

**the**  
**human**  **energy**  
**company**<sup>®</sup>



**preventing  
serious injuries  
and fatalities**

**field guide**

plan, prepare, deliver and learn

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## **purpose**

This field guide is a simple tool for people who perform work that could potentially cause a serious injury or fatality. It helps work teams identify hazards and safeguards for different tasks. This guide can be used before and during the different phases of work to make sure the work gets done safely.

## **this guide is intended for:**

- Frontline supervisors planning and preparing high-risk work
- Frontline workers performing hazard analysis and delivering work
- Leaders, safety professionals and Verification and Validation (V&V) coaches during field visits

## **control of work (CoW) guide**

Control of work process was created to consistently manage workplace safety and health hazards and to prevent workforce serious injuries and fatalities (SIF).



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## plan

Identifies and evaluates the steps and controls required to prevent workforce injuries and fatalities while achieving the desired outcome in an efficient and cost-effective manner.



## prepare

Authorizes work as defined in the planning phase, assesses site conditions for unplanned changes, and verifies controls are in place and functioning immediately prior to the work starting.



## deliver

Work is conducted according to plan, regularly monitored for any deviations and stopped immediately if unsafe conditions arise.

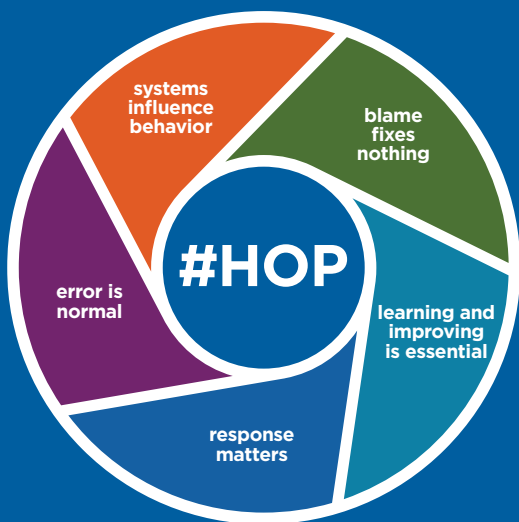


## learn

Captures operational learning to increase Chevron's performance and reliability for future tasks. Work authorizations are closed out.

# the role of human and organizational performance (HOP)

HOP is the way work systems, culture, processes and equipment interact as one system.



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## error traps build on each other and increase the likelihood of error

### organizational

- Changes
- Time pressure
- Inadequate training
- Unclear roles and responsibilities
- Organizational peer pressure
- Poor communication
- Poor job planning

### individual

- Stress
- Fatigue
- Distraction
- Fitness for duty
- Risk tolerance
- Complacency
- Overconfidence



### task demands

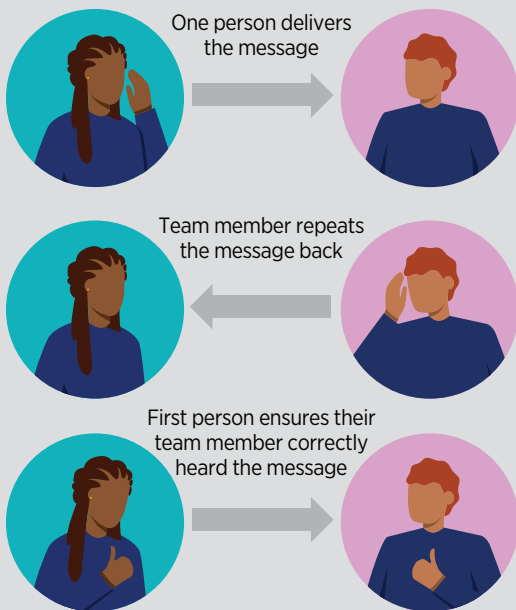
- Vague or poorly written guidance/procedures
- High workload, multitasking
- Simultaneous operations
- Infrequent or first-time tasks
- Inadequate job planning or design

### work environment

- Operational upset
- Inadequate labels, signs, displays
- Confusing system feedback
- Poor equipment interface
- Limited tool availability/accessibility
- Challenging peer interactions

# error-reduction tools

## three-way communication



## speaking, pointing and checking

- Stop and focus, remove distractions
- Understand the task
- Speak the step and expected outcome
- Point to the item/component/equipment
- Check that you got the expected outcome

