Potential Hydraulic Injection

QSE alert

Associated non-conformity code: EV.0000000655

This document aims to share the lessons learned following a significant incident or dangerous condition that may be of interest to workers at workplaces operated by Acciona Energía.
This Alert may be updated as further information or analysis becomes available and may include additional proposed actions, etc… Therefore it is important to consult with Acciona Energía for up-to-date versions of Alerts.

SCOPE

☒ World-wide ☐ Local. Country:
☐ All Business
☐ All Technologies

☐ Construction ☐ Production
☒ Wind power ☐ Hydraulic ☐ Thermoelectric
☐ Photovoltaic ☐ High Voltage

☐ Others. Specify:

FACTS

Two technicians were responding to the turbine for a hydraulic system fault. They had the tools and supplies for replacing the nitrogen filled general accumulator. One technician opened the circuit breaker to the hydraulic pump unit but did not apply a lock and the second technician did not verify the zone of protection or the absence of harmful energy within the planned zone of protection. The technicians erroneously used the touchscreen and determined there was zero pressure indicated in the system. A technician closed the flow regulator valve on the hydraulic side of the accumulator and then began to disassemble the hydraulic fitting and near the last thread the pressure released - spraying the area with hydraulic fluid and forcing the wrench to impact the technician's shin with sufficient force to break the skin and raise a welt.

The technician was transported to the hospital for the potential treatment of hydraulic injection – a very serious condition that often results in amputation and sometimes death. The technician was examined and it was determined that no hydraulic injection occurred and the technician was released with only first aid treatment.

The residual pressure was held in the system by the flow regulator valve which had been closed. The sensor for the pressure on the touchscreen was not for the hydraulic side of the accumulator, but on the other side of a check valve at the hydraulic unit. The technicians did not have the procedure to change out the accumulator open or printed and relied on memory from five previous successful changes.

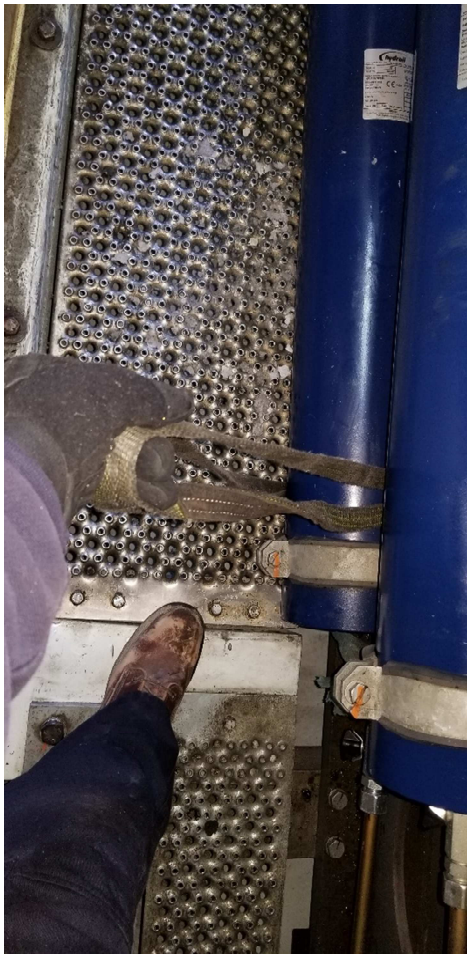
LESSONS LEARNED

- Procedures must be open and consulted to ensure the correct and complete order of operations for all turbine (and substation) work. When LOTO is not specified (as was the case of these particular turbine vendor procedures), the Lead Authorized Person is trained and required to supplement the procedures to ensure proper LOTO and harmless energy levels.

- LOTO requires the use of a schematic or procedure or the Lead Authorized Person to set a zone of protection. LOTO must be performed every time a technician will be potentially exposed to harmful levels of energy. A second-person verification must be performed to ensure no harmful energy can be released.

Acciona Energía QSE Dpt
Avda. Ciudad de la Innovación, 5
31621 Sarriguren. Navarra. SPAIN
Tel: +34 948 006 000
www.acciona-energia.com

- A gauge was not used to measure pressure in the proposed zone of protection.



Nitrogen charged general accumulator

Result of impact after first aid treatment

Acciona Energía QSE Dpt
Avda. Ciudad de la Innovación, 5
31621 Sarriguren. Navarra. SPAIN
Tel: +34 948 006 000
www.acciona-energia.com