MONTHLY REFRESHER TRAINING
Process Safety Management
December Week 1 — Taking The Field

1. **Employee Involvement** — TEAM HUDDLE Safety talks, JHAs, pre-job briefs, and observations. Everyone participates. Everyone has a voice. A strong huddle prevents a bad play.

2. **Process Safety Information** — SCOUTING REPORT Know your opponent: chemical behavior, flammability, reactivity, corrosivity, safe limits, incompatibilities. You don't run the play unless you know the field.

3. **Process Hazard Analysis** — FILM STUDY
Learn from past failures, near misses, breakdowns, and "what-if" scenarios. PHAs expose how the opponent has beaten teams before. Film study prevents repeat losses.

4. **Operating Procedures** — PLAY CALLS
Written, step-by-step instructions for how to do the job safely. If the play changes mid-game, call timeout — don't improvise. The playbook exists so no one runs the wrong route.

5. **Training** — PRACTICE DRILLS
Repetition builds instinct. Instinct builds confidence. Confidence keeps you calm when the field gets loud. Every player must know their assignment.

6. **Contractor Safety** — SPECIAL TEAMS
We run the hardest, highest-risk plays. We must know the hazards, the boundaries, and the rules of each PSM zone. No solo plays — always coordinated. Special Teams wins or loses the game in seconds.

A normal jobsite becomes a PSM field the moment the chemical chameleons show up in force — when enough of them are stored, pumped, or moved to cross OSHA's threshold quantity. Once those quantities are hit, the stadium changes. New rules apply. New plays must be run. The field becomes high-hazard territory identified as a PSM area.

Hexane morphs into the Sprinter — low, invisible vapor already downfield before a rookie notices the snap. Sulfuric acid shifts into the Lineman — forcing through steel and generating heat with every move. Pressure systems morph into the Blitzbacker — quiet one moment, explosive the next.

And these aren't the only Chemical Chameleons. There are more, each with their own tendencies, reactions, and formations. Just image Space Jam with their monstrous appearance standing over the All Star.

Once this team takes the field, the stadium fills with players and plays. Operations running the offense, engineering holding the defensive line, fire watch scanning for sparks, gas testers reading the air, and contractors lined up inches from the hazard.

That's why OSHA requires a playbook. That's why this is a PSM field in which there are 14 elements, each designed to identify, control and prevent catastrophic chemical releases.

WHO IS ON THE FIELD
Chemical Chameleons — Opposing Team — Their behavior shapes every play
Operations — Offense — Runs the process safely
Engineering/Safety — Defense — Build and maintain safeguards
Contractors/Maintenance — Special Teams — Execute high-risk plays (repairs, shutdowns, hot work)

THE PLAYBOOK EVERY PLAYER CARRIES
Once the chemical chameleons take the field, the stadium hands out the official playbook to everyone — **operators, engineering, fire watch, gas testers, and contractors stepping onto the turf.** OSHA requires this playbook and requires it to be followed.

Inside the PSM playbook you'll find:

The SOPs that tell us exactly how each play is supposed to run. The permits that decide when Special Teams enter the formation. The isolations and blinds that lock Chemical Chameleons in place during work. The emergency play to call when a Chameleon breaks formation. The worst-case scenario play that's written long before the game starts
On a PSM field, success isn't about improvising. It's about running the plays exactly as written.

POSSESSION — THE ONLY THING THAT DECIDES THE GAME
Possession = control of the process.

If we keep possession: pressure stays steady, vapors stay contained, temperatures stay right, equipment behaves, chameleons stay boxed in.

If they take possession: fire, explosion, toxic release, injury, shutdown, catastrophic consequences.

There is no next drive. No redo. No second half.

We protect possession because they know what the chameleons can do with the ball.

WHAT WE MUST KNOW
Contractors work closest to the Chemical Chameleons. So we MUST know what the PSM is telling us.

- **What we're dealing with** — "What chemical is here? How does it move? How does it change form? What sets it off?"
- **How it reacts when things break down** — Some chameleons move low. Some go airborne. Some explode with heat. Some corrode steel quietly. Some release stored energy in one violent motion.
- **How we hold the line** — Mechanical Integrity is reading the signs the chameleons give off.
- **How we work around them safely** — isolations, blinds, lockout, ventilation, gas testing, PPE, Hot Work permits.