## **pre-job brief**

- Immediately before tasks
- Always before a critical step
- Always before a nonrecoverable step

## **commit to:**

- Review work instructions
- Review hazard analysis during Tool Box Talk
- Identify additional hazards
- Verify all safeguards are effective and functioning
- Review written procedure and standards
- Assign roles and responsibilities
  - Identify and discuss personal tendency error traps
- Discuss all four categories of error traps
- Identify start/stop conditions

## **post-job review**

- Complete each job or day with a post-job review/debrief
- Capture successes and any unexpected changes
- Integrate learning into future work and planning

Ask these questions:

- What safeguards worked?
- Were they effective and functioned as expected?
- Which HOP tools did you use and were they effective?
- What contributed to the error?
- What can we do to improve next time?





## **step-by-step place-keeping**

- Used with standard operating procedures (SOP), hazard analysis
- Review the procedure
- Follow as written
- One step at a time, in order
- Without adding or eliminating steps
- Physically mark steps in the procedure

## **stop and get help if you are concerned**

## **start work checks**

- A tool that incorporates two HOP aspects – checklists and a peer review/check
- Used for work that could potentially result in a serious injury or fatality
- Final check immediately before work is executed

# figure it out safely

for frontline workers

pause



assess



act

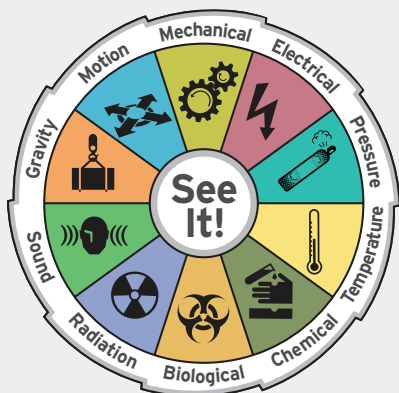


## pause and get help if you find yourself thinking:

- This seems different
- This doesn't seem right
- This doesn't look how it was planned/described
- This isn't like what I expected
- This is my first time doing this task

# identifying a hazard

A hazard is a condition or action that has the potential for an unplanned release or unwanted contact with an energy source that may result in harm or injury to people, property or the environment.



## what is the hazard identification wheel?

- A visual aid that helps you focus on hazard recognition
- A simple method to help you complete daily activities and tasks safely

# energy sources



## gravity

The force caused by the attraction of all other masses to the mass of the earth.

**Examples:** falling object, collapsing roof and a body tripping or falling



## motion

The change in position of objects or substances.

**Examples:** vehicle, vessel or equipment movement; flowing water; wind and body positioning when lifting, straining or bending



## mechanical

The energy of the components of a mechanical system, i.e., rotation, vibration or motion within an otherwise stationary piece of equipment or machinery.

**Examples:** rotating equipment, compressed springs, drive belts, conveyors and motors



## electrical

The presence and flow of an electric charge.

**Examples:** power lines, transformers, static charges, lightning, energized equipment, wiring and batteries



## pressure

Energy applied by a liquid or gas that has been compressed or is under a vacuum.

**Examples:** pressure piping, compressed cylinders, control lines, vessels, tanks, hoses and pneumatic and hydraulic equipment



## temperature

The measurement of differences in the thermal energy of objects or the environment which the human body senses as either heat or cold.

**Examples:** open flame; ignition sources; hot or cold surfaces, liquids or gases; steam; friction; and general environmental and weather conditions



## chemical

The energy present in chemicals that inherently or through reaction has the potential to create a physical or health hazard to people, equipment or the environment.

**Examples:** flammable vapors, reactive hazards, carcinogens or other toxic compounds, corrosives, pyrophorics, combustibles, oxygen-deficient atmospheres, welding fumes and dusts



## biological

Living organisms that can present a hazard.

**Examples:** animals, bacteria, viruses, insects, blood-borne pathogens, improperly handled food and contaminated water



## radiation

The energy emitted from radioactive elements or sources and naturally occurring radioactive materials (NORM).

**Examples:** lighting issues, welding arcs, solar rays, microwaves, lasers, X-rays and NORM scale

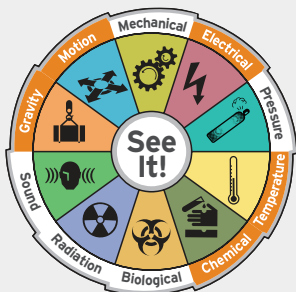


## sound

Sound is produced when a force causes an object or substance to vibrate and the energy is transferred through the substance in waves.

