Implementation of Integrated Management System in Automobile Industry

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Abstract:
The second phase of this Project work focuses on implementation of the EOHS management system documented in the Phase I of this project. As part of Implementation, we have developed integrated processes, integrated risk management and emergency preparedness and response plan to support effective implementation of the standard requirement as per ISO 14001; 2015 & ISO 45001:2018. We have formed EOHS committee with cross functional team members to identify 1. Internal issues and external issues affecting EOHS strategy and intended outcome of the EOHS management system. 2. Workers and other interested parties requirements that are relevant to the EOHS management system. 3. Occupational and health hazards with regards to the activities, processes, products and services. 4. Environment aspects related to the activities, processes, products and services. The outcome of the above exercise were considered to assess the risk and opportunities with the identifying and evaluating existing and foreseeable Environmental, occupational health and safety hazards and recommending operational controls for the organization to plan, implement, maintain and continually improve Integrated management system by providing resources to help with training, elimination, prevention methods to comply with the requirement of ISO 14001:2015 and ISO 45001:2018. During the documentation of the EOHS Management system, it was identified 13 processes required to be implemented as per the requirement of ISO 14001:2015 & ISO 45001:2018, even though it is not mandatorily required by the ISO standards to document these processes.

I. INTRODUCTION
- Management of EOHS Risk and opportunity for establishing EOHS operational controls to enhance environment, occupational health and safety performance by preventing ill-health, injury and environmental impact.
- Planning for the preparedness and Response plan for the identified potential EOHS emergency situation to prevent or mitigate EOHS risk during such emergencies.

II. INTEGRATED PROCESSES
All The International Standards promotes the adoption of a process approach when developing, implementing and improving the effectiveness of a management system, to enhance the performance of the management system’s intended outcome by Understanding and managing interrelated processes as a system contributes to the organization’s effectiveness and efficiency in achieving its intended results. This approach enables the organization to control the interrelationships and interdependencies among the processes of the system, so that the overall performance of the organization can be enhanced. The process approach involves the systematic definition and management of processes, and their interactions, so as to achieve the intended results in accordance with the policy and strategic direction of the organization. Management of the processes and the system as a whole can be achieved using the PDCA cycle with an overall focus on risk-based thinking aimed at taking advantage of opportunities and preventing undesirable results. The application of the process approach in an environment, occupational health and safety management system enables
- a) Understanding and consistency in meeting requirements;
- b) The consideration of processes in terms of added value;
- c) The achievement of effective process performance;
- d) Improvement of processes based on evaluation of data and information.

The monitoring and measuring check points, which are necessary for control, are specific to each process and will vary depending on the related risks. We have identified the following processes are mandatorily implemented to meet ISO 14001:2015 Requirement for environmental management system and ISO 45001:2018 Requirement for occupational health and safety management system.
1. EOHS Risk and Opportunity Management
2. Consultation and participation of workers
3. Compliance of Legal & Other Requirement
4. Competency and Awareness
5. Communication
6. Control of documented information
7. EOHS Operational Control
8. Change Management process
9. Control of Procurement process
10. Emergency preparedness and response plan
11. EOHS Monitoring and Measurement
12. Internal audit
13. Incident, Non-conformity and Corrective action

Even though it is not mandatory to document all these processes according to the latest version of ISO standard for E& OHS Management system, considering the size of the organization and its type of activities, processes, products and services, the complexity of processes and their interactions and the competence of persons, it is advisable to document the processes to support the operation of its processes and to

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retain documented information to have confidence that the processes are being carried out as planned. For documenting the processes, SIPOC approach used. SIPOC is an acronym for supplier-input-process-output-customer. A SIPOC diagram helps to identify the process outputs and the customers of those outputs so that the voice of the customer can be captured. When mapping the SIPOC, one can choose the swim lane or unrelated method. The unrelated method requires that the business unit capture all information without directly relating it to a certain process, output, etc. similar to a brainstorming session. This method works best with high-level mapping and is vertical in nature. The swim lane method is best suited for lower detail level mapping. Swim lanes allow the business unit to capture all information directly related to a specific process, output, etc. This method requires more space and several mapping sessions due to the amount of time required to map each process and is horizontal in nature. Basically the documentation used is a combination of matrix, flow chart and summarization. And once again includes:

- Suppliers: Significant internal/external suppliers to the process.
- Inputs: Significant inputs to the process like material, forms, information, etc.
- Process: One block representing the entire process.
- Outputs: Significant outputs to internal/external customers.
- Customers: Significant internal/external customers to the process.

