitting flammable gases. Flammable solid, in the molten state at an elevated temperature* | 842 | Corrosive solid which reacts with water, emitting flammable gases |
| 43 | Spontaneously flammable (pyrophoric) solid | 85 | Corrosive or slightly corrosive substance, oxidizing (fire-intensifying) |
| X432 | Spontaneously flammable (pyrophoric) solid that reacts dangerously with water, emitting flammable gases* | 856 | Corrosive or slightly corrosive substance, oxidizing (fire-intensifying) and toxic |
| 44 | Flammable solid, in the molten state at an elevated temperature | 86 | Corrosive or slightly corrosive substance, toxic |
| 446 | Flammable solid, toxic in the molten state, at an elevated temperature | 88 | Highly corrosive substance |
| 46 | Flammable or self-heating solid, toxic | X88 | Highly corrosive substance, which reacts dangerously with water* |
| 462 | Toxic solid that reacts with water, emitting flammable gases | 883 | Highly corrosive substance, flammable (flashpoint between 23°C and 60°C inclusive) |
| X462 | Solid that reacts dangerously with water, emitting toxic gases* | 884 | Highly corrosive solid, flammable, or self-heating |
| 48 | Flammable or self-heating solid, corrosive | 885 | Highly corrosive substance, oxidizing (fire-intensifying) |
| 482 | Corrosive solid that reacts with water, emitting corrosive gases | 886 | Highly corrosive substance, toxic |
| X482 | Solid that reacts dangerously with water, emitting corrosive gases* | X886 | Highly corrosive substance, toxic, which reacts dangerously with water* |
| 50 | Oxidizing (fire-intensifying) substance | 89 | Corrosive or slightly corrosive substance, which can spontaneously lead to a violent reaction |
| 539 | Flammable organic peroxide | 90 | Environmentally hazardous substance; miscellaneous dangerous substances |
| 55 | Strongly oxidizing (fire-intensifying) substance | 99 | Miscellaneous dangerous substance carried at an elevated temperature |

## 15. Decontamination Plan

Decontamination Solutions

*The following list should be used as a guideline for selecting solutions for the type of hazard identified*

| | Hazard Types | Solution A | Solution B | Solution C | Solution D | Solution E | Solution F |
|---|---|---|---|---|---|---|---|
| ☐ | Inorganic Acids, Metal Processing Wastes | X | | | | | |
| ☐ | Heavy Metals: Mercury, Lead and Calcium | | X | | | | |
| ☐ | Pesticides | | X | | | | |
| ☐ | Cyanides, Ammonia, and Other Nonacidic Inorganic Wastes | | X | | | | |
| ☐ | Solvents And Organic Compounds Such As Trichloro-Ethylene, Chloroform, and Toluene | X | | X | | | |
| ☐ | Oily, Greasy, Non Specific Wastes not Suspected to be Contaminated with Pesticides | | | X | | | |
| ☐ | Inorganic Bases, Alkali, and Caustic Wastes | | | | X | | |
| ☐ | Radioactive Materials | | | | | X | |
| ☐ | Etiologic Materials | | | | | | X |

Solution A:

5% Sodium carbonate and 5% trisodium phosphate. Mix 4 pounds of commerical grade trisodium phosphate and 4 pounds of sodium carbonate with 10 gallons of water. ***2 pounds per gallons**

Solution B:

Solution of 10% calcium hypochlorite. Mix 8 pounds of calcium hypochorite with 10 gallons of water.

***1 pound per 5 gallons**

Solution C:

A solution of water and 5% trisodium phospate which can also be used as a general purpose rinse.

Solution D:

Mix 1 pint of concetrated HCL into 10 gallons of water (always add acid to water, never add water to acid) to produce a dilute solution of hypochlorrous acid – HCLO (a very weak acid). ***1 cup per 5 gallons**

Solution E:

A concentrated solution of detergent and water. Mix into a paste and scrub with a brush. Rinse with water.

Solution F:

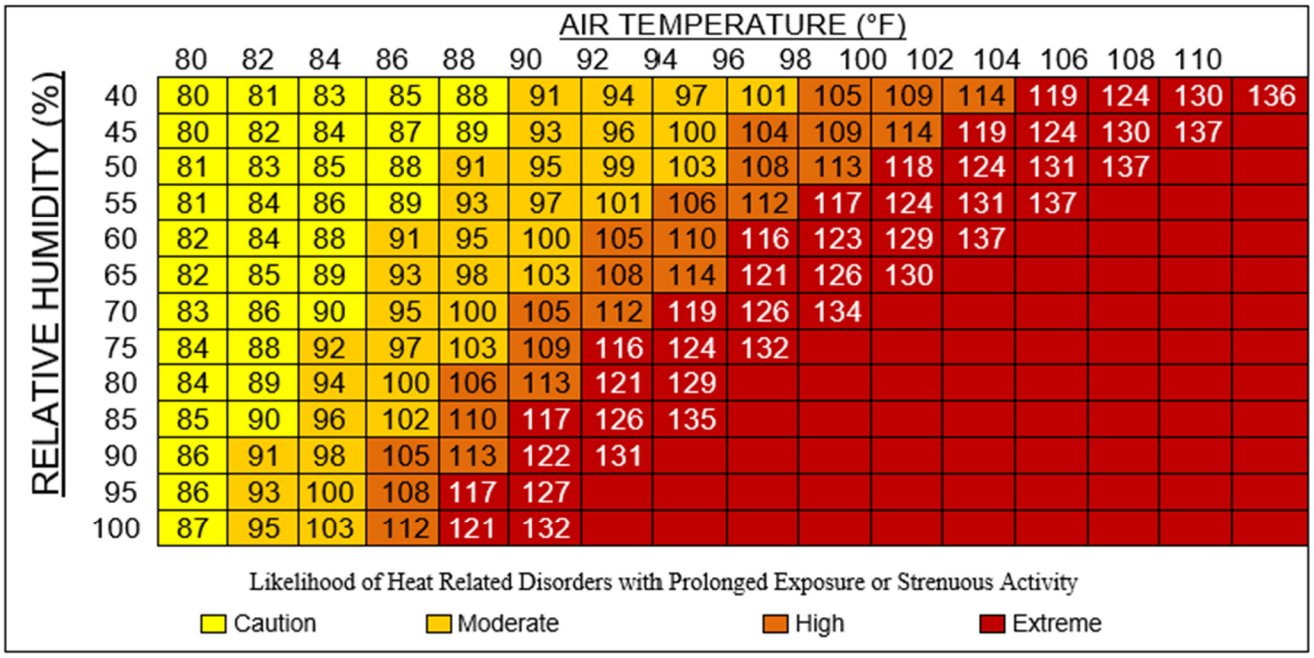
A solution of 1 cup household bleach for every 10 cups of water OR 1 cup of hydrogen peroxide (3-4%) for every 10 cups of water. ***1/2 cup per gallons**

