MOC BEST PRACTICES

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Upcoming Seminars:

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Perspectives

In this series of 3 newsletters, I wanted to get to the point where we can look at best practices for change initiation. That requires a thorough understanding of what, exactly, constitutes a change which demands an MOC. This analysis comes in 3 parts:

- In order to require an MOC, the activity in the plant must impact a covered process. The definition of covered process is provided by OSHA [1]. A more detailed assessment appears in the January 2010 newsletter [2].
- Once a process is considered "covered" by PSM, then it's necessary to have a clear understanding of what constitutes a change. That's the subject of this, current, newsletter.
- Even if one is dealing with a covered process, and an apparent change is taking place, there is an exemption for "replacements in kind". A detailed review of replacement in kind appears in the July 2009 newsletter [3].

So, let's get started with *What's a Change?…*

What's a Change?

> *By far the most challenging aspect of managing change is identifying that the proposed modifications are in fact a change. [4]*

The OSHA definition of what constitutes a change is[1] :

(l) ***Management of change.***

(1) The employer shall establish and implement written procedures to manage changes (except for "replacements in kind") to

- *process chemicals,*
- *technology,*
- *equipment,*
- *procedures; and,*
- *changes to facilities that affect a covered process.*

Another, rather broad definition is "any changes that could increase risk" [5]. In the context of risks that are relevant to plant operations, this definition can be broken down into several elements[2,3]:

- process chemicals [1]
- materials [6]
- chemical inventory [7]
- technology [1]
- processing conditions [6]
- process sequence [8]
- equipment [1]
- procedures [1]
- diagnostics [9]
- testing [9]
- installation [9]
- changes to facilities that affect a covered process [1]
- changes to site security [7]
- changes that result in a change to a controlled document [5]

Several of these elements warrant further discussion:

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Changes to Process Chemicals

Changes to process chemicals include:

- new suppliers [10]
- procuring the chemical under a different trade name [11]
- different physical properties (like particle size, which may cause clogging in filters) [11]
- more corrosive feed [12]
- reintroduction of a chemical after an absence of 2 years or more [5]

Changes to Technology

Changes to technology include:

- changes to production rates [6, 12]
- changes to operating conditions [6]
- operation outside safe operating limits [4]
- experimentation [6]
- new product development [6]
- equipment unavailability [6]
- flare unavailability [12]
- bypassing of alarms, interlocks and relief systems [4, 13]
- changes to the control scheme of an instrument loop [13]
- changes to reduce emissions [13]
- capital projects [4, 14]

Changes to Equipment

Changes to equipment include:

- piping re-arrangements [6]
- pressure safety valve settings [13]
- flange seal material [12]
- alarms and interlocks [6]
- settings of alarms and interlocks [10]
- instrument transmitter ranges [5]
- rotational speed of equipment (e.g. in dry powder use) [8]
- safety shutdowns added or modified or new trip points [15]
- safety dumps or purges added [15]
- fire detection and suppression systems added, removed, or modified [15]
- new equipment suppliers (see also, the RIK discussion [3])
- experimental equipment [6]
- equipment bypass [4, 9]
- decommissioning [4]
- dismantling [5]
- changes to the turnaround interval [11]
- changes to the turnaround schedule [11]
- software changes [16]
- software documentation changes [16]
- new units or major additions to a unit [14]
- capital projects [14]

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1. The bullets don't appear in the regulation; they have been added for emphasis.
2. The elements in this list are not mutually exclusive
3. This newsletter contains many lists which refer to many references. Almost all the references refer to "process chemicals", but only one citation is provided. The same is true for most other elements in the various lists: many references are applicable, but only a representative citation is provided..

Changes to Procedures

The phrase "changes to procedures" immediately invokes the notion of changes to operating procedures. Changes to operating procedures are certainly covered by the regulation, but the regulation doesn't limit itself to just operating procedure changes [1]:

(l) ***Management of change.***

(1) …manage changes to

- …
- *procedures*
- …

In fact, the Petroleum Refinery Process Safety Management National Emphasis Program [12] is one of the most comprehensive guidance documents which lists, in detail, what OSHA believes to be important in a process safety management program. Numerous different procedures, in addition to operating procedures, are specifically identified in the NEP protocol. The NEP items are identified in the list that follows.

