INDUSTRY INSIGHT

Setting Up A Corrosion Management System – 3 Points To Consider

This article is a very brief overview detailing a few key points from recently completed assignments. The points are in general terms and, although extracted from our mining portfolio, will hopefully be of use to most industries. Three issues are tackled in this article, namely: Work Flow Best Practice, Issue Capture Control and Contractor Management.

TECHT

"A corrosion management strategy needed to be developed and implemented"

The Issue…
TECHT have been engaged by West Australian mine sites, tasked with assisting in the set up and execution of a framework to ensure that concrete, structural steel and asphalt infrastructure (integrity items) remain fit for purpose for the intended life of mine.

The process involved a stepped or staged approach to ensure mine site integrity issues were identified, prioritised, planned and executed in a technically competent, safe and pragmatic manner.

Essentially this is about the Goldilocks principle: the aim is to spend the correct amount of money in the correct areas in order to ensure assets are fit for service (safety and production point of view) until the day the plant closes. Prioritisation through an approved system using expert knowledge can achieve this.

The Existing Situation…
West Australian mine sites are inherently corrosive. Process/bore waters are usually used for wash down purposes and are notoriously high in dissolved chlorides (as high as 3-5 times seawater), sulphates and exhibit low pHs. As a consequence, mine site assets are at risk of premature degradation without an active corrosion management system.

The following are three points that serve as guidelines which can be applied to increase efficiency, quality and overall reliability of integrity assets. Even if the points do not necessarily pertain to your line of work, perhaps with some modification they can be applied.

Point 1 - Systematic Capture of Issues, Allocation and Ownership

The first item to address is issue capture. Generally mine sites have well developed systems that capture issues onsite. These systems should be set up in a way that all personnel onsite, whether they are site employees, contractors, consultants or just visitors, can report corrosion related issues, however large or seemingly small. The system should allow the issues to be directed to the appropriate site contact. Each of these issues are then vetted or reallocated to the relevant department or asset owner for planning.

Clear asset ownership by a department allocates accountability for that asset. It is a common issue for an operational mine site to have a dedicated integrity team but often work generation and information flow is not managed in an integrated manner because of assets falling across multiple departments with differing lines of accountability. This means there is often not a holistic approach to site based integrity management. This leads to ambiguity as to the responsibility for management of the assets which, in turn, means it is more difficult to assign accountability. As a consequence the issues can reach a point where they render the asset unserviceable.

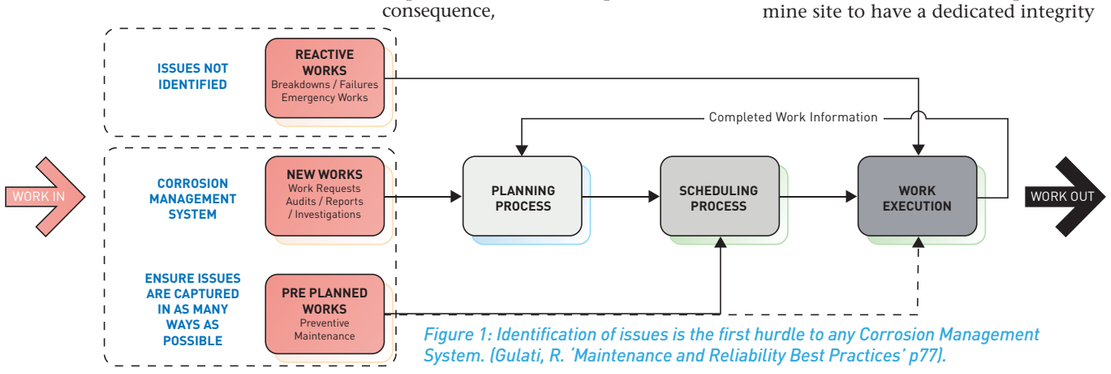

Figure 1: Identification of issues is the first hurdle to any Corrosion Management System. (Gulati, R. 'Maintenance and Reliability Best Practices' p77).

