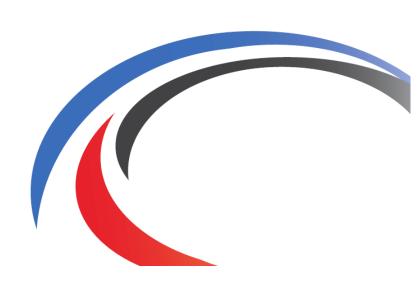


# Working on Installed Systems

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#### Hazards encountered on site

- Electricity
- Working at height
- Hot/cold surfaces
- Asphyxiation/Toxicity
- Flammability (refrigerants, oils, acetylene, paint, glue, buildings)
- Lifting and moving equipment
- Slips, trips and falls
- Working around other workers
- Decommissioning



- Original design
  - Is it safe?
  - Was it ever safe?
  - Is the access to work points adequate?
  - Did it work as intended?
  - Is it big enough?
  - Are there enough safety devices/shut off valves?
  - What type of oil is used?
  - Is the oil management system adequate?
  - Can liquid be trapped between valves?



- As installed
  - Is it safe?
  - Was it ever safe?
  - Is the welding/brazing to a suitable standard?
  - Is the original design properly documented?
  - Is the maintenance and repair history documented?
  - How is oil management achieved in practice?
  - Are the safety systems compliant?
  - Are the electrical panels safe to work on?



- In operation
  - Is it safe?
  - Was it ever safe?
  - How do the plant controls operate?
  - What are the consequences of poor/no maintenance previously?
  - Does oil drain from the system or is it clogging the evaporators?
  - What are the consequences of previous site attitudes to health and safety?
  - Does the plant suffer from liquid hammer (expansion valves/defrost etc)?
  - What condition are the cold store ceiling panels in?
  - Is there any evidence of corrosion under insulation?
  - Are the safety devices functional and in good condition?







#### Two key principles

Expect the Unexpected





(until you have proved otherwise)







Is It Safe?



Was It Ever Safe?





- Imagine that you have taken over a site maintenance contract and you are walking the site for the first time.
- Write down one thing that could present a hazard to your staff that has not been mentioned so far in this presentation....