A complete list of procedures, whose change may trigger MOC includes:

- operating procedures (f.1.i)[4] (i.2.ii) [12]
  - initial start-up
  - normal operations
  - temporary operations
  - emergency shutdown
  - emergency operations
  - normal shutdown
  - start-up following a turnaround or emergency shutdown
  - preparation for maintenance [4]
- operating limits (f.1.ii)
  - consequences of deviations
  - steps to correct or avoid deviations
  - safety systems to handle deviations outside acceptable limits [4]
- safety and health considerations (f.1.iii), which are contained in procedures
  - properties, hazards of chemicals
  - precautions to prevent exposure
    - identifications of exposure possibilities [17]
    - engineering controls
    - administrative controls
    - personal protective equipment
  - control measures in case of physical contact or airborne exposure
  - quality control of raw materials
  - special or unique hazards
  - control of ignition sources [16]
  - control of equipment brought into the area temporarily [16]
  - disposal of flammable materials [16]
  - disposal of combustible dusts [16]
- safety systems and their functions (f.1.iv) [12], which are documented in procedures
- safety procedures (i.2.ii) [12]
- emergency planning and response (n)
  - emergency management plans [7]
  - emergency response plans [7]
  - procedures for emergencies (i.2.ii) [12]
  - procedures for small releases (n)
- computerized process control systems
  - logic of the software [6]
  - relationship between equipment and the control system [6]

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4. The letters and numbers in parentheses, e.g. (f.1.i) refer to specific sections of 29CFR1910.119. The sub bullets are also from the same section of 1910.119.

Changes to Procedures continued...

- procedures to maintain the on-going integrity of process equipment (i.2.ii), (j.2) [12]
  - maintenance [18]
  - maintenance intervals [19]
  - cleanout and steamout [20]
  - inspection procedures
    - general [6]
    - pressure vessel inspection [12]
    - piping inspection [12]
    - evidence that inspection procedures follow RAGAGEP (j.4.ii) [12]
  - inspection intervals [11, 12]
  - calibration
  - testing
    - evidence that testing procedures follow RAGAGEP (j.4.ii) [12]
    - location of thickness measurements [12]
  - repair [12]
  - equipment deficiency management [12]
  - servicing [12]
  - alteration [12]
  - indication of who or what group is authorized to conduct mechanical integrity activities, including their qualifications and credentials [12]
- nonroutine work procedures [6]
- quality assurance
  - fabrication [6]
  - installation [6]
- process safety management procedures (i.e. procedures for conducting the various elements of PSM) [16]
  - the MOC procedure, itself (l.1)
- administrative procedures
  - car-seal procedures [12]
  - personnel reassignment and replacement [16]
  - lockout, tagout [21]
- information management procedures [16]
  - procedures to keep process safety information up to date [16, 22]
  - training material maintenance [5]
- audit procedures [6]
  - audit frequencies [15]

Changes to Facilities

Changes to facilities include:

- shutdown of facility for 6 months or more, or restart after a greater than 6 month idle [5]
- siting
  - siting of occupied structures [12, 23]
  - moving a trailer near a covered process [12]
  - equipment staging and relocation [15]
- increased occupancy [15]
- traffic concerns
  - changes to emergency vehicle access routes [15]
  - increased vehicle traffic [15]
  - changes in occupancy patterns or locations of personal work areas [15]
- structural integrity and/or support changes [13]
- warehouse operations
  - changes to warehouse conditions, like temperature [24]
  - storage quantity [25]
  - size of containers stored [25]
  - types of chemicals stored [24]
  - method of storage [24]
  - changes to warehouse activities, like:
    - repackaging [24]
    - transfer [24]

Orgainizational Changes

The PSM regulation does not explicitly state that an organizational change is a change that must be addressed with an MOC. There is, however, an implicit connection since organizational changes commonly cause changes to procedures, and procedure changes are subject to MOC.

