MANAGEMENT OF CHANGE

January 2012

3rd Edition

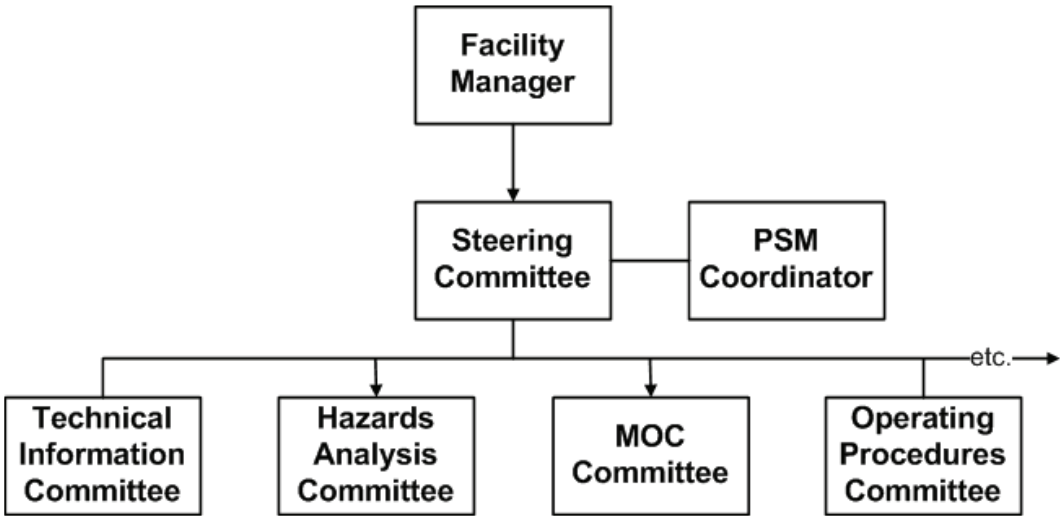
The elements of OIM interact strongly with one another. With regards to Management of Change, most changes will require as a minimum that the technical information (element 2) be updated, new operations and training will be required (elements 6 and 7), the equipment integrity program (element 8) will require modification, and a prestartup safety review (element 5) will be needed before the change is implemented.

When companies in the process industries first implemented Management of Change (typically in the late 1980s or early 1990s), the topic was perceived as being essentially technical. However managers now increasingly recognize that organizational changes can be equally important in terms of plant operation and safety, and that such changes should be incorporated into the MOC program. The topic of organizational change is discussed further on page 25.

Management Structure

Most OIM / PSM programs are organized around a committee structure such as that shown in Figure 1.

Figure 1
OIM / PSM Management Structure



The facility manager appoints a steering committee (of which he or she is the chair). The committee will consist of the senior managers from operations, maintenance, engineering and human resources. The day-to-day work of the committee will be handled by the facility PSM coordinator, who may also be the MOC coordinator.

Reporting to the steering committee will be a group of sub-committees: one for each of the major discipline elements listed in Table 1. The structure of the Management of Change committee is discussed on page 45.

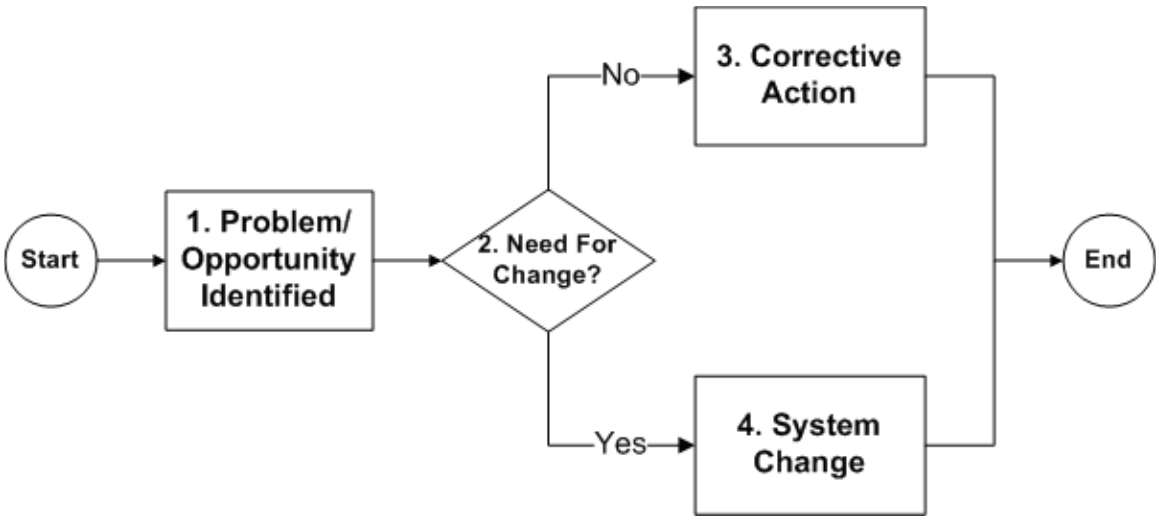
THE CHANGE PROCESS

Before launching into an MOC program, it is important to make sure that the problem or issue at hand does, in fact, require a system change. For example, if a pump seal is leaking too frequently,

someone may propose that a new type of seal be installed. However, it may be that the problem could be alleviated merely by making sure that existing training programs for the operations and maintenance technicians are applied more thoroughly.

The manner in which a proposed change can be evaluated is illustrated in Figure 2.

