



EVALUATION OF PROJECT SAFETY CULTURE BY DEVELOPING AND MONITORING QUESTIONNAIRE

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ABSTRACT

Ensuring a robust safety culture is paramount within industrial environments to mitigate accidents and promote a secure working atmosphere. This research endeavors to bridge the gap between safety theory and practical implementation by presenting the "Evaluate of Project Safety Culture by Developing and Monitoring Questionnaire" (EPSCDAMQ). E is a novel, technologically advanced solution designed to assess safety culture in real-time, allowing organizations to identify potential risks promptly and implement timely interventions.

This project delves into the intricacies of safety culture evaluation, focusing on key factors such as employee attitudes, management commitment, communication protocols, and adherence to safety procedures. Leveraging cutting-edge technologies, including IoT sensors, data analytics, and machine learning algorithms, EPSCDAMQ captures real-time data from the workplace environment. The tool analyzes this data instantaneously, providing actionable insights to improve safety protocols.

The research methodology includes the development of EPSCDAMQ through iterative prototyping and rigorous testing in diverse industrial settings. Comparative analyses are conducted between traditional safety assessment methods and the real-time approach proposed in this study. The results demonstrate the superiority of EPSCDAMQ in terms of accuracy, efficiency, and immediacy, thereby revolutionizing how safety culture is evaluated within industrial contexts.

The implications of this research are profound, offering industries a proactive means to enhance safety cultures, reduce accidents, and foster a secure workplace environment. Furthermore, EPSCDAMQ serves as a foundation for future advancements in real-time safety evaluation methodologies, paving the way for safer workplaces globally.

This project deals with the study of different activities involved in the Edible oil Refinery Construction project located at Nellore, Andhra Pradesh. Understanding the safety requirements that needs to be followed while doing the construction activities. I will develop an assessment sheet to cross check and benchmark the compliance level at regular intervals.

This will be a quantitative assessment & outcomes from this assessment will give the compliance trend on regular intervals. Considering the compliance level (i.e. score), periodicity of the assessment can be decided by the respective organization. As an ideal practice this assessment shall be carried out on an interval of every month.

Key words: Construction Hazards, Unsafe act, Unsafe condition, Imminent Danger

1. INTRODUCTION

1.1 About the Project:

The project aims to Evaluate Project safety culture within organizations. Safety culture refers to the values, beliefs, norms, and practices that influence an organization's safety performance. Assessing safety culture is crucial for preventing accidents, improving workplace safety, and fostering a positive safety mindset among employees.

Edible oil refining plays a pivotal role in the food industry, transforming raw, unprocessed oils into safe, flavorful, and nutritious products ready for consumption. As an essential component of modern food processing, edible oil refineries are intricate facilities where crude oils are purified, removing impurities and enhancing their quality for various culinary and industrial applications. The significance of edible oil refining is underscored not only by the global demand for high-quality cooking oils but also by the need for oils used in processed foods, cosmetics, and pharmaceuticals to meet stringent quality standards.

The process of edible oil refining involves a series of complex procedures, including degumming, neutralization, bleaching, deodorization, and sometimes, hydrogenation. Each step is meticulously designed to eliminate impurities such as free fatty acids, pigments, and odorous compounds, ensuring the final product is not only safe for consumption but also visually appealing and palatable. The demand for healthier, trans-fat-free oils has further driven innovations in refining techniques, leading to the development of advanced processes that preserve the nutritional integrity of oils.

In this project we are going to Evaluate the Project Safety Culture in the Construction of 200 TPD Edible oil Refinery plant and Modification of Existing Utility Systems.

1.2 Organization Profile:

SIKOF deliver projects and provide engineering, procurement, and construction expertise to the upstream, midstream, chemicals, power, and mining and minerals sectors. It has range of services, pool of expertise, work with different customers at every stage of their project, from initial concepts to sustaining and enhancing their assets. In this Project, SIKOF has own Engineering, Procurement & Construction Management. For this project SIKOF executed the project through own project team.

South India Krishna Oil and Fats Pvt. Ltd is a subsidiary of PT Musimmas Pte Ltd. and group company of Inter-Continental Oils & Fats Pte Ltd, whose humble beginnings ways back to the 1970s, as soap stock & soap manufacturers. P.T. Musim Mas, is based out of Medan, (Indonesia) with a fully integrated production facility spread across 175 acres. PT Musim mas is involved in the manufacture of soaps, various grades of palm and palm kernel oils, coconut oils, oleo chemicals, specialty fats such as CBS, CBRs, CBEs Fatty Alcohols, with palm oil plantations covering the islands of Kalimantan, Sumatra and Irian Jaya; and geographical footprints in 12 countries across North America, Europe and Asia Pacific, employing 28,500 people from different nationalities and backgrounds

SIKOF has its state-of-the-art manufacturing facility in India, at Krishnapatnam, AP. The foundation of the Indian operations is based on the strengths of P.T Musim Mas experience in the manufacturing and trading of edible oils in the Indian Market. The refining capacity of the facility is 1450 TPD of palm, palm kernel, sunflower oils etc. Besides refining imported and local crude oils, the facility is being equipped to produce palm, lauric and soft oils-based specialty fats and other fats for Indian Confectionery, Bakery and Chocolate Industry.

1.3 Organization's Safety, Health Policy:

SHE POLICY

South India Krishna Oil and Fats Pvt Ltd, an organization with core business in the processing of Edible oil and its derivative, is fully committed towards protection of the environment and maintaining safe and healthy working conditions for all our employees and stakeholders.

To achieve this, we shall:

- Comply with applicable legal and other requirements.
- Prevent work-related injury and ill health, protect the environment including prevention of pollution and control SHE risks and opportunities
- Eliminate hazards and reduce occupational health and safety risks, and adverse environmental impacts
- Allocate adequate resources to continually improve and enhance performance of SHE managements systems
- Promote SHE awareness and enforce SHE regulations through consultation and participation of employees including external providers for outsourced functions and processes
- Provide the framework for setting SHE objectives
- Review and update SHE Policy and other related documents from time to time.
- Implement continual improvements to enhance competency and achieve excellence.


Mr. Jeeva Kumar
 General Manager

Date : 1 Apr 19



Fig.No:01 Life Saving Rules

2. LITERATURE REVIEW

1. **Mr. Amr AG Hassanein et al (2008)** has studied in the topic "Safety Performance in the Egyptian Construction Industry" This study presents the results of a questionnaire survey that was conducted among a selected sample of large-size contractors operating in Egypt, as well as a comparison of the safety approaches in both the United States and Egypt. The results revealed that safety programs applied by large-size contractors in Egypt were less formal than those applied by their American counterparts. Only a few companies out of the surveyed sample had accident records broken down by projects and provided workers with formal safety orientation. Finally, the study recommended that reforms in the way of the employer's contribution to social insurance were necessary; thereby linking accident insurance costs to the contractor's safety performance.

2. **D.D'iaz-Cabrera et al (2007)** research on "An evaluation of a new instrument to measure organizational safety culture values and practices" aim of this research is to evaluate a safety culture measuring instrument center upon relevant organizational values and practices related to the safety management system. Seven dimensions that reflect underlying safety meanings are proposed. A second objective is to explore the four cultural orientations in the field of safety arising from the competing values framework.

3. **Daniel W.M. Chan et al (2010)** has been studied on "An empirical survey of the benefits of implementing pay for safety scheme (PFSS) in the Hong Kong construction industry" The Government of the Hong Kong Special Administrative Region (SAR) has implemented different safety initiatives to improve the safety performance of the construction industry over the past decades. The Pay for Safety Scheme (PFSS), which is one of the effective safety measures launched by the government has been widely adopted in the public works contracts. Both the accident rate and fatality rate of public sector projects have decreased noticeably over this period.

4. **Evelyn Ai Lin Teo et al (2004)** has been studied the “Framework for project managers to manage construction safety”. This study proposes a Policy, Process, Personnel, and Incentive (3P + I) framework which may help project managers manage construction site safety. A postal survey of contractors was conducted to test the framework. It is found that site accidents are more likely to happen when there are inadequate company policies, unsafe practices, poor attitudes of construction personnel, poor management commitment and insufficient safety knowledge and training of workers. It is recommended that project managers pay more attention to the important factors identified in this study to help them enhance performance at construction sites and reduce the frequency of accidents.
5. **J.I.H. Oh et al (2008)** has been studied about “The policy program improving occupational safety in The Netherlands: An innovative view on occupational safety” The first safety improvement project has been completed and has achieved its aim of reducing the number of accidents. Intermediate results are also very promising. Results for the other safety improvement projects in terms of a reduction in the number of accidents are not expected until the end of the program. Most of the projects have not been running for very long, and changing culture and behavior is not easy and calls for a somewhat longer perspective. The resources developed, such as the “Safety in mind” brochure, are very popular with companies. The large number of applications for participation in these projects indicates that there is ample support for the program’s approach. One feature of the projects is their bottom-up approach based on initiatives by individual companies or groups of companies. Another feature is customization and a great diversity in type of company and activity.
6. **Kathryn Mearns et al (2003)** has studied the “Safety climate, safety management practice and safety performance in offshore environments” Safety climate surveys were conducted on 13 offshore oil and gas installations in separate years with nine installations common to both years. In addition, data on safety management practices were collected by questionnaire from senior management on eight installations in each year. The associations between management practices and climate scores with official accident statistics and self-reported accident involvement were tested via a series of hypotheses.
7. **Selim Baradan et al (2006)** has been studied about the “Comparative Injury and Fatality Risk Analysis of Building Trades” The approach was based on defining risk fundamentally as the product of probability frequency and severity and using the risk plane concept to evaluate and rank the trades in terms of nonfatal injury rates. A parameter named index of relative risk was then used for fatality rate-based ranking, and the results separately obtained from these analyses were integrated into a combined risk score for arriving at final rankings.
8. **So’nia M. Pedroso et al (2008)** studied “The impact of work accidents experience on causal attributions and worker behavior” the experience of work accidents is an important variable to be considered as a predictor of workers’ perceptions (e.g. causal attributions) and behaviors. To test the stability of the results, the same analyses have been performed in two Portuguese organizations, one in an industrial context and the other in an R&D context.
9. **Tam, C. M et al (2003)** study about the “Relationship between construction safety signs and symbols recognition and characteristics of construction personnel” Safety symbols are intended to provide information and convey safety messages to the construction personnel. They are recognized as effective tools to influence behavior and increase the risk perception of the recipients. Results from this study indicate that the effectiveness of some safety symbols is low such as ‘Oxidizing’, ‘Irritant’ and ‘Harmful’ symbols. Evaluation and re-design of these symbols are recommended to enhance their effectiveness.
10. **Weiwei Wu et al (2010)** has been studied “Accident precursors and near misses on construction sites: An investigative tool to derive information from accident databases” Safety problems on construction sites seem to be largely unresolved as the fatality and injury records in construction continue to plague the industry across the world. The lack of an effective system to interrupt and prevent the precursors and contributory factors on construction sites is argued to be the critical deficiency of extant research and practice. This paper covers research to develop a systematic mechanism to interrupt and prevent precursors and immediate factors (PaIFs) on construction sites. First, the importance of precursors and near misses to further improve safety margins are emphasized. Furthermore, a systematic model of improving safety on construction sites is presented to consummate and perfect extant safety-improving systems on construction sites by reinforcing and accentuating the real-time tracking of precursors and immediate factors.

