

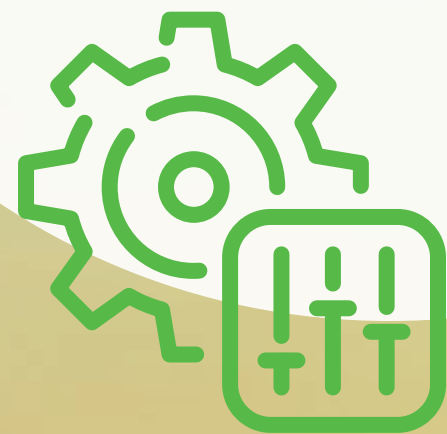
# TURNAROUND





# WHAT IS A TURNAROUND (TA)?

A turnaround represents a significant maintenance project where a “plant” is taken off line in order to execute the work.



Often this is driven from a statutory requirement (Pressure equipment, cranes and passenger ropeways).



With the plant offline it provides an opportunity to conduct work and remove vulnerabilities, defects or implement capital projects.



As a result a Turnaround represents a short duration high intensity work period.





# TURNAROUND – A SIGNIFICANT RISK

Turnarounds are non-routine, troublesome, complex, and potentially more hazardous than normal plant operations.

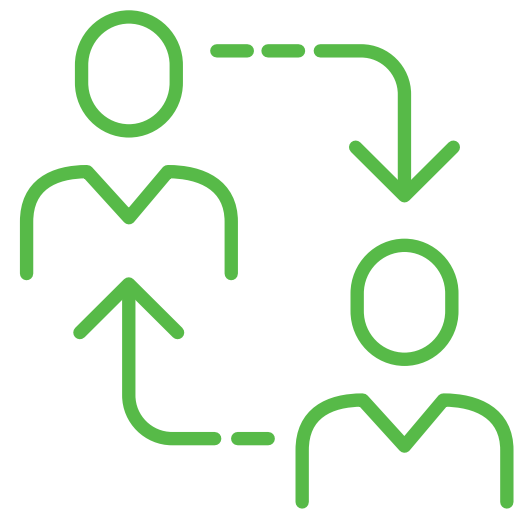
The situation becomes more complex and hazardous when revamp of the unit is also involved along with turnaround.

Moreover, a short shutdown for partial maintenance of equipment is also a big safety risk because some sections of the unit remain pressurized with process chemicals.

Safety must be the top priority in every step of turnaround otherwise accidents may happen.

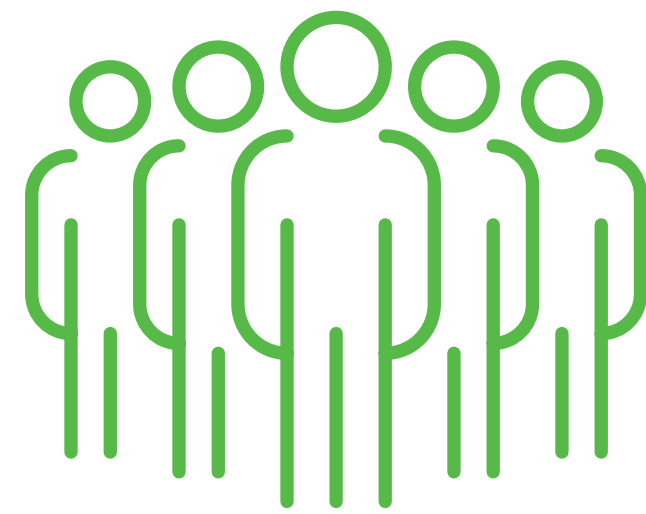


# COMMUNICATION BETWEEN TEAMS



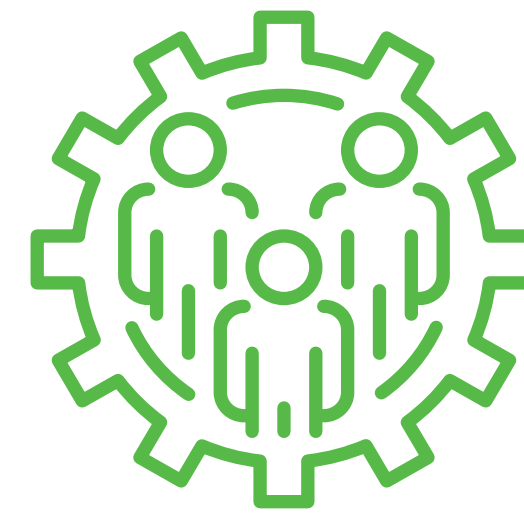
## Shift Handover

Used to ensure that the oncoming shift is fully aware of work state, current hazards, warning signs, changes, that could potentially impact progress forward



## Community Meetings

Used to provide oversight to the whole turnaround, and particularly focus on SIMOPs between teams



## Toolbox talks

To utilize knowledge from the shift handover, community meeting, and the job site to clearly explain all the risks



## Daily reporting

Daily tracking of progress against the plan. Ensure that impact to the workfronts (recording of progress) is minimized as much as possible such that progress is not impacted

# COMMUNICATION OF HAZARDS DURING TURNAROUND



Good communication is the key to safety at process plants.

