

Subject: Yellow Alert- Steam Valve Near-Miss

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Date: 1/7/2002 Identifier: RFETS-02-0004

Lessons Learned: A near miss during troubleshooting of a steam control valve shows the importance of complete, detailed planning and clear communication between the individuals involved in the work.

Discussion: On 12/12/01 while maintenance personnel were de-coupling an actuator from the facility service steam 100-psi steam control valve in order to troubleshoot a problem with the valve actuator, the packing gland was removed from the valve without first removing residual pressure. The valve was isolated (single valve), but was not under lockout/tagout control. The wrong fasteners were removed due to an inadequate description of the work to be performed, inadequate instructions detailing the specifics of the steam valve assembly and insufficiently detailed instructions for removal of the actuator from the valve assembly. The removed fasteners included the packing gland follower fasteners and subsequently, the packing bore components were unexpectedly expelled from the valve due to a small amount of residual steam pressure of approximately 10-15 psi. Although the inlet valve and outlet valve to the control valve were closed, and the drain valve was opened, there was a failure to identify potential residual steam pressure and venting of any residual pressure. There were no personnel injuries or equipment damage as a result of this event. The job was stopped and personnel left the area until the valve was placed under lockout/tagout control. This event was reported by Facility Management as a Near Miss Event.

Analysis: The direct cause was inattention to detail. A troubleshoot and repair standard work package was being used. The valve actuator was being removed as part of the troubleshooting process. The planning team did not sufficiently discuss how the work would be performed such that an accurate assessment of the hazard could be accomplished (Error #1). The resulting work package steps generated following the walk-down did not contain any specific valve information such as a drawing or sketch for the worker to refer to when performing the disassembly (Error #2). The planner and an electrical engineer prepared the specific work instructions for the task that included a step for "CRAFT- Uncouple the actuator from the 100-psi valve" assuming the personnel performing the work knew how to accomplish that task without compromising the pressure boundary parts (Craft Knowledge). (Error #3). Additionally, the technical manual for the valve was not available on site. The procedure did require that if the system would be breached, a Lock Out Tag Out (LO/TO) would be required that specified double valve isolation. Engineers involved in the development of the work package thought that the only fasteners that were going to be removed were for the mounting bracket assembly. This was not clearly identified in the work package (Error #4). The failure to accurately and clearly identify the removal of the correct fasteners resulted in maintenance removing several fasteners which not only included the fasteners for the assembly, but also the fasteners that held the valve packing in place. During the pre-evolution briefing, the job supervisor repeatedly asked whether or not the work was a breach of the system and was assured by the engineers that it was not. Engineers failed to recognize and identify that bolts planned to be removed held the valve packing

assembly in place. The job supervisor was not sufficiently familiar with the work to be accomplished to be able to assure himself of the proper way to remove the actuator and did not obtain enough knowledge of the planned work to determine if the job could be executed safely. (Error #5). The stationary operating engineers (SOEs) isolated the control valve and opened a drain valve to depressurize that portion of the system as a good practice. This isolation was not required by the work package. When the crew arrived at the job site, the craft inspected the component and the mechanic elected to remove the four fasteners on the valve body to bracket side. The involved mechanic failed to recognize the need for a LO/TO when removing the packing gland follower retaining fasteners (Error #6). He stated during the fact finding that he knew it was the packing gland that he was removing and was comfortable doing this work without a LO/TO since the Stationary Operating Engineers (SOE's) had isolated the work area and opened a drain valve. A Mechanical Engineer covering the job was present when the incorrect fasteners were removed from the valve assembly, but failed to recognize that removal of the fasteners would result in an unplanned breach of the system thus missing an opportunity to stop the work due to inattention (Error #7).

Recommended Actions: To avoid similar situations, make sure your planning processes include the following:

1. Discuss specific work details sufficiently during walk-downs to properly develop the scope of the work.
2. Make sure work instructions contain sufficient detail to identify the specific components and methods involved in the job. For work involving complicated equipment, obtain and use technical direction from the manufacturer/technical manuals prior to starting work. Use engineering drawings or photographs and label components whenever possible.
3. Make sure worker training and level of knowledge are evaluated in determining the level of detail necessary in work instructions.
4. Identify those components that aren't part of the work scope but can create hazards if removed.
5. Ensure workers are aware of and strictly follow lockout/tagout requirements.
6. Make sure supervisors have enough knowledge of the planned work to determine whether the task can be conducted safely.
7. Emphasize worker responsibility to stop work and get help when any part of the job is unclear, confusing or when encountering unexpected conditions.

Priority Descriptor: Yellow/Caution

Work/Function: Conduct of Operations

Hazards: Pressurized systems

ISM Core Function: Define work, analyze hazards, develop/implement controls.

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References: ORPS Report RFO--KHLL-374OPS-2001-0004

FOLLOW-UP ACTIONS: Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please contact the originator of significant actions taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.