

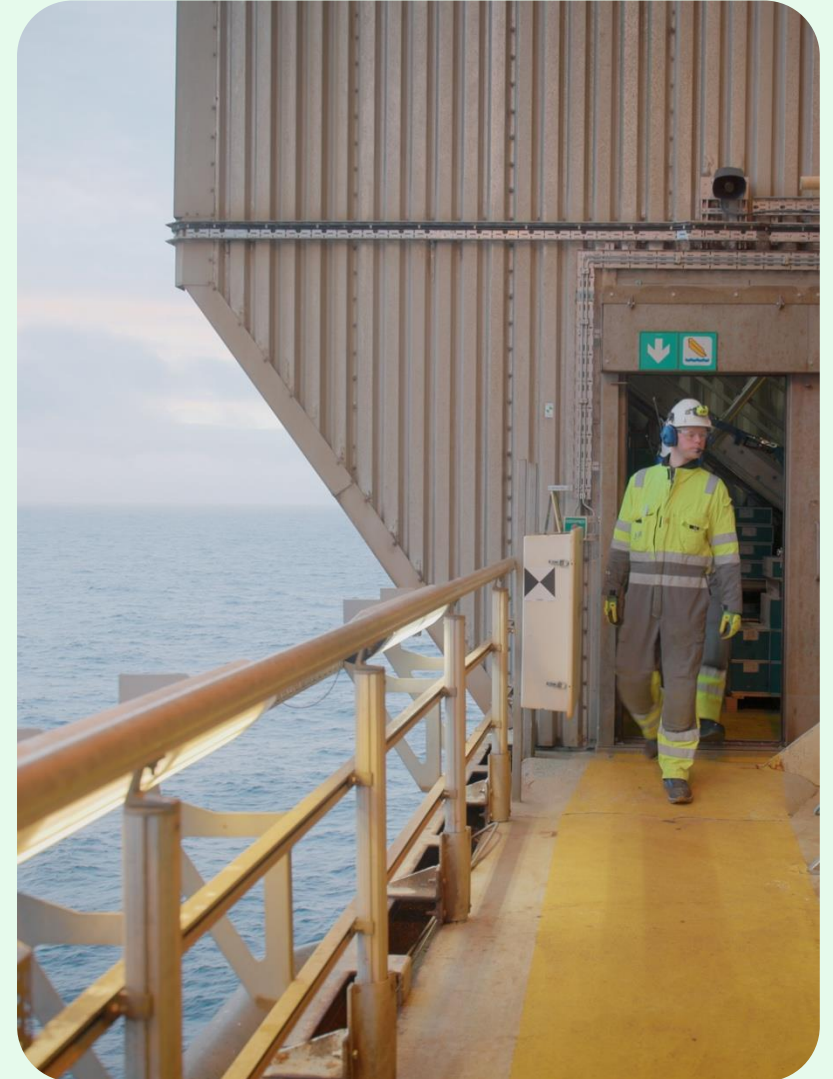
# Always Safe

## TASK: TRIP 1 FOR OPERATIVE PERSONNEL

Choose one of the three incidents presented on the next pages and discuss:

1. Could this have happened here? Why? Why not?
2. Underlying causes: What do we recognize here?
3. If many of the conditions that contribute to an incident are common, what distinguishes a job that goes well from a job that ends in an incident?

*On each page, there is a link to Synergi for the incident described.*



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## Process: Line overpressure

1977633 • Overpressurising of line downstream of PSV 4. pr compr. to • Synergy Life

During the reset of a safety valve (PSV) on the 4th stage compressor on Johan Sverdrup on 06.05.2022, a pipe segment was overpressurized to around seven times the design pressure. The segment that was pressurized should have had a free relief path to the flare, but the downstream valve was closed, and pressurization was carried out via an external source (hose trolley/manifold).

The use of external pressurization meant that the key-interlock barrier was put out of action, and the risk of preventing overpressure was shifted from a physical system to administrative measures. In addition, the procedure lacked a clear step to open the valve to the torch, and the ICC plan for reset was not used as a governing document.

The investigation shows that under slightly changed circumstances, an explosion with the potential for fatal injury, or a hydrocarbon leak could have occurred. There was no external leak in the actual incident.