WHEN THE FIELD SHIFTS — RECOGNIZING THE BLITZ
Pressure creeps. A smell appears. Vapor flickers. A pump tone changes. A single alarm chirps.

Yellow flag = pause the play.
Red flag = play over, clear the field, run the two-minute drill described in the PSM.

PROTECTING POSSESSION
Never hand the ball to someone who doesn't know the playbook. (The PSM)

We know where these locations are and what's in there. If you are ever unsure of the PSM areas where you are working, ask your supervisor!

We are the ringers on a PSM field. We run the plays with discipline. We read the formations early. We protect possession. We throw the flag when something shifts. We execute the two-minute drill when needed.
And we walk off the field safely because that is the win that counts.

7. **Pre-Startup Safety Review** — PRE-GAME WARMUP Before a new or modified system starts, everything must be checked: equipment, communication, isolations, valves, guards. No kickoff until the field is ready.

8. **Mechanical Integrity** — STRENGTH & CONDITIONING Inspect, test, repair, and maintain equipment: pumps, lines, tanks, hoses, supports, sensors, reliefs. If something is worn, corroded, or vibrating wrong—the opponent sees that weakness too.

9. **Hot Work Permits** — SIGNAL FROM THE SIDELINE No sparks without the signal: gas testing, authorization, fire watch. Hot work changes the entire field instantly. One missed signal can hand the ball to the opponent.

10. **Management of Change** — FORMATION SHIFT When equipment, chemicals, or procedures change — the whole play changes. Stop, regroup, reassess. New formation = new risks = new responsibilities.

11. **Incident Investigation** — POST-GAME FILM REVIEW Break down what went wrong, why it happened, and how the opponent got through. Learn the lesson, update the playbook, and don't run the same mistake twice. Every loss teaches the next victory.

12. **Emergency Planning & Response** — TWO-MINUTE DRILL
The emergency play is already written in the PSM. When the red flag flies, we don't improvise — we follow the plan. This play is about calm, discipline, and life safety.

13. **Compliance Audits** — SEASON REVIEW
Check the plays, check the performance, check the discipline. Are we following the playbook? Are the plays still good? Championship teams review their season.

14. **Trade Secrets** — PLAYBOOK SECURITY
Every worker has the right to know the hazards, limits, and risks associated with the process. Hazard knowledge is not optional — it's required. You can't run plays from a sealed playbook.

MONTHLY REFRESHER TRAINING
SDS Pictogram Review
DECEMBER WEEK 2 – SDS RECRUITING REVIEW

Centurion Safety Education

#	Section	Football Terms	Why It Matters
1	Identification	Jersey & Team Info	Product name, manufacturer, emergency contact.
2	Hazard Identification	Combine Results	Lists hazards and pictograms—how this "player" performs under stress and gives the signal word.
3	Composition / Ingredients	Team Roster	What's inside, who this player runs with.
4	First Aid Measures	Trainer's Instructions	Immediate response to exposure.
5	Fire-Fighting Measures	Defensive Play Call	Proper extinguisher class and isolation steps.
6	Accidental Release Measures	Fumble Recovery Plan	Contain and clean spills safely.
7	Handling & Storage	Locker Assignment	Correct storage and separation.
8	Exposure Controls / PPE	Protective Gear	Uniform requirements
9	Physical & Chemical Properties	Player Metrics	Flash point, vapor pressure, density.
10	Stability & Reactivity	Temper Rating	What it reacts with; how volatile it gets.
11	Toxicological Info	Injury History	Health effects from exposure.
12–15	Environmental / Disposal / Transport / Regulatory	League Rules	Travel, disposal, and compliance details.
16	Other Info	Coach's Notes	Revision date — review when a supplier changes.

