#playyourpart

HIGH VALUE LEARNING

High Value Learning

Surface Preparation on Live Lines (SPOLL) also known as Blasting on Live Lines (BOLL)

Who could be interested in this?

Asset Managers, OIMs, Integrity Managers, Maintenance Managers, Integrity Engineers, Offshore Inspection Engineers, Inspection Teams, Fabric Maintenance Teams

What is this all about?

The OEUK Asset Integrity Task Group (AITG), including the Health & Safety Executive (HSE) recently discussed notable incidents over the last few years where the condition of Pressure Systems (including hydrocarbon-containing) pipework had not been fully understood as part of preparation work for fabric maintenance.

Outcomes have variously included unanticipated pipe wall perforation and even Loss of Primary Containment (LOPC); the potential in many cases could have been far more severe (i.e., ignition, localised fire, risk to persons working in vicinity, potential MAH precursor event etc).

Given the age and condition of some of the UKCS infrastructure, more fabric maintenance work potentially of this nature may be required going forward. As such the AITG, HSE and Step Change in Safety wish to reinforce the requirement for a systematic, documented and auditable process of Risk Assessment for live-line surface preparation activity. Where the surface preparation of live lines is unavoidable (rather than conducting work offline), then the risks presented must be managed to levels which are As Low As reasonably Practicable (ALARP) via demonstrably effective inspection techniques and effective Control of Work.

Typically, surface preparation on live lines in support of fabric maintenance may be permitted following completion of an inspection and risk assessment demonstrating adequate remaining wall

thickness to proceed safely. The inability to accurately determine the remaining pipework condition and, therefore, wall thickness of heavily scaled, large bore, thin-walled piping has led to failings related to remaining wall thickness assessments and the subsequent perforation of hydrocarbon containing pipework during surface preparation activities.

This HVL has been released to share and promote the recommendations and observations of the AITG in relation to effective risk assessment, prior to surface preparation.

Some things to consider?

Duty holders should initially apply the hierarchy of control; this means plant (in particular where there is a risk of harm) should ideally be made safe/taken offline prior to surface preparation.

Where this is not practicable, risks arising from live-line preparation through uncertainty over remaining wall thicknesses should be managed to ALARP; i.e. where an assessment/inspection technique exists that would provide more certainty than that already being used, then it should be employed, e.g. if Close Visual Inspection (CVI) has been used to estimate the remaining wall thickness beneath a corrosion scab, this could and should be supplemented by profile radiography, for example.

General Visual Inspection (GVI)

- A broad look at equipment or structures to spot obvious issues like leaks, rust, damage, or missing parts. Done from a distance, it's quick and wide-ranging, helping identify areas needing more detailed checks. Think of it like a routine walk-around safety check.

Close Visual Inspection (CVI)

- A detailed check of specific areas or components, often up close and sometimes with tools like lights or magnifiers. Used to find smaller problems like cracks, pitting, or coating damage. It gives a clearer picture of condition, much like a doctor's close examination after spotting a concern.

The majority of Operators consulted have developed differing, but largely effective condition & risk assessment processes. The AITG would guide industry to the Energy Institute (EI) Guidelines for the management of coatings for external corrosion protection as an example industry risk assessment methodology.

The EI risk assessment example methodology is notable and laudable for guiding escalating approval levels based on consequence of failure and confidence but is an example of a system risk ranking process and must be reviewed and adapted by each end user.

Recommended amendments to the EI methodology include the adoption of Technical Authority reviews for high risk assessment outcomes, the specification of minimum measured wall thickness

thresholds for surface preparation; the review of the H/M/L risk ranking categories related to fluid properties (H/C presence, pressure, temperature); and differentiation of assessment methodology for Carbon Steel and Corrosion Resistant Alloys.

Scale height measurement is being used by some operators as a technique to estimate remaining wall thickness. This is not considered to be a robust or accurate means of wall thickness measurement and where there is doubt, it should be used with caution and ideally be supplemented with a more accurate technique(s), particularly on higher Consequence of Failure systems (see above). Furthermore, the reliance on General Visual Inspection (GVI) and Close Visual Inspection (CVI) techniques for assessing remaining wall thicknesses from surface scale extent/scab height should consider;

- The possibility of scale having spalled from corrosion scabs, resulting in lower scab heights and under estimations of wall loss.
- The likelihood of localised water/liquid impingement on external surfaces (for example run off from equipment/structures above, leaking water systems) causing exaggerated scabbing/thinning not immediately apparent on an already corroded surface.
- Internal corrosion/wall thinning
- Narrow/steep side pit morphology producing relatively low volumes of corrosion product resulting in a deceptively low scab height.

Inspection data should be for the specific area to be worked; it should be recent and of high quality. This requires the use of competent personnel and demonstrably effective techniques that can detect deterioration in wall thickness due to corrosion.

If the available inspection techniques do not support a condition assessment that accurately establishes a remaining wall thickness on higher consequence systems, then surface preparation should only proceed when offline.

The absence of incidents should not be used as confirmation of effective procedural control or barrier health. As surface preparation on live hydrocarbon containing equipment has the potential to lead to an LOPC incident and MAH event, regular and effective auditing of procedures and their application is highly recommended.

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