In contrast, other studies stress the importance of managing organizational change just like any other change. For example:

- The Report of the BP U.S. Refineries Independent Safety Review Panel [26] listed "management of organizational change" as a corrective action, particularly in regard to transferring projects and the related knowledge from one person to another when the former changes jobs.
- Recent OECD reports identify "changes of organizational or administrative character" [27] as important. Specifically, "Procedures should also exist to ensure that changes in management, labour and organization do not compromise safety (including, for example, changes in corporate structure or financing, downsizing of staff, out-sourcing of certain production)" [28].
- A detailed analysis of the effects of downsizing was provided by Perron and Friedlander [29]

Organizational changes may be caused by [13]:

- reorganization
- vacation
- temporary leave
- strikes and other labor disputes
- illness
- natural disasters
- retirements [5]

Organizational changes include [4]:

- extra work
    - substantial increase in existing operators' duties [5]
    - reduction in the number of operations specialists, engineers, supervisors [5]
    - substantive increase in the duties of operations specialists, engineers, supervisors [5]
    - elimination of positions [4, 15], which may lead to
        - insufficient skills or training
        - slower or incorrect response to process upsets
    - increases in staffing which, paradoxically, increase the work of the existing staff as the additional resources are integrated into the existing operations, and procedures are modified [15]
- capability concerns:
    - substitution of personnel [4]
    - training program modifications [15]
- organizational structure issues:
    - changes to job assignments [4]
    - changes to reporting authority [11]
- external impacts:
    - changes in "nonprocess" safeguards (e.g. diminished capabilities from off-site response organizations) [15]
    - significant external events that could impact a process [15]

Systemic Change Effects

How various changes interact with each other is not explicitly identified in any regulation as an issue which triggers an MOC, since it's assumed that change interactions are addressed during the hazards analysis. Nonetheless, there are two classes of changes which warrant consideration:

- cumulative impact of multiple changes [13], also known as "slow drift in conditions". E.g.
  - multiple personnel reductions, which may make emergency response more difficult [10]
  - the effects of incremental changes to safety instrumented systems [30]
  - incremental increases in the amount of combustables can eventually render existing fire protection inadequate [10]
- a given change violating the assumptions of a previous change [15]

New Items versus Changes

An aggressive or legalistic interpretation of the word "change" may conclude that a new item or an additional item isn't a change, because one cannot change something that doesn't exist. In today's vernacular, one can only say, "Good luck with that" since there's no regulatory support for such a notion. A more rigorous argument would look something like this:

- every new item or addition occurs at a given level in some hierarchy: e.g. adding a relief valve on a line.
- each level in a hierarchy has a higher level: e.g. a line is part of the piping arrangement for the unit
- when an item is added, it's new or additional at its own level, but it's a change at the next level up in the hierarchy: e.g. adding a relief valve is a change to the piping arrangement.

But what if an entirely new unit is to be added? Is that still a change? That question was asked shortly after the PSM regulations were promulgated [14]:

> How can we determine the point where changes to an existing facility have become so extensive that it should be considered a "new" facility? We find the PSM standard to be very clear in the definition of "replacement in kind" and how to determine the point when a facility is considered "modified', but less clear on the issue of when changes have progressed beyond "modification".

OSHA responded that, generally speaking, a new unit on an existing site is a change [14]:

> Please note under paragraph 1910.119(b), "Definitions" that a "facility" means buildings, containers and equipment which contain a process. A facility constructed on a work site where there are no other facilities is considered a new facility… A facility, subsequently constructed on the work site such that it is physically separated from and otherwise independent from existing facilities, is considered a new facility. (A facility is considered independent when the facility including the process(es) contained in the facility would not affect or be affected by an existing facility including the process(es) it contains. Otherwise the facility is considered a dependent facility.) …A facility, subsequently constructed on the work site such that the facility or the process(es) it contains is connected to or otherwise dependent on an existing facility including the process(es) it contains, is considered collectively to be a modified facility.

The OSHA definition[1] of what constitutes a change is:

(l) ***Management of change***.