**Examples:** equipment noise, impact noise, vibration, high-pressure release and the impact of noise to communication

# confined spaces



hazards		safeguards
Hazardous atmosphere		Energy isolation, gas testing and ventilation
Engulfment		Energy isolation, rescue plan, rescue equipment and emergency response
High heat		Ventilation
Fire/explosion		Energy isolation, gas testing and ventilation
Fall from height		Fall prevention and fall protection
Electrocution		Energy isolation

## how to recognize and act on common error traps

**error trap:** Poor job planning

**Example:** Improper classification of confined space, improper selection of ventilation and/or rescue equipment, untrained work team

**error-reduction tools:**

Start Work Check; stop and get help

**error trap:** Poor communication

**Example:** Unable to communicate with those entering the space or the rescue team

**error-reduction tools:**

Start Work Check; 3-way communication

**error trap:** Unclear roles and responsibilities

**Example:** Confined space attendants, supervisor and rescue team do not understand their roles and responsibilities

**error-reduction tools:**

Pre-job brief; pause and get help

**error trap:** Limited tool availability/accessibility

**Example:** Gas testing, ventilation and/or rescue equipment is inadequate

**error-reduction tools:**

Start Work Check; pause and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner**

- Are there lessons learned from previous jobs to consider?
- Are there alternatives to performing confined space entry?
- What type of confined space will be entered?
- What procedures are available for this work?
- What work will be done in the space? Has a trained work team been identified?
- Is ventilation needed? Where will the ventilation be located?
- What type of rescue is needed? Who will develop the rescue plan? How was the rescue plan developed?
- Is there an isolation plan? How was it developed? How can the work team verify the plan?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team, Rescue Team**

- How did the work team verify the confined space is isolated per isolation plan?
- Has ventilation been installed? How did the work team verify it is adequate?
- Are entry points open and ready?
- Where is the rescue equipment located? Is the rescue team available?
- How does the work team know it is working? Is the gas testing equipment onsite, calibrated and in the hole?



## deliver

### **Permit Approver, Permit Holder, Work Team, HSE Rep, Rescue Team**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- How was the pre-job briefing conducted with the work team?
- Have the needed Start Work Checks been identified and their controls physically verified? How was this work done and by whom?
- How was work authorization completed?



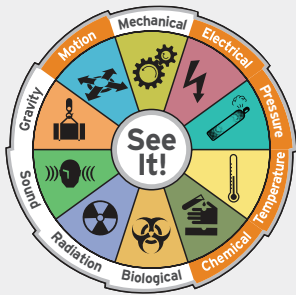
## learn






### **Permit Approver, Permit Holder, Work Team, HSE Rep, Rescue Team**

- How was the task completed compared to how it was planned?
- What challenges did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.



# energy isolation



hazards		safeguards
Release of stored pressure		Isolation plan, isolation equipment properly rated, positive physical isolation and isolation devices
Electrocution		Isolation plan, test before touch, isolation devices
Struck by objects		Isolation equipment (restraint, anchor), exclusion zone
Hazardous atmosphere		Zero energy verification, gas testing and respiratory protection
Fire/explosion		Zero energy verification, cold work alternatives, isolation equipment, gas testing, firefighting equipment

## how to recognize and act on common error traps

**error trap:** Complacency

**Example:** Not verifying zero energy/temperature

**error-reduction tools:**

Speak, point and check; Start Work Check

**error trap:** Vague or poorly written procedures

**Example:** Isolation plan or drawings unclear and don't show all the isolation points

**error-reduction tools:**

Step-by-step place-keeping; speak, point and check

**error trap:** Inadequate labels, signs, displays

**Example:** Lines, drawings or panels labeled incorrectly

**error-reduction tools:**

Start Work Check; stop and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner, Permit Approver**

- Are there lessons learned from previous jobs to consider?
- What type of work requires isolation (location, work activity and service of equipment)?
- What procedures are available for this work?
- How were isolation methods determined (e.g., Positive Physical Isolation, Verified Valve Isolation, Unverified Valve Isolation)?
- How were isolation points identified on P&ID or drawing?
- What steps were taken to de-energize and isolate equipment? What methods will be used to verify isolation?
- What steps will be taken to re-energize equipment and de-isolate?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team**

- What type of isolation devices will be used and where are they located (locks/tags/lock box)?
- Where is the isolation plan and what is the sequence of isolations?
- How were the electrical circuits de-energized/locked out?
- How did the work team verify blinds/spades/skillets were installed per the isolation plan? How did the work team verify they are rated for the equipment?
- How did the work team verify valves/bleeders/vents are open or closed per plan?
- How and where was zero energy verification done? For electrical isolation, test before touch.