III. INTEGRATED RISK MANAGEMENT

For assessing EOHS risks and opportunities for the EOHS management system and its intended outcomes, we considered the following as the input,

- Internal and External issues affects the purpose of the organization, its strategic direction and intended outcome of the EOHS Management system
- Workers and other interested parties requirements that are relevant to the EOHS Management System
- Scope of the EOHS management system including processes and activities
- Environmental aspects
- OH&S Hazards
- EOHS Legal requirements and other requirements

We have chosen semi-Quantitative risk Assessment methodology, the Risk and Opportunity indices calculated by multiplying severity, occurrence and the detection. The guidelines for assessing severity, occurrence and detection are established as given in the guideline sheet.

IV. PLANNING OF PREPAREDNESS AND RESPONSE PLAN FOR POTENTIAL EMERGENCY SITUATION IN AN AUTOMOBILE INDUSTRY

Emergency planning is an essential part of the major hazard control. They should cover all the emergency aspects arising inside the factory boundaries and also the probable aspects outside the factory also. These aspects are further analyzed to identify the potential significant aspects. Emergency preparedness plans deals with the systematic approach of preventing the re occurrence of the emergency and the controlling of an emergency. Everyone should aim at controlling the emergency at the shortest possible time with proper preparations. Emergency planning is concerned with the proper utilization of the factory resources in a systematic way to prevent and control an emergency. During the EOHS risk assessment, we have identified following Potential Emergency situations may arise in the organization.

1. Medical emergency
2. Fire
3. Chemical emergency
4. Electrical shock
5. Gas leak and explosion
6. Sabotage
7. Natural disaster

For all the identified, potential emergency situation, we have devised a preparedness plan as well as response plan.

### 4.1 MEDICAL EMERGENCY

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fainting / Heart attack / other similar situation.</td>
<td>Entire Factory premises</td>
</tr>
<tr>
<td>2. Food poisoning</td>
<td></td>
</tr>
<tr>
<td>3. Body contact with chemicals and burns</td>
<td></td>
</tr>
<tr>
<td>4. Heat burns</td>
<td></td>
</tr>
<tr>
<td>5. Slip and fall</td>
<td></td>
</tr>
<tr>
<td>6. Eye Injury</td>
<td></td>
</tr>
<tr>
<td>7. Cut or amputation injuries</td>
<td></td>
</tr>
</tbody>
</table>

#### 4.1.1 Emergency Preparedness

- Establishment of emergency response team members and securities in all locations.
- Establishment of communication channels such as radios, mobile phones for the emergency response team members and Securities.
- Provision of first aid boxes in all departments / areas.
- Provision emergency shower and eye wash station at appropriate locations.
- Provision of occupational Health center with doctor in general shift and staff nurse for all three shifts.
- Provision of ambulance at company premises and access / egress for the ambulance to reach all specified locations.
- Displaying emergency evacuation route map comprising route to emergency assembly point, emergency services such as fire extinguishers, fire sprinklers, fire hydrant system, first aid boxes, spill control kits, emergency shower and eye wash station, emergency exit and contact number of emergency team, etc.
- Training of ERT, securities and relevant workers in first aid and Cardiopulmonary resuscitation procedures.

#### 4.1.2 Emergency Response plan

1. Contact nearby security / Emergency response team members
2. Security / emergency team member shall contact nearby trained first aider and call for OHC & ambulance.
3. Trained first aider shall asses the injured and provides first aid as necessary till ambulance arrives.
4. Security / ERT shall evacuate injured worker to OHC / nearest hospital based on the assessment of the staff nurse.
5. Staff nurse shall provide treatment as per doctor's advice and proceed further.
6. Injured person shall be sending to nearby hospital based on doctor’s advice if required.

4.1.3 Testing of preparedness and response plan
1. Regular inspection of first aid boxes, emergency shower and eye wash station, access and egress routes and 5S audits.
2. Effectiveness analysis of first aid and CPR training through mock drills.
3. Verifying communication channels, access / egress, time taken to reach OHC and first aid, response of other team members through Mock drill for medical emergency.