(1) The employer shall establish and implement written procedures to manage changes (except for "replacements in kind") to

- *process chemicals,*
- *technology,*
- *equipment, and*
- *procedures; and,*
- *changes to facilities that affect a covered process.*

The first three items in the list relate to paragraphs (1), (2) and (3) of the "process safety information" definition [1]

(d) ***Process safety information**. In accordance with the schedule set forth in paragraph (e)(1) of this section, the employer shall complete a compilation of written process safety information before conducting any process hazard analysis required by the standard. The compilation of written process safety information is to enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals. This process safety information shall include information pertaining to the hazards of the highly hazardous chemicals used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.*

(1) Information pertaining to the hazards of the highly hazardous chemicals in the process. This information shall consist of at least the following:

(i) Toxicity information;
(ii) Permissible exposure limits;
(iii) Physical data;
(iv) Reactivity data:
(v) Corrosivity data;
(vi) Thermal and chemical stability data; and
(vii) Hazardous effects of inadvertent mixing of different materials that could foreseeably occur. Note: Material Safety Data Sheets meeting the requirements of 29CFR1910.1200(g) may be used to comply with this requirement to the extent they contain the information required by this subparagraph.

(2) Information pertaining to the technology of the process.

(i) Information concerning the technology of the process shall include at least the following:

(A) A block flow diagram or simplified process flow diagram (see appendix B to this section);
(B) Process chemistry;
(C) Maximum intended inventory;
(D) Safe upper and lower limits for such items as temperatures, pressures, flows or compositions; and,
(E) An evaluation of the consequences of deviations, including those affecting the safety and health of employees.

(ii) Where the original technical information no longer exists, such information may be developed in conjunction with the process hazard analysis in sufficient detail to support the analysis.

(3) Information pertaining to the equipment in the process.

(i) Information pertaining to the equipment in the process shall include:

(A) Materials of construction;
(B) Piping and instrument diagrams (P&ID's);
(C) Electrical classification;
(D) Relief system design and design basis;
(E) Ventilation system design;
(F) Design codes and standards employed;
(G) Material and energy balances for processes built after May 26, 1992; and,
(H) Safety systems (e.g. interlocks, detection or suppression systems).

Process Safety Information continued...

(ii) The employer shall document that equipment complies with recognized and generally accepted good engineering practices.

(iii) For existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in general use, the employer shall determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

The OSHA definition for process safety information, "PSI", is not comprehensive. Words like "consist of at least", "include at least" and "shall include" give an indication that the listed items are a minimum, and the expectation is that there may be many more items which belong to process safety information.

The following sections provide a much more comprehensive list of PSI items, based on recognized published references. However, it is impossible for any author to create a complete list, since that would require an understanding of all process safety risks and the names of the documents which permit perpetual safe operation in the presence of those risks. At best, a more comprehensive list can be presented with the intention of providing some benefit to the reader.

Highly Hazardous Chemicals in the Process

The PSM regulation identifies a number of information items that are important for understanding the hazards of highly hazardous chemicals. It further states, "Material Safety Data Sheets meeting the requirements of 29CFR1910.1200(g) may be used to comply with this requirement to the extent they contain the information required by this subparagraph."

29CFR1910.1200(g) [31] does not specify any format or organization for Material Safety Data Sheets. But, ANSI Z400.1[32] does provide a structure for MSDSs. The following list inserts key process safety information items into the ANSI Z400.1 structure.

Information pertaining to the hazards of the highly hazardous chemicals in the process includes:

Section 1. Product and company identification
- name [4], noting that vendors may use different names or trade names [11]
- trade name(s) [11]
- chemical formula[4]

Section 2. Hazards identification

Section 3. Composition/information on ingredients

Section 4. First aid measures

Section 5. Fire fighting measures

Section 6. Accidental release measures

Section 7. Handling and storage

Section 8. Exposure controls/personal protection
- permissible exposure limits [1]

Section 9. Physical and chemical properties
- physical data[5] [1]
- thermodynamic data[5]
- explosive properties

Section 10. Stability and reactivity
- reactivity data[5] [1]
- corrosivity data [1]
- thermal and chemical stability data [1]
- hazardous effects of inadvertent mixing [1]
- reaction kinetics

Section 11. Toxicological information
- toxicity information [1]

Section 12. Ecological information

Section 13. Disposal considerations

Section 14. Transport information

Section 15. Regulatory information

Section 16. Other information

[5] Detailed examples appear in Guidelines for auditing process safety management systems, CCPS, 1993.