- Is the gas testing equipment onsite, calibrated? How does the work team know it is working (bump tested, functionality check)?



## deliver

### **Permit Approver, Permit Holder, Work Team, HSE Rep**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Have the needed Start Work Checks been identified?
- How was the pre-job briefing conducted with the work team?
- Have the controls on Start Work Checks been physically verified? How was this done and by whom?
- How was work authorization completed?

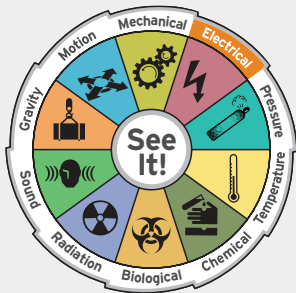


## learn

### **Permit Approver, Permit Holder, Work Team, HSE Rep**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.

# energized/live electrical



## hazards

Electrocution/shock



## safeguards

PPE rated for electrical hazard, restricted access zones established, standby person in place, certified insulated tools and test equipment rated for the task, personnel are qualified to work on rated equipment

## hazards

Arc flash/burns



## safeguards

PPE rated for electrical hazard, restricted access zones established, certified insulated tools and test equipment rated for the task, personnel are qualified to work on rated equipment

## how to recognize and act on common error traps

**error trap:** Inadequate training

**Example:** Not having the qualifications to work on live electrical systems

**error-reduction tools:**

Start Work Check; stop and get help

**error trap:** Infrequent or first-time tasks

**Example:** Infrequently work on live electrical conductors

**error-reduction tools:**

Start Work Check; step-by-step place-keeping

**error trap:** Risk tolerance

**Example:** Low sense of vulnerability based on voltage

**error-reduction tools:**

Start Work Check; stop and get help

**error trap:** Overconfidence

**Example:** Highly qualified individuals who perform work on live electrical systems may lose sense of vulnerability

**error-reduction tools:**

Start Work Check; 3-way communication

**error trap:** Inadequate labels, signs, displays

**Example:** Cannot see the electrical current going through conductors, equipment may be mislabeled or confusing

**error-reduction tools:**

Speak, point and check; stop and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, Permit Approver, HSE Rep, Planner**

- Are there lessons learned from previous jobs to consider?
- Can the electrical energy be isolated?
- What procedures are available for this work?
- Where will the electrical work be done?
- Will the work be completed in the restricted or limited approach boundary?
- What type of tools and special PPE will be needed?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team, Standby Person**

- Are insulated tools and special PPE available and inspected? How did the work team verify they are inspected?
- How was the exclusion zone established and a standby person identified?



## deliver

### **Permit Approver, Permit Holder, Work Team, HSE Rep, Standby Person**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Have the needed Start Work Checks been identified?
- How was the pre-job briefing conducted with the work team?
- Have the controls on Start Work Checks been physically verified? How was this done and by whom?



## learn









### **Permit Approver, Permit Holder, Work Team, HSE Rep, Standby Person**

- How was the task completed compared to how it was planned?
- What challenges did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.



# excavation



hazards		safeguards
Underground line strike	 	Excavation plan, underground line survey/line finding/line marking, spotter, emergency response procedure
Overhead line strike		Excavation plan, exclusion zone, spotter, emergency response procedure
Cave in		Protective systems (sloping, benching, shoring), access and egress, dewatering (as needed), rescue plan and equipment (if confined space), emergency response procedure
Asphyxiation		Gas testing
Fire/explosion		Gas testing
Fall from height		Excavation plan, barricades, exclusion zones
Struck by equipment		Excavation plan, barricades

## how to recognize and act on common error traps

**error trap:** Poor job planning

**Example:** Location of excavation and/or underground lines are not verified, improper sloping/shoring

**error-reduction tools:**

Start Work Check; speak, point and check; stop and get help

**error trap:** Distraction

**Example:** People working around excavation area

**error-reduction tools:**

Start Work Check; 3-way communication

**error trap:** Inadequate labels, signs, displays

**Example:** Underground/overhead lines not marked or marked incorrectly

**error-reduction tools:**

Start Work Check; stop and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner**