4.2. FIRE

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>LPG storage area- Canteen</td>
</tr>
<tr>
<td>2.</td>
<td>Kitchen – Canteen</td>
</tr>
<tr>
<td>3.</td>
<td>Gas storage area – (Acetylene and Hydrogen)</td>
</tr>
<tr>
<td>4.</td>
<td>Diesel storage area</td>
</tr>
<tr>
<td>5.</td>
<td>Chemical storage area</td>
</tr>
<tr>
<td>6.</td>
<td>Waste storage area-Scrap yard</td>
</tr>
<tr>
<td>7.</td>
<td>Battery storage area</td>
</tr>
<tr>
<td>8.</td>
<td>Electrical equipment such as plants, machineries, Furnace, DG, etc.</td>
</tr>
<tr>
<td>9.</td>
<td>Shop floor-Usage of Flammable substance as process aids such as oils, solvents, grease, lubricants, etc.</td>
</tr>
<tr>
<td>10.</td>
<td>Falls ceiling area and other office locations</td>
</tr>
</tbody>
</table>

4.2.1 Emergency Preparedness
- Establishment of emergency response team members and securities in all locations.
- Establishment of communication channels such as radios, mobile phones for the emergency response team members and Securities.
- Provision of appropriate fire detection and fire suppression systems including smoke detectors, sprinkler, fire hydrant, potable fire extinguishers, etc.
- Recommended potable fire extinguishers against type of fire
- Provision first aid boxes, emergency shower and eye wash station at appropriate locations.
- Provision of occupational Health center with doctor in general shift and staff nurse for all three shifts.
- Provision of ambulance at company premises and access / egress for the ambulance to reach all specified locations.
- Displaying emergency evacuation map comprising route to emergency assembly point, emergency services such as fire extinguishers, fire sprinklers, fire hydrant system, first aid boxes, spill control kits, emergency shower and eye wash station, emergency exit and contact number of emergency team, etc.
- Training of ERT, securities and relevant workers in first aid and chemical spill control procedures.

4.2.2 Emergency Response plan:
1. Contact nearby security / Emergency response team members.
2. Security / emergency team member shall contact nearby trained fire fighter.
3. Trained fire fighter shall asses the fire and extinguishes if safe to do so or inform to Incident controller.
4. Incident controller shall call nearby fire station.
5. Security / emergency response team member shall contact OHC and ambulance if any injured
6. Security / ERT shall evacuate the area in case of possible spread of fire
7. Ensure that the main gate is clear and open for fire brigade van and no vehicle is standing in between the entry road.
8. EHS department shall perform environmental impact assessment and further waste disposal.

4.2.3 Testing of preparedness and response plan
1. Regular inspection of fire detection and fire suppression systems, first aid boxes, emergency shower and eye wash station, access and egress routes and 5S audits.
2. Effectiveness analysis of first aid and CPR training through mock drills.
3. Verifying communication channels, access / egress, time taken to extinguishes mock fire, time taken to evacuate building, time taken to reach OHC and first aid, response of other team members through Mock drill for fire.

4.3. CHEMICAL EMERGENCY

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical spillage on land</td>
<td>1. Chemical storage area</td>
</tr>
<tr>
<td>Chemical splash in to skin or eye</td>
<td>2. Shop floor</td>
</tr>
<tr>
<td>inhalation of chemical vapor / dust / mist</td>
<td>3. Scrap yard</td>
</tr>
<tr>
<td>4. ETP &amp; STP</td>
<td></td>
</tr>
</tbody>
</table>