Technology of the Process

Information concerning the technology of the process includes:

- block flow diagram or simplified process flow diagram [1, 12]
- process narrative description [12]
- operating philosophy, operating margins, error-likely situations [17]
- operating manuals
- safe upper and lower limits on temperature, pressure, flow rates and compositions [1, 4, 12]
- safe upper and lower limits on pH, vibration, rate of reaction, contaminants, availability of utilities [12]
- consequences of deviation [1]
    - o on equipment
    - o on employees
- unit throughput changes [12]
- process chemistry [1]
    - o raw materials
    - o feedstocks [11]
    - o intermediates[5]
    - o catalysts[5]
    - o products
    - o waste streams and by-products
    - o reactive chemicals[5]
    - o residues [21]
- maximum intended inventory [1, 12]
- design basis [12]; see the section on RAGAGEP, below
- special design considerations[5]

Note that the collection of safe upper and lower limits for all of the process parameters is often termed “operating parameters”. A graphical depiction of safe ranges is often called the “operating envelope”.

Equipment in the Process

Information pertaining to the equipment in the process includes:

- materials of construction [1, 12]
- drawings of the current plant configuration[6]
    - o architectural
        - architectural drawings of facilities
    - o civil/structural
        - plot plans [12], plant layouts [20], site maps [21]
        - plot plans of underground services [4]
            - process and material lines
            - water lines (process, cooling, potable)
            - fire water lines
            - process drain lines
            - electrical power cables
            - utility supplies (natural gas, nitrogen, air)
            - communication lines
    - o process
        - piping and instrumentation diagrams [1, 12]
        - process flow diagrams
        - block flow diagrams
    - o HVAC
        - HVAC distribution diagram [16]
    - o fire protection
        - fire protection system drawings [16]
    - o piping
        - plot plan
        - piping isometric

[6]Each of these sub-bullets contains common examples of drawings in the category, but this is not an exhaustive list

Equipment in the Process continued...

- mechanical
  - equipment arrangements [20]
  - detail drawings [16]
- vessels
  - pressure vessel detail drawings [20]
- electrical
  - electrical classification [1, 12]
  - electrical one-line diagrams [12]
  - schematic diagrams
- control systems
  - instrument loop diagrams [4]
  - interlock drawings [21]
  - ladder logic drawings [21]
  - instrument wiring diagram
- hazardous area classification drawings [16]

- relief system design and design basis [1, 12]
  - life of relief devices [12]
  - description of the design basis overpressure events [33]
- ventilation system design [1]
  - HVAC systems related to process safety (fume or dust controls) [16]
- design codes and standards employed [1]
  - company standards [16]
  - industry standards [16]
  - piping specifications [5]
- software [16]
  - source code
  - reference manuals
  - training manuals
  - upgrades
- material and energy balances [1]
- safety systems (e.g. interlocks, detection, suppression) [1]
  - alarms [16]
    - alarm set points [21]
  - interlocks [16]
  - fire fighting [13]
  - safety critical instrument index [4, 16]
    - sensors
    - transmitters
    - controllers
    - control valves
    - pressure reducers
    - unit alarm listing [5]
    - unit safety equipment checklist [5]
    - unit safety relief device checklist [5]
    - critical equipment list [5]
  - control system documentation
    - narrative descriptions [5]
    - hardware specifications [4]
      - DCS computer
      - uninterruptable power supply
      - PLCs
    - wiring diagrams [4]
      - DCS to instrument connections
      - process control devices
    - DCS/PLC software documentation [4]
    - DCS/PLC configuration information [21]
      - e.g. PLC set points

Recognized and Generally Accepted Good Engineering Practices

The PSM regulations include a reasonable requirement whereby it's not sufficient to simply document the current plant configuration. Rather, it is necessary to ensure that the plant is properly designed, maintained, inspected, tested and operated:

(d) ***Process safety information. …***
(3) Information pertaining to the equipment in the process.
(ii) The employer shall document that equipment complies with recognized and generally accepted good engineering practices.