3. PROJECT SAFETY CULTURE INDEX

3.1. Scope:

The Scope of this Project Work covers the project activities carried out within the boundary of Edible oil Refinery Project, SIKOF Nellore.

3.2. Definitions & Abbreviations:

SIKOF – South India Krishna Oil and Fats Pvt Ltd
EPCM - Engineering, Procurement and Construction Management
PSCI - Project Safety Culture Index
HSE - Health, Safety and Environment

3.3. Background:

In this project, SIKOF has their own robust system in place for the HSE Inspection of Individual systems like Electrical Equipment, Portable Tools, Mechanical Equipment like Cranes, Man lift, etc., Tools & Tackles, Fire Extinguishers, Hygiene, Personal Protective Equipment, etc. However, the outcome of the same cannot be portrayed to Management as these parameters are standalone documents. In addition to that not all the parameters are being assessed for its compliance.

There is need for Management review in these issues as it will have a major impact on the Project and the Business Risk as well. The combination of all these parameters / attributes into a single score will give a brief outcome and a broader picture to the Management. And this will also assist the project team to focus on their lagging area & set the action plan to increase the compliance level.

Summary of the overall score against all the parameters will give the Overall HSE score which is termed as Project Safety culture Index (PSCI) score. This can be further grilled down to Contractor wise / area wise PSCI score to compare analyze the performance. My Phase-I project deals with the study of existing HSE practices at 200 TPD Edible oil Refinery Project - SIKOF and to develop a "HSE Project Safety Culture Index" for rolling it out at the project level and across other project sites.

3.4. Outline of Safety Hazards:

In this project, considering the complexity of the project it is more important to assess and review the compliance of all areas to have an incident free workplace.

Root cause of hazards identified needs to be analyzed to set the corrective and preventive action plan. Also, it is equally important to know the level of leadership commitment which is shown towards the HSE. A typical HSE Management system will have well established systems. I have seen the compliance level of all following areas and taken this as reference to prepare the Project Safety Culture Index Checklist.

- Leadership Involvement
- Employee Involvement
- Management System Compliance
- Human Behaviour
- Housekeeping & Sanitation
- Fall Protection & Prevention
- Scaffold, Ladders & Stairways
- PPE Usage
- Excavation
- Hoisting & Rigging Equipment/Cranes
- Vehicle & Mobile Equipment
- Tools & Equipment
- Fire Prevention
- Manual Material Handling & Ergonomics
- Electrical
- Health Hazards & Chemical Hazards
- Welding, Cutting & Grinding
- Pressure System / Testing
- Office Work Environment
- Environmental
- Confined Space Entry
- Emergency Response
- Control of Hazardous Energy
- Permit to Work System
- Competent Person Designation
- Critical Lifts
- Medical Monitoring
- Contractor HSE Management
- Documentation & Record Keeping
- Radiography

Required compliance for each element is briefed in the upcoming sections.

3.5. Project Safety Culture Index Checkpoints:

3.5.1. Leadership Involvement:

- ◆ **Zero Harm Vision** - Whether Leadership communicates the Zero Harm vision including expectations for all levels of the organization for creating and sustaining an incident-free workplace. Communications are made effective by use of multiple means and methods and are intended to eliminate at-risk behaviors and ensure compliance with the safety program by developing a culture of peer-to-peer accountability.
- ◆ **Engagement** - A documented assessment process is used to assess leadership engagement at all levels. This process is used to identify strengths and weaknesses in both individuals and groups with respect to Zero harm leadership. The results are used to coach and mentor leaders and to improve the effectiveness of their engagement and that of their workers in safety core processes.
- ◆ **Program Knowledge** - Leadership is knowledgeable of the HSE program and core HSE processes and is actively engaged in implementation. Leadership uses information and data from HSE processes to guide decision-making and to identify and implement initiatives to improve the level and effectiveness of their engagement and that of their employees.

- ◆ **Visibility** - Leadership openly demonstrates their commitment to safety by example. Their engagement in the safety core processes is evident through their visibility in the workplace where they are actively engaged with the workforce in meaningful activities (e.g., coaching and mentoring on hazard recognition, reviewing Job Safety Analysis, observing work and engaging employees in meaningful conversations regarding their personal commitment to safety).
- ◆ **Accountability** - Leadership knows their roles and responsibilities with regard to managing and leading the safety program and helps others achieve the same clarity of understanding. The expectations and roles and responsibilities for all persons (supervision, HSE staff, workforce) in the safety program are clearly understood and communicated. When there is misunderstanding or conflict, Leadership actively engages others to reach an effective resolution.
- ◆ **Recognition** - Leadership recognizes both individual employees and workgroups for working safely, for their engagement in the safety program and for their actions to develop and sustain a culture of caring, including their attitudes toward safety, their commitment to looking out for one another, their willingness to intervene and their discipline in following processes and procedures. Recognition by leadership occurs at all levels and is in various forms (public, private, verbal, material, etc.).
- ◆ **Risk Control** - Leadership recognizes and understands the hazards associated with the scope of the work as well as the controls that are required to mitigate risk. They understand how the various elements of the site HSE program provide focus on these hazards and controls. They have a working knowledge of the activities in progress and are mindful of those things that "keep them up at night". They understand the need to be vigilant and ensure the appropriate level of oversight and control during the execution of higher risk activities.
- ◆ **HSE Metrics & Results** - Leadership sets aggressive goals for HSE and tracks metrics for both lagging and leading indicators to measure the health of the program and overall performance. They understand the impact leading indicators have on safety performance and they recognize the current challenges and impediments to improvement. They maintain the appropriate balance between the focus on metrics and achieving good results and the focus on organizational learning that comes from sharing of lessons learned from incidents including near misses.
- ◆ **Team Effectiveness** - Leadership promotes teamwork, communications, and integrated planning of activities to maximize group participation and learning. Metrics are reviewed on a regular basis with site leadership and actions are identified to reverse negative trends. Incident reviews are utilized to identify learning opportunities, and these are effectively communicated to the workforce and shared within the company at large, as appropriate.
- ◆ **Performance Management** - Leadership holds all personnel accountable for safety, including their active engagement in the safety program and their responsibility to look out for others. They actively coach and mentor other leaders and employees on improving behaviors and intentions regarding safety and openly encourage peer-to-peer accountability.



Fig. No: 02 Leadership Involvement

3.5.2. Employee Involvement:

- ◆ **Zero Harm Awareness & Participation** - Employees know what is expected of them with respect to their personal engagement in the Zero Harm program and in helping to ensure an incident-free workplace. They are knowledgeable of the program and understand their specific roles and responsibilities and they are actively engaged.
- ◆ **Hazard Identification & Risk Control** - Employees recognize the major hazards associated with the work they do and understand the controls that are required and in place to mitigate the risk. They also understand the role the various elements of the Zero harm program play in ensuring an appropriate focus on these controls (Hazard Observations / Safety Observation Report, Job Safety Analysis, permit process, etc.).

- ◆ **Competency** - Employees receive training which includes: an orientation defining their role and responsibilities in the Zero harm program, job or task specific training, training for the use of tools and equipment, and “toolbox” training on relevant and specific issues. Employees are engaged in the training process and their feedback is used to improve the effectiveness of the training.
- ◆ **Intervention** - Employees know the process for intervening when they observe at risk behaviors and conditions and are encouraged and feel empowered to do so. They perceive the interventions as both positive and resulting in actions. Employees expect others to intervene on their behalf. There is evidence that interventions are occurring.
- ◆ **Compliance** - Employees demonstrate a commitment to and ownership of the Zero harm program, policies, procedures and practices. Employees are encouraged to and provide feedback on safety policies, procedures and practices and feel that their input is valued, and actions are taken where appropriate.
- ◆ **Recognition:** Employees are recognized by their supervision and leadership for their positive contributions to the safety program. Both individual employees and groups of employees (crews, organizational elements, etc.) receive recognition via various means. The recognition is perceived as valued and sincere.
- ◆ **Emergency Preparedness:** Employees are aware of the overall safety plan; including the emergency response plan(s) and understand their roles and responsibilities should an emergency occur. Employees are informed of changes in the plan and the impact(s) if any those changes have on their roles and responsibilities.
- ◆ **Consultation:** Employees participate in various safety committees, zero harm leadership teams, and other groups that are actively engaged in discussing and taking action on relevant safety issues. Participation in these groups is valued and appropriate time and resources are dedicated to ensuring their active and effective participation.
- ◆ **Coaching Others:** Employees are involved in mentoring, coaching and assisting less experienced employees. They understand their role and responsibilities in helping ensure that less experienced employees understand the specific hazards associated with the work and the controls required to mitigate the risk, as well as the local policies and procedures.
- ◆ **Engagement in Core Processes:** Employees are actively engaged in the Safety observation (SOR) / Hazard observations and pre-task planning (SPA) / Job Safety Analysis (JHA) processes and recognize the critical role their involvement plays in preventing incidents and injuries. Metrics indicate a high level of involvement by the workforce in the SOR / Hazard observations and SPA/ JSA process. Employees both give and receive feedback on these processes.