- Are there lessons learned from previous jobs to consider?
- What procedures are available for this work?
- Where will the work team excavate? Can it be moved away from overhead and underground lines?
- Is the underground line survey complete? Who will review the line survey? How will excavation around underground lines in excavation area be managed (hand digging/hydro excavation)?
- How will the excavation plan be developed? Who will develop the plan?
- Will the work team enter the excavation? Have protective systems been identified and how will they be used?
- Will the excavation be a confined space? How was the determination made? See **Confined Space** section.
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team, Rescue Team (if required)**

- Did the work team verify the excavation area? How did the work team verify there were no underground or overhead lines in the area?
- How did the work team establish an exclusion zone? How will it be marked?
- Where is the shoring equipment located (If required)?
- Where is dewatering equipment located (If required)?
- Is the gas testing equipment onsite, calibrated? How does the work team know it is working (bump test, functional check)?



## deliver

### **Permit Approver, Permit Holder, Work Team, HSE Rep, Rescue Team (If required)**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Have the needed Start Work Checks been identified?
- How was the pre-job briefing conducted with the work team?
- Have the controls on Start Work Checks been physically verified? How was this done and by whom?
- How was work authorization completed?

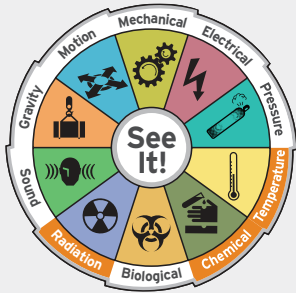






## learn

### **Permit Approver, Permit Holder, Work Team, HSE Rep, Rescue Team (If required)**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.

# hot work



hazards		safeguards
Hazardous atmosphere		Energy isolation, gas testing, ventilation, equipment purge
Fire/explosion		Energy isolation, gas testing, ventilation, hot work alternatives, intrinsically safe equipment
Flammable and combustible material		Energy isolation, gas testing, ventilation, hot work alternatives, equipment purge
Arc flash/burns		PPE

## how to recognize and act on common error traps

**error trap:** Complacency

**Example:** Not verifying that drains, vents and seals are protected from ignition sources

**error-reduction tools:**

3-way communication; Start Work Check

**error trap:** Vague or poorly written procedures

**Example:** Not verifying isolation points

**error-reduction tools:**

Stop and get help; step-by-step place-keeping

**error trap:** High workload/multitasking

**Example:** Not verifying safeguards when welding on a vessel or tank while in service

**error-reduction tools:**

Stop and get help; speak, point and check



## plan

### **Facility/Area Supervisor, Frontline Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Planner**

- Are there lessons learned from previous jobs to consider?
- Are there hot work alternatives (cold work) for this job?
- What procedures are available for this work?
- Where will the hot work occur? Is it inside or near a classified hazardous area?
- Will equipment be isolated/purged from potential flammable/combustible material? How will this be done?
- Will hot work be performed on a live equipment (hot tapping)? What type of service? What is the procedure?
- Is the work team trained?



## prepare

### **Frontline Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team**

- How was the equipment de-energized, purged and isolated from flammable/combustible material?
- How did the work team verify blinds/spades/skillets were installed per the isolation plan? How did the work team verify they are rated for the equipment (if required)?
- How did the work team verify valves/bleeders/vents are open or closed per isolation plan (if required)?
- How and where was zero energy verification done (if required)?
- Is the gas testing equipment onsite, calibrated? How does the work team know it is working (bump test, functional check)?



## deliver

### **Frontline Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Have the needed Start Work Checks been identified?
- How was the pre-job briefing conducted with the work team?
- Have the controls on Start Work Checks been physically verified? How was this done and by whom?
- How was work authorization completed?