- Properly Designed
  - design basis assumptions [21]
  - design calculations [21]
  - design basis documentation [12]
    - new construction: the design basis for new construction is normally contained in documents which have various names: "data books", "blue binders", "vendor manuals", "construction and design information" [12]
    - changes to an existing plant/unit: the design basis evolves when acted upon by various change agents: MOCs, capital projects, turnarounds, PHA revalidation, etc. the most common locations for design basis changes are "project files", "project folders", "capital project files"
  - pressure ranges [4]
  - temperature ranges [4]
  - flow rates [4]
  - concentrations and reactant ratios [4]
  - operation and control philosophy [4]
  - consequences of exceeding these limits [4]
  - piping and vessel design documents. The Refinery National Emphasis Program identifies over 20 information items needed for piping and vessels [12].
  - fitness for purpose assessments [12]
  - piping tie-ins [15]
  - utility tie-ins [15]
  - vessel rerating [15]
  - special design considerations: e.g.
    - integrally-bonded pressure vessel liners [12]
    - insulation [12]
    - nonlubricated equipment [4]
    - exclusion of or requirements for oxygen [4]
    - exclusion of water [4]
  - design reports [7]
  - pressure relief strategy [20]
  - causes of deviations [16]
  - failure tolerance design aspects [17]
    - corrosion resistance
    - erosion resistance
    - fire proofing
    - explosion proofing
    - natural disaster resistance
  - failure mitigations
    - disposal of relieved materials [16]
  - equipment files [12]
    - data sheets/specification sheets [12]

Recognized and Generally Accepted Good Engineering Practices continued...

- equipment files [12]
    - data sheets/specification sheets [7][12]
        - equipment
            - pumps [12]
            - tanks [12]
            - vessels [21]
            - gaskets [21]
            - flanges [21]
            - electrical switch gear [21]
            - electrical equipment [21]
            - etc.
        - instrumentation [20]
            - sensors [21]
            - transmitters [21]
            - controllers [21]
        - valves [20]
            - control valves [20, 21]
            - pressure reducers [20]
        - relief devices [20]
            - safety valves
            - rupture disks
            - rupture pin
    - hydrostatic test reports [4, 12]
    - weld radiographs [4, 12]
    - portable or temporary equipment data [21]
- software documentation [16]
    - requirements specification
    - functional specification
    - system hardware specification
    - test plan
    - architectural design specification
    - software module design specification

- Properly installed
    - Software [16]
        - Module software code
    - Calibration records [12]
- Properly inspected
    - Vendor/manufacturer's inspection report [4, 12]
    - Inspection history [12]
    - Internal inspection data [12]
    - Pressure vessel inspections [17]
    - Inspection records [21]
- Properly maintained
    - Repair, alteration and rerating information [12]
    - Maintenance records [21]
- Properly tested
    - Installation documentation [12]
    - Fabrication and installation test data [12]
    - Shutdown system tests [17]
    - Pressure relief valve tests [17]
    - Software [16]
        - Module software test plan
        - Module test procedure
        - Module test results
        - Site acceptance test plan
        - Site acceptance test procedure
        - Site acceptance test results

[7] Each of the equipment type sub-categories contains a number of representative, but not exhaustive, examples.

Recognized and Generally Accepted Good Engineering Practices continued...

- Properly Operated
    - Operating history [12]
    - Analysis of abnormal operations [12]
    - Alarm strategy [20]
    - Interlock strategy [20]
    - Temporary and portable equipment [11]

Changes to Process Safety Information

The similarity between MOC triggers (changes to chemicals, technology, equipment, …) and process safety information (information about chemicals, technology, equipment…) has led to confusion. A common misconception is that a change to process safety information immediately requires an MOC. Let's look at this more closely…

The MOC triggers, described in the PSM regulations, "changes to process chemicals, technology, equipment, …" actually refer to changes in assets. The PSI elements, "…chemicals… technology… equipment" refer to information. Obviously the information items describe the assets, but the information items are not the same as the assets.

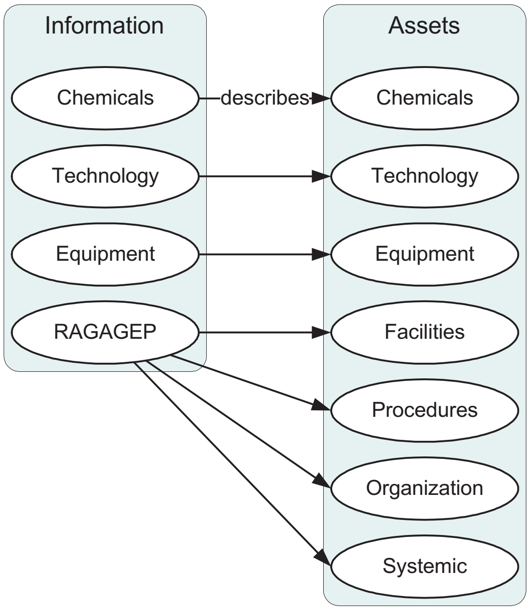

Figure 1. Relationship between PSI information items and MOC triggers.

