SAFER Safety Advisory Foundation for Education & Research

SAFER Combustible Dust Management Assessment Handout

Management of Change

Management of Change is an extremely important process that Joint Health & Safety Committees should fully understand and adopt. Now more than ever, Joint Health & Safety Committees are moving towards embracing a management of change process to eliminate workplace hazards that could lead to injuries, equipment damage, production losses, or environmental impact. Dust mitigation and/or abatement in lumber manufacturing plants should be viewed through the lens of a management of change procedure so no change occurs that could increase the severity or consequence of an existing dust hazard, or that a dust hazard is introduced where none existed previously. SAFER urges Joint Health & Safety Committee to adopt and routinely exercise a formal management of change process in their operation.

What is Management of Change (MOC)?

Management of Change, or MOC, is a best practice used to ensure that safety, health and environmental risks are controlled when a company makes changes in their facilities, documentation, personnel, or operations.

When decisions and changes are made rapidly, safety and health risks can increase resulting in disasters such as deflagrations and/or explosions. There are many notable examples of how even simple changes at a worksite have led to tragedy; sugar and oil refineries are at considerable risk and now BC sawmills – after the Babine Forest Products and Lakeland Mills explosions – find themselves in a similar risk classification.

At worksites where combustible dust is present, a safety management process for the application of MOC is not just a best practice, but is highly recommended. A MOC program can be used to ensure that all changes to a manufacturing process is properly reviewed and any hazards introduced by the change are identified, analyzed, and controlled before start-up and/or before resuming the production process.

MOC often seems deceptively simple in concept, but can be very effective in the prevention of accidents and can be used as a best practice.

When is MOC used?

Generally, a business need or opportunity becomes a project or business solution and requires changes in the workplace that can affect processes, systems, people, or organizational structure. Think about whether implementing this change improves your safety program and makes good business sense.

One obvious benefit MOC provides is avoiding the consequences of unforeseen safety and health hazards through planning and coordinating the implementation of the change. In many high risk operations, particularly oil and gas refining, MOC is required to mitigate safety risks and concerns.

What are the benefits of MOC?

- It minimizes unplanned adverse impacts on system integrity, security, stability, and reliability for the manufacturing process being altered or added.
- It maximizes the productivity and efficiency of staff planning, coordinating, and implementing the changes.
- It provides a stable and safe production environment.
- It ensures the proper level of technical completeness, accuracy of modifications, and testing of systems before implementation.
- It provides an appropriate level of management approval and involvement.

How do you effectively design and implement MOC?

Managing change begins with a discussion of the types of changes being considered that could affect workplace safety and health, including effects that may not be obvious.

Procedures for managing change should be written and regularly reviewed to reduce the risk associated with any changes.

Changes being considered must be thoroughly evaluated for how they affect employee safety and health. Sometimes there is a domino effect, where one change leads to more changes, and you will need to determine if the changes being considered will cause additional changes to operating procedures.

A MOC program must specify what types of changes are to be managed. For example, will the Joint Health & Safety Committee decide that they will apply MOC parameters to physical alterations to equipment only or new operating procedures only – or both. Will the Joint Health & Safety Committee also recommend MOC parameters to examine manning levels and/or training procedures.

A proper MOC system also requires that any change be evaluated before implementation. The level of evaluation can depend on the degree of change and how critical it is to the safety of your operations.

Employees, as well as maintenance and contract workers whose work will be affected by the change, must be informed and trained on the new equipment, process or whatever the change includes. This must be done before startup of the process or startup of the affected part of the process.

Managing change also means updating any safety information, operating procedures or practices related to the new procedures. Engaging the Joint Health & Safety Committee in this type of work has proven to be a worthy practice that promotes and strengthens Joint Health & Safety Committee involvement.