Point 2 - Capture Control

A Suggested Stepped Approach…

- Identification of all site issues through a Corrosion Management Audit and/or Condition Monitoring regime.
- Determine the associated risk of failure (Safety, Environmental, Production, etc) and place items into a criticality matrix based on likelihood and consequence of occurrence to determine priority.
- Develop an Integrity Strategy that allows a fixed number of issues or plant footprint to be scheduled for repair based on current and predicted resourcing available.
- Determine the most appropriate technical remedial options to be used on site so that the best return on investment is achieved in a safe, timely and cost efficient manner.
- Implement best practice Quality Control and Quality Assurance requirements for all Integrity works. This often needs to be achieved through both correct documentation and on-site education.
- Increase awareness of durability related issues and their causes to minimise future repairs through education.
- Ensure environmental regulations pertaining to both the International Cyanide Management Code and hazardous chemical containment are adhered to.
- Ensure best safety practices are followed. Where possible Engineer out, Eliminate or Substitute inherent safety risks within a specified task during the job planning phase.
- Carry out benchmarking activities and site data collection to establish a knowledge base which can be used to assess/implement future remedial repair options.

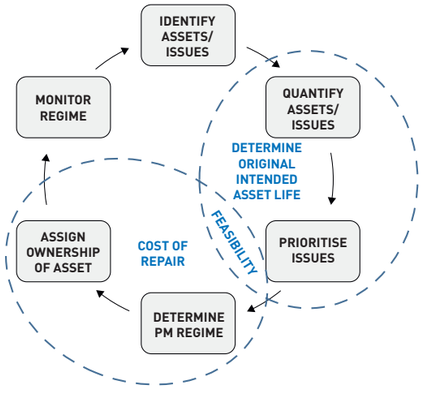

Figure 2: Basic representation of Issue Capture Control cycle.

Integrity infrastructure (concrete, structural steel) generally deteriorate at a slower pace or have a longer time to first maintenance requirement when compared to mechanical or mobile plant which tends to allow any issues to remain undetected for longer. Thus a modified reliability system is required to ensure the items are fit for service.

Point 3 - Contractor Management

For contractors to operate efficiently, it is helpful that accurate and complete documentation is available. This unfortunately is sometimes not usually the case due to a number of reasons. The importance of a complete documentation package is especially prevalent in unplanned works or shut down situations. Having site standard documents such as Scoping documents, Specifications, Data sheets, QA/QC **forms means that there is a documented expectation for the work scope and the quality of work required**. Further to this if these documents are produced as proformas then in unplanned situations the documents can be relatively quickly modified and used undoubtedly producing a better result.

The repairs need to be carried out using correct governing documentation and adequate supervision. This means correct use of a QA/QC system. Without correct and concise documentation it may be difficult for the contractor to carry out the task. Issues arise from ambiguity and differences in understanding of the job.

In Conclusion…
Whether this information is useful in your line of work or not, we trust that this has been of interest. In conclusion the main points or 'lessons' have been summarised in the figures below.

The corrosion management process needs to be done in a methodical, logical and mathematical way. Methodical ensures issues are picked up, logical ensures the system can be retaught and mathematical ensures that the 'thumb-suck' element is removed. The process then can provide a quantitative way to report on progress.

Implementing an appropriate Corrosion Management System, which results in the reduction/elimination of corrosion related deterioration of assets, not only assists in compliance with regulatory requirements but also has a direct effect on the asset's overall economic performance.

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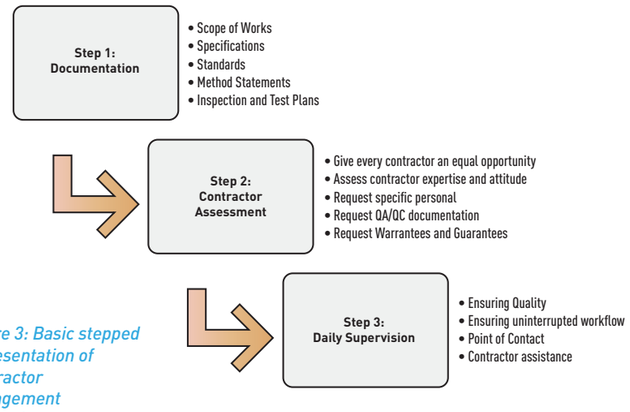

Figure 3: Basic stepped representation of Contractor Management interaction steps.