Figure 2
The Change Process



Step 1 — Problem / Opportunity Identified

The change process starts when someone, referred to later in this ebook as the *Initiator,* recognizes that there is a problem that requires correction, or that there is an opportunity to improve the operation. By suggesting that the system can be improved and filling out the appropriate paper work the initiator triggers the Management of Change process.

The identification of the need for change is the most important step in the whole MOC process; if no one takes the initiative to suggest change, then no improvements will ever be made. Therefore it is vital all personnel, including temporary, office and contract workers, participate in the change management process. In particular, senior employees such as managers, technical experts and experienced supervisors need to be willing to listen to the ideas of those who do not possess their knowledge or seniority. An employee's lack of experience does not mean that he or she cannot come up with useful insights and suggestions. Indeed, lack of experience may even be an advantage at this stage of the MOC process; the initiator may be able to perceive issues more clearly than those who have lived with them for years.

Step 2 — Need For Change

As already discussed at the start of this section, when someone requests that a change to the system be made, it is very important to make sure that the problem or opportunity cannot be better addressed simply by making sure that existing management systems are being executed properly. It often is tempting to call for a change without making sure that the current equipment and procedures cannot resolve the issue. Such a temptation should be resisted.

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 procedures shall assure that the following considerations are addressed prior to any change:

- *The technical basis for the proposed change;*
- *Impact of change on safety and health;*
- *Modifications to operating procedures;*
- *Necessary time period for the change; and,*
- *Authorization requirements for the proposed change.*

Employees involved in operating a process and maintenance and contract employees whose job tasks will be affected by a change in the process shall be informed of, and trained in, the change prior to start-up of the process or affected part of the process.

If a change covered by this paragraph results in a change in the process safety information required by paragraph (d) of this section, such information shall be updated accordingly.

If a change covered by this paragraph results in a change in the operating procedures or practices required by paragraph (f) of this section, such procedures or practices shall be updated accordingly.

The regulation is non-prescriptive. It provides a framework in which companies can organize the management of change, but it does not provide much detail.

RISK MATRICES

Management of Change is part of the broader topic of risk management because most proposed changes are intended to reduce risk to an acceptable level. Most companies use a risk matrix to assess levels of risk, as discussed in the book *Process Risk and Reliability Management.* A brief overview of the use of risk matrices is provided below.

Typically, three matrices are used. They are:

- Consequence Matrix;
- Frequency Matrix; and
- Risk Matrix.

Consequence Matrix

A representative consequence matrix is shown in Table 2. The matrix has four levels of consequence covering worker safety, public safety, the environment and economic loss. There are no rules as to how many levels should be selected, nor does any major regulatory body insist on a particular size of matrix. However, many companies choose four levels; three levels does not provide sufficient flexibility and differentiation, but five levels imply a level of accuracy that is probably not justified — estimates of hazard consequences are usually very approximate. The steps in Table 2, from 'Low' to 'Very Severe', are roughly in orders of magnitude, *i.e.,* each increased level is about ten times more serious than the one before it.

Table 2
Consequence Categories

	Worker Safety	Public Safety / Company Reputation	Environment	Economic (annual)
Low, 1	Reportable or equivalent.	None.	Limited impact that is readily corrected.	$10,000 to 100,000
Moderate, 2	Hospitalization or lost-time injury.	Minor medical Attention.	Report to Agencies and take remediative action.	$100,000 to 1 million
Severe, 3	Single disabling injury.	Hospitalization or serious injury. Some local reporting.	Irreversible damage to low quality land, or clean-up of environmentally sensitive areas required.	$1 million to 10 million
Very Severe, 4	Fatality or multiple serious injuries.	Fatality or multiple serious injuries. Massive negative publicity.	Months of clean-up work needed in environmentally sensitive areas.	≥ $10 million

Worker Safety

The first of the consequence columns shown in Table 2 is worker safety — the topic that usually receives the most attention during risk analyses. Indeed many risk analysts will elect to consider this item only. If the workers are safe, it is argued, then the other consequence terms will probably be acceptable also.

Public Safety and Health

Incidents that affect members of the public usually attract a good deal of attention. Hence the categories for public safety, which are shown in the second consequence column of Table 2, are an order of magnitude higher than for worker safety. (It could be argued that all people have the same value, and that a member of the public is not 'more valuable' than a worker. However, as is stressed throughout this ebook, risk is fundamentally a subjective topic. Incidents that affect the public are 'worse' than those involving just workers. Such incidents become even less acceptable if they affect children.)

Related to public safety and health is the topic of company reputation and negative publicity, particularly those major events that 'make the newspapers'.

Environmental Impact

Environmental risks are also shown in Table 2. In practice environmental issues are normally controlled by rules and regulations rather than an objective analysis of risk.

Economic Loss

The final consequence category in Table 2 is economic loss. All process incidents generate losses in one or more of the following areas:

- Damaged or destroyed equipment;
- Lost production;
- Off-quality product;
- Litigation; and
- Clean-up.

As discussed in the ebook *Process Risk Management,* great care must be taken when setting up a system that apparently creates a monetary value for human life and injury.

Frequency Matrix

Once the consequences associated with an incident have been identified, the next step is to estimate the frequency with which the incident may occur. A representative frequency matrix is shown in Table 3. As with the consequence matrix, four value levels are provided. The use of just three levels is probably too coarse, but five levels or more implies a degree of accuracy that probably cannot be justified (precision is not the same as accuracy).

As with the consequence matrix, the steps in Table 3 are roughly an order of magnitude greater than the one before it.

The previous pages where just a sample of …

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