Elements of an effective MOC Program are:

- Procedures that consider:
    - The technical basis for the proposed change.
    - Impact of the change on employee safety and health.
    - Modifications to operating procedures.
    - Time needed for the change.
    - Authorization required for the proposed change.
- Steps taken to identify hazards before the changes are made.
- Identifying methods to screen and classify changes.
- Identifying the key hazards in changes.
- Identifying methods for documenting MOC reviews.
- Procedures to make approvals and authorizations workable.
- Plans to inform and train personnel about the changes.
- Methods for updating Process Safety Information, procedures and other Process Safety Management information.
- Steps for effective implementation.
- Procedures for reviewing and revising any existing MOC Program.

Best Practices in MOC

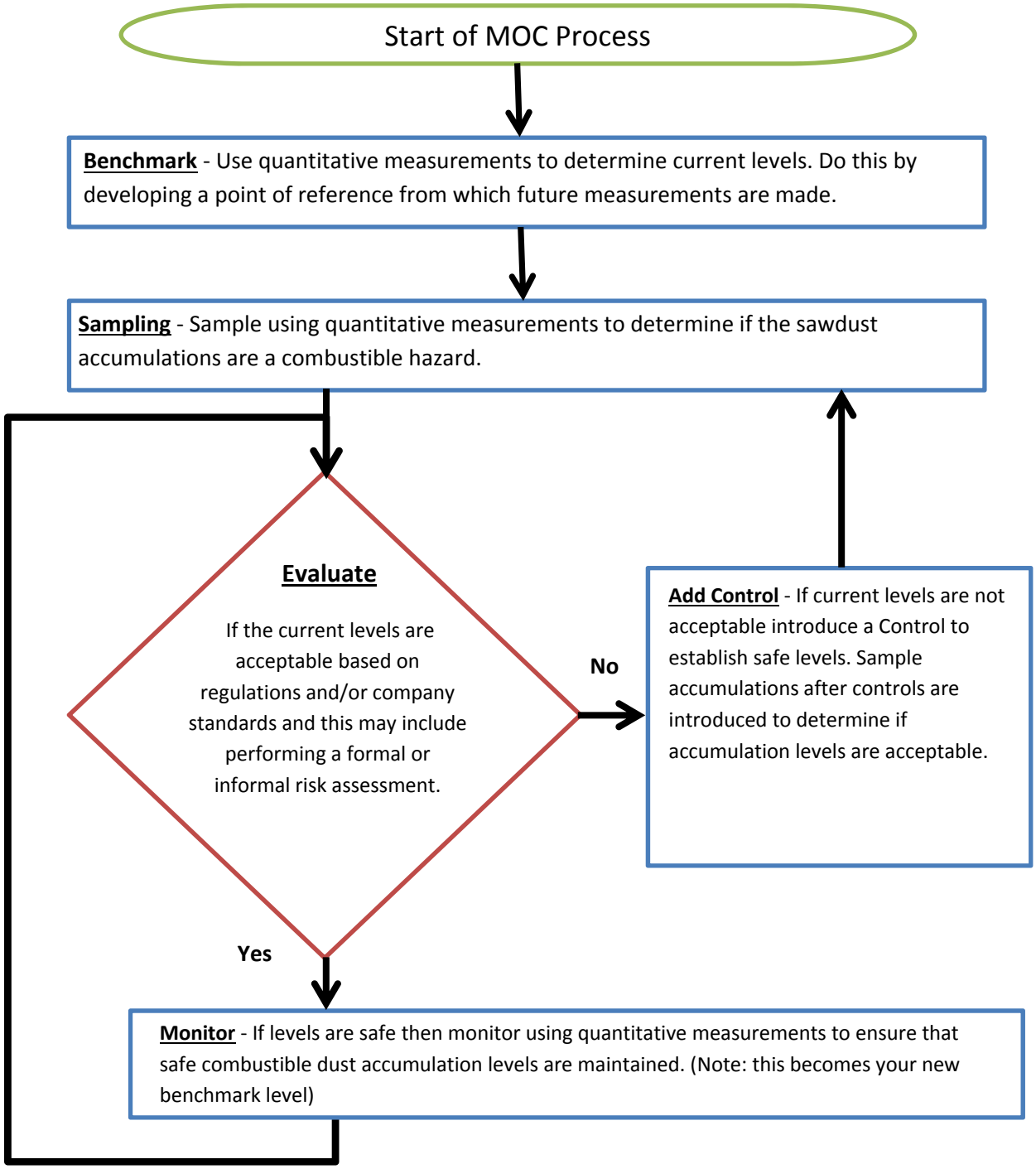
1. Compile safety information on the products, equipment, materials or processes that are changing and write policies and procedures to incorporate the new information. Be sure to include information on how to investigate accidents, audit compliance with safety procedures and plan for emergency responses.
2. Establish a way to gather employee input on the changes, such as interviews, group discussions or surveys. Incorporate employee comments and suggestions into your draft policy and procedures.