4.3.1 Emergency Preparedness:
- Establishment of emergency response team members and securities in all locations.
- Establishment of communication channels such as radios, mobile phones for the emergency response team members and Securities.
- Provision of HAZCOM / MSDS in all chemical storage, dispensing, usage and waste disposal areas.
4.3.2 Emergency Response plan:
1. Contact nearby security / Emergency response team members.
2. In case of personnel injury
   - Security / emergency team member shall contact nearby trained first aider and call for OHC & ambulance.
   - Trained first aider shall assess the injured and provides first aid as stated in the Hazcom / MSDS till ambulance arrives.
   - Security / ERT shall evacuate injured worker to OHC / nearest hospital based on the assessment of the staff nurse.
   - Staff nurse shall provide treatment as per doctor's advice and proceed further.
3. In case of spillage
   - Less than 5 liters of non-hazardous to EOHS is not considered as emergency, operator shall clean up the spill as per MSDS and report as incident to EHS team.
   - For any EOHS hazardous chemical spillage (including more than 5 liters of nonhazardous liquids), Security / emergency team member shall contact nearby spill clean team.
   - Security / ERT shall evacuate the workers to emergency assembly team.
   - Spill clean team shall
     - Identify all hazardous substances, the conditions present, handling procedures, amount of liquid and potential dangers.
     - Protect them by properly wearing all Personal Protective Equipment (PPE). This includes PPE suits, respirators, boots, gloves and goggles as specified in Hazcom / MSDS.
     - Stop the spill at its source. This can be done by turning a valve, rolling a drum over or using a leak stopper.
     - Limit the spread and exposure of the spill by properly containing the liquid. This can be done by utilizing the correct equipment like SPILL KITS and proper sorbents like SORBENT SOCKS. These products can all be used to dam, dike or divert the spill for easy, manageable clean up.
     - Acids and Bases will need to be neutralized and at times oil and their by-products can be emulsified using DEGREASERS and MICROBLAZE as per HAZCOM / MSDS.
   - Spill control team shall clean up the spill and pack the spilled material appropriately.
   - Spill control team shall decontaminate the area including equipment and then clean up self without contaminating themselves.
   - EHS department shall perform environmental impact assessment and proceed further for waste disposal.

4.3.3 Testing of preparedness and response plan
1. Regular inspection of spill control kit, secondary containers, emergency shower and eye wash station, access and egress routes and 5S audits.
2. Effectiveness analysis of spill cleaning training through mock drills.
3. Verifying communication channels, access / egress, time taken to clean up the spill, decontaminate the area and team, time taken to evacuate building, time taken to reach OHC and first aid, response of other team members through Mock drill for chemical spill.

4.4 Electrical shock

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical shock / burn /</td>
<td>1 Electrical panel and</td>
</tr>
<tr>
<td>electrocution</td>
<td>cable areas</td>
</tr>
<tr>
<td></td>
<td>2.Plants and Machineries</td>
</tr>
</tbody>
</table>

4.4.1 Emergency Preparedness
- Establishment of emergency response team members and securities in all locations.
- Establishment of communication channels such as walkie-talkie, mobile phones for the emergency response team members and Securities.
- Provision of first aid boxes in all departments / areas.
- Provision of occupational Health center with doctor in general shift and staff nurse for all three shifts.
- Provision of ambulance at company premises and access / egress for the ambulance to reach all specified locations.
- Emergency evacuation route map comprising route to emergency assembly point, emergency services such as fire extinguishers, fire sprinklers, fire hydrant system, first aid boxes, spill control kits, emergency exit and contact number of emergency team, etc.
- Training of ERT & securities for first aid and Cardiopulmonary resuscitation procedures.

4.4.2 Emergency Response plan
- Switch off power / equipment if safe to do so.
- Remove injured person from electricity by dry wood piece / rubber if safe to do so.
- Contact nearby security / Emergency response team members.
- Security / emergency team member shall contact nearby trained first aider and call for OHC & ambulance.
- Trained first aider shall assess the injured and provides first aid as necessary till ambulance arrives.
- Security / ERT shall evacuate injured worker to OHC / nearest hospital based on the assessment of the staff nurse.
- Staff nurse shall provide treatment as per doctor's advice and proceed further.
- Injured person shall be sending to nearby hospital based on doctor's advice if required.

4.4.3 Testing of preparedness and response plan
- Regular inspection of first aid boxes, emergency shower and eye wash station, access and egress routes and 5S audits.
- Effectiveness analysis of first aid and CPR training through mock drills.
- Verifying communication channels, access / egress, time taken to reach OHC and first aid, response of other team members through Mock drill for medical emergency.
4.5 Gas leak & Explosion

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
</table>
| LPG Gas leak / Liquid Nitrogen leak / Toxic gas release due to fire in chemical storage | 1. Liquid nitrogen storage area  
2. LPG Storage area-Canteen  
3. Gas cylinder storage area  
4. Scrap yard |

4.5.1 Emergency Preparedness
- Establishment of emergency response team members and security services in all locations.
- Establishment of communication channels such as radios, mobile phones for the emergency response team members and Securities.
- Provision of site wide public address system.
- Provision of wind sacks in appropriate locations.
- Provision of first aid boxes, in all departments / areas.
- Provision of occupational Health center with doctor in general shift and staff nurse for all three shifts.
- Provision of ambulance at company premises and access / egress for the ambulance to reach all specified locations.
- Displaying emergency evacuation route map comprising route to emergency assembly point, emergency services such as fire extinguishers, fire sprinklers, fire hydrant system, first aid boxes, spill control kits, emergency exit and contact number of emergency team, etc.
- Training of ERT & securities for first aid and Cardiopulmonary resuscitation procedures.