*CAUTION*

*The decontamination solutions listed above are recommended for the 9 general groups of hazardous materials. Always seek expert assistance from manufacture, a poison control center, or medical specialists, etc., to determine the best solution to use.*

## 16. Medical Plan A) Rehab / Heat Stress Management

# HEAT INDEX CHART




### Heat Stress Control Methods by Danger Level

| Heat Index | Danger Levels (1-4) | Control Methods |
|---|---|---|
| 80° to 91°F | 1 Caution | Basic health and safety planning |
| 91°F to 103°F | 2 Moderate | Heighten awareness and implement additional control methods |
| 104°F to 115°F | 3 High | Additional control methods to protect workers |
| Greater than 115°F | 4 Extreme | Implement the most aggressive control methods up and including stopping and rescheduling work |

### Work/Rest Guideline for Heat Index Based on Standard PPE / Hour

| Heat Index | Moderate Work | Heavy Work | Fluids |
|---|---|---|---|
| LEVEL 1 | Work 50 min / Rest 10 min | Work 45 min / Rest 15 min | 12-24 oz |
| LEVEL 2 | Work 40 min / Rest 20 min | Work 30 min / Rest 30 min | 24-36 oz |
| LEVEL 3 | Work 30 min / Rest 30 min | Work 20 min / Rest 40 min | 36-48 oz |
| LEVEL 4 | Work 20 min / Rest 40 min | Management Approval | 36-48 oz |

### Work/Rest Guideline for Heat Index Based on Special PPE / Hour

| Heat Index | Moderate Work | Heavy Work | Fluids |
|---|---|---|---|
| LEVEL 1 | Work 45 min / Rest 15 min | W 20 / R 20 / W 20 | 12-24 oz |
| LEVEL 2 | Work 30 min / Rest 30 min | W 15 / R 30 / W 15 | 24-36 oz |
| LEVEL 3 | Work 20 min / Rest 40 min | W 10 / R 40 / W 10 | 36-48 oz |
| LEVEL 4 | Management Approvals | Not Permitted | TBD |

## 16. Medical Plan A) Rehab / Heat Stress Management (continued)

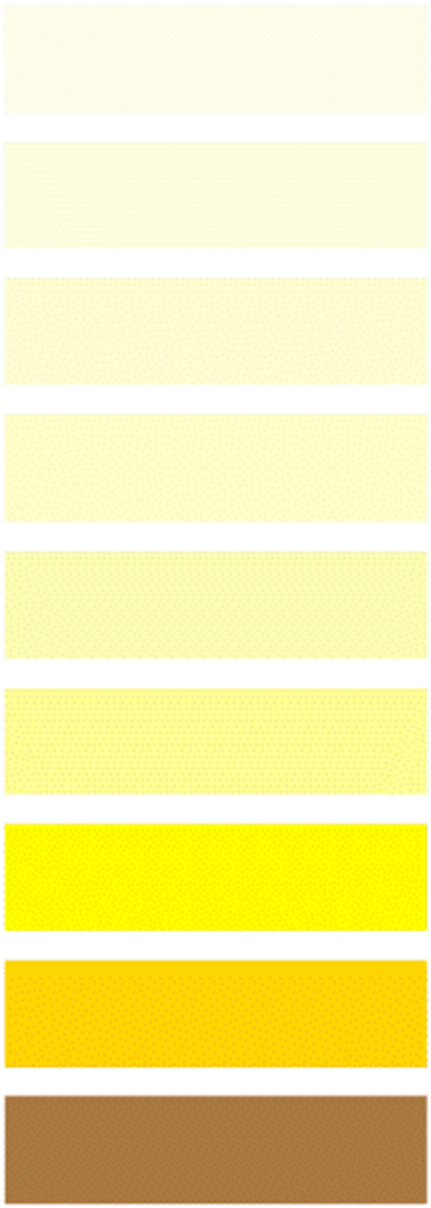
| Heat Index | Danger Levels (1-4) | Control Methods |
|---|---|---|
| 80° to 91°F | (1) Caution | ▪ Ensure that adequate medical services are available<br>▪ Plan ahead for times when heat index is higher, including worker heat safety training<br>▪ Encourage workers to wear sunscreen<br>▪ Provide drinking water<br><br>**If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are required to protect workers from heat-related illness.** |
| 91°F to 103°F | (2) Moderate | In addition to the steps listed above:<br><br>▪ Remind workers to drink water often (about 4 cups/hour)**<br>▪ Review heat-related illness topics with workers: how to recognize heat-related illness, how to prevent it, and what to do if someone gets sick<br>▪ Schedule frequent breaks in cool, shaded area<br>▪ Acclimatize workers<br>▪ Set up buddy system/instruct supervisors to watch workers for signs of heat-related illness<br>▪ Schedule activities at a time when the heat index is lower<br>▪ Develop work/rest schedules<br>▪ Monitor workers closely<br><br>**If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are required to protect workers from heat-related illness.** |
| 104°F to 115°F | (3) High | In addition to the steps listed above:<br><br>▪ Alert workers of high-risk conditions<br>▪ Actively encourage workers to drink plenty of water (about 4 cups/hour)**<br>▪ Limit physical exertion (e.g. use mechanical lifts)<br>▪ Have a knowledgeable person at the worksite who is well-informed about heat-related illness and able to determine appropriate work/rest schedules<br>▪ Establish and enforce work/rest schedules<br>▪ Adjust work activities (e.g., reschedule work, pace/rotate jobs)<br>▪ Use cooling techniques<br>▪ Watch/communicate with workers at all times<br><br>When possible, reschedule activities to a time when the heat index is lower. |
| Greater than 115°F | (4) Extreme | Reschedule non-essential activity for days with a reduced heat index or to a time when the heat index is lower.<br><br>Move essential work tasks to the coolest part of the work shift; consider earlier start times, split shifts, or evening and night shifts. Strenuous work tasks and those requiring the use of heavy or non-breathable clothing or impermeable chemical protective clothing should not be conducted when the heat index is at or above 115°F.<br><br>If essential work must be done, in addition to the steps listed above:<br>▪ Alert workers of extreme heat hazards<br>▪ Establish water drinking schedule (about 4 cups/hour)**<br>▪ Develop and enforce protective work/rest schedules<br>▪ Conduct physiological monitoring (e.g., pulse, temperature, etc)<br>▪ Stop work if essential control methods are inadequate or unavailable |