3.5.3. Management System Compliance:

- ◆ **Documented HSE Plan and its compliance level** - Site HSE plan outlines a detailed integrated approach for implementing the core safety processes (SOR/ Safety Observation, JHA/JSA, Training, Incident Reporting/Investigation, Inspections and Audits, etc.). The approach defines roles and responsibilities for leadership and employees at all levels including expectations for engagement. The plan also includes goals for leading metrics that are used to gauge the health and effectiveness of the processes.
- ◆ **Pre-task planning** - A pre-task planning process (SPA or equivalent) is implemented and involves supervision and all workers in the development of the plan. Pre-task plans are developed for each task and consider changes in the work environment or conditions, adjacent work activities and other factors that could impact the outcome of the task. The process includes a quality assessment of the plan by leadership with feedback to the workers. The focus of the feedback is on hazard identification, effectiveness of the controls implemented and correct use of tools and equipment including PPE.
- ◆ **Observation Process** - A process for observing and reporting at-risk behaviors and un-safe conditions (SOR or equivalent) is implemented and involves leadership and employees at all levels. The process is constantly monitored and evaluated to ensure effectiveness. Data from the process is used to identify and correct deficiencies and to drive improvement. Actions from the observations are taken in a timely manner and feedback is communicated to the workforce by site leadership.
- ◆ **Inspections & Audits** - Workplace inspections and audits are conducted by leadership and HSE staff on a routine basis. Findings are used to ensure compliance and to identify improvement opportunities, including the need for additional focused audits, training, etc. Actions resulting from the inspections and audits are timely and lessons learned are communicated to the workforce.
- ◆ **Incident Management** - Incidents, including near misses, are reported and investigated to the appropriate level and in a timely manner. Leadership actively participates in the incident review and investigation process. Actions resulting from investigations are taken in a timely manner and lessons learned are communicated to the workforce and shared across the company as appropriate. There is a focus on both low-frequency, high severity incidents and higher-frequency, low severity incidents.

- ◆ **Zero Harm Integration** - Where appropriate, the Zero harm program is integrated with the programs of other entities (client, contractor, teammate, etc.) to ensure there is a singular integrated approach to managing and implementing the safety program. Expectations are aligned and roles and responsibilities are communicated. Periodic reviews are conducted to assure on-going alignment.



Fig. No 03. PDCA Cycle

3.5.4. Human Behavior:

Behavioral Observation Tool (BOT) is a tool used to observe and record safe/unsafe act committed by personnel while performing work activity for the purpose of identifying the underlying cause(s) that influence the act. It is a planned activity which must be agreed by both observer and the person being observed. The main objective of BOT is to reduce incidents triggered by unsafe behavior.

1	Falls
2	Overexertion
3	Striking Against/Struck By
4	Caught Between Objects
5	Intake/Contact with Hazardous Substance
6	Contact with Hot/Cold surface
7	Contact with Electric Current

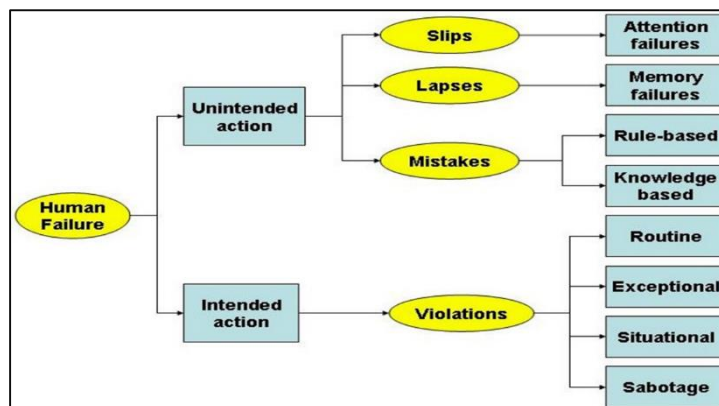


Fig. No 04. Human failure

3.5.5. Housekeeping & Sanitation:

1	General appearance of the site is neat and orderly.
2	Trash, debris, and liquids are not allowed to accumulate.
3	Walkways are maintained clear & designated walkways are established.
4	Materials and equipment are stored properly.
5	Cords and hoses are routed in a manner to prevent trip hazards or damage
6	Eating areas are away from work areas & possible sources of contamination.
7	Refrigerators are used appropriately (no storage of non-food items).
8	Floor coverings are in good condition (do not pose a tripping hazard).
9	Items are properly stacked on shelves.

10	Drinking water containers are properly labeled, sealed, & free of contaminants.
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Fig. No 05. Housekeeping & Sanitation:

3.5.6. Fall Protection & Prevention:

Table 3	
1	Fall hazards are identified in the job hazard analyses and pre-task plans.
2	The 100% fall protection policy is clearly communicated, understood, and enforced.
3	Floor and wall openings are protected. Hole covers are secure and labeled.
4	Personnel are protected when working at elevation. Fall rescue plans are developed.
5	Affected workers have been trained in the use, inspection, and care of the fall protection equipment.
6	Personal fall protection is used appropriately when working in lifts and on incomplete scaffolding.
7	Qualified persons supervise the installation of fall arrest systems.
8	Anchorage points are adequate and have been verified by a qualified person.
9	Personal fall protection equipment is properly stored and maintained.
10	Horizontal and vertical lifelines, perimeter guarding, and handrails are properly installed.



Fig No:06 Fall Protection & Prevention

3.5.7. Scaffold, Ladder & Stairways:

Table 4	
1	Scaffolds are erected and maintained by qualified scaffold erectors.
2	Scaffolds are inspected and tagged by a competent person.
3	Workers are trained in scaffold use.
4	Scaffolds are erected complete with proper platforms, toe boards, bracing, & footings. All pins & connectors are in place.
5	Scaffold wheels are locked or blocked when in use (not being rolled).
6	Scaffold boards are of the proper materials, capacity & installed properly.
7	Portable ladders are tied off or held while in use.
8	Ladders are properly inspected, used, and stored.
9	Stairways have appropriate handrails.
10	Stairways are adequately lighted.

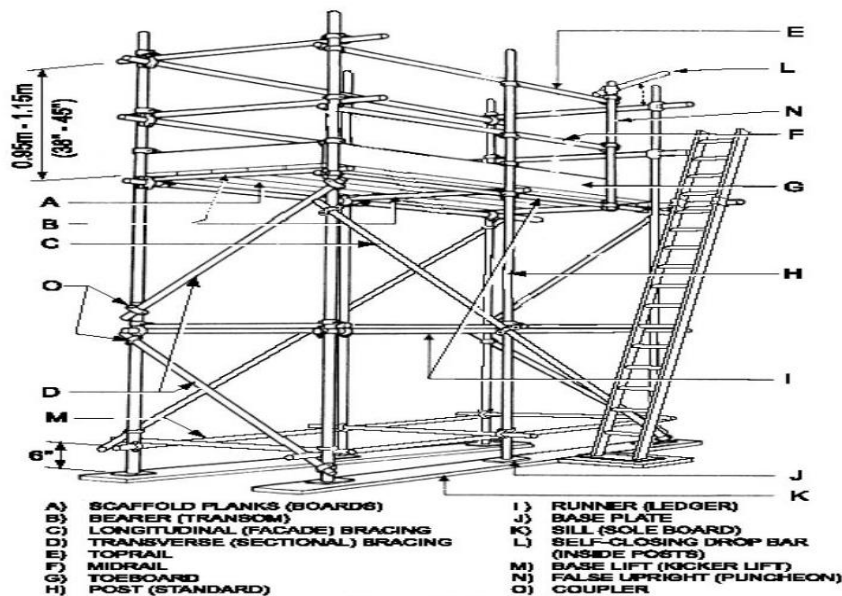


Fig. No. 07 Scaffold, Ladder & Stairways

3.5.8. PPE Usage:

Table 5	
1	The site has a PPE policy that addresses minimum mandatory PPE requirements as well as PPE requirements for visitors.
2	The policy is understood by management and workers.
3	PPE is being used in accordance with the policy.
4	A written respiratory protection program is or is not required.
5	High visibility clothing is required and is used appropriately.
6	PPE requirements are identified on pre-task plans.
7	Areas designated as PPE required areas are marked appropriately.
8	Hazard assessments are performed to determine PPE requirements.
9	Personnel are trained in the proper use and care of PPE.
10	PPE is readily available.



Fig. No. 08 PPE Usage

3.5.9 Excavation:

Table 6	
1	Excavations are properly sloped, benched, shored, or otherwise protected (trench boxes or other approved means).
2	Access/egress ladders are located appropriately and secured. Structural ramps are designed by a competent person.
3	Excavations are properly barricaded or guarded and are protected from water accumulation.
4	Daily inspections are performed and documented by a competent person.
5	Equipment is either prevented from being operated in close proximity to excavations or is controlled.
6	Underground utility clearance procedures are performed prior to excavating.
7	Atmospheric testing is performed in excavations or trenches where there is potential for oxygen deficiency or a hazardous atmosphere.
8	Soil type is properly identified by a competent person using an approved method.
9	Excavation spoil material is properly placed (safe distance from excavation).
10	Trench or excavation crossings are used. The crossing structures are verified for the intended loads.



