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| | Hazard Identification, Risk Assessment & Control Procedure | | |
| | Doc. No- EMOS/EMH/HSE/P06 Dtd 01.03.2020 | Rev: 00 | |

Title: To The purpose of this procedure is to identify the hazards involved in the process, develop and implement the measures necessary to control or mitigate the risk. This procedure provides information on how to identify, analyze, evaluate, and react to risk(s) associated with decisions made under the program, e.g. risks inherent to the program, and risks associated with recognition decisions based on program outcomes.


Scope: This procedure specifies when the risk management process described in this document is either encouraged or required by EMHS participants.

- a. Hazard Identification & Risk assessments of routine & non routine activity.
- b. Activities of all persons having access to the work place including contractors
- c. Human behavior, skills, capabilities and other human factors.
- d. Hazards originating from outside EMHS workshop / sites which shall directly affect the health & safety of EMHS employees.
- e. Hazards created due to day to day activities of EMHS and its sub-contractors / suppliers.
- f. Infrastructures, equipment and materials at the workshops, sites or customer designated areas.
- g. Changes made to company activities, process, machine capacity or model, machine re-location etc.
- h. HSE Management system changes including temporary changes, and their impacts on EMHS activities, process and operations.

Responsibility:

- a. **Safety officers:** The safety officers are responsible for monitoring that this procedure is implemented and adhered to by all personnel/subcontractors. They conduct regular workplace inspection and ensure that any improvements resulting from such an inspection are auctioned in the required time frame.
- b. **Supervisors:** Supervisors have key responsibility in the planning and coordination of work activities and assessing potential safety hazards on the job and instructing employees in risk control methods to accomplish the work. He plays major role in collecting information directly from the workmen/site and report the concerned. Express the OH&S concerns with monthly quality council meetings.

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- c. **Workmen:** Workmen shall participate during the risk assessment process. The necessary inputs regarding the activity related hazards inputs shall be given.

Procedure:

Definitions


- a. **Safety:** Freedom from unacceptable risk of harm.
- b. **Health:** Physical and mental well-being of a human being.
- c. **Risk:** Combination of the likelihood and consequences (s) of a specified hazardous event or exposure(s) and the severity of injury or ill health that can be caused by the event or expose(s)
- d. **Hazard:** Source or situation or act with potential for harm in terms of human injury or ill health, damage to property, damage to the work place environment, or a combination of these.
- e. **Risk:** assessment: Identifying & analyzing potential event that may negatively impact individuals, assets, and/or the environment.
- f. **Routine activities:** Activity or set of activities that are generally performed on daily or routine basis. For e.g. – material loading - unloading, fabrication, assembly testing, blasting, painting, dispatch, etc.
- g. **Non routine activities:** Activity or set of activities that are not generally performed on daily or routine basis. For e.g. – new construction, excavation, roof girder cleaning, etc.
The controls or changes to existing controls shall reduce the risks according to the following steps:

1. Establish Goals and Context

It includes:

- OH&S Policy
- OH&S Objectives
- Culture and values of organization
- Legal requirements
- Financial, operational, business requirements/constraints

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- Customer requirements
- View of interested parties
- Industry best practice

2. Identify risks

- Identify the hazards –
 - Routine & non routine activities
 - Activities of employees, contractors, visitors
 - Facilities at the work place (own and others)
 - Health hazards – physical, chemical, biological & ergonomic.
- Decide who might be harmed and how
- Evaluate the risks and decide whether the existing precautions are adequate or whether more should be done
- Record the findings

Review the assessment and revise it necessary.

3. Identify risks


- ✓ What could go wrong?
- ✓ Are people, assets, etc. exposed to potential risk?

Identify the risks most likely to impact on Electromech outputs, together with their sources and impacts.

4. Analyze risks

Identify the controls (currently in place) that deal with the identified risks and assess their effectiveness. Based on this assessment, analyze any remaining risks in terms of likelihood and consequence. Identify and Analyzing Risks Form (optional) to assist you in determining the level of likelihood and consequence, and the current risk level (a combination of likelihood and consequence).

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5. Evaluate risks

- ✓ What are the causes and consequences?
- ✓ How likely is it?
- ✓ How bad will it be?

This stage of the risk assessment process determines whether the risks are acceptable or unacceptable. The person with the appropriate authority makes this decision. Participants should periodically monitor a risk that has been determined acceptable to ensure it remains acceptable when existing controls are applied.

6. Determine the treatments/action for the risks

- ✓ How can we avoid the undesired/hazardous event?
- ✓ How can the risks be kept to as low as reasonably practicable?
- ✓ How effective are controls (barriers)? How could their effectiveness become undermined?
- ✓ Is there a better way?

7. Monitor and report on the effectiveness of the risk action taken

- ✓ Can the potential consequences be limited?
- ✓ What recovery measures are needed?
- ✓ Are recovery capabilities suitable and sufficient?

The relevant project manager is required to monitor the effectiveness of risk treatments/actions and has the responsibility to identify new risks as they arise and treat/act accordingly. Project managers are also required to provide feedback and report on the progress of risk treatments/actions at regular intervals.

6. Risk Control – table or text

Eliminate the hazards giving rise to the risk, thereby eliminating the risk.