## 16. Medical Plan A) Rehab / Heat Stress Management (continued)

| Illness | Symptoms | First Aid* |
|---|---|---|
| **Heat stroke** | ▪ Confusion<br>▪ Fainting<br>▪ Seizures<br>▪ Excessive sweating or red, hot, dry skin<br>▪ Very high body temperature | ▪ Call 911 or Plant Emergency Number or press the "Orange" emergency button<br><br>While waiting for help:<br><br>▪ Place worker in shady, cool area<br>▪ Loosen clothing, remove outer clothing<br>▪ Fan air on worker; cold packs in armpits<br>▪ Wet worker with cool water; apply ice packs, cool compresses, or ice if available<br>▪ Provide fluids (preferably water) as soon as possible<br>▪ Stay with worker until help arrives |
| **Heat exhaustion** | ▪ Cool, moist skin<br>▪ Heavy sweating<br>▪ Headache<br>▪ Nausea or vomiting<br>▪ Dizziness<br>▪ Light headedness<br>▪ Weakness<br>▪ Thirst<br>▪ Irritability<br>▪ Fast heart beat | ▪ Have worker sit or lie down in a cool, shady area<br>▪ Give worker plenty of water or other cool beverages to drink<br>▪ Cool worker with cold compresses/ice packs<br>▪ Take to clinic or emergency room for medical evaluation or treatment if signs or symptoms worsen or do not improve within 60 minutes.<br>▪ Do not return to work that day |
| **Heat cramps** | ▪ Muscle spasms<br>▪ Pain<br>▪ Usually in abdomen, arms, or legs | ▪ Have worker rest in shady, cool area<br>▪ Worker should drink water or other cool beverages<br>▪ Wait a few hours before allowing worker to return to strenuous work<br>▪ Have worker seek medical attention if cramps don't go away |
| **Heat rash** | ▪ Clusters of red bumps on skin<br>▪ Often appears on neck, upper chest, folds of skin | ▪ Try to work in a cooler, less humid environment when possible<br>▪ Keep the affected area dry |
| * Remember, if you are not a medical professional, use this information as a guide only to help workers in need. | | |

# Am I De-hydrated?
## *Check with this urine color chart*

This urine color chart is a simple tool your can use to assess if you are drinking enough fluids throughout day to stay hydrated.



If your urine matches these colors **you are hydrated**.

---

If your urine matches these colors **you are de-hydrated** and you should drink more!

---

If your urine matches these colors **you are seriuosly de-hydrated** or could have blood in your urine. You should contact a doctor!