Fig. No. 09 Safe Baricade in Excavation

3.5.10 Hoisting & Rigging Equipment:

Table 7	
1	Workers are trained in proper rigging, flagging, and hoisting procedures.
2	Loads are properly rigged.
3	Lifting equipment (chokers, slings, chain falls, come along, etc.) are in good condition, properly inspected, and maintained.
4	Tag lines are used appropriately.
5	Load hooks, latches, and other rigging hardware are in good condition and properly inspected.
6	Cranes are set up properly including outriggers properly extended and outrigger pads used appropriately.
7	Crane operators are trained, qualified, and have current certification.
8	Cranes inspections are current.
9	Appropriate precautions are taken for crane operations in close proximity to overhead electrical lines or near other adjacent hazards.
10	Signal persons are qualified. Hand signals are posted.

**Fig. No. 10 Safe Rigging Practice****3.5.11 Vehicles & Mobile Equipment:**

Table 8	
1	Vehicle and equipment inspections and certifications are current.
2	Vehicles and equipment are in good conditions (safety devices, windshields, mirrors, lights, etc.).
3	Brakes, back-up alarms, and horns work properly.
4	Drivers and operator's licenses are current.
5	Photocopies of licenses are maintained in the site file.
6	Motor vehicle operators have completed defensive driving training.
7	Mobile equipment operators are identified on the competent person list.
8	Aerial lift and scissor lift operators are trained on the model(s) lift being operated.

9	Vehicle and equipment controls are properly labeled. Warning labels are present and in good condition.
10	Forklift operators are trained on the model(s) being operated.
11	Forklifts are inspected daily before use and the inspections are documented.
12	Seat belts are used in vehicles and mobile equipment.
13	Cell phones are not used by personnel when operating vehicles or mobile equipment.



Fig. No. 11 Safe Forklift Operation

3.5.12 Tools & Equipment:

Table 9	
1	Tools are appropriate for the task.
2	Tools are being used for their intended purpose.
3	Hand tools are in good condition. Handles, striking and cutting surfaces, etc. do not show signs of abuse.
4	Tool and equipment guards are in place and in good condition.
5	Hydraulic and/or pneumatic components including hoses, fittings, and connectors are in good condition.
6	Damaged tools are taken out of service and properly tagged or disposed of.
7	Tires, hose connections, welding leads, etc. are in good condition?
8	Belt guards, fan blade guards, shaft guards and other guards are in place.
9	Powder activated tools are used properly by trained and qualified personnel.
10	Grinder wheels on portable grinders are appropriate for the grinder RPM and for the application.



Fig. No. 12 Safe Handling of Tools and Equipment's

3.5.13 Fire Prevention:

Table 10	
1	Flammables, oxidizers, and combustibles are stored properly.
2	Fire extinguishers are properly located and are appropriate for the application.
3	Fire extinguishers and firefighting equipment are properly inspected and maintained.
4	Oxy-fuel rigs are properly set up and stored. The hoses are appropriate for the application and flashback arrestors are properly installed.
5	Gas cylinders are properly secured.
6	Cylinder gauges are removed, and caps put in place when not in use.
7	Flammable and combustible wastes are properly handled.
8	Flammable storage cabinets are properly utilized.
9	Safety cans are used for storing and dispensing gasoline.
10	Outside storage tanks are properly located, installed, and protected.

**Fig. No. 13 Fire Hazard During Grinding Operation****3.5.14 Manual Material Handling:**

Table 11	
1	Manual material handling hazards are adequately identified.
2	Effective controls for manual material handling are being employed including adequate supervision.
3	Tasks that put personnel at risk for repetitive motion injuries have been evaluated.
4	Lifting accessories are available to assist in manual material handling. They are used and maintained properly.
5	Personnel use proper body position when performing tasks.
6	Pre-task plans adequately address body position as a potential hazard.
7	Personnel do not lift loads of 50 pounds (23 kg) or more (single person lift).
8	Overhead material handling hazards have been identified.
9	Tasks do not require materials to be carried up/downstairs. Alternate means such as lifts, elevators, etc. are used.
10	Tasks involving complex lifting and placing operations have ergonomic assessments.



Fig. No. 14 Safe and Unsafe Practice in Manual Materials Handling

3.5.15 Electrical:

Table 12	
1	Electrical components are properly covered and protected.
2	Temporary cords are in good condition and/or properly repaired.
3	Ground Fault Circuit Interrupter (GFCI) devices or similar devices are installed on temporary circuits and where required by local standards.
4	Routine inspections are conducted for circuit grounding.
5	Electrical devices are appropriate for the location and hazard classification.
6	The site has a lockout program that is being used properly.
7	Circuit breakers are properly marked and labeled.
8	The site has designated electrical workers (electricians and others designated as being qualified to work on or near energized parts) that are trained and qualified.
9	Arc flash hazards have been identified, equipment is properly labeled, and the proper protective equipment is available.
10	Proper clearance distances are maintained near electrical equipment.



Fig. No. 15 Safety in Electrical Works

3.5.16 Health & Chemical Hazards:

Table 13	
1	Potential chemical and biological hazards have been identified and evaluated.
2	The location of hazardous chemical information (MSDS or equivalent) is identified during worker orientation.
3	The chemical information sheets (MSDS) are shared on multiemployer worksites.
4	An information sheet is available for each chemical.
5	Hazardous materials are properly stored and labeled.
6	Specific training on hazardous chemicals is provided.
7	Worker training addresses accessing the chemical hazard information when developing specific procedures / methods for tasks involving chemical hazards.
8	Eyewash and shower units are located appropriately.
9	Employees working around any regulated hazardous materials (asbestos, lead, etc.) are properly trained and qualified.
10	Appropriate precautions are taken for working in adverse working environments (hot, cold, wet, snow, humid, windy, dusty, etc.).



Fig. No. 16 Chemical Hazards Symbols

3.5.17 Welding, Cutting & Grinding:

Table 14	
1	Hot work permits are obtained prior to performing work.
2	A fire extinguisher or fire watch is stationed nearby.
3	Appropriate controls are in place to prevent or limit personnel exposure to smoke and/or fumes.
4	Controls are in place to prevent personnel and equipment exposure to sparks, heat, and flames.
5	Welding blankets and shields are being used appropriately.
6	Welding machines are properly grounded.
7	Appropriate PPE is worn by personnel performing welding and grinding.
8	Welding and cutting gas cylinders are properly stored when not in use.
9	Welding cables, leads, hoses, and connectors are in good condition.
10	Portable grinders are in good condition, guards are in place, and wheels appropriate for grinder.



Fig. No. 17 Welding Safety

3.5.18 Pressure System / Testing:

Table 15	
1	Piping and hoses are in good condition. Hose ends are restrained from whipping where appropriate.
2	Relief devices are located appropriately and are inspected periodically in accordance with local standards.
3	Relief device outlets and vent outlets are oriented appropriately (away from personnel).
4	Boiler and other specialty equipment inspections are current.
5	Gauges and other process indicators are functional.
6	The overall condition of the system is good (no unusual signs of wear, leaks, damage, corrosion, etc.).
7	Gas cylinders are properly stored.
8	Rotating equipment is properly guarded.
9	Potential chemical hazards have been identified.



Fig. No. 18 Safe Distance During Pressure Testing

3.5.19 Office Work Environment:

Table 16	
1	Tools are appropriate for the specific tasks performed.
2	Cutting tools are in good condition, appropriate for the task, and equipped with safety devices.
3	File cabinets are properly loaded and secured. File and desk drawers are kept closed when not in use.
4	Furniture and equipment are in good repair.
5	Walking surfaces (carpet, tile, etc.) are in good condition.
6	First-aid kits are properly stocked and available for use.
7	Employees are trained and qualified in first aid and CPR. AEDs are available and personnel are trained in their use.
8	Storage areas are organized and properly utilized (heavy items on bottom shelves).
9	Emergency exits are well marked and clear.
10	A facility siting analysis has been performed/reviewed for siting of occupied facilities.

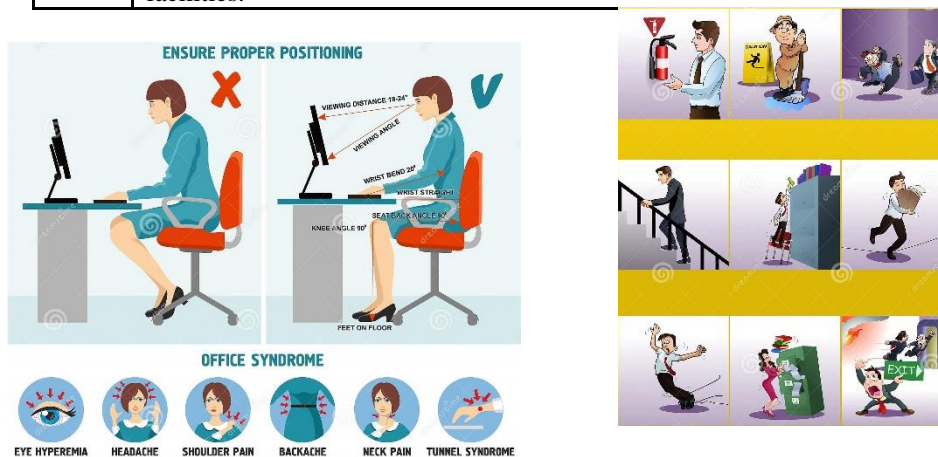


Fig. No. 19 Safe Practices in Office Environment

3.5.20 Environmental:

Table 17	
1	Potential environmental hazards on the site have been identified and evaluated.
2	The project has coordinated with the client regarding environmental compliance issues.
3	Employees are trained and qualified to work with and around hazardous materials.
4	A recycling program is in place.
5	Appropriate environmental permits have been obtained.
6	The site emergency response plan addresses chemical spills.
7	Hazardous wastes have been identified.
8	Spill containment is provided around tank and drum storage.
9	Employees understand their roles and responsibilities in the environmental program.
10	Containers are properly labeled.