3. Write instructions for all employees on every process in which changes are involved. The procedures must be clear, include steps for performing every operation, cover safety information, state what to do in the case of an emergency and be readily available to the employees performing the procedures.
4. Train employees on the changes. Emphasize any safety and health hazards and what to do in the case of an emergency. The training must take place before an employee is allowed to operate the equipment or perform the job that the changes were related to.
5. Establish written procedures for what you will do the next time you have a change in safety management.

Flow Chart Process Overview: (next page)

1. Benchmark: Use quantitative measurements to determine current levels.
2. Sampling: Using quantitative measurements to determine if the sawdust accumulations are a combustible hazard.
3. Evaluation: If the current levels are acceptable based on regulations and/or company standards. May include performing a formal or informal risk assessment.
4. Add Control: If current levels are not acceptable introduce a control to establish safe levels. Sample accumulations after controls are introduced to determine if accumulation levels are acceptable.
5. Monitor: If levels are safe then monitor accumulations using quantitative measurements to ensure that safe combustible dust accumulation levels are maintained. This becomes your new benchmark level.

Combustible Dust Management of Change Flow Chart



Definitions

Benchmark: develop a point of reference from which future measurements are made.

- Use quantitative measurements,
- 3rd party measurement,
- internal measurements,
- communicate benchmark levels if acceptable
- accumulations identified during the benchmark process will aid in establishing cleanup schedules

Evaluation: make judgements about the current accumulations (acceptable or unacceptable).

- Use quantitative measurement,
- Assessment is based on regulatory/company standards,
- use internal or external resources if regulations not understood,
- if accumulations are unacceptable introduce controls,
- Measure effectiveness of controls; if still unacceptable continue to introduce additional controls. Take measurements after each control is introduced to determine if the control was successful.

Monitor: observe the accumulations to identify changes over time and/or because of changes to system.

- Use quantitative measurements to help identify when you deviate from acceptable levels,
- Monitoring will also indicate how accurate your measurements are – this helps to establish a buffer if required.

Change: any trigger that causes the levels to deviate from the benchmarked levels. Change can be process, equipment, speeds, species, personnel, seasons, etc.. Change can be identified either by monitoring or anticipated because of mill cutting schedules.

Controls: any new process/equipment that will bring the accumulations back to acceptable levels. Using the hierarchy of control protocols, change can be:

- Elimination – *can the problem be eliminated?*
- Substitution – *can the problem be eliminated by substituting any part of the process or resource?*
- Engineering – *can an engineering control reduce or eliminate the problem by using misting, foggers, and/or passive controls?*
- Administrative – *can the problem be controlled with a change to process for instance such as cleanup schedules?*
- Personal Protective Equipment – *used as a last resort*.

Sampling (General Procedure): Identify areas for site sampling and establish route to cover pick up areas. Accepted procedure includes:

- Use lockout when required to ensure your safety
- Take picture of specific area that sample will be taken from
- Record sample location
- Record the time the sample was taken
- Measure and record temperature of the sample prior to scooping it up – (®C)
- If possible immediately measure the moisture of the sawdust sample.
- Put at least 200 grams of material in the zip lock bag (fill ½ of a large zip lock bag) try to remove chunks and splinter pieces if present
- With the sharpie felt marker number the sample, write down temperature, time and moisture reading if taken at that time

Dust Sample Thresholds:

Moisture Content – if the moisture content of the sample is >25% then the sawdust is not a combustible dust hazard. The sample may be a fire hazard or may become a combustible dust hazard if it dries out over time.