If shift handovers are not handled well with good communication, then the consequences can be devastating.

**According to the data,**

...more than  
**40%** of plant incidents

**occur during start-up, shutdown, and shift handover periods.**



Operations personnel must convey the specific state of the process at the point of shift handover in verbal as well as written format.

# HIGHER NUMBERS OF PEOPLE ON SITE

**In TA or shutdown, there might be five to six times higher workforce than the normal worker traffic. Further, many of whom may be unfamiliar with the site and its potential hazards.**

Administrative controls must be applied to keep away the workers from potential plant hazards. Because some of the employees can be unfamiliar with the working environment.

In addition, safety inductions must be properly implemented and Contractor Competencies reviewed.

All the incoming workforce should be trained and made aware of all the site-specific dangers and safety rules.





# SIMULTANEOUS OPERATIONS (SIMOPS)

This is where two or more activities happen with contractors at the same time and place, this can create new risks that are not considered when analysing the operation in isolation

e.g. welding inside a vessel, inspections being done, and working at height scaffolding is placed adjacent to the operation

All jobs need to be planned well in advance so that job permits are not rushed, and controls are set in place to avoid interference from other contractors

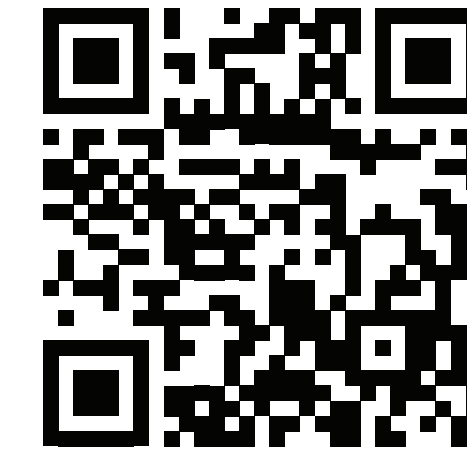
One central PTW control centre so there is no confusion of responsibilities



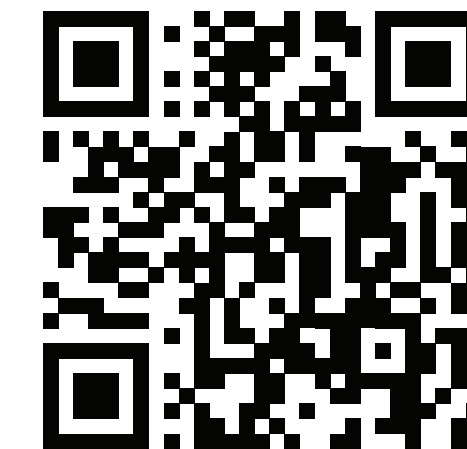


# EXTENSIVE WORKING HOURS

Long working hours may lead to fatigue, illness, stress, poor work-life balance, and other health risks to the employees, they can experience numerous mental, physical, and social effects if fatigue is not well managed as part of the TAR work planning.



<https://besafe.nz/fitness-for-work/>



<https://besafe.nz/fatigue-2/>



# OCCUPATIONAL HEALTH HAZARDS

- ▶ Process gases and vapours in non-drained systems
- ▶ abrasive, hydro-blasting aerosols
- ▶ catalysts and other dusty materials
- ▶ asbestos and other insulating materials
- ▶ noise from fixed installations and equipment
- ▶ ultraviolet radiation
- ▶ Thermal Stress – hot/cold working conditions





# CONTRACTOR QUALIFICATIONS



All contract companies working on the TA will be prequalified as per the Vendor Qualification Procedure



Contractors must ensure that the HSE Management systems have been assessed by ISN or Tokita and that this assessment is current before any work commences.