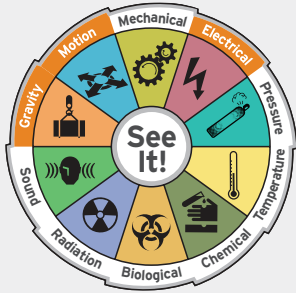
## learn




### **HSE Rep, Permit Approver, Permit Holder, Work Team**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.



# mechanical lifting



hazards		safeguards
Dropped load/failure of lifting equipment		Certified and inspected equipment, secure load, crane set up properly, exclusion zone, trained and qualified riggers and operator
Struck by load		Stay out of line of fire, confirm clear load path, exclusion zone, flagman
Overhead line strike		Confirm and avoid overhead power lines <b>(Look Up and Live)</b> , marked exclusion zone is away from overhead lines, spotters, communication with operators

## how to recognize and act on common error traps

**error trap:** Poor communication

**Example:** Poor communication between operators and flagman

**error-reduction tools:**

Start Work Check; 3-way communication

**error trap:** Distraction

**Example:** Multiple people providing direction and hand signals to operators

**error-reduction tools:**

Start Work Check; 3-way communication

**error trap:** Simultaneous operations

**Example:** Multiple work teams working around mechanical lift equipment

**error-reduction tools:**

Start Work Check; 3-way communication; stop and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner**

- Are there lessons learned from previous jobs to consider?
- What procedures are available for this work?
- Has the location of the lifting equipment been identified?
- Do we have appropriate crane for the weight of the load? How was this determined?
- Has the type of lift been identified? How was this determined?
- Has a lift plan been developed?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team**

- How were weather conditions evaluated?
- Have overhead power lines been identified and mitigated (if applicable)? How was this done?
- How will the lifting equipment be setup?  
How will we know the equipment is stable? (solid surface, outriggers)?
- Have red zones (exclusion zones) been identified and barricaded for lift?
- Are red zones (exclusion zones) are in place and functioning as intended?



## deliver

### **Permit Approver, Permit Holder, Work Team, HSE Rep**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Have the needed Start Work Checks been identified?
- How was the pre-job briefing conducted with the work team?
- Have the controls on Start Work Checks been physically verified? How was this done and by whom?
- How was work authorization completed?

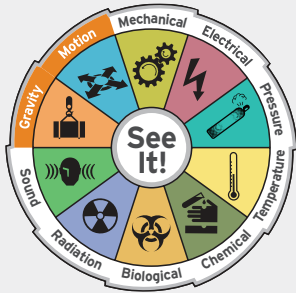






## learn

### **Permit Approver, Permit Holder, Work Team, HSE Rep**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.

# man riding



hazards		safeguards
Falling to a lower level		Certified winch (approved for man riding), secondary fail-safe brake system, fall arrest system, rescue plans
Dropped objects		Tool lanyards, tool bags, temporary, equipment log, tools-at-height inventory, exclusion zones
Contact with rotating or lifting equipment/ with overhead obstructions		Mechanical isolation, certified winch (approved for man riding) tension limiter, rescue plan, agreed communication
Suspension trauma		Relief straps, rescue plan

## how to recognize and act on common error traps

**error trap:** Poor communication

**Example:** Visual obstructions making it difficult for operator to see hand signals, blocked visibility operator unable to see person providing hand signals

**error-reduction tools:**

Speak, point and check; 3-way communication; stop and get help

**error trap:** Infrequent or first-time task

**Example:** Not a routine activity

**error-reduction tools:**

3-way communication

**error trap:** Inadequate labels, signs, displays

**Example:** Lines, drawings or panels labeled incorrectly

**error-reduction tools:**

Start Work Check; 3-way communication; Speak, point and check; stop and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner, Stand By**

- Are there lessons learned from previous jobs to consider?
- What is the scope of work and where is it located?
- Are there man-riding alternatives for this job?
- What procedures are available for this work?
- Is the rigging approved for the man-riding winch? How can we verify?
- Is the rigging and man-riding equipment available? How was it inspected?
- What SIMOPS (operations or other) are planned in the area? Have SIMOPS hazards been mitigated?
- How do we know exclusion zones won't affect evacuation routes?
- How was the rescue plan developed? Who will develop the rescue plan?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team, Stand By**

- How were weather conditions evaluated?
- Are the rotating and lifting devices in the immediate area isolated? How did the work team verify?
- Have considerations for managing dropped objects been addressed (tool lanyards, exclusion zones)?
- Have exclusion zones been identified and barricaded for job?
- Are exclusion zones in place and functioning as intended?
- Where is the rescue equipment located?