Fig. No. 20 Waste Segregation & Collection

3.5.21 Confined Space Entry:

Table 18	
1	Is a written confined space program required?
2	Have confined space hazard analyses been performed?
3	Does a written program exist?
4	Are personnel trained?
5	Has a rescue plan been developed?



Fig. No. 21 Safety in Confined Space Works

3.5.22 Emergency Response:

Table 19	
1	Does a written emergency response plan exist? Are employees aware of the plan?
2	Is the emergency response plan coordinated with the client/site plan?
3	Are emergency response drills performed?
4	Are the site office facilities tied into the client/site emergency alarm/notification system?
5	Does the written plan address all credible scenarios?
6	Is the emergency plan reviewed and updated periodically?

3.5.23 Control of Hazardous Energy:

Table 20	
1	Is a control of hazardous energy program required?
2	Is the program documented? Is it reviewed periodically?
3	Have specific energy control (LOTO) procedures been developed?
4	Are the procedures being used? Are the personnel trained and qualified?
5	Is the LOTO training current?
6	Is the program periodically audited?



Fig. No. 22 Lock-Out and Tag-Out

3.5.24 Permit to Work System:

Table 21	
1	Applicable Work Permits issued
2	Work Permit Compliance
3	Issuer/Receiver Site Inspection Conducted
4	Inspection Conducted Before and During Work Activity
5	Permits closure and submission

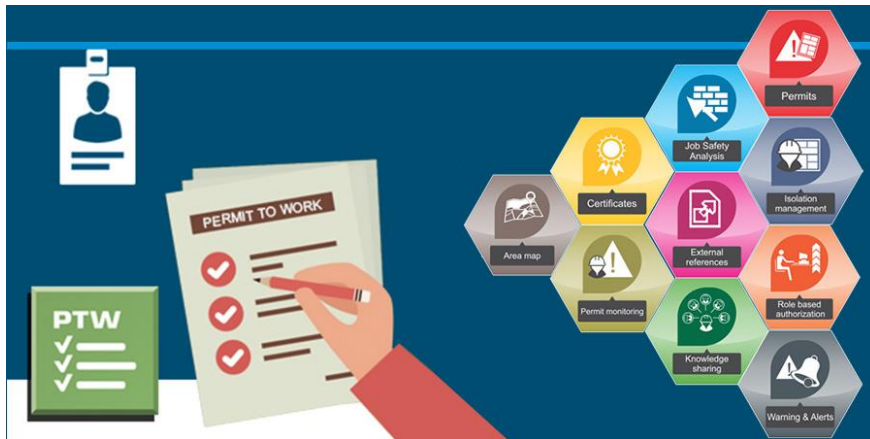


Fig. No. 23 Permit to Work Management

3.5.25 Competent Person Designation:

Table 22	
1	Is there a process for designation of competent persons on site?
2	Are competent persons identified for hazardous activities?
3	Do the competent persons have the appropriate training?
4	Are the competent persons engaged in the work?



Fig. No. 24 Identification of Competent Person

3.5.26 Critical Lifts:

Table 23	
1	Does the site perform critical lifts?
2	Is the pre-lift checklist used to ensure appropriate precautions have been taken?
3	Is critical lift planning performed and documented?
4	Are critical lift plans reviewed by a qualified person?



Fig. No. 25 Critical Lifting

3.5.27 Medical Monitoring:

Table 24	
1	Are required medical surveillance programs in place?
2	Does the client conduct medical surveillance testing on our employees?
3	Is medical surveillance testing conducted by a SIKOF approved third party medical provider?
4	Are copies and/or original medical records and test results maintained at the work site?
5	Are medical records and test results maintained by the client?
6	Are medical records and test results forwarded to the Occupational Health Services Department to be maintained?



Fig. No. 26 Workers Fitness

3.5.28 Contractor HSE Management:

Table 25	
1	Is a contractor screening and evaluation process used?
2	Are HSE requirements included in the contract?
3	Does site management communicate HSE expectations?
4	Is subcontractor safety performance monitored, measured, and given appropriate attention?
5	Are regular safety meetings conducted with subcontractors?

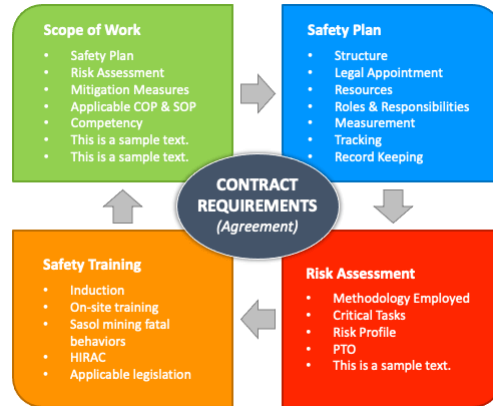


Fig. No. 27 Contractor HSE Management System

3.5.29 Radiography:

Table 26	
1	In Compliance with BARC requirements
2	Approved Storage Area (Pit room)
3	Warning Signs on Storage Area
4	Barricades and Lights
5	Radiation Safety Officer (RSO)
6	Medical Screening
7	TLD Badges
8	Dosimeter and Survey meter



Fig. No. 28 Safe Practice During Radiography

3.5.30 Documentation & Record Keeping:

Table 27	
1	Is required documentation current? (Documentation Checklist or equivalent)
2	Are all required written programs documented as part of the HSE Plan?
3	Are all required signs and posting present?

4 CULTURE EVALUATION CHECKLIST

Table:28

Project Name		Date of Assessment	
Client		Manpower	
Month		Contractor Associated	
ELEMENT	SCORE (%)	ELEMENT	SCORE (%)
Leadership Involvement		Health Hazards & Chemical Hazards	
Employee Involvement		Welding, Cutting & Grinding	
Management System Compliance		Pressure System / Testing	
Human Behaviour		Office Work Environment	
Housekeeping & Sanitation		Environmental	
Fall Protection & Prevention		Confined Space Entry	
Scaffold, Ladders & Stairways		Emergency Response	
PPE Usage		Control of Hazardous Energy	
Excavation		Permit to Work System	
Hoisting & Rigging Equipment/Cranes		Competent Person Designation	
Vehicle & Mobile Equipment		Critical Lifts	
Tools & Equipment		Medical Monitoring	
Fire Prevention		Contractor HSE Management	
Manual Material Handling & Ergonomics		Documentation & Record Keeping	
Electrical		Radiography	
TOTAL PSI SCORE		EVALUATION PERFORMANCE CODE	
ASSESSED BY	NAME & SIGNATURE		
HSE MANAGER	NAME & SIGNATURE		
RESIDENT CONSTRUCTION MANAGER	NAME & SIGNATURE		
Evaluation Performance Code	PSI Score	Score Grade	
1	95 - 100%	Excellent	
2	80 - 94.99 %	Very Good	
3	65 - 79.99 %	Good	
4	50 - 64.99 %	Average	
5	Below 50	Needs Improvement	

5. CULTURE EVALUATION CRITERIA

5.1. Assessment Rating Criteria

Rating will be provided on the level of compliance against each element and rating scale will be between 0 -3. Sum of score against the total score will be converted into % Score for each category. Score each element of the category from 0 to 3 based on the following:

0	No evidence exists on which to base an assessment; program element is not implemented
1	Some evidence to support assessment; program element implemented partially or in initial or rudimentary stages
2	Consistent evidence exists to support assessment; program element is fully implemented but not functioning at a high level
3	High degree of evidence exists to support assessment; program element is fully implemented and functioning at a high level

5.2. Evaluation Performance Code

Total Score of Project Safety Culture Index Checklist will be categorized as given below,

Evaluation Code	Performance	PSCI Score	Score Grade
1		95 - 100%	Excellent
2		80 - 94.99 %	Very Good
3		65 - 79.99 %	Good
4		50 - 64.99 %	Average
5		Below 50	Needs Improvement

6. PSCI ASSESSMENT

6.1. Scope of Assessment

This assessment will be carried by conducting physical verification in a construction site for three consecutive months as pilot basis to see effectiveness. PSCI assessment will be carried by the Site HSE Manager or his representative.

6.2. Assessment Results

Assessment results are categorized into three elements such Compliance to HSE Management System effectiveness, Compliance to Operation Control Procedures of an organization, Compliance to the Safe Code of Practices. Each element will have different focus areas which will be evaluated by verifying the compliance level physically.

6.2.1. Reflection of HSE Management System

Following elements will be evaluated to see the effective implementation of HSE Management System.