More info: www.mayoclinic.com/health/urine-color/AN00868

Cold Stress Management Chart

**ACGIH Work/Warm Schedule for Light Work Over a 4-Hour Shift**

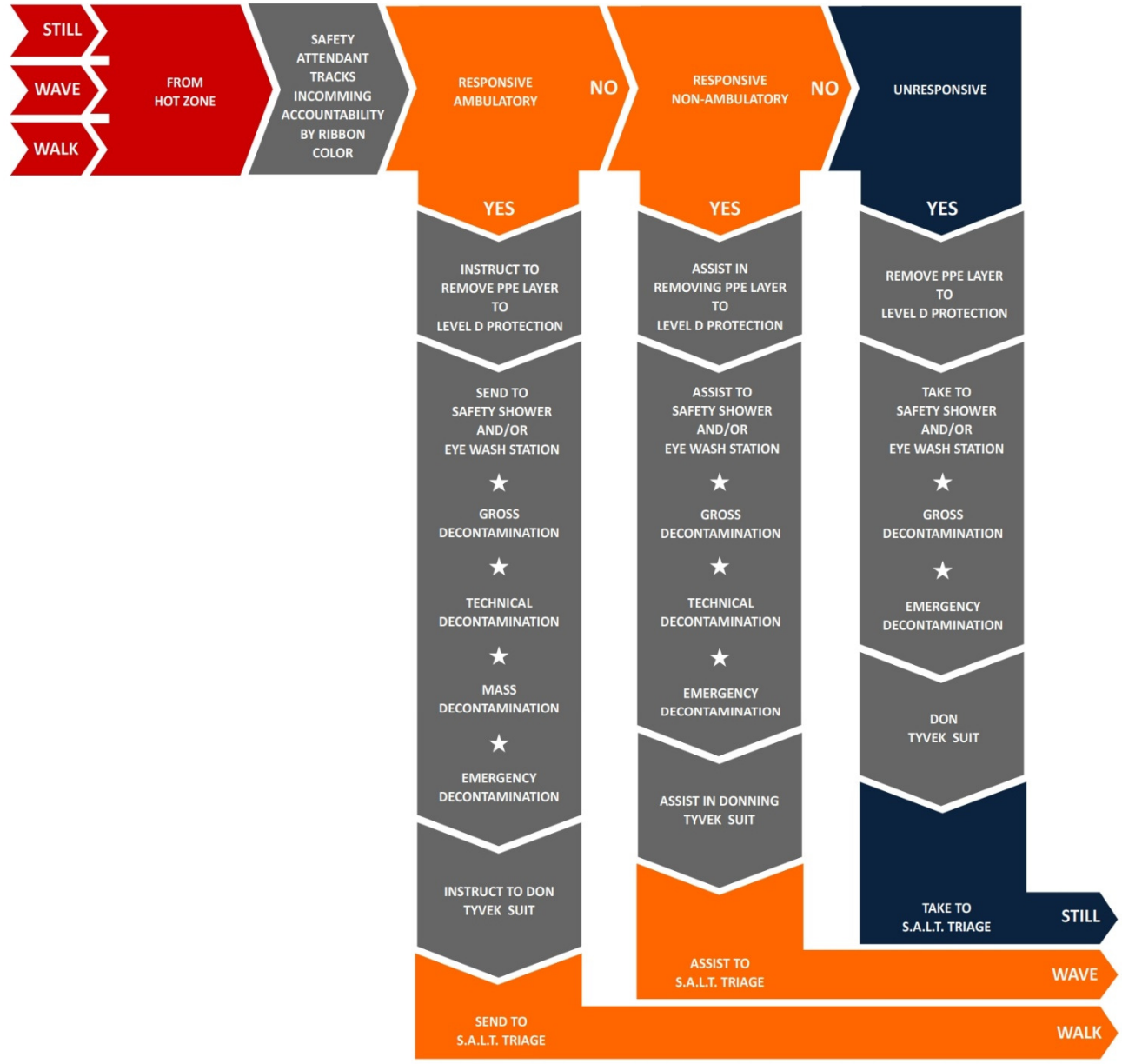
| Air Temperature in °F Sunny Sky | No Wind | | 5 mph Wind | | 10 mph Wind | | 15 mph Wind | | 20 mph Wind | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Max Work Period | No. of 10 min Breaks | Max Work Period | No. of 10 min Breaks | Max Work Period | No. of 10 min Breaks | Max Work Period | No. of 10 min Breaks | Max Work Period | No. of 10 min Breaks |
| 10 to 14 | No recommendation | | No recommendation | | No recommendation | | No recommendation | | 120 min | 1 |
| 5 to 9 | | | | | | | 120 min | 1 | 120 min | 1 |
| 0 to 4 | | | | | 120 min | 1 | 120 min | 1 | 75 min | 1 |
| -1 to -5 | | | 120 min | 1 | 120 min | 1 | 75 min | 2 | 55 min | 2 |
| -10 to -14 | 120 min | 1 | 120 min | 1 | 75 min | 2 | 55 min | 3 | 40 min | 3 |
| -15 to -19 | 120 min | 1 | 75 min | 2 | 55 min | 3 | 40 min | 4 | 30 min | 4 |
| -20 to -24 | 75 min | 2 | 55 min | 3 | 40 min | 4 | 30 min | 5 | Non-emergency work should stop | |
| -25 to -29 | 55 min | 3 | 40 min | 4 | 30 min | 5 | Non-emergency work should stop | | | |
| -30 to -34 | 40 min | 4 | 30 min | 5 | Non-emergency work should stop | | | | | |
| -35 to -39 | 30 min | 5 | Non-emergency work should stop | | | | | | | |
| -40 to -44 | Non-emergency work should stop. | | | | | | | | | |
| -45 to below | | | | | | | | | | |