Every chemical has a stat line, now respect the data.
THE SCOUTING REPORT: WHAT A SDS IS! In football, no coach takes the field without reviewing the scouting report. You study your opponents. You study their strengths, weaknesses, and tendencies. Winning starts with knowing what you're up against. In the safety world, that scouting report is called the Safety Data Sheet/

The 16 Sections of an SDS = Your Scouting Data.
A SDS tells you everything about a chemical before you step onto the field.
- What it's made of
- How dangerous it is
- How it reacts
- How to protect yourself if things go wrong

SDS Signal Word – Coach's Tone on the Scouting Report
Every SDS uses one — and only one — Signal Word to tell you how severe the hazard is. There are only two options:

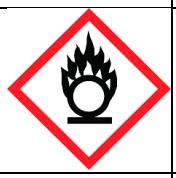
🔴 **DANGER** – Highest Hazard Level - Used for chemicals that can cause severe burns, immediate toxicity, explosions, rapid fire spread, or irreversible damage.
Football Translation: Full Blitz — maximum pressure; one mistake equals big consequences.
🟠 **WARNING** – Moderate Hazard Level - Used for chemicals that can cause irritation, dizziness, reversible health effects, mild burns, or harm with repeated exposure.
Football Translation: Zone Coverage — threat is real but controlled; avoid sloppy mistakes.
Summary: DANGER = Most severe hazard ("full blitz"). WARNING = Serious but manageable ("zone coverage").

Your Questions Before the game can really be broken down into four parts:

Question	SDS Section	Purpose
Who are you playing against?	Sections 1–3 (Identification, Hazards, Composition)	Tells you what the chemical is and what it can do.
How can you get hurt?	Sections 4–8 (First Aid, Fire, Accidental Release, PPE)	Explains exposure routes, health risks, and protection.
What happens under pressure?	Sections 9–10 (Physical/Chemical Properties, Stability)	Shows flammability, flash points, reactivity, and stability.
What's the game plan?	Sections 11–16 (Toxicology, Disposal, Transport, Regulations)	Teaches safe storage, disposal, and transport.

Pictograms - THE HALL OF FAME ROSTER

Before you even read half the SDS, your eyes should go straight to the pictograms. These are the chemical's position icons — quick visuals that tell you exactly what kind of "player" you're dealing with. Every SDS uses the same set of GHS symbols, and each one signals a different threat level: flammable, toxic, corrosive, reactive, and more.
To make them easier to remember, here's the Hall of Fame roster — the football legends whose playing style mirrors how each hazard behaves on the field.

Every chemical play is unique	Hall of Fame Player	Why They're Dangerous
Flame (Flammable) - Flammable liquids, gases, and vapors ignite easily. One spark can cause fire.	**Bo Jackson** Raiders 	Bo Jackson was **instant acceleration**. No buildup, no warm-up, just explosive power the moment the ball touched his hands. Flammables behave the same way: **One spark, one static pop, one hot surface — and they're gone.**
Flame Over Circle (Oxidizer) Oxidizers intensify fire and make other materials burn hotter.	**Barry Sanders** Detroit Lions 	Barry Sanders took small plays and exploded them into highlights. Oxidizers do the same — they turn a small flame into a raging reaction, amplifying everything around them.
Exploding Bomb (Explosive / Reactive) Explosive or reactive chemicals can detonate suddenly and violently.	**Brett Favre** Green Bay Packers 	Brett Favre was the ultimate boom-or-bust QB — unpredictable, high-energy, and capable of massive game-changing plays in an instant. Explosive hazards behave the same way: stable one moment, total detonation the next.
Corrosion (Corrosive to Skin/Metal) Corrosive chemicals burn skin, eyes, and eat through metal and PPE.	**Reggie White** Packers/ Eagles 	Reggie White bulldozed through protection like it wasn't there. Corrosives do the same — relentlessly eating through barriers and equipment.
Gas Cylinder (Compressed Gas) Compressed gas can explode if dropped, heated, or punctured.	**Troy Polamalu** Steelers 	Polamalu was calm before the snap, then launched like a missile. Compressed gas looks harmless until pressure releases — then all stored energy hits at once.
Skull and Crossbones (Acute Toxicity) Highly toxic — can cause serious or fatal effects quickly.	**Brian Urlacher** Chicago Bears 	Urlacher ended plays instantly — direct, decisive, no build-up. Acute toxins strike the same way: exposure leads to fast, severe consequences.
Health Hazard (Chronic) Chronic hazards cause long-term damage: cancer, organ damage, fertility issues.	**Peyton Manning** Colts/ Broncos 	Peyton didn't win with one big hit — he wore you down with precision over time. Chronic hazards do the same: small exposures add up into major long-term harm.
Environmental Hazard Harms waterways, wildlife, soil, and ecosystems — long-term impact.	**Ray Lewis** Baltimore Ravens 	Ray Lewis didn't just affect one player — he affected the entire field environment. Environmental hazards have that same field-wide, long-term influence.
Exclamation Mark (Irritant) Causes irritation: coughing, dizziness, skin rash, eye burn, or allergic reactions.	**Hines Ward** Pittsburgh Steelers 	Hines Ward was the ultimate irritant — annoying, distracting, always in your way. Irritant hazards won't kill you, but they ruin your day and cause mistakes.