# 7 LIFE SAVING RULES

The 7 Life Saving Rules identifies the activities that present the greatest risk to workers



## Electrical Work

Only qualified electrical personnel may carry out electrical work, obtain authorisation before conducting electrical work



## Work at height

Protect yourself and others when working above 1.8 meters by ensuring zero potential for fall, prevent objects from falling and by controlling traffic below



## Excavation

Obtain authorisation for all site excavation work; do not enter un-shored or un-sloped excavations



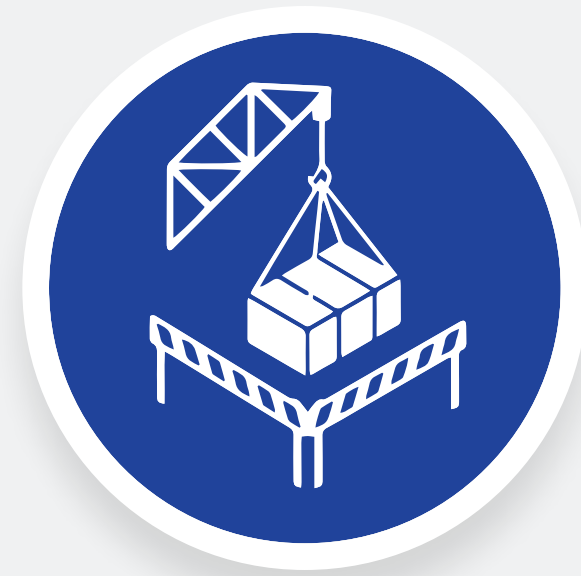
## Hot Work

Obtain authorisation before work begins, start hot work once safe atmosphere is proven and combustibles removed; contain flames, sparks



# 7 LIFE SAVING RULES

The 7 Life Saving Rules identifies the activities that present the greatest risk to workers



## Lifting

Ensure there is no person under suspended loads; do not walk under suspended loads



## Hazardous Energy

Verify zero energy before work begins; do not tamper with energy isolations



## Confines Space Entry

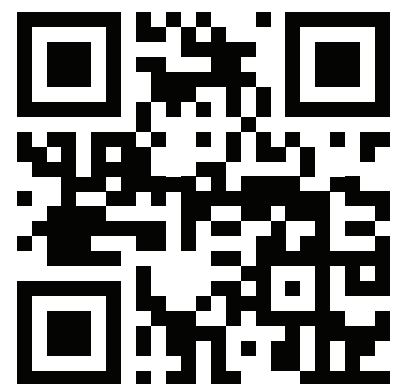
Obtain authorisation before entering a confined space; ensure that safety watch is in place





## Electrical Work

The Electrical Workers Registration Board promotes safety for all New Zealanders by ensuring the competence of electrical workers.



<https://www.ewrb.govt.nz/>



## Work at Height

Many unsafe conditions may cause incidents due to work at height like fragile roofs, openings in roofs, voids, sloping roofs, deteriorating materials, unprotected edges, unstable or poor access equipment, improper scaffolding platforms, adverse weather conditions, and an untrained workforce.



<https://besafe.nz/working-at-height-a-presentation-for-companies-where-this-is-not-your-main-line-of-work>





## Excavation

Excavation work includes:

- ▶ Open excavations
- ▶ pot holing
- ▶ pit excavations
- ▶ trenches and retaining walls
- ▶ shafts and drives



## Confined Space

- ▶ Are large enough and so designed that an employee cannot easily enter and stay in that space to perform assigned work;
- ▶ (Has restricted entry or exit (for example, tanks, vessels, heaters, furnace, boiler, towers, pits, etc. (3) is not designed for continuous stay and work.



<https://besafe.nz/excavation-confined-space/>





## Hot Work

- ▶ Any work activity that introduces or has the potential to introduce a source of ignition.
- ▶ High hazard hot work (cutting, grinding, welding) requires a safety fire watch to monitor area for a minimum of 30 minutes once hot work is finished.
- ▶ High hazard hot work (cutting, grinding, welding) can only be carried out in compressor buildings when the compressor process systems have been verified as gas free.



## Lifting

- ▶ Turnarounds can see large amounts of cranaage happening with very heavy lifting and or complex lifts involving lifts with two cranes due to awkward center of gravity or size of the lift.
- ▶ It may be that the lifts need to take place over live equipment or just over essential equipment
- ▶ **NEVER LIFT OVER PEOPLE**





## Hazardous Energy

- ▶ Energy sources including electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other sources in machines and equipment can be hazardous to workers.
- ▶ During the servicing and maintenance of machines and equipment, the unexpected startup or release of stored energy can result in serious injury or death to workers.



**THE TURNAROUND WORK  
SCOPE IS THE MOST  
CRITICAL ITEM RELATED TO  
PERFORMANCE OUTCOMES,  
AS IT IS THE FOUNDATION  
FOR COST, SCHEDULE, AND  
PLANT RELIABILITY.**