**ACGIH Work/Warm Schedule for Moderate and Heavy Work Over a 4-Hour Shift**

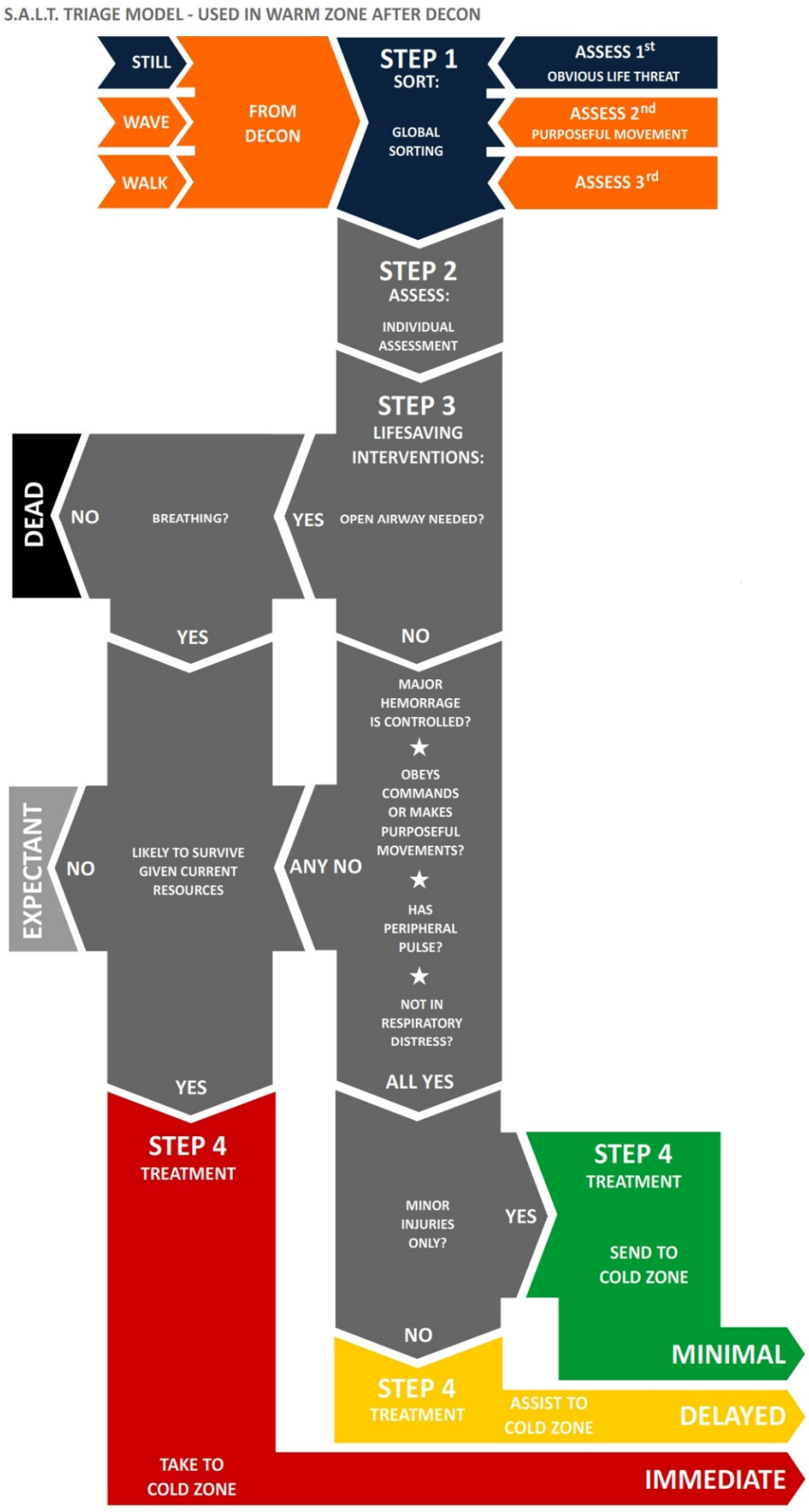
| Air Temperature in °F Sunny Sky | No Wind | | 5 mph Wind | | 10 mph Wind | | 15 mph Wind | | 20 mph Wind | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Max Work Period | No of 10 min Breaks | Max Work Period | No of 10 min Breaks | Max Work Period | No of 10 min Breaks | Max work Period | No of 10 min Breaks | Max work Period | No of 10 min Breaks |
| 5 to 9 | No recommendation | | No recommendation | | No recommendation | | No recommendation | | 120 min | 1 |
| 0 to 4 | | | | | | | 120 min | 1 | 120 min | 1 |
| -1 to -5 | | | | | 120 min | 1 | 120 min | 1 | 75 min | 2 |
| -10 to -14 | | | 120 min | 1 | 120 min | 1 | 75 min | 2 | 55 min | 3 |
| -15 to -19 | 120 min | 1 | 120 min | 1 | 75 min | 2 | 55 min | 3 | 40 min | 4 |
| -20 to -24 | 120 min | 1 | 75 min | 2 | 55 min | 3 | 40 min | 4 | 30 min | 5 |
| -25 to -29 | 75 min | 2 | 55 min | 3 | 40 min | 4 | 30 min | 5 | Non-emergency work should stop | |
| -30 to -34 | 55 min | 3 | 40 min | 4 | 30 min | 5 | Non-emergency work should stop | | | |
| -35 to -39 | 40 min | 4 | 30 min | 5 | Non-emergency work should stop | | | | | |
| -40 to -44 | 30 min | 5 | Non-emergency work should stop. | | | | | | | |
| -45 to below | Non-emergency work should stop. | | | | | | | | | |

## 16. Medical Plan C) MCI / Triage (M.A.S.S., S.A.L.T., S.T.A.R.T)

M.A.S.S. DECON MODEL - USED IN WARM ZONE AFTER HOT ZONE



## 16.Medical Plan C) MCI / Triage (M.A.S.S., S.A.L.T., S.T.A.R.T) (continued)



# 17. PPE Plan A) Respiratory

Note: Suitable respiratory protection is indicated by a ✔ in the appropriate box.

If oil mist is present, use R or P filters.

| | Air Purifying | | | | | | | | | | | | Supplied Air | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Half-Face Respirators | | | | | | | Full-Face Mask | | | Powered Air-Purifying Respirator (PAPR) | | Hood or Helmet NIOSH type CE Pressure demand | SCBA or SCBA +Airline Full face piece and + pressure |
| | Filtering Half-Facepiece | | Half-Face Mask | | | | | | | | Loose fitting | Tight fitting | | |
| **Filtering Efficiency and Type** | **95** | **100** | **95** | **100** | **Organic vapour** | **95 + Organic vapour** | **100 + Organic vapour** | **95** | **100** | **100 + Organic vapour** | **HEPA** | **HEPA** | | |
| Assigned Protection Factor* (NIOSH 1987) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 50 | 50 | 50 | 25 | 50 | 1000 | 10,000 |
| Rock and gravel crushing | | | ✔ N, R or P | ✔ N, R or P | | | | | | | | | | |
| Roofing material removal (built-up roofing, no asbestos) | ✔ R or P | | ✔ R or P | | | | | ✔ R or P | | | | | | |
| Sandblasting (nozzle operator) | | | | | | | | | | | | | ✔ | |
| Sandblasting (other workers in enclosed area) | | | | | | | | | ✔ N, R or P | | | ✔ | | |
| Rock drilling | | | ✔ N, R or P | ✔ N, R or P | | | | | | | | | | |
| Wood dust, including pressure-treated | ✔ N, R or P | | ✔ N, R or P | | | | | | | | | | | |
| **Painting and Using Adhesives** | | | | | | | | | | | | | | |
| Latex paint spraying (large scale use) | | | | | | ✔ N, R or P | | | | | | | | |
| Latex paint spraying (small scale use) | ✔ N, R or P | | ✔ N, R or P | | | | | | | | | | | |
| Alkyds and enamels: brush and roller application indoors but well ventilated | | | | | ✔ | | | | | | | | | |
| Alkyds and enamels: spray painting in well ventilated area | | | | | | ✔ N, R or P | | | | | | | | |
| Alkyds and enamels: painting in a confined space | | | | | | | | | | | | | | ✔ |
| Epoxy or polyurethane spray painting | | | | | | | | | | | | | | ✔ |
| Lead paint spraying | | | | | | | | | | ✔ N, R or P | | ✔ +OV | | |
| Epoxy adhesive (large scale use) | | | | | | | | | | | | | | ✔ |
| Epoxy adhesive (large scale use) | | | | | | | | | | ✔ OV | | | | |
| Caulking compounds, solvent based, large scale use | | | | | ✔ | | | | | | | | | |
| **Welding and Flame Cutting** | | | | | | | | | | | | | | |
| Any welding in confined spaces when atmosphere not monitored | | | | | | | | | | | | | | ✔ |
| Aluminum** | ✔ N, R, or P | | ✔ N, R or P | | | | | | | | | | | |
| Galvanized or plated metals | ✔ N, R or P | | ✔ N, R or P | | | | | | | | | | | |
| Lead-painted steel, flame cutting | | | | | | | | | | | | ✔ Good ventilation | | ✔ Poor ventilation |
| Stainless steel | ✔ N, R, or P | | ✔ N, R or P | | | | | | | | | | | |
| **Miscellaneous** | | | | | | | | | | | | | | |
| Roofing membrane heat welding | ✔ N, R, or P | | ✔ N, R or P | | | | | | | | | | | |
| Roofing membrane adhesive welding | | | | | ✔ | | | | | | | | | |
| Roofing kettle operators (asphalt) | | | | | | | | | | ✔ N, R, or P | | ✔ +OV | | |
| Form oil spraying | | | | | ✔ R, or P | | | | | | | | | |