MONTHLY REFRESHER TRAINING
EXTRACTION PROCESS & HEXANE SAFETY
December Week 3 — When the Sprinter Takes the Field

THE PROCESS

1. Extraction Process

In industrial processing, extraction uses a solvent—often hexane—to separate oil from material. Hexane dissolves oils, the mixture is separated, and the hexane is recovered and reused. This is a hazardous process because hexane is highly flammable and can form explosive mixtures with air.

Extraction Broken Down
1. Material is washed with warm hexane.
2. Hexane dissolves the oil and carries it away.
3. Hexane evaporates, is captured, cooled, and reused.

2. Why This Area Falls Under PSM

If a facility stores or uses more than OSHA's threshold quantity of hexane, the process becomes regulated under Process Safety Management (PSM). This requires written procedures, mechanical integrity, training, hot work controls, emergency planning, and SDS access.

THE SPRINTER — HEXANE'S ROLE ON A PSM FIELD

Once hexane steps onto the field, it becomes the Sprinter:

- Fast: Already halfway downfield before someone notices
- Flammable: Highly flammable in presence of open flames and sparks, of heat
- Low to the ground (Heavier than air –Hexane will sink when exposed to the atmosphere.)
- Invisible

This makes extraction efficient — and extremely high-hazard. Hexane vapor is flammable, heavy, and able to travel to ignition sources.

PSM FIELD RULES — HOW WE KEEP POSSESSION

1. REPORT ANY FIELD SHIFT Unusual odors, leaks, noises, vapor movement, alarms — these are signs the Chameleons are changing formation. Yellow flag: pause the play. Red flag: stop the work and clear the field.	**3. HOT WORK = SPECIAL TEAMS ONLY** Permits are required for welding, cutting, grinding, torch work, or any spark-producing tools. Special Teams plays are run only when the playbook calls for it, the atmosphere is tested, fire watch is posted, and safeguards are in place.
2. ELECTRONICS STAY ON THE BENCH In extraction zones, unless approved and intrinsically safe, keep the following out: - Cell phones - Smart watches - Earbuds - Key fobs - Cameras- Battery tools - Non-IS flashlights or radios Any battery-powered device can create a tiny spark. Hexane vapor needs almost nothing to ignite.	**4. NO SPARK-PRODUCING ITEMS WITHOUT AUTHORIZATION** No lighters, matches, cigarettes, vapes, grinders, saws, welders, or tools capable of producing friction sparks, electrical arcs, or static discharge.

POSSESSION — THE ONLY THING THAT DECIDES THE GAME

Keeping possession means vapors contained, pressures steady, temperatures controlled, and no sparks. If the Chemical Chameleons take possession: fire, explosion, toxic release, shutdown, no second half.

n-Hexane Safety Data Sheet (SDS)

SDS #: 388.5
Revision Date: October 20, 2015
Save SDS to Your Library

SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

n-Hexane

Flinn Scientific, Inc. P.O. Box 219, Batavia, IL 60510 (800) 452-1261
Chemtrec Emergency Phone Number: (800) 424-9843