Rule	Relevance	Reasons
<b>Plan 1:</b> The ICC is prepared in the correct sequence for isolation and reset; Use to-do lists/actions	★ ★ ★	In practice, the work was governed by the O-procedure (PSV trolley) – not by a detailed reset sequence in the ICC. Critical steps were missing from the plan → allowed for overprinting.
<b>Plan 2:</b> Define PBU interval (check of bleed point) in ICC	★ ★ ★	Not explicitly triggering in this incident, but the PBU in the ICC could have revealed pressure build-up/leakage past barriers before further steps. Relevance: preventive weakness.
<b>Plan 3:</b> Verify against concurrent activities before isolation/reset	★ ★	Night work + reset with a hose trolley in a complex area increased cognitive load; Inadequate coordination/role clarifications discussed in the report
<b>Plan 4:</b> WP level 1 at HC risk; The correct ICC should be linked to the WP	★ ★	The report highlights discrepancies in compliance with governing documents and linking/using the ICC as a governing basis; risk of incorrect ICC against AT
<b>Perform 1:</b> Clarify who sets the ICC and who verifies (two independent roles)	★ ★ ★	Verification was not performed prior to pressurization; two people shared tasks over three levels without a clear leadership role; critical step was omitted.
<b>Perform 2:</b> Hoses/couplings approved for medium and pressure class	★ ★ ★ ★ ★	HC gas up to 145 barg in manifold/hoses; findings of unsecured hoses >20 barg and inadequate pressure protection (R-25346). Increases the potential for consequences in the event of errors.
<b>Perform 3:</b> Changes that deviate from the original ICC must be documented/approved	★ ★ ★	Critical: The working method (external pressure line) deviated from the design/ICC logic (key-interlock). The change was not formally handled → physical barrier is bypassed.
<b>Perform 4:</b> Before splitting – verify depressurization and protection against pressure build-up (two points close to work)	★ ★ ★	The downstream segment was not depressurised – the pressure was 135-145 barg due to a PSV leak and a closed downstream valve. The last barrier failed.
<b>Perform 5:</b> Inertia, gross leakage test and possibly leakage test before the introduction of HC	★ ★	The setup went straight to pressurization with HC via a hose trolley. Lack of step-by-step/low-pressure verification increased the risk in the event of a leak/incorrect assembly.
<b>Perform 6:</b> The ICC should accurately reflect the condition of the system (status/valve position) – follow up regularly	★ ★ ★	ICC did not mirror reality: Downstream block valve was closed, but reset/follow-up was not in step → map vs. terrain mismatch before pressurization

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## Electrical: Personal injury when working in a 440 V switchboard

3288032 • Personal injury when working in a 440V switchboard • Synergy Life

During work on replacing the control circuit breakers in a 440 V switchboard in M12, an earth circuit occurred, which led to an arc reaction. One person was exposed to the electric arc and was exposed to heat and shock, while it is still unclear whether there was actually electric shock. There were four people in the blackboard room when the incident happened. The injured person had the correct protective equipment, but the glove on his left hand shrunk from heat, indicating significant energy in the arc.

The findings after the incident show, among other things, that a conductor on the A-side had been in contact with a grounded DIN rail, which probably triggered the arc. Burn marks were also observed on a fuse other than the one to be worked on. The work was covered by two different work permits (A and B side), and the job was to be carried out on the B side, while the error occurred in the A field. The injured person was followed up by a nurse on board and later sent by SAR to shore for medical assessment. The incident was classified as yellow 3 (lost-time injury) and everyone involved has been taken care of with a debrief and health-related follow-up.