4.5.2 Emergency Response plan
- Switch off power / equipment if safe to do so.
- Contact nearby security / Emergency response team members.
- Security / ERT shall evacuate all workers to emergency assembly point which is in the perpendicular direction of the wind.
- Staff nurse shall provide treatment as per doctor's advice.
- Injured person shall be sending to nearby hospital based on doctor's advice if required.
- Incident controller shall lead the situation as described in this manual.

4.5.3 Testing of preparedness and response plan
- Regular inspection of first aid boxes, emergency shower and eye wash station, access and egress routes and 5S audits.
- Effectiveness analysis of first aid and CPR training through mock drills.
- Verifying communication channels, access / egress, time taken to reach OHC and first aid, response of other team members through Mock drill for gas leak / explosion emergency.

4.6 Sabotage

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
</table>
| Public unrest / Riot / Bomb threat / communal violence   | 1. Security gate  
2. During travel to and from work  
3. Working outside factory premises  
4. Factory premises |

4.6.1 Emergency Preparedness
- Establishment of emergency response team members and security services throughout FACTORY premises and in all buses used for employee pick up and drop.
- Establishment of communication channels such as walkie-talkie, mobile phones for the emergency response team members and Securities.
- 24*7 CCTV monitoring throughout factory premises.
- Provision of occupational Health center with doctor in general shift and staff nurse for all three shifts.
- Provision of ambulance at company premises.
- Training of ERT & securities for first aid and Cardiopulmonary resuscitation procedures.

4.6.2 Emergency Response plan
- Contact nearby security / Emergency response team members.
- Security / emergency team member shall contact nearby trained first aider and call for OHC & ambulance.
- Trained first aider shall asks the injured and provides first aid as necessary till ambulance arrives.
- Security / ERT shall evacuate injured worker to OHC / nearest hospital based on the assessment of the staff nurse.
- Staff nurse shall provide treatment as per doctor's advice and proceed further.
- Injured person shall be sending to nearby hospital based on doctor's advice if required.
- Incident controller shall lead the situation as described in this manual.

4.6.3 Testing of preparedness and response plan
- Regular inspection of first aid boxes, fire fighting equipment, emergency shower and eye wash station, access and egress routes and 5S audits.
- Effectiveness analysis of CCTV monitoring, fire fighting, first aid and CPR training through mock drills.
- Verifying communication channels, access / egress, time taken to reach OHC and first aid, response of other team members through Mock drills.

4.7 Natural disaster

<table>
<thead>
<tr>
<th>Possible situations</th>
<th>Possible Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood / Earthquake/Cyclone</td>
<td>Factory premises</td>
</tr>
</tbody>
</table>

4.7.1 Emergency Preparedness
- Establishment and maintenance of pools around the factory to store flood water and canals to lead out excess water from factory premises.
- Racking system for storing all hazardous chemicals only in tightly packed and appropriate containers.
- Segregation and storage of waste material appropriately with secondary containers.
- Establishment of emergency response team members and security services throughout factory premises.
- Establishment of communication channels such as walkie-talkie, mobile phones for the emergency response team members and Securities.
- 24*7 CCTV monitoring throughout factory premises.
- Provision of occupational Health center with doctor in general shift and staff nurse for all three shifts.
- Provision of ambulance at company premises.
• Training of ERT & securities for first aid and Cardiopulmonary resuscitation procedures.

4.7.2 Emergency Response plan:
• Incident controller shall lead the incident as per the disaster management response plan.

4.7.3 Testing of preparedness and response plan
• Not practical

5. CONCLUSION

The Phase II of this project focused in the development and implementation of Integrated Management System for the automobile industry with complying with the requirement of ISO 14001:2015 Requirement for Environmental Management System and ISO 45001:2018 Requirement for Occupational health and Safety Management System. The result of Phase II project, we have developed integrated processes and integrated risk management. The integrated processes and integrated risk can be audited in an integrated manner to achieve the benefits of the integration more effectively for managing EOHS system in the automobile industry. The Phase II of the project shall focus on the implementation of the Integrated Management System in the automobile industry as per the documented management system in this project report.

6. REFERENCE

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