Signal Word
DANGER

SECTION 2 — HAZARDS IDENTIFICATION

Hazard class: Flammable liquids (Category 2). Highly flammable liquid and vapor (H225). Keep away from heat, sparks, open flames, and hot surfaces. No smoking (P210).
Hazard class: Aspiration hazard (Category 1). May be fatal if swallowed and enters airways (H304).
Hazard class: Skin corrosion or irritation (Category 2). Causes skin irritation (H315).
Hazard class: Specific target organ toxicity, single exposure; Narcotic effects (Category 3). May cause drowsiness or dizziness (H336). Avoid breathing mist, vapors or spray (P261).
Hazard class: Reproductive toxicity (Category 2). Suspected of damaging fertility or the unborn child (H361). Obtain special instructions before use (P201). Do not handle until all safety precautions have been read and understood (P202). Use personal protective equipment as required (P281).
Hazard class: Specific target organ toxicity, repeated exposure (Category 2). May cause damage to organs through prolonged or repeated exposure (H373). Do not breathe mist, vapors or spray (P260).

Pictograms

SECTION 3 — COMPOSITION, INFORMATION ON INGREDIENTS

Component Name	CAS Number	Formula	Formula Weight
n-Hexane	110-54-3	$CH_3(CH_2)_4CH_3$	86.18

SECTION 4 — FIRST AID MEASURES

If exposed or concerned: Get medical advice or attention (P308+P313).
If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing (P304+P340).
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing.
If on skin or hair: Immediately remove all contaminated clothing. Rinse skin with water (P303+P361+P353). **If skin irritation occurs:** Get medical advice or attention (P332+P313).
If swallowed: Rinse mouth. Do not induce vomiting. Call a POISON CENTER or physician if you feel unwell.

SECTION 5 — FIRE FIGHTING MEASURES

Class IB flammable liquid.
Flash point: -22 °C Flammable limits: Upper 7.5% Lower: 1.1% Autoignition Temperature: 225 °C
When heated to decomposition, may emit toxic fumes.
In case of fire: Use tri-class dry chemical fire extinguisher (P370+P378).

NFPA Code H-2 F-3 R-0

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Remove all ignition sources and ventilate area. Contain the spill with sand or other inert absorbent material and deposit in a sealed bag or container. See Sections 8 and 13 for further information.

SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #3.
Store with hydrocarbons, oils, esters and aldehydes. Store in a cool, dry place. Keep container tightly closed (P233). Keep cool (P235). Ground or bond container and receiving equipment (P240). Use explosion-proof electrical and ventilating equipment (P241). Use only non-sparking tools (P242). Take precautionary measures against static discharge (P243). Use only in a hood or in a well-ventilated area (P271).

SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Wear protective gloves, protective clothing, and eye protection (P280). Wash thoroughly after handling (P264). Use only in a hood or in a well-ventilated area (P271).
Exposure guidelines: TLV 50 ppm (ACGIH); PEL 500 ppm (OSHA); IDLH 1100 ppm

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES
Clear, colorless liquid. Weak, characteristic odor.
Soluble in alcohol and ether. Not miscible with water.
Explosion limits: 1.2 vol% (lower) 7.4 vol% (upper)
Boiling point: 69 °C Melting point: -95 °C
Flash point: -23 °C Ignition temp: 240 °C
Refractive index: 1.375
Specific gravity: 0.6591 Density at 20 °C: 0.659 g/cm3
Vapor density: 3 Vapor pressure at 20 °C: 160 hPa

SECTION 10 — STABILITY AND REACTIVITY
Avoid heat, sunlight, and ignition sources. Reacts with oxidizing agents.
Shelf life: Good.

SECTION 11 — TOXICOLOGICAL INFORMATION
Acute effects: Eye, skin, and mucous membrane irritant. Headache, peripheral neuropathy, dizziness, dermatitis.
Chronic effects: Nervous system and reproductive system damage.
Target organs: Skin, PNS, lung, kidneys, liver, brain, reproductive system.
ORL-RAT LD_{50}: 25 g/kg
IHL-RAT LC_{50}: 48,000 ppm/4H
SKN-RBT LD_{50}: N.A.