- ◆ Leadership Involvement
- ◆ Employee Involvement
- ◆ Management System Compliance
- ◆ Human Behavior

Section	Element	Dec-23	Jan-24	Feb-24
1	Leadership Involvement	53%	70%	93%
1.1	Zero Harm Vision	1	2	3
1.2	Engagement	1	2	3
1.3	Program Knowledge	2	3	3
1.4	Visibility	2	2	3
1.5	Accountability	2	2	3
1.6	Recognition	2	2	3
1.7	Risk Control	1	2	2
1.8	HSE Metrics & Results	1	2	3
1.9	Team Effectiveness	2	2	2
1.10	Performance Management	2	2	3
Section	Element	Dec-23	Jan-24	Feb-24
2	Employee Involvement	57%	77%	93%
2.1	Zero Harm Awareness & Participation	1	2	3
2.2	Hazard Identification & Risk Control	2	3	3
2.3	Competency	2	3	3
2.4	Intervention	2	2	3
2.5	Compliance	2	3	3
2.6	Recognition	2	2	3

2.7	Emergency Preparedness	2	2	3
2.8	Consultation	2	2	2
2.9	Coaching Others	1	2	2
2.10	Engagement in Core Processes	1	2	3
3	Management System Compliance	72%	83%	94%
3.1	Compliance to HSE Plan	2	2	2
3.2	Pre-task planning	2	3	3
3.3	Observation Process	3	2	3
3.4	Inspections & Audits	2	2	3
3.5	Incident Management	2	3	3
3.6	Zero Harm Integration	2	3	3
4	Human Behavior	62%	76%	95%
4.1	Falls	2	2	2
4.2	Overexertion	1	2	3
4.3	Striking Against/Struck By	1	2	3
4.4	Caught Between Objects	3	2	3
4.5	Contact with Hazardous Substance	2	2	3
4.6	Contact with Hot/Cold surface	2	3	3
4.7	Contact with Electric Current	2	3	3

Below mentioned chart gives the performance trend of HSE Management System compliance & its reflection.

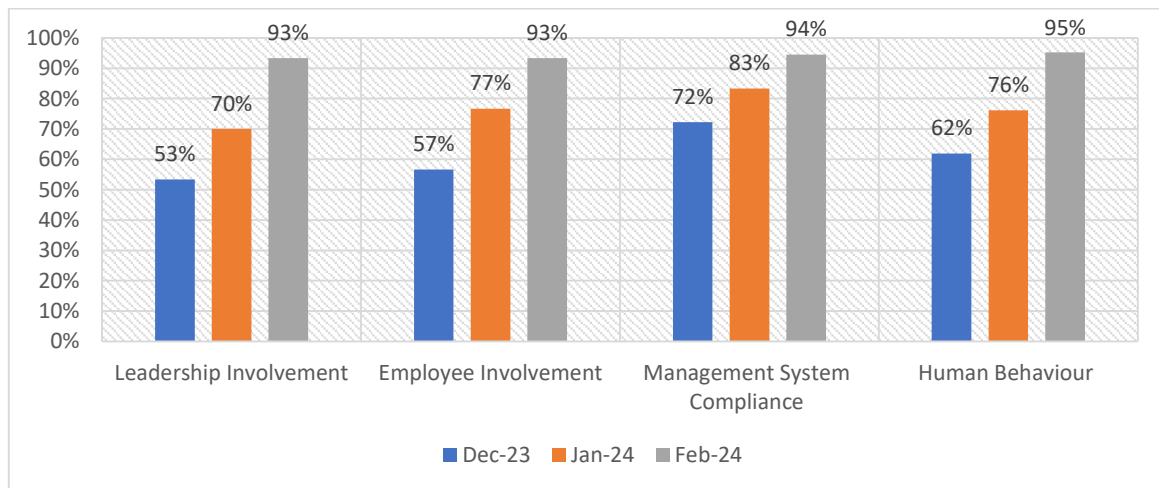


Chart. No. 01 Reflection of HSE Management System

6.1.1. Compliance to Operation Control Procedures

Following elements will be evaluated to understand the compliance level of Operation Control Procedures,

- ◆ Emergency Response
- ◆ Permit to Work System
- ◆ Competent Person Designation
- ◆ Medical Monitoring
- ◆ Contractor HSE Management
- ◆ Document & Record Keeping

Table 32 -Score Card for Evaluating Operation Control Procedure Compliance				
Section	Element	Dec-23	Jan-24	Feb-24
1	Emergency Response	56%	78%	94%
1.1	ERP Plan & Awareness	1	2	3
1.2	Approved by Client	3	3	3
1.3	Mock Drill Conducted	1	2	2
1.4	Emergency Notification System	1	2	3
1.5	Emergency Scenarios Identified	2	2	3
1.6	Periodic review of ERP	2	3	3
2	Permit to Work System	53%	67%	93%
2.1	Applicable Work Permits issued	1	2	3
2.2	Work Permit Compliance	2	2	3
2.3	Issuer/Receiver Site Inspection Conducted	1	2	3
2.4	Periodic Inspection	2	2	2
2.5	Permits closure and submission	2	2	3
3	Competent Person Designation	67%	75%	92%
3.1	Competency Screening Process	3	3	3
3.2	Are competent persons identified for hazardous activities?	2	2	3
3.3	Do the competent persons have the appropriate training?	1	2	3
3.4	Are the competent persons engaged in the work?	2	2	2
4	Medical Monitoring	61%	83%	94%
4.1	Whether medical surveillance programs in place?	3	3	3
4.2	Contractors follow the procedure	2	3	3
4.3	Whether medical surveillance done by competent person	2	3	3
4.4	Medical Records are being maintained	2	2	3
4.5	Medical records are considered by Client	1	2	3
4.6	Are medical records and test results forwarded to the Occupational Health Services Department to be maintained?	1	2	2
5	Contractor HSE Management	53%	67%	87%
5.1	Is a contractor screening and evaluation process used?	1	2	3
5.2	Are HSE requirements included in the contract?	2	2	2
5.3	Does site management communicate HSE expectations?	2	2	3
5.4	Contractor Safety Performance Monitoring	2	2	2
5.5	Regular safety meetings conducted with contractors?	1	2	3
6	Documentation & Record Keeping	67%	78%	89%
6.1	Documentation is up to date	2	2	3
6.2	Are all required written programs documented as part of the HSE Plan?	2	3	3
6.3	Are all required signs and posting present?	2	2	2

Below mentioned chart gives the performance trend of Compliance level of Operation Control Measures,

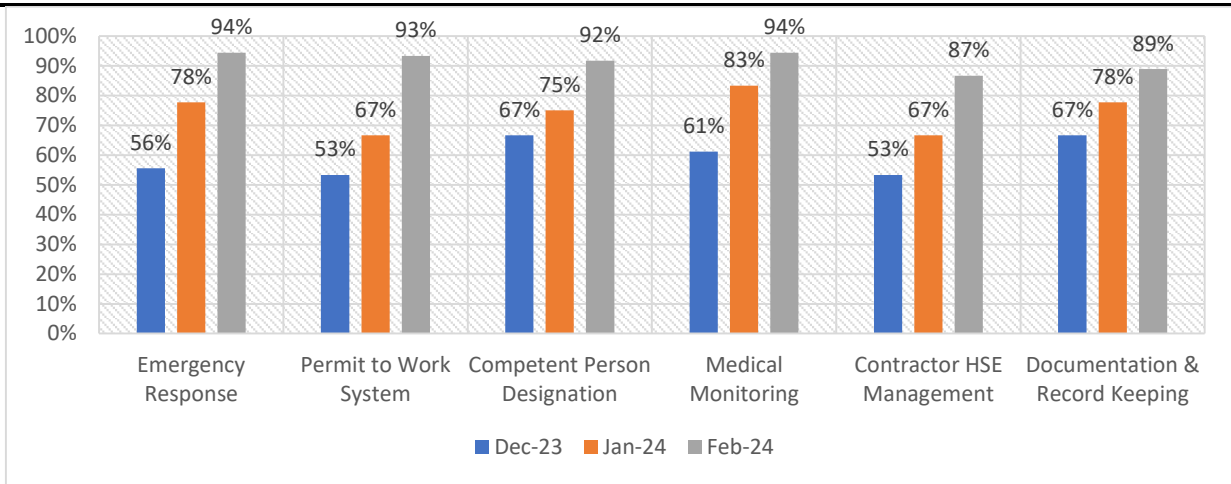


Chart. No. 02 Score Card for Evaluating Operation Control Procedure Compliance

6.1.2. Compliance to Code of Practices

Following elements will be evaluated to understand the compliance level on the Safe Code of Practices followed,

- ◆ Housekeeping & Sanitation
- ◆ Fall Protection & Prevention
- ◆ Scaffold, Ladders & Stairways
- ◆ PPE Usage
- ◆ Excavation
- ◆ Hoisting & Rigging Equipment
- ◆ Vehicle & Mobile Equipment
- ◆ Tools & Equipment
- ◆ Fire Prevention
- ◆ Manual Material Handling
- ◆ Electrical
- ◆ Health Hazards & Chemical Hazards
- ◆ Welding, Cutting & Grinding
- ◆ Pressure System / Testing
- ◆ Environmental
- ◆ Confined Space Entry
- ◆ Control of Hazardous Energy
- ◆ Critical Lifts
- ◆ Radiography

Section	Element	Dec-23	Jan-24	Feb-24
1	Housekeeping & Sanitation	60%	77%	90%
1.1	General appearance of the site is neat and orderly.	1	2	3
1.2	Trash, debris, and liquids are not allowed to accumulate.	1	2	3
1.3	Walkways are maintained clear & designated walkways are established.	2	2	3
1.4	Materials and equipment are stored properly.	2	2	3
1.5	Cords and hoses are routed in a manner to prevent trip hazards or damage	2	2	2
1.6	Eating areas are away from work areas & possible sources of contamination.	2	2	2
1.7	Refrigerators are used appropriately (no storage of non-food items).	3	3	3
1.8	Floor coverings are in good condition (do not pose a tripping hazard).	2	3	3
1.9	Items are properly stacked on shelves.	1	3	3
1.10	Drinking water containers are properly labeled, sealed, & free of contaminants.	2	2	2
2	Fall Protection & Prevention	70%	80%	92%