Rule	Relevance	Reasons
<b>Plan 1:</b> Plan and assess the risk of electric surge, arcing and short circuits	★ ★ ★	The job was to replace the control circuit breakers in the 440 V switchboard. The A-side was re-energized and a wire came into contact with grounded DIN rail → arc exposure. The incident shows that the risk assessment did not sufficiently take into account neighbouring energy (A-side) and arc potential when refeeding/further work.
<b>Plan 2:</b> Choice of working method + identification of AFA/LFS/LFK is made visible on WP	★ ★	There were two ATs (A- and B-side). They were supposed to work on the B-side, but IP started working on the A-side after defect findings. This indicates weaknesses in the choice of methodology/role clarifications on the AT basis for what was the work side.
<b>Plan 3:</b> At least two safety barriers; be made visible on WP	★ ★ ★	Neighboring voltage (A-side) was available, and the wire came towards the ground → indicates defective/system barriers (covering/shielding/grounding/shut-off) near the work site. Two independent barriers were not effectively established.
<b>Plan 4:</b> Operation list/link order for HV work; Appendix to WP	○	The case applies to 440 V (LV), not work on disconnected HV systems. Not relevant to this course.
<b>Perform 1:</b> Establish physical barrier against accidental switch-on; log (LOTO)	★ ★ ★ ★	The A-side was energised while working on the switchboard, and the conductor came into contact with earth → indicates that the downstream/adjacent course was not sufficiently locked/shielded in relation to the work site. This is at the core of the LOTO requirement.
<b>Perform 2:</b> AFA/LFS verifies that planned barriers are physically established at the workplace	★ ★	The failure shows that barriers at the work site were not sufficient (covering of live parts, positioning, earthing). AFA/LFS must physically verify this before starting.
<b>Perform 3:</b> In the event of a change of job/prerequisites, a new approval from an authorised person → electrical	★ ★	Change occurred when IP detected defect on the A-side and started working there after it was energized again. This is a change in scope that should trigger a stop and new approval.
<b>Perform 4:</b> Stop at safety trip/alarm; Understand the cause before further surgery	○	Not mentioned in the incident; No safety trip/alarm that controlled the course. Not relevant here.
<b>Perform 5:</b> In case of uncertainty – contact an authorised person electrical	★	May be implicitly relevant (doubt about voltage status/change), but not documented used in the course. Low.
<b>Perform 6:</b> Report electrical safety events (and when energy is not released)	★	The incident was notified/followed up (DFU6, Synergy). Important for learning, but not causal.

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## Crane and lift: Dropped object with personal injury

2570132 • Dropped object with injury • Synergy Life

After unhooking and the “free hook” signal at the landing area between M07–M08, the crane hook/pendant was hoisted into a blind zone beneath the scaffold overhang

The hook’s safety latch/bolt hooked into the scaffold upright → a composite scaffolding piece came loose and fell into the landing area where the flagman, slinger and a mechanic were inside the barrier.

Flagman was hit and suffered medical treatment; under «insignificant changed circumstances» assessed Red 1 (death)

Rule	Relevance	Reasons
<b>Plan 1:</b> Operator leads the lift + joint risk assessment	★ ★ ★	Blind spots from new scaffolding were not risk assessed. It was not considered that the hook could be hooked in the cantilever. The lift was treated as routine.
<b>Plan 2:</b> Adequate and qualified personnel	★ ★	The crew was experienced, but the task required extra monitoring of scaffolding cantilevering parts. No dedicated person dedicated to supervising the structure above the lifting route.
<b>Plan 3:</b> Roles and responsibilities are clarified	★ ★	Roles (squatter, flagman, operator) were known, but no one was responsible for monitoring the integrity of the scaffolding or the risk of squatting.
<b>Plan 4:</b> Affirmative communication	★ ★	The signaller gave a "free hook" → the operator began to pull without everyone having visually secured the scaffolding. Incorrect timing of command increased risk.
<b>Plan 5:</b> At least 2 people must see both cargo and each other in the blind spot	★ ★ ★	Blind lift with significant structure obstructed visibility. Flagman and hooker followed the hook, but no one monitored the scaffolding from above. There was no one who saw the whole area at the same time.
<b>Perform 1:</b> Necessary cordoning off	★ ★	The area was cordoned off, but falling scaffolding parts entered the blocked area, and three people were inside the barrier → the positioning did not provide real protection.
<b>Perform 2:</b> Pre/post-use check of equipment + load secured	★	Not the main cause. Cargo was correctly unchecked. Problem arose due to area conditions (scaffolding), not lifting equipment.
<b>Perform 3:</b> Hooks must not be in contact with cargo without a go-ahead signal	★ ★	Not a direct break, but the hook was close to the load/area and had to move to avoid hits. Challenging as it is a narrow area.
<b>Perform 4:</b> Personnel must not be in the line of fire + have a clear escape route	★ ★ ★	The flagman and crouch were in the fall zone under the scaffolding. Flagman was hit despite attempts to seek cover. Critical LSR violation.
<b>Perform 5:</b> Stop and reschedule in case of unforeseen circumstances	★ ★ ★	Scaffolding over the lifting route represented a new relationship. One should have stopped and reassessed FJS/plan.