Size – if the fine material is < 40% of the total sample then the sawdust is not a combustible dust hazard.

Combustible Dust Hazard:

If the sample is > 40% fine material and < 25% moisture content, then the sample is a combustible dust hazard and you are limited to a maximum of 1/8" over 5% of the enclosed area accumulation at any given time.

Combustible Dust Explosion Hazard Unknowingly Created – Case Study

Harmless Change?

What if a change was made – seemingly harmless – that was the root cause of an explosion. It could happen. Follow the fictional case study below which is used to demonstrate what could happen without a MOC procedure in place.

Sawmill filing rooms create both metal grindings and wood dust; mostly metal grinding from sharpening saws. But there is a fair amount of fine wood dust that is either tracked into the filing room under the boots of the Saw Filers and/or filters up through the cracks and voids in the floors and walls – essentially migrating up with the warm sawmill air that rises as the day progresses.

Metal grindings in nearly all instances have properly designed blower fans and ducting to vacuum and remove the metal grinding at their source – the saw grinders. Wood dust however, is usually blown or dusted off elevated beams and grinding equipment and then manually swept off the floor into piles for disposal. A common occurrence whether the filing room is located above the sawmill production level or adjacent at the same level.

Many filing rooms have adopted an easy way of disposing of wood dust – simply sweep the wood dust into a pipe extension of the grinder ducting that is extended down from the ceiling to floor level. Easy – now just sweep the wood dust into the a floor level opening and it is vacuumed away – gone for good.

Undetected Combustible Dust Hazard

It has been discovered that changes of this nature have created a silent hazard. By introducing combustible dust into the grinder ducting system, there is a risk that tramp metal – an ignition source – would also be introduced and mixed with the fine combustible dust sweepings from the floor. Tramp metal is an ignition source which has been proven to create a spark when colliding against other grinding particles or ducting walls. And in the enclosed area of the ducting, an conflagration can result which could lead to a disastrous explosion.

If a Management of Change program had been in place, this change to sweep dust into the filing room ducting system would have likely not happened. I believe a MOC discussion on the possible hazard associated with extending the ducting to the floor would have been identified; especially if an outside professional ducting company would have been contacted. As in many cases however, these types of changes are handled in-house by company tradesman who may not be totally aware that they may be creating an explosion hazard.

The Joint Health & Safety Committee's management of change discussions would have likely followed an agreed upon procedure that would have taken the steps to identify hazards before the changes are made; identifying methods to screen and classify changes and identify the key hazards. They would have made plans to inform and train personnel about the changes and decided on the steps to take for

effective implementation. It's likely that if the Joint Health & Safety Committee used a management of change procedure to thoroughly explore all the possible solutions to removing the filing room floor dust, they may have come up with a solution.

Solution Found

Floor-level openings in grinder ducting for disposing of wood dust and debris can now be found in many sawmills. The solution – discovered through a management of change process – was to attach strong magnets on the openings to trap tramp metal before it is sucked into the grinder ducting. Effectively removing the tramp metal eliminated the hazard – a possible source of a spark that could ignite secondary dust in an enclosed space – resolved the risk of sweeping something into the grinder ducting that could cause an explosion.

Establishing a management of change procedure in sawmills is a way of engaging Joint Health & Safety Committees to work constructively together. Joint Health & Safety Committees are a resource that in many sawmills are underutilized because there seems to be pre-conceived barriers – some traditional – that block ingenuity and imagination. The combustible dust situation in BC sawmills is an opportunity for Joint Health & Safety Committees – essentially management and union – to take ownership of the problem and explore solutions to mitigate combustible dust together. Both sawmill owners and the workers themselves have a big stake in the success of the business and it makes perfect sense that an effective Joint Health & Safety Committee provide leadership to control combustible dust.

It may be helpful to remember the SAFER acronym.

S	Survey others involved for potential hazards
A	Assess the change for possible negative effects
F	Find a safe implementation procedure that is safe and effective
E	Execute the change in a safe manner
R	Review the change and evaluate