Management Of Change Or Change Of Management?

ioMosaic Corporation

Introduction

An effective management of change (MOC) process simply prevents accidents. In fact, several process industry incident investigations have identified a weakness in the MOC process as the root cause, including two case histories published in a 2001 safety bulletin issued by the United States Chemical Safety and Hazard Investigation Board (CSB). In addition to concluding that the proper application of MOC methodology could have prevented the incidents, the bulletin stressed the need for companies to adopt a *systematic* MOC process.

Following the completion of initial process hazard analyses (PHAs), a systematic MOC process serves as the principal process safety management (PSM) system to ensure risk levels associated with process/plant modifications are addressed adequately. Further, operating companies that continue to incorporate MOC best practices and systems in their process are now able to achieve the "holy grail" of PSM – *continuous PHA revalidation* – that drives measurable cost reductions and safety benefits to the facility.

Although many operating companies have reshaped their MOC programs based on past experiences and prevalent best practices, many are still struggling to address issues that continue to affect overall program objectives and effectiveness. Our experiences in helping a wide spectrum of clients implement MOC processes and systems have led us to identify some of the most common pitfalls:

- Inadequate definition of a change: What is replacement in kind?
- Resolution of temporary changes: Do I want to extend the duration of the change, return the process to original condition or make the change permanent?
- Managing emergency changes: How to ensure that all requirements of normal changes are satisfied?
- Procedural changes: Do they require a pre-startup safety review?
- Tracking/closure of action items: How to verify that action items have been completed and meet intent of the recommendation?
- Communication of the change: How to accomplish this and maintain adequate documentation?
- Pre-startup safety review: How to decide when one is needed?
- Updating process safety information: How to manage updating to ensure MOCs are closed out in a timely manner?
- PHA interface: How to revalidate an existing PHA for each MOC?

MOC Implementation Issues

- ***Inadequate definition of a change***

A common shortfall of many MOC programs is an inadequate and inconsistent methodology in identifying changes that should by captured by the MOC process. In general, all process and plant changes except

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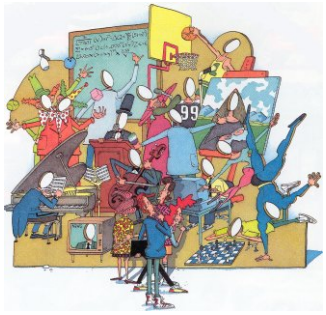
replacements in-kind should be associated with a MOC, although some latitude can be exercised regarding the specific methodologies and the level of reviews required. Care should be taken to ensure that even seemingly "minor issues" such as personnel changes in key positions, changing set points of instruments, etc., are captured in the process to ensure the requisite safety and reliability levels are maintained. For instance, lowering the set point of a pressure relief valve by 5% may seem trivial until one realizes that lowering the set point will result in a reduced relieving capacity, which in turn would require a larger relief valve orifice. Upgrading a gasket material to Teflon® for better corrosion resistance sounds reasonable until one considers the creep property of PTFE and the tendency of certain types of gaskets to squirm between flanges and eventually cause leakage.



- *Temporary changes*

The documentation, closure, and communication of temporary changes are often cited as major quality issues in MOC programs. Common issues include:

a. The authorized time period expires without removing or making the change permanent.
b. The change is made permanent, but is not reflected in the piping and instrumentation diagrams (P&IDs) and other process safety information (PSI).
c. The change is improperly or incompletely removed.

- *Emergency changes*

Due to the their nature, emergency changes are extended special privileges in the MOC process. These privileges allow plant personnel to perform emergency field changes/modifications using a less rigorous process than normal changes. However, very often these field changes are not brought into the mainstream MOC process even after the emergency situation has been addressed. Consequently, a change that may be temporary, inadvertently becomes permanent.

- *Procedural changes*

Although the OSHA 1910.119 standard specifically mentions "*Modifications to Operating Procedures*" as falling under the MOC requirements, many operating companies do not process procedural changes through a MOC. Our discussions with operating companies leads us to believe that part of the confusion may stem from the wording of the pre-start up safety review (PSSR) element, i.e. "*A PSSR is not required if there is no change in the PSI*". Since operating procedures are not included in the definition of PSI, companies often think that a PSSR is not required for a change that only affects procedures.