SECTION 12 — ECOLOGICAL INFORMATION
Toxic to aquatic life. EC50 Daphnia 3878 mg/L/48H

SECTION 13 — DISPOSAL CONSIDERATIONS
Please review all federal, state and local regulations that may apply before proceeding.
Flinn Suggested Disposal Method #18b is one option.

SECTION 14 — TRANSPORT INFORMATION
UN number: UN1208 Shipping name: hexanes. Hazard class: 3, Flammable liquids. Packing group: II

SECTION 15 — REGULATORY INFORMATION
TSCA listed.

SECTION 16 — OTHER INFORMATION
This Safety Data Sheet (SDS) is for guidance and is based upon information and tests believed to be reliable.
Revision Date: October 20, 2015

MONTHLY REFRESHER TRAINING
COLD STRESS
December Week 4 — Warmups

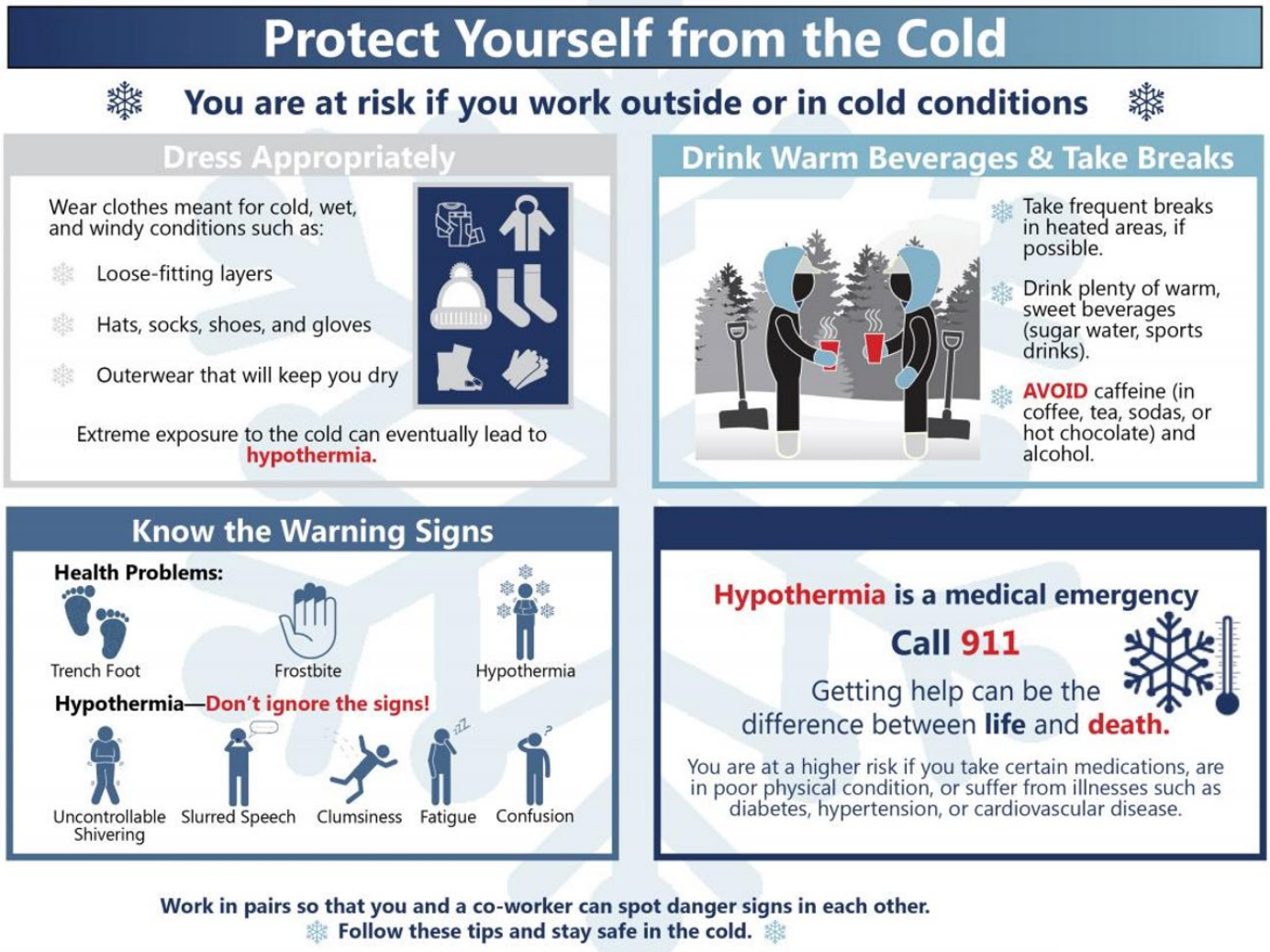
Centurion Safety Education

THE COLD CHANGES THE GAME
Cold weather is one of the most underestimated hazards on a job site. It affects grip strength, reaction time, decision-making, and balance.

When the cold cuts in and the wind won't quit,
That's when sharp crews gear up and commit.
Watch your buddy close, keep your warmth in mind
Cold stress hits fast, so don't get left behind.

Key Statistics:
- Cold environments cause a 14–20% decrease in hand dexterity.
- Grip strength can drop by 25–30% when fingers are cold.
- Over half of cold-related incidents happen within the first hour of exposure.
- Wind chill can make exposed skin freeze in as little as 10 minutes at extreme temps.

WHAT COLD STRESS DOES TO YOUR BODY
Cold stress happens when your body loses heat faster than it can produce it. This leads to:
- Loss of coordination
- Slow reflexes
- Poor grip
- Mental fog or confusion
- Increased slips and falls
- Strain on the heart



THE BIG THREE: WARNING SIGNS

1. Hypothermia

Early Signs:

- Shivering
- Pale or cold skin
- Numbness
- Slow thinking
- Trouble with fine motor tasks

Advanced Signs:

- Slurred speech
- Confusion
- Stumbling
- Slow movements
- Shivering stops (emergency)

2. Frostbite

Early Signs:

- Redness
- Tingling
- Pins and needles
- Skin feels firm

Advanced Signs:

- Waxy or bluish skin
- Stiff skin
- Complete numbness
- Blisters after rewarming

3. Trench Foot

