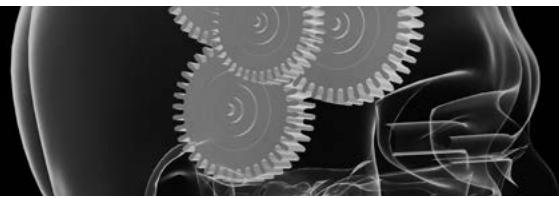


HUMAN FACTORS

How to take the next steps



CASE STUDY 8 - Close-enough procedures aren't close enough...

What happened?

Burning fluids ran down the outside of the lit flare stack after a knock-out drum filled with crude oil.

While preparing for a shutdown, a drain valve was opened to depressurise a meter skid. The operator didn't realise that the meter skid was still connected to the process via an open skid discharge valve which he should have isolated. Crude oil flowed into the skid through the open drain valve and into the flare line. It overflowed the flare knock-out drum and passed on into the lit flare.

There was no procedure for draining the skid so the supervisor asked the operator to use a maintenance procedure. The steps required to isolate and drain the skid were in different parts of the document. The supervisor and operator discussed which parts of the procedure could be used. The operator misunderstood the instruction and started at the wrong step. He missed the step where the outlet valve was closed.

The high level trip on the drum should have shut down the process. Unfortunately the switch had been incorrectly calibrated, and allowed liquid into the flare where it was ignited.



What human factors were involved?

Barriers

What did people do intentionally?

The supervisor asked the operator to use a procedure which was not suited to the task

Although the procedure could be used to drain this skid, it included lots of other unnecessary steps which were likely to cause confusion.



What did people do without meaning to?

The operator opened the vent valve without realising the outlet valve was open

The operator became confused about where to start the procedure, and picked the wrong place.



- Procedures
- Safety Critical Communications



- Training & Competence
- Supervision

What can we learn from this incident?

- Procedures should be specific to the task being done.
- The sequence is vital, so anything which disrupts that sequence (such as jumping from one section to another) increases the chance of error.
- Where a procedure is not right, take time to amend it. Do a risk assessment to ensure that you know what hazards you need to control. Involve the people that have to carry out the job and technical staff who understand the process hazards that the procedure should address.
- Don't rely on automatic shutdowns to protect you. Safety systems can fail in all sorts of unpredictable ways - many associated with human error!