N = not resistant to oil  R = oil resistant  P = oil proof  OV = organic vapour cartridge

* Assigned Protection factor = The protection factor assigned by NIOSH. A measure of the effectiveness of a type of respirator and suitable filter. Higher numbers mean greater protection.

** Protection from ozone may be required in some circumstances. Contact your respirator manufacturer.

Note: Respirators with a protection factor greater than indicated above may be used. Never use a respirator with a smaller protection factor.

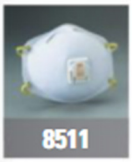
## 17. PPE Plan A) Respiratory (continued)

# 3M Respirator and Filter Selection Guide

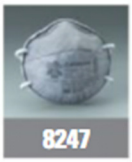
## Particulate Respirators


**N95**
**Applications:**
Grinding, sanding and other dusty operations
• available in small 8110S

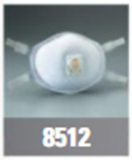

**P95**
**Applications:**
Grinding, sanding, machining and other dusty/oily operations



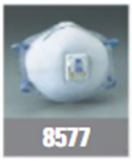

**N95**
**Applications:**
Same as 8210 plus other hot/dusty operations



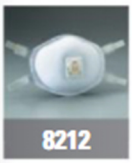

**R95**
**Applications:**
Foundry operations, labs, agriculture, petrochemical, undercoating[2]




**N95**
**Applications:** Welding, metal cutting/pouring, grinding, sanding, and other dusty/hot operations

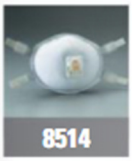



**P95**
**Applications:**
Same as 8247 plus hot operations[2]



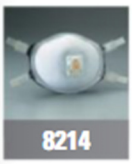

**N95**
**Applications:**
Same as 8512
• with faceseal


**R95**
**Applications:**
Glass etching, chemical processing, paper processing, brewing, aluminum smelting[3]

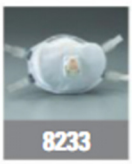



**N95**
**Applications:**
Welding, metal cutting/pouring, grinding, sanding, foundry, labs, petrochemical, undercoating[1]


**P95**
**Applications:**
Same as 8246 plus hot operations[3]

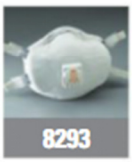



**N95**
**Applications:**
Same as 8514
• with faceseal[1]




**N100**
**Applications:**
OSHA substance specific particle exposures (lead, cadmium, arsenic, 4,4'-methylenedianiline) and pharmaceuticals


**R95**
**Applications:**
Grinding, sanding and other dusty/oily operations




**P100**
**Applications:**
Same as 8233

## Filters


**P95**
**Applications:**
Grinding, sanding, bagging and other dusty/oily operations


**P95**
**Applications:**
Aluminum smelting, glass etching, chemical manufacturing, hydrogen fluoride gas up to 10 times PEL[3]


**P95**
**Applications:**
Utilities operations, chemical manufacturing, aluminum smelting[1,3]


**P100**
**Applications:**
Welding, metal pouring, OSHA substance specific particle exposures, pharmaceuticals


**P100**
**Applications:**
Same as 2091 plus utility operations, chemical manufacturing, aluminum smelting[3]


**P100**
**Applications:**
Same as 2091 plus chemical manufacturing, undercoating[1]


**P100**
**Applications:**
Same as 2091
• hard shell

3M Series 6000 Half Facepiece

6100 Small
6200 Medium
6300 Large

C1

3M Series 6000 Full Facepiece

6700 Small
6800 Medium
6900 Large

## 17. PPE Plan A) Respiratory (continued)

**Selection Guide for Respiratory Protection in Construction**

**3M Selection Guide for Reusable Respirators**

**PPE Highlights by CHEMM**

| Assigned Protection Factors[6] | | | | | | |
|---|---|---|---|---|---|---|
| Type of Respirator [1,2] | Quarter mask | Half mask (filtering facepiece) | Half mask (elastomeric) | Full facepiece | Helmet/ hood | Loose-fitting facepiece |
| Air-Purifying Respirator | 5 | 1[3] | 10[4] | 50 | | |
| Powered Air-Purifying Respirator (PAPR) | | | 50 | 1,000 | 25/1,000[5] | 25 |
| Supplied-Air Respirator (SAR) or Airline Respirator | | | | | | |
| • Demand mode | | | 10 | 50 | | |
| • Continuous flow mode | | | 50 | 1,000 | 25/1,000[5] | 25 |
| • Pressure-demand or other positive-pressure mode | | | 50 | 1,000 | | |
| Self-Contained Breathing Apparatus (SCBA) | | | | | | |
| • Demand mode | | | 10 | 50 | 50 | |
| • Pressure-demand or other positive-pressure mode (e.g., open/closed circuit) | | | | 10,000 | 10,000 | |