Table 33 – Score Card for Evaluating Compliance Code of Practice				
Section	Element	Dec-23	Jan-24	Feb-24
2.1	Fall hazards are identified in the job hazard analyses and pre-task plans.	1	2	3
2.2	The 100% fall protection policy is clearly communicated, understood, and enforced.	2	2	3
2.3	Floor and wall openings are protected. Hole covers are secure and labeled.	2	3	3
2.4	Personnel are protected when working at elevation. Fall rescue plans are developed.	3	2	3
2.5	Affected workers have been trained in the use, inspection, and care of the fall protection equipment.	2	2	3
2.6	Personal fall protection is used appropriately when working in lifts and on incomplete scaffolding.	2	2	2.5
2.7	Qualified persons supervise the installation of fall arrest systems.	3	3	2
2.8	Anchorage points are adequate and have been verified by a qualified person.	2	3	3
2.9	Personal fall protection equipment is properly stored and maintained.	2	3	3
2.10	Horizontal and vertical lifelines, perimeter guarding, and handrails are properly installed.	2	2	2
3	Scaffold, Ladders & Stairways	53%	77%	90%
3.1	Scaffolds are erected and maintained by qualified scaffold erectors.	2	2	3
3.2	Scaffolds are inspected and tagged by a competent person.	2	2	3
3.3	Workers are trained in scaffold use.	2	2	3
3.4	Scaffolds are erected complete with proper platforms, toe boards, bracing, & footings. All pins & connectors are in place.	2	2	3
3.5	Scaffold wheels are locked or blocked when in use (not being rolled).	1	2	3
3.6	Scaffold boards are of the proper materials, capacity & installed properly.	1	2	2
3.7	Portable ladders are tied off or held while in use.	1	3	2
3.8	Ladders are properly inspected, used, and stored.	2	3	3
3.9	Stairways have appropriate handrails.	1	3	3
3.10	Stairways are adequately lighted.	2	2	2
4	PPE Usage	53%	70%	97%
4.1	The site has a PPE policy that addresses minimum mandatory PPE requirements as well as PPE requirements for visitors.	2	2	3
4.2	The policy is understood by management and workers.	1	2	3
4.3	PPE is being used in accordance with the policy.	2	1	3
4.4	A written respiratory protection program is or is not required.	1	2	3
4.5	High visibility clothing is required and is used appropriately.	1	1	3
4.6	PPE requirements are identified on pre-task plans.	1	2	3
4.7	Areas designated as PPE required areas are marked appropriately.	2	3	3
4.8	Hazard assessments are performed to determine PPE requirements.	2	3	3
4.9	Personnel are trained in the proper use and care of PPE.	2	3	3
4.10	PPE is readily available.	2	2	2
5	Excavation	53%	67%	90%
5.1	Excavations are properly sloped, benched, shored, or otherwise protected (trench boxes or other approved means).	1	2	3
5.2	Access/egress ladders are located appropriately and secured. Structural ramps are designed by a competent person.	2	1	2

Table 33 – Score Card for Evaluating Compliance Code of Practice				
Section	Element	Dec-23	Jan-24	Feb-24
5.3	Excavations are properly barricaded or guarded and are protected from water accumulation.	2	2	3
5.4	Daily inspections are performed and documented by a competent person.	1	2	3
5.5	Equipment is either prevented from being operated in close proximity to excavations or is controlled.	2	3	3
5.6	Underground utility clearance procedures are performed prior to excavating.	2	2	2
5.7	Atmospheric testing is performed in excavations or trenches where there is potential for oxygen deficiency or a hazardous atmosphere.	1	2	3
5.8	Soil type is properly identified by a competent person using an approved method.	2	2	3
5.9	Excavation spoil material is properly placed (safe distance from excavation).	1	2	2
5.10	Trench or excavation crossings are used. The crossing structures are verified for the intended loads.	2	2	3
6	Hoisting & Rigging Equipment/Cranes	60%	67%	90%
6.1	Workers are trained in proper rigging, flagging, and hoisting procedures.	2	2	3
6.2	Loads are properly rigged.	2	2	2
6.3	Lifting equipment (chokers, slings, chain falls, come along, etc.) are in good condition, properly inspected, and maintained.	2	3	3
6.4	Tag lines are used appropriately.	2	2	3
6.5	Load hooks, latches, and other rigging hardware are in good condition and properly inspected.	2	3	3
6.6	Cranes are set up properly including outriggers properly extended and outrigger pads used appropriately.	2	1	2
6.7	Crane operators are trained, qualified, and have current certification.	2	2	3
6.8	Cranes inspections are current.	1	2	3
6.9	Appropriate precautions are taken for crane operations in close proximity to overhead electrical lines or near other adjacent hazards.	2	2	3
6.10	Signal persons are qualified. Hand signals are posted.	1	1	2
7	Vehicle & Mobile Equipment	51%	64%	92%
7.1	Vehicle and equipment inspections and certifications are current.	2	2	3
7.2	Vehicles and equipment are in good conditions (safety devices, windshields, mirrors, lights, etc.).	2	2	2
7.3	Brakes, back-up alarms, and horns work properly.	2	1	3
7.4	Drivers and operator's licenses are current.	1	2	3
7.5	Photocopies of licenses are maintained in the site file.	2	3	3
7.6	Motor vehicle operators have completed defensive driving training.	2	1	3
7.7	Mobile equipment operators are identified on the competent person list.	2	1	3
7.8	Aerial lift and scissor lift operators are trained on the model(s) lift being operated.	2	2	3
7.9	Vehicle and equipment controls are properly labeled. Warning labels are present and in good condition.	1	2	3
7.10	Forklift operators are trained on the model(s) being operated.	1	3	3
7.11	Forklifts are inspected daily before use and the inspections are documented.	1	2	2
7.12	Seat belts are used in vehicles and mobile equipment.	1	2	2

Table 33 – Score Card for Evaluating Compliance Code of Practice				
Section	Element	Dec-23	Jan-24	Feb-24
7.13	Cell phones are not used by personnel when operating vehicles or mobile equipment.	1	2	3
8	Tools & Equipment	53%	72%	90%
8.1	Tools are appropriate for the task.	2	2.5	3
8.2	Tools are being used for their intended purpose.	2	2	3
8.3	Hand tools are in good condition. Handles, striking and cutting surfaces, etc. do not show signs of abuse.	2	2	3
8.4	Tool and equipment guards are in place and in good condition.	2	2	3
8.5	Hydraulic and/or pneumatic components including hoses, fittings, and connectors are in good condition.	2	2	3
8.6	Damaged tools are taken out of service and properly tagged or disposed of.	1	3	2
8.7	Tires, hose connections, welding leads, etc. are in good condition?	1	2	2
8.8	Belt guards, fan blade guards, shaft guards and other guards are in place.	2	2	3
8.9	Powder activated tools are used properly by trained and qualified personnel.	1	2	2
8.10	Grinder wheels on portable grinders are appropriate for the grinder RPM and for the application.	1	2	3
9	Fire Prevention	57%	80%	93%
9.1	Flammables, oxidizers, and combustibles are stored properly.	2	3	3
9.2	Fire extinguishers are properly located and are appropriate for the application.	2	2	3
9.3	Fire extinguishers and firefighting equipment are properly inspected and maintained.	2	3	3
9.4	Oxy-fuel rigs are properly set up and stored. The hoses are appropriate for the application and flashback arrestors are properly installed.	2	3	3
9.5	Gas cylinders are properly secured.	2	2	3
9.6	Cylinder gauges are removed, and caps put in place when not in use.	1	3	2
9.7	Flammable and combustible wastes are properly handled.	1	2	2
9.8	Flammable storage cabinets are properly utilized.	2	2	3
9.9	Safety cans are used for storing and dispensing gasoline.	1	2	3
9.10	Outside storage tanks are properly located, installed, and protected.	2	2	3
10	Manual Material Handling & Ergonomics	60%	80%	93%
10.1	Manual material handling hazards are adequately identified.	2	3	3
10.2	Effective controls for manual material handling are being employed including adequate supervision.	2	3	3
10.3	Tasks that put personnel at risk for repetitive motion injuries have been evaluated.	2	2	3
10.4	Lifting accessories are available to assist in manual material handling. They are used and maintained properly.	2	2	3
10.5	Personnel use proper body position when performing tasks.	2	2	2
10.6	Pre-task plans adequately address body position as a potential hazard.	1	3	3
10.7	Personnel do not lift loads of 50 pounds (23 kg) or more (single person lift).	2	2	3
10.8	Overhead material handling hazards have been identified.	2	2	3

Table 33 – Score Card for Evaluating Compliance Code of Practice				
Section	Element	Dec-23	Jan-24	Feb-24
10.9	Tasks do not require materials to be carried up/downstairs. Alternate means such as lifts, elevators, etc. are used.	1	3	3
10.10	Tasks involving complex lifting and placing operations have ergonomic assessments.	2	2	2
11	Electrical	50%	60%	80%
11.1	Electrical components are properly covered and protected.	2	1	3
11.2	Temporary cords are in good condition and/or properly repaired.	1	1	3
11.3	Ground Fault Circuit Interrupter (GFCI) devices or similar devices are installed on temporary circuits and where required by local standards.	2	2	2
11.4	Routine inspections are conducted for circuit grounding.	1	2	3
11.5	Electrical devices are appropriate for the location and hazard classification.	2	2	2
11.6	The site has a lockout program that is being used properly.	1	3	3
11.7	Circuit breakers are properly marked and labeled.	1	2	2
11.8	The site has designated electrical workers (electricians and others designated as being qualified to work on or near energized parts) that are trained and qualified.	2	2	3
11.9	Arc flash hazards have been identified, equipment is properly labeled, and the proper protective equipment is available.	1	1	1
11.10	Proper clearance distances are maintained near electrical equipment.	2	2	2
12	Health Hazards & Chemical Hazards	57%	70%	93%
12.1	Potential chemical and biological hazards have been identified and evaluated.	2	2	3
12.2	The location of hazardous chemical information (MSDS or equivalent) is identified during worker orientation.	2	2	3
12.3	The chemical information sheets (MSDS) are shared on multiemployer worksites.	1	2	2
12.4	An information sheet is available for each chemical.	2	2	3
12.5	Hazardous materials are properly stored and labeled.	2	2	3
12.6	Specific training on hazardous chemicals is provided.	2	2	3
12.7	Worker training addresses accessing the chemical hazard information when developing specific procedures / methods for tasks involving chemical hazards.	1	2	3
12.8	Eyewash and shower units are located appropriately.	1	3	3
12.9	Employees working around any regulated hazardous materials (asbestos, lead, etc.) are properly trained and qualified.	2	2	2
12.10	Appropriate precautions are taken for working in adverse working environments (hot, cold, wet, snow, humid, windy, dusty, etc.).	2	2	3
13	Welding, Cutting & Grinding	63%	74%	89%
13.1	Piping and hoses are in good condition. Hose ends are restrained from whipping where appropriate.	2	2	3
13.2	Relief devices are located appropriately and are inspected periodically in accordance with local standards.	2	2	3
13.3	Relief device outlets and vent outlets are oriented appropriately (away from personnel).	1	2	3
13.4	Boiler and other specialty equipment inspections are current.	1	2	3
13.5	Gauges and other process indicators are functional.	2	2	3
13.6	The overall condition of the system is good (no unusual signs of wear, leaks, damage, corrosion, etc.).	2	3	3