## deliver

### **Frontline Supervisor/Work Team Lead, HSE Rep, Work Team, Stand By**

- What is the work plan and how was it shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Have the needed Start Work Checks been identified?
- How was the pre-job briefing conducted with the work team?
- Have the controls on Start Work Checks been physically verified? How was this done and by whom?
- How was work authorization completed?



## learn






### **HSE Rep, Permit Approver, Permit Holder, Work Team, Planner**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.



# rig floor tubular handling



hazards		safeguards
Improper lifting device, misidentified tubular		Elevator change-out log, exclusion zone, stand-back areas
Failure of equipment		Certified lifting devices, exclusion zone, stand-back areas
Contact with obstructions (winch lines, hoses, temporary equipment)		Temporary equipment log, communication plan, secondary retention, exclusion zone, stand-back areas
Stacking out		Communication plan, exclusion zone, stand-back areas
Faling object(s)		Tool tethers, exclusion zones, stand-back areas

## how to recognize and act on common error traps

**error trap:** Poor communication

**Example:** Language barrier, high-noise area

**error-reduction tools:**

Speak, point and check; 3-way communication; stop and get help

**error trap:** High workload/multitasking

**Example:** Communicating with multiple co-workers, monitoring/participating in more than one work activity

**error-reduction tools:**

3-way communication

**error trap:** Infrequent first-time task

**Example:** Inexperienced personnel on the rig floor  
Short Service Employees (SSE) involved with job

**error-reduction tools:**

Start Work Check; pre-job briefing;  
3-way communication; speak, point and check;  
stop and get help



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Driller/Tool Pusher**

- Are there lessons learned from previous jobs to consider?
- What is the scope of work and where is it located?
- What procedures are available for this work?
- What SimOps (operations or other) are planned in the area? Have SimOps hazards been mitigated?
- How do we know exclusion zones won't affect evacuation routes?
- What lifting devices will be used? How was it inspected?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Work Team**

- Are there any weather conditions that could affect the work?
- Have considerations for managing dropped objects been addressed (tool lanyards, exclusion zones)?
- Where are the stand-back areas? How were they identified?
- How was temporary equipment logged?
- How and when was lifting equipment inspected?
- Are exclusion zones in place and functioning as intended?
- Does the work team understand latching requirements?



## deliver

### **Frontline Supervisor/Work Team Lead, HSE Rep, Work Team**

- How was the work plan shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Were Start Work Checks identified?
- How was the pre-job briefing conducted with the work team?
- How were the controls on the Start Work Checks verified?
- How was work authorization completed?







## learn

### **HSE Rep, Permit Approver, Permit Holder, Work Team, Planner, Driller, Tool Pusher**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.

# work around mobile equipment (WAME)



hazards		safeguards
Struck by equipment		Exclusion zone, worksite isolation/barriers, spotters, high-visibility garment, proximity alarm/sensor, communication, load securing
Equipment rollover		Premobilization inspection, spotter/flagger, proximity alarm/sensor
Noise		PPE, remove workers from area
Low visibility		High-visibility clothing (vests)

## how to recognize and act on common error traps

**error trap:** Distraction

**Example:** Not verifying safeguards are in place to keep pedestrians away from mobile equipment

**error-reduction tools:**

Start Work Check; pre-job brief;  
3-way communication

**error trap:** Inadequate job planning or design

**Example:** Not verifying equipment travel paths and pedestrian paths are identified

**error-reduction tools:**

Start Work Check; pre-job brief

**error trap:** Simultaneous operations

**Example:** Not verifying safeguards when personnel and additional mobile equipment is in proximity

**error-reduction tools:**

Start Work Check; pre-job brief



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner**

- Are there lessons learned from previous jobs to consider?
- What is the scope of work and where is it located and what type of mobile equipment will be used?
- Are personnel required to be in proximity to mobile equipment (spotters)?
- What procedures are available for this work (traffic management plan)?
- Are there geographical challenges where work will occur that would prevent safe operation of mobile equipment?
- Is the work team trained?



## prepare

### **Frontline Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team/Person Performing Work**

- Does the work area meet the traffic plan determined in planning?
- How was the work area set up? Does the work area separate workers from mobile equipment?
- How did the work team establish an exclusion zone? How will it be marked?
- Are exclusion zones in place and functioning as intended?



## deliver

### **Permit Approver, Permit Holder, Work Team, HSE Rep**

- How was the work plan shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Were Start Work Checks identified?
- How was the pre-job briefing conducted with the work team?
- How were the controls on the Start Work Checks verified?
- How was work authorization completed?