## Bottle Attendant Worksheet

| CERTIFICATE OF ANALYSIS | # OF AIR CYLINDERS | REGULATORS | EQUALIZED PSI | RESERVE PSI (LP 500 / 1100 HP) | BREATHING RATE | HORIZONTAL HOSE DISTANCE (7 PSI FL) | VERTICAL HOSE DISTANCE (9 PSI FL) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| BOTTLE ATTENDANT | # OF PEOPLE | FULL VOLUME | CALCULABLE USABLE AIR | CYLINDER DIVIDER | MINUTES OF AIR | PRIMARY RESPIRATOR | BACKUP RESPIRATOR |
| | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MAX 1 PERSON PER AIR CYLINDER | 1 AIR CYLINDER @ 2400 PSI ~ 2HR OF AIR | MAX 8 PEOPLE TO A REGULATOR | WHERE FILLED VS WHERE USED | DO NOT HOT AIR SWAP | DO NOT TURN ON ESCAPE PACK PRIOR TO USE | CHECK FOR CERTIFY RECEIPT | 3 WAYS VIBE ALERT WILL FAIL |
| MINIMUM MOISTURE DEW POINT AT 1 ATM IS 10° < AMBIENT TEMP | TAG MOST RECENT, DATED, SIGNATURE AT COMPRESSOR | AIR PURITY CO < 10 PPM CO2 < 1000 PPM | COUPLINGS ARE NOT COMPATIBLE WITH OTHER NON RESPIRABLE SYSTEM OUTLETS | | RESPIRATOR SELECTION, PROPER FIT, USAGE, MAINTENANCE, INSPECTION, LIMITATIONS AND CAPABILITIES, HOW TO USE IN CASE OF MALFUNCTION | | |
| BREATHING RATE 1.5 -2.0 | CALCULABLE USABLE AIR PSI -> LPM X = Y ( A - B ) Z | r * # PEOPLE = R (X / R) = MIN OF AIR (M) M / 60 MIN = HR DECIMAL : 100 = (T) : 60 MIN & SEC TIME CONV | X = VOLUME OF AIR | Y = # OF CYLINDERS | A = EQUALIZED REGULATOR GAUGE PSI | B = RESERVE PSI (25% OR ~500PSI) | Z = CYLINDER DIVIDER (FULL VOLUME / FULL PSI ~ 300FT^3 / 2400PSI = .125) |

# Glove Compatibility Chart

## Permeation/Degradation Resistance Guide for Ansell Gloves

The first square in each column for each glove type is color coded. This is an easy-to-read indication of how we rate this type of glove in relation to its applicability for each chemical listed. The color represents an overall rating for both degradation and permeation. The letter in each square is for Degradation alone…

- GREEN: The glove is very well suited for application with that chemical.
- YELLOW: The glove is suitable for that application under careful control of its use.
- RED: Avoid use of the glove with this chemical.



| CHEMICAL | LAMINATE FILM BARRIER | | | NITRILE SOL-VEX | | | UNSUPPORTED NEOPRENE 29-865 | | | SUPPORTED POLYVINYL ALCOHOL PVA | | | POLYVINYL CHLORIDE (Vinyl) SNORKEL | | | NATURAL RUBBER CANNERS AND HANDLERS* | | | NEOPRENE/ NATURAL RUBBER BLEND CHEM-PRO* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Degradation Rating | Permeation: Breakthrough | Permeation: Rate | Degradation Rating | Permeation: Breakthrough | Permeation: Rate | Degradation Rating | Permeation: Breakthrough | Permeation: Rate | Degradation Rating | Permeation: Breakthrough | Permeation: Rate | Degradation Rating | Permeation: Breakthrough | Permeation: Rate | Degradation Rating | Permeation: Breakthrough | Permeation: Rate | Degradation Rating | Permeation: Breakthrough | Permeation: Rate |
| 1. Acetaldehyde | ■ | 380 | E | P | — | — | E | 10 | F | NR | — | — | NR | — | — | E | 7 | F | E | 10 | F |
| 2. Acetic Acid | ■ | 150 | — | G | 270 | — | E | 60 | — | NR | — | — | F | 180 | — | E | 110 | — | E | 260 | — |
| 3. Acetone | ▲ | >480 | E | NR | — | — | E | 10 | F | P | — | — | NR | — | — | E | 10 | F | G | 10 | G |
| 4. Acetonitrile | ▲ | >480 | E | F | 30 | F | E | 20 | G | ■ | 150 | G | NR | — | — | E | 4 | VG | E | 10 | VG |
| 5. Acrylic Acid | — | — | — | G | 120 | — | E | 390 | — | NR | — | — | NR | — | — | E | 80 | — | E | 65 | — |
| 6. Acrylonitrile | E | >480 | E | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 7. Allyl Alcohol | ▲ | >480 | E | F | 140 | F | E | 140 | VG | P | — | — | P | 60 | G | E | >10 | VG | E | 20 | VG |
| 8. Ammonia Gas | ■ | 19 | E | ▲ | >480 | — | ▲ | >480 | — | — | — | — | ■ | 6 | VG | — | — | — | ■ | 27 | VG |
| 9. Ammonium Fluoride, 40% | — | — | — | E | >360 | — | E | >480 | — | NR | — | — | E | >360 | — | E | >360 | — | E | >360 | — |