Early Signs:

- Tingling or burning
- Redness or blotchy patches
- Swelling
- Numbness
- Cramping
- "Prune-like" skin

HYDRATE

Cold weather drains your body faster than most people realize. When temperatures drop, the human body burns more calories, uses more energy, and loses hydration more rapidly — even if you don't feel thirsty. To stay safe and maintain performance, workers must hydrate and fuel correctly throughout cold-weather operations.

Warm water helps maintain core temperature and supports circulation.

- Keeps blood flowing to fingers and toes
- Prevents cold-induced cramping
- Reduces shivering intensity
- Rehydrates the body faster than cold water

Warm water = hydration + internal heat support.

Sports drinks provide fast-acting energy and replace minerals lost through cold exposure.

- Replaces electrolytes (sodium, potassium, magnesium)
- Restores muscle function
- Provides simple carbs for immediate heat and energy
- Reduces fatigue and keeps reaction time sharp

Sports drinks = fuel your body uses instantly.

Electrolytes keep the nervous system functioning correctly.

- Prevent muscle cramping
- Maintain mental clarity
- Keep the heart and muscles firing properly
- Help stabilize body temperature during exposure

Electrolytes = nerve and muscle protection in the cold.

WHAT TO AVOID

Caffeine (coffee, tea, sodas, energy drinks) increases heat loss and dehydration.

- Speeds up dehydration
- Restricts blood flow to hands/feet
- Causes jitteriness, reducing fine-motor control
- Can worsen cold-induced heart strain

Caffeine + cold = cold hands, poor grip, and faster heat loss.

Alcohol is extremely dangerous in cold weather.

- Drops core temperature rapidly
- Makes you feel warm while cooling your core
- Slows reaction time and judgment
- Increases risk of hypothermia

Alcohol + cold = a fast-track to medical emergencies.

Energy Drinks combine caffeine, stimulants, and sugars.

- Spike and crash effect leads to fatigue
- Increase dehydration
- Strain the heart during cold exposure
- Reduce coordination and grip strength

Energy drinks = temporary hype, long-term danger