Chevron Wafra Joint Operations

See It!

Mechanical · Electrical · Pressure · Temperature · Chemical · Biological · Radiation · Sound · Gravity · Motion

preventing serious injuries and fatalities

field guide

plan, prepare, deliver and learn

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).

QR code for internal use only

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.
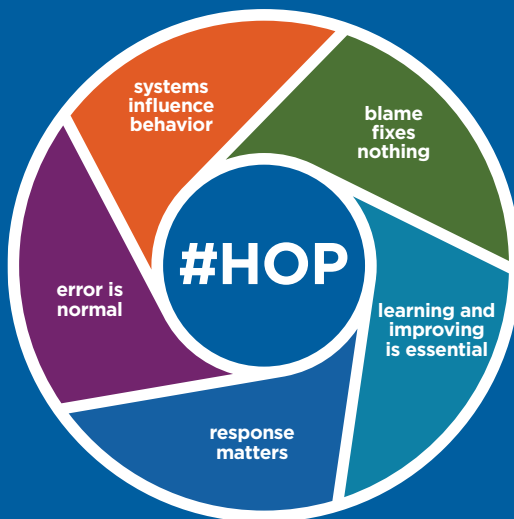
learn

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.

- systems influence behavior
- blame fixes nothing
- learning and improving is essential
- response matters
- error is normal

#HOP

QR code for internal use only

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
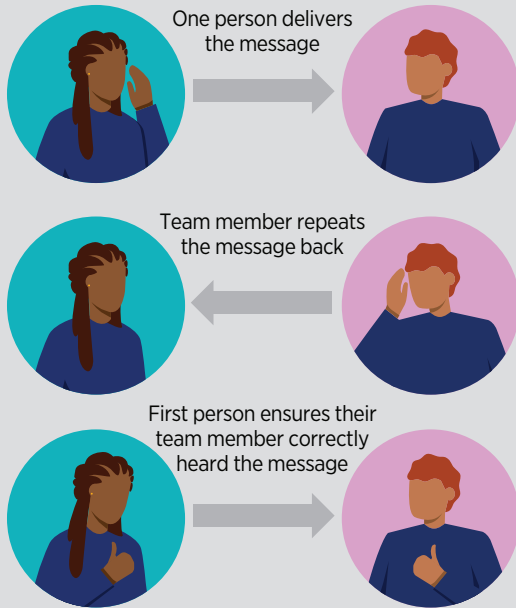
Risk tolerance

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

One person delivers the message

Team member repeats the message back

First person ensures their team member correctly heard the message

speak, point and check
- 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.
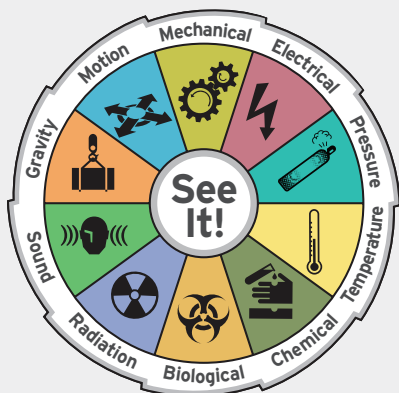
what is the hazard identification wheel?

- 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
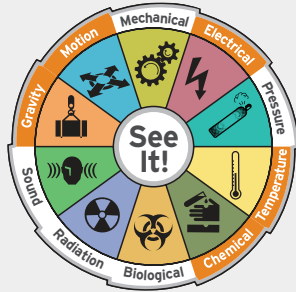
sound
Sound is produced when a force causes an object or substance to vibrate and the energy is transferred through the substance in waves.
Examples: equipment noise, impact noise, vibration, high-pressure release and the impact of noise to communication

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?
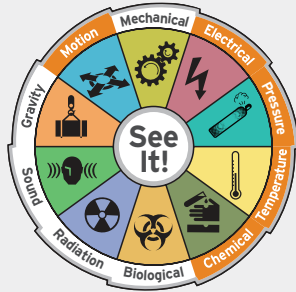- How was work authorization completed?

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?
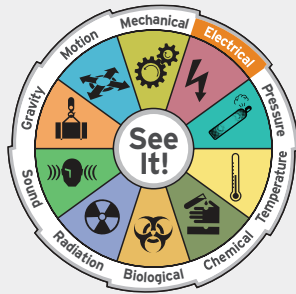- How was work authorization completed?

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		safeguards
Electrocution/shock		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
Arc flash/burns		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?
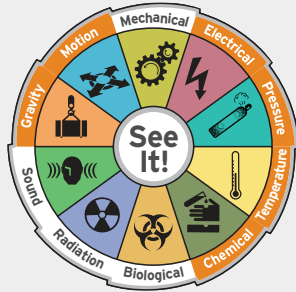

learn

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?
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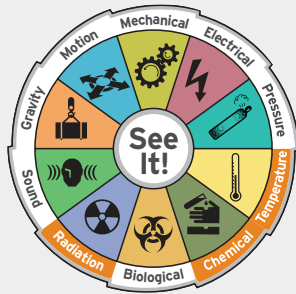- How was work authorization completed?

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?
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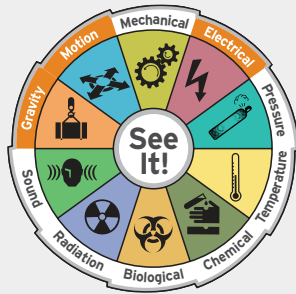- How was work authorization completed?

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 **(Look Up and Live)**, 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?
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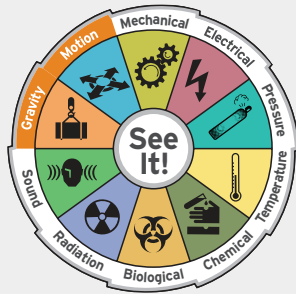- How was work authorization completed?

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?
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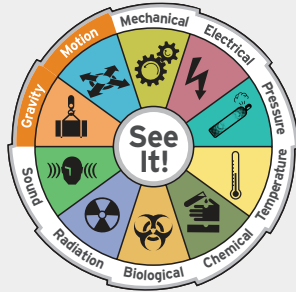- How was work authorization completed?

learn

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

- How was the task completed compared to how it was planned?
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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)
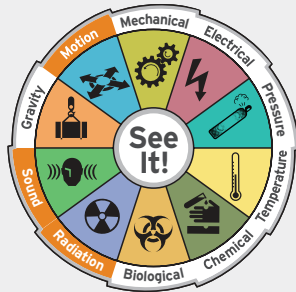
hazards		safeguards
Struck by equipment		Exclusion zone, worksite isolation/ barriers, spotters, high-visibility garment, proximity alarm/sensor, communication, load securing
Equipment rollover		Premobilization inspection, spotter/ flagger, proximity alarm/sensor
Noise		PPE, remove workers from area
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?
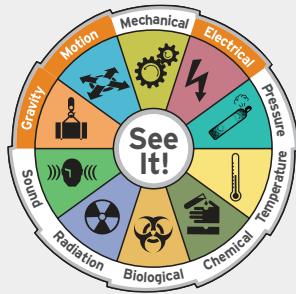- How was work authorization completed?

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