1. Select Chemical of interest
2. Look for Green Square
3. Select Glove Type




## 18. Risk Matrix

| RISK MATRIX Chart 1 | | | | | | | | PROBABILTY | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Almost Impossible (1) | Not likely to Occur (2) | Could Occur (3) | Known to Occur (4) | Common Occurrence (5) |
| | REGIMES | Health & Safety | Environmental Impacts | Financial & Asset Loss | Reputational Damage | Production / Projects | Information Technology | Occurs less than once in 10,000-man hours | Occurs once in 1,000-to-10,000-man hours | Occurs once in 100-to-1,000-man hours | Occurs once in 10-to-100-man hours | Occurs once in 1-to-10-man hours |
| SEVERITY | Catastrophic (5) | One or more fatalities, irreversible health problems for employees and/or community | One or more fatalities, irreversible health problems for employees and/or community | On or off-site spill causing groundwater pollution with detrimental long-term effects | Sever financial loss or asset replacement cost impact. (> US $2 million) | International loss of reputation / Damaging international TV exposure with impact | Indefinity cessation of production activity / Extended | **5 Medium** | **10 High** | **15 High** | **20 Extreme** | **25 Extreme** |
| | Major (4) | Partial, or medium term, disabilities, or major health problems for employees and/or community | Partial, or medium term, disabilities, or major health problems for employees and/or community | Off-site release, contained & medium-term effects on community health and or groundwater | Major financial loss or asset cost impact. (> US $1 million) | National loss of reputation / damaging national TV exposure with impact on costumers. | Long-term production cutback / major project schedule slip of 40 to 75% of plan. | **4 Medium** | **8 Medium** | **12 High** | **16 High** | **20 Extreme** |
| | Moderate (3) | Lost time injuries or potential medium-term health problems for employees and/or community. | .Lost time injuries or potential medium-term health problems for employees and/or community. | On site release contained & restored with medium-term effects on employees / groundwater. | Moderate financial loss or asset cost impact. (> US $100,000 < US $1 million) | Regional loss of reputation / local radio & newspaper reports impacting suppliers / customers. | Medium-term production cutback / project schedule slip of 20-40% of plan. | **3 Low** | **6 Medium** | **9 Medium** | **12 High** | **15 High** |
| | Minor (2) | Minor, very short-term health concerns or recordable injury cases. | Minor, very short-term health concerns or recordable injury cases. | On site release immediately contained & restricted with no short-term effects. | Tolerable financial loss or asset cost impact (> US $10,000 < US $100,000) | Loss of regional reputation by word of mouth | Short-term production cutback / minor project schedule slip of 10 to 20% of plan. | **2 Very Low** | **4 Medium** | **6 Medium** | **8 Medium** | **10 High** |
| | Insignificant (1) | Inherently safe, unlikely to cause health problems. First Aid injuries | Inherently safe, unlikely to cause health problems. First Aid injuries | Minor localized spills with insignificant effects on employees and/or community. | Relatively low financial loss or asset cost impact (< US $ 10,000) | Unsubstantiated rumors with light to moderate impact on reputation | Very short-term production cutback / schedule slip of up to 10% plan. | **1 Very Low** | **2 Very Low** | **3 Low** | **4 Medium** | **5 Medium** |

## 18. Risk Matrix (continued)

| RISK MGMT % Chart 2 | INSUFFICIENT | | | | | | | MARGINAL | | | | | QUESTIONABLE | | | | BOMBPROOF | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NO RMP | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% | 90% | 95% |
| **EXTREME** | 25 | 24 | 23 | 21 | 20 | 19 | 18 | 16 | 15 | 14 | 13 | 11 | 10 | 9 | 8 | 6 | 5 | 4 | 3 | 1 |
| | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| **HIGH** | 16 | 15 | 14 | 14 | 13 | 12 | 11 | 10 | 10 | 9 | 8 | 7 | 6 | 6 | 5 | 4 | 3 | 2 | 2 | 1 |
| | 15 | 14 | 14 | 13 | 12 | 11 | 11 | 10 | 9 | 8 | 8 | 7 | 6 | 5 | 5 | 4 | 3 | 2 | 2 | 1 |
| | 12 | 11 | 11 | 10 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 5 | 5 | 4 | 4 | 3 | 2 | 2 | 1 | 1 |
| | 10 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 4 | 4 | 3 | 3 | 2 | 2 | 1 | 1 |
| **MEDIUM** | 9 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 3 | 2 | 1 | 1 | 1 |
| | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 |
| | 6 | 6 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **LOW** | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| PPE (1%. each) | Administrative (5% each) | Engineering (6% each) | | Isolation (20% each) | Hierarchy of Hazard Control | (%) |
|---|---|---|---|---|---|---|
| ☐ Dermal | ☐ Permitting | ☐ Monitoring | ☐ Hazard Control | ☐ LOTO | Elimination | 100 |
| ☐ Respiratory | ☐ Hazard Space Joint Meeting | ☐ Ventilation | ☐ Decon | ☐ Zoning | Substitution | 90 |
| ☐ Fall | ☐ Signage, Labels and Placards | ☐ Rigging | ☐ Medical | | Isolation | 40 |
| ☐ Medical | | | | | Engineering | 36 |
| | | | | | Administrative | 15 |
| | | | | | PPE | 4 |

1 / .75 / .5 / .25 5 / 3.75 / 2.5 / 1.25 6 / 4.5 / 3 / 1.5 20 / 15 / 10 / 5 P / A / C / E

**18. Risk Management Plan Adjusted Risk Value**

1) Chart 1, determine the severity for the potential loss or consequence of the hazard space job scope = _____
2) Chart 1, determine the probability of the potential loss or consequence = _____
3) Chart 1, determine the risk (use the number where probability and severity intersect) = _____
4) PACE the subplans utilized (100% of full potential points for Primary, 75% of potential points for Auxiliary, 50% for Contingent, 25% for Emergent)
5) Chart 2, total and round the percentage points for the subplans (this is arbitrary and can be adjusted to the nearest % listed) = _____
6) Multiply the number from step 3 by the percentage in step 5 for the Risk Management Plan (RMP) adjusted risk value = _____