In general, the process safety information describes the assets in the plant. The steady-state case, when a change is not occurring, is shown by Case 1 in Figure 2.

When an asset change takes place, it is governed by MOC. Process safety information must be updated as part of the change process: Case 2.

When only process safety information is changed or created, there may or may not be a change to the underlying assets, and consequently there may or may not be a need for MOC. This is an important observation.

A comprehensive view of PSI (including RAGAGEP) includes a very large number of information types, not only the expected types like drawings, but also equipment data, maintenance data, inspection data, operations data, etc. If each time a new data item was produced, an MOC were required, then work at plants would essentially stop, as each item is logged on an MOC and approved. So, again, while some PSI changes trigger MOC (see Table 1), most PSI changes do not.

Changes to Process Safety Information continued...

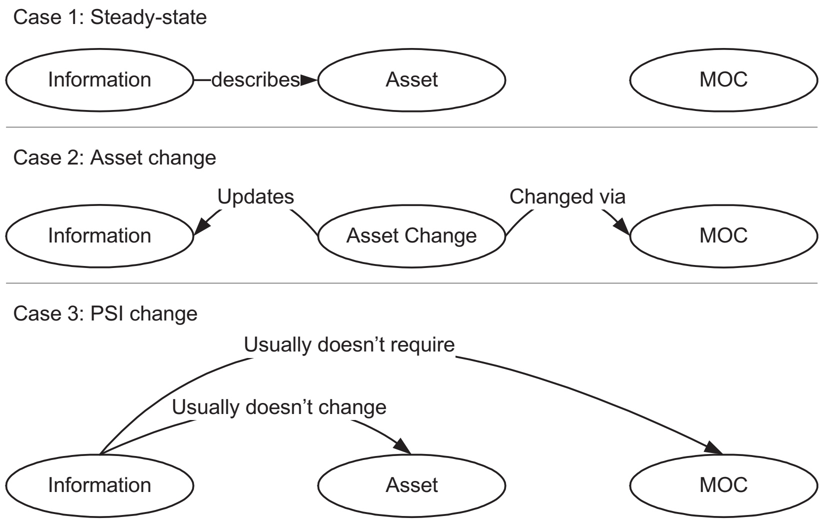

Figure 2. Relationship between PSI informaiton items and MOC triggers.

PSI Change Requiring MOC	PSI Change Not Requiring MOC
Changing the maximum intended inventory in plant documentation	Receiving those very same materials at the loading dock
Changing procedures and operating parameters to increase unit throughput	Logging unit throughput in a database
Changing the data on an MSDS for intermediates	Receiving an MSDS from a supplier and storing it in the MSDS binder
Obtaining spec sheets from a vendor, when a new instrument is added to a line.	Adding specification sheets to an equipment file
Adding, removing or relocating inspection points	Collecting data from measurements taken at an inspection point
Changing maintenance procedures	Documenting maintenance activities that comply with the procedures
Creating an operating procedure for a new set of conditions	Maintaining operations history in an operators log

Table 1. PSI changes with and without an associated MOC

Summary

In this letter, we have carefully analyzed what a change is. This includes consideration of the PSM regulation, which specifically lists asset changes (process chemicals, technology of the process, equipment and facilities) as well as procedures. Furthermore, there is an evolving consensus that organizational changes are also changes that should be managed by MOC. And finally, the notion of impacts of systemic change is introduced.

MOC almost always requires changes to process safety information. A thorough review of PSI is presented, within the practical limitation that it's impossible to know what every company calls every kind of document.

And, finally, a critical look is taken at PSI changes. Recalling the old adage that "all horses are animals, not all animals are horses", similar logic applies to PSI inasmuch as "all MOCs change PSI, but not all PSI changes require an MOC". The analysis presented on this topic is a bit more rigorous than would be suggested by my use of these clichés.

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