However, this reasoning clearly does not exempt procedural changes from being managed via the MOC process.

- *Tracking/closeout of action items*

A very common finding in PSM audits is a lack of an efficient mechanism for the tracking and closeout of assigned action items. A typical MOC will involve multiple departments and personnel, each with an assigned responsibility. Very often, a single individual may have hundreds of assigned action items related to MOCs, PHAs, audits, etc. Under these or even lesser demanding circumstances, one frequently comes across situations where many MOC items remain active simply because the assigned individuals have not documented the closeout stage. Over time, without a proper tracking system (especially prevalent in paper-based MOC systems), the facility accumulates a large MOC backlog, or worse, physically loses track of open MOCs. *It is not uncommon for a medium sized refinery to have over one thousand open MOCs due to a lack of an efficient tracking mechanism*.

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- *MOC initiated training*

An MOC will frequently generate the need for additional training. Operating companies often encounter the following issues in fulfilling the requirements associated with MOC initiated training:

a. Lack of documentation regarding the training date and participants
b. Commencing operations (covered by the MOC) before conducting the required training

The latter finding also suggests that there is an issue with the implementation of the PSSR procedure.

- *Pre-Startup Safety Review*

Although the PSM standard does not require a PSSR for every MOC item (such as those that do not entail any PSI changes), it is not uncommon to come across situations where there is no record of a PSSR even though it is required. In most cases, this may be due to a lack of adequate documentation or a formal approval process prior to startup. An absent PSSR may well be taken as a serious omission by an OSHA inspector.

- *Updating of PSI*

The update of relevant PSI is the litmus test of an effective and systematic MOC process. Most operating companies attach redlined copies of the relevant PSI (such as procedures, P&IDs, loop diagrams, etc.) to the respective MOC forms that serve as guidelines to update the master/controlled copies. However, a random field audit of completed MOCs in an operating facility will reveal that the PSI in many cases has not been updated and is not reflective of the field conditions. Therefore, one must conclude that many operating companies are struggling to identify procedures and work processes that ensure a MOC process captures PSI updates in their entirety.

- *PHA issues*

An MOC for a major plant modification and/or change involving inherently hazardous materials requires a formal PHA using one of the accepted methodologies (HAZOP, Fault-Tree Analysis, etc.). However, many MOC programs do not provide clear guidance on when a PHA may be beneficial or required. Consequently, there may be a tendency to bypass a PHA in the interest of cost/schedule even though one may be required.

Another inherent inefficiency occurs when a PHA associated with a particular MOC item is conducted without integrating the information with the then current PHA documentation. By not integrating the two, the operating facility is leaving the revalidation aspect of the overall PHA unaddressed. This will inevitably result in a longer and more costly PHA revalidation effort at the next five-year cycle. At that time, the operating facility would need to review and incorporate all MOCs into the PHA, thereby incurring redundant cost and schedule demands.

Conclusion

The overall quality and effectiveness of MOC programs in the process industries has room for improvement. Most of the gaps in existing MOC programs can be attributed to a lack of well-defined workflow, documentation, and information management capabilities. Implementation of electronic systems can help operating companies be both more *efficient* and *effective* in instituting MOC programs that drive measurable cost and safety benefits to the facility.

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References

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Mr. Ozog is a General Partner at ioMosaic Corporation. Prior to joining ioMosaic, Mr. Ozog was a consultant with Arthur D. Little, Inc. for twenty one years, where he managed the process safety consulting business. He also worked for seven years at the DuPont Company as a process and startup engineer.

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Mr. Stickles has extensive experience in failure analysis and quantitative risk assessment (QRA) applied to a variety of facilities. He is also a senior Hazard and Operability (HAZOP) study facilitator. He is a training instructor for hazard identification, fault tree analysis, and safeguarding memorandum courses. He has also participated in several major industrial incident investigations, and has provided expert testimony in the area of process safety management.

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