## learn








### **Permit Approver, Permit Holder, Work Team, HSE Rep, Planner**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.



# work at height



hazards		safeguards
Falling to a lower level		Fall-prevention system, fall-arrest system, relief straps, rescue plan
Dropped objects (tools, equipment)		Tool lanyards, tool bags, toe boards, temporary equipment log, tools at height inventory, netting, exclusion zones
Environmental conditions (wind, lightning)	 	Weather monitoring, rescue plan
Live electrical lines		Electrical isolation, insulating materials, rescue plan
Inadequately supported surfaces		Fall-arrest system, NDT testing, rescue plan
Suspension trauma		Relief straps, rescue plans

## how to recognize and act on common error traps

**error trap:** Complacency

**Example:** Personnel not understanding fall distance

**error-reduction tools:**

Start Work Check; stop and get help

**error trap:** Limited tool availability/accessibility

**Example:** Personnel using incorrect lanyard

**error-reduction tools:**

Start Work Check; pre-job brief

**error trap:** Overconfidence

**Example:** Personnel not maintaining 100% tie off

**error-reduction tools:**

Start Work Check



## plan

### **Facility/Area Supervisor, Front Line Supervisor/Work Team Lead, HSE Rep, Planner, Stand By**

- Are there lessons learned from previous jobs to consider?
- What is the scope of work and where is it located?
- For scaffolds, what provisions will be made to build away from overhead power lines? **Refer to electrical standard.**
- Will the work at height be around open holes? How will they be managed (hard barricades, covers)?
- Is there work-at-height alternatives for this job? Determine the best tool to use for the work at height, including portable ladders.
- What procedures are available for this work?
- What SimOps (operations or other) are planned in the area? Have SimOps hazards been mitigated?
- How do we know exclusion zones won't affect evacuation routes?
- How was the rescue plan developed? Who will develop the rescue plan (if applicable)?
- Where will rescue personnel and equipment be staged or located?
- Is the work team trained?



## prepare

### **Front Line Supervisor/Work Team Lead, HSE Rep, Permit Approver, Permit Holder, Work Team, Stand By**

- What special work-at-height PPE will be needed and is it available?
- How and when was all safety equipment inspected?
- Are all tools and equipment tethered, or how will tools be tethered?
- How did the work team establish an exclusion zone/controlled area? How will it be marked?

- How will open holes be managed throughout the shift (hard barricades, covers)?
- Are exclusion zones in place and functioning as intended?
- Is the rescue team available?



**deliver**

**Frontline Supervisor/Work Team Lead, HSE Rep, Work Team**

- How was the work plan shared with the work team?
- How was the hazard analysis developed and shared with the work team?
- What Stop-Work Triggers were discussed by the work team?
- Were Start Work Checks identified?
- How was the pre-job briefing conducted with the work team?
- How were the controls on Start Work Checks verified?
- How was work authorization completed?



**learn**

**HSE Rep, Permit Approver, Permit Holder, Work Team, Planner**

- How was the task completed compared to how it was planned?
- What obstacles did the work team find?
- What changes to the plan need to be considered for future work? Incorporate lessons learned into planning phase.

# common abbreviations

abbreviations	
<b>GFCI</b>	Ground-fault circuit interrupter
<b>HSE</b>	Health, Safety and Environment
<b>NDT</b>	Non-destructive testing
<b>P&amp;ID</b>	Piping and instrument diagram
<b>PPE</b>	Personal protective equipment
<b>RCD</b>	Residual current device
<b>SIMOPS</b>	Simultaneous operations
<b>SOP</b>	Standard Operating Procedure
<b>SWC</b>	Start Work Check
<b>TBT</b>	Tool Box Talk
<b>V&amp;V</b>	Verification and Validation

# tenets of operation

1. **Always** operate within design and environmental limits.
2. **Always** operate in a safe and controlled condition.
3. **Always** ensure safety devices are in place and functioning.
4. **Always** follow safe work practices and procedures.
5. **Always** meet or exceed customers' requirements.
6. **Always** maintain integrity of dedicated systems.
7. **Always** comply with all applicable rules and regulations.
8. **Always** address abnormal conditions.
9. **Always** follow written procedures for high-risk or unusual situations.
10. **Always** involve the right people in decisions that affect procedures and equipment.



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