Use risk control 'hierarchy' to control risk. The hierarchy is as follows:

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HIERARCHY OF CONTROLS

| Level of Control | Controls | Description | Concept |
|------------------|---------------------|---|---|
| A | ELIMINATION | Elimination of Process / dangerous operation, reorientation of work place, machines etc. so as to eliminate the hazards | No Activity / No man / No Machine / NO Material then No Hazard. If no Hazard then NO RISK |
| B | SUBSTITUTION | Alteration / Modification / replacement of machine, tools, substances etc. so as to minimize / reduce the risk. | Change in type of Hazard which has less Risk Level |
| C | ENGINEERING CONTROL | Automation , robotic operations, safety guards, limit switches etc. | Activity / machine/ Materials will be there and hence associated hazards too. Controls here are inbuilt with machine (mostly mechanical / alert / emergency indicators) to avoid contact of hazard and human. |
| D | ADMINISTRATIVE | SIGNAGE, WARNINGS, SOPs, OCPs, Work instructions, Motivational program, Trg. Etc. | Activity / machine/ Materials will be there and hence associated hazards too. Controls here are mostly "WISH" in terms of Display / trainings to control risks. If practice does not improve RISK shall happen. |
| E | PPEs | Helmet, Nose mask, Hand gloves, Aprons, Ear muffs / plugs, Safety belts etc. | TELL ME WHAT ? |

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7. Risk Evaluation

Risk Priority Number (RPN) - It is calculated by using the formula:

RPN= Occurrence (O) *Severity (S)

The risk shall be rated according to the table below:

| Category | Low Risk | Medium Risk | High Risk |
|------------|----------|-------------|-----------|
| Occurrence | 1 | 3 | 5 |
| Severity | 1 | 3 | 5 |
| RPN | 1 | 9 | 25 |
| RPN Range | 1-5 | 5 -9 | 9-25 |

As depicted above, the higher the risk priority number, higher is the risk and vice versa.

a. Occurrence(O)

Occurrence refers to an assessment of the probability of the incident risk effect or discrepancy or deviation or failure. A higher probability of occurrence may be possible if the equipment's or system or process is poorly designed or the operation is in manual mode instead of automation.

| Ranking | Criteria |
|---------|---|
| 1-2 | Remote probability of failure. One occurrence every 6 months to 3 year or One occurrence in million events. |
| 3-4 | Moderate probability of failure. One occurrence every 3 months or Three occurrence in 1000 events |
| 5 | Very high probability/ frequency of failure |

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b. Severity(S)

Severity refers to an assessment of the seriousness of the risk effect or the discrepancy or deviation or failure as it affects the end user. A higher severity rating may be assigned to process steps that involved manual operations or interventions as compared to done by automation.

| Ranking | Criteria |
|---------|---|
| 1-2 | First aid required on injury, Could result in minor injury |
| 3-4 | Could result in temporary loss of function, Could result in fatality or permanent loss body function. |
| 5 | Result in fatality |

- **Low Risk:** This risk has low potential and is less likely to impact directly or indirectly the process, system, operation, product quality, yield, purity, potency, identity, stability, safety or efficacy.
- **Moderate Risk:** This risk has moderate potential and is likely to moderately impact directly or indirectly the process, system, operation, product quality, yield, purity, potency, identity, stability, safety or efficacy.
- **High Risk:** This risk has high potential and is likely to highly impact directly or indirectly the process, system, operation, product quality, yield, purity, potency, identity, stability, safety or efficacy.
- If the risk and impact is considered to be moderate or high, the discrepancies, deviations or failures shall be immediately reported to the QA and the Quality Risk Manager. After initial review and assessment, it must be reported to RMT members within 5 days.

If the risk and impact is Low, then it shall be only reported to the Safety Officer within 10 working days. For any such identified risk (Low, Moderate, High), necessary Risk Control Measures shall be identified and evaluated to mitigate / reduce the risk to an acceptance level.

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Safety Officer shall evaluate the risk of Moderate and High categories and examine the existing control measures and other immediate possible control measures.

Safety Officer shall finalize the control measures and communicate to the department representative and the Quality Risk Manager to effect implementation within a pre-determined planned time-frame.

8. Criteria significance & in significance

For significance – If RPN score is equal 10 or more than 10

For in significance – If RPN score is less than 10

9. Management Review

The senior management representative(s) shall review the activities related to Risk Management Program and the actions and follow-up being done by the Risk Management Team, periodically.

The Annual Report shall also be reviewed by the senior management representative(s) and a feedback will be sent to the Risk Management Team by the Quality Risk Manager for providing necessary directions and facilitation in deploying resources and funds where necessary.

Documents/ Records:

Hazard Identification risk Assessment: EMOS/EMH/HSE/D02

List of personal protective equipment's (PPE's): EMOS/EMH/HSE/L24

Record of Change:

| Change No. | Description | Change Date | Approved By |
|------------|-------------|-------------|-------------|
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|---------------------|-----------------|---------------------|-------------------|
| Prepared By (Name): | Sanjay Warudkar | Approved By (Name): | Ajit Bhosale |
| Designation | Safety Officer | Designation | Head QA & Systems |

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