Table 33 – Score Card for Evaluating Compliance Code of Practice				
Section	Element	Dec-23	Jan-24	Feb-24
13.7	Gas cylinders are properly stored.	2	3	2
13.8	Rotating equipment is properly guarded.	2	2	2
13.9	Potential chemical hazards have been identified.	3	2	2
14	Pressure System / Testing	59%	70%	89%
14.1	Piping and hoses are in good condition. Hose ends are restrained from whipping where appropriate.	2	2	3
14.2	Relief devices are located appropriately and are inspected periodically in accordance with local standards.	2	2	3
14.3	Relief device outlets and vent outlets are oriented appropriately (away from personnel).	2	1	3
14.4	Boiler and other specialty equipment inspections are current.	1	3	3
14.5	Gauges and other process indicators are functional.	2	1	3
14.6	The overall condition of the system is good (no unusual signs of wear, leaks, damage, corrosion, etc.).	2	2	3
14.7	Gas cylinders are properly stored.	1	2	2
14.8	Rotating equipment is properly guarded.	2	3	2
14.9	Potential chemical hazards have been identified.	2	3	2
15	Office Work Environment	60%	77%	87%
15.1	Tools are appropriate for the specific tasks performed.	2	2	3
15.2	Cutting tools are in good condition, appropriate for the task, and equipped with safety devices.	2	2	3
15.3	File cabinets are properly loaded and secured. File and desk drawers are kept closed when not in use.	2	2	3
15.4	Furniture and equipment are in good repair.	1	3	3
15.5	Walking surfaces (carpet, tile, etc.) are in good condition.	2	1	3
15.6	First-aid kits are properly stocked and available for use.	2	2	3
15.7	Employees are trained and qualified in first aid and CPR. AEDs are available and personnel are trained in their use.	1	2	2
15.8	Storage areas are organized and properly utilized (heavy items on bottom shelves).	2	3	2
15.9	Emergency exits are well marked and clear.	1	3	2
15.10	A facility siting analysis has been performed/reviewed for siting of occupied facilities.	3	3	2
16	Environmental	57%	73%	90%
16.1	Potential environmental hazards on the site have been identified and evaluated.	2	2	3
16.2	The project has coordinated with the client regarding environmental compliance issues.	2	2	3
16.3	Employees are trained and qualified to work with and around hazardous materials.	1	2	3
16.4	A recycling program is in place.	2	2	3
16.5	Appropriate environmental permits have been obtained.	2	2	3
16.6	The site emergency response plan addresses chemical spills.	1	2	2
16.7	Hazardous wastes have been identified.	2	3	3
16.8	Spill containment is provided around tank and drum storage.	1	2	2
16.9	Employees understand their roles and responsibilities in the environmental program.	1	3	2
16.10	Containers are properly labeled.	3	2	3
17	Confined Space Entry	67%	60%	93%

Table 33 – Score Card for Evaluating Compliance Code of Practice				
Section	Element	Dec-23	Jan-24	Feb-24
17.1	Is a written confined space program required?	2	2	3
17.2	Have confined space hazard analyses been performed?	2	1	3
17.3	Does a written program exist?	2	2	3
17.4	Are personnel trained?	2	2	3
17.5	Has a rescue plan been developed?	2	2	2
18	Control of Hazardous Energy	61%	78%	89%
18.1	Is a control of hazardous energy program required?	2	2	3
18.2	Is the program documented? Is it reviewed periodically?	2	3	3
18.3	Have specific energy control (LOTO) procedures been developed?	2	3	3
18.4	Are the procedures being used? Are the personnel trained and qualified?	2	2	3
18.5	Is the LOTO training current?	2	2	2
18.6	Is the program periodically audited?	1	2	2
19	Critical Lifts	58%	75%	83%
19.1	Does the site perform critical lifts?	2	2	3
19.2	Is the pre-lift checklist used to ensure appropriate precautions have been taken?	2	2	2
19.3	Is critical lift planning performed and documented?	1	2	2
19.4	Are critical lift plans reviewed by a qualified person?	2	3	3
20	Radiography	54%	71%	92%
20.1	In Compliance with BARC requirements	2	2	3
20.2	Approved Storage Area (Pit room)	2	2	3
20.3	Warning Signs on Storage Area	1	3	3
20.4	Barricades and Lights	2	3	3
20.5	Radiation Safety Officer (RSO)	1	2	3
20.6	Medical Screening	2	2	3
20.7	TLD Badges	1	1	2
20.8	Dosimeter and Survey meter	2	2	2

Below mentioned chart gives the performance trend of Compliance level of Operation Control Measures,

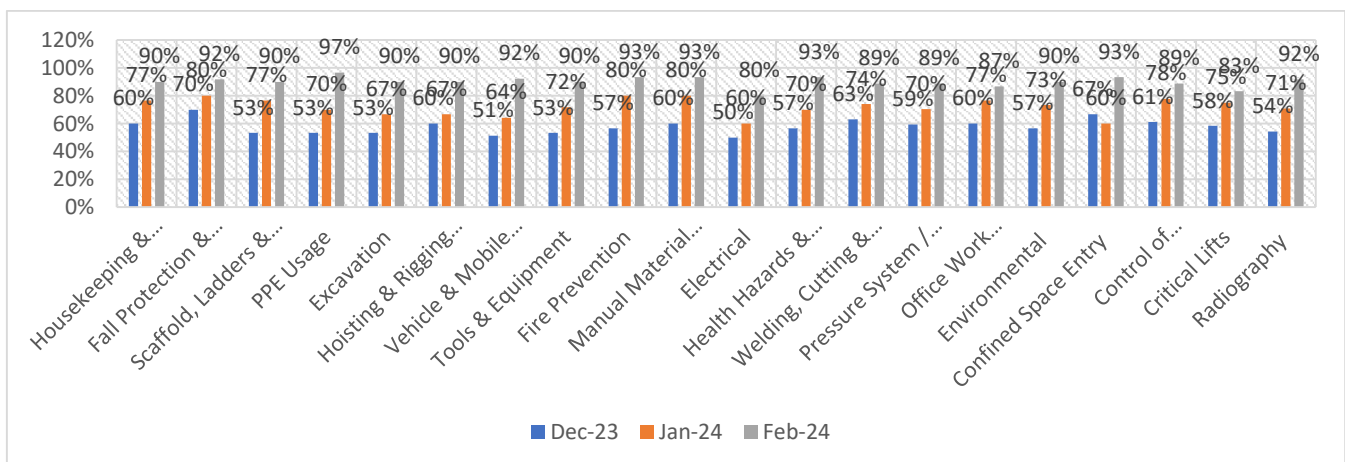


Chart. No. 03 Score Card for Evaluating Compliance Code of Practice

6.3 Project Safety Culture Index – Score Card Summary

Table: 34 Project Safety Culture Score Card Summary for the Month of Dec-23

PROJECT SAFETY CULTURE INDEX - SCORE CARD SUMMARY			
Project Name	200 TPD REFINERY	Date of Assessment	01-01-2024
Client	SIKOF	Manpower	460
Month	Dec-23	Contractor Associated	7
ELEMENT	SCORE (%)	ELEMENT	SCORE (%)
Leadership Involvement	53%	Health Hazards & Chemical Hazards	57%
Employee Involvement	57%	Welding, Cutting & Grinding	63%
Management System Compliance	72%	Pressure System / Testing	59%
Human Behaviour	62%	Office Work Environment	60%
Housekeeping & Sanitation	60%	Environmental	57%
Fall Protection & Prevention	70%	Confined Space Entry	67%
Scaffold, Ladders & Stairways	53%	Emergency Response	56%
PPE Usage	53%	Control of Hazardous Energy	61%
Excavation	53%	Permit to Work System	53%
Hoisting & Rigging Equipment/Cranes	60%	Competent Person Designation	67%
Vehicle & Mobile Equipment	51%	Critical Lifts	58%
Tools & Equipment	53%	Medical Monitoring	61%
Fire Prevention	57%	Contractor HSE Management	53%
Manual Material Handling & Ergonomics	60%	Documentation & Record Keeping	54%
Electrical	50%	Radiography	67%
TOTAL PSCI SCORE	59%	EVALUATION PERFORMANCE CODE	2
ASSESSED BY	NAME & SIGNATURE		
HSE MANAGER	NAME & SIGNATURE		
RESIDENT CONSTRUCTION MANAGER	NAME & SIGNATURE		
Evaluation Performance Code	PSI Score	Score Grade	
1	95 - 100%	Excellent	
2	80 - 94.99 %	Very Good	
3	65 - 79.99 %	Good	
4	50 - 64.99 %	Average	
5	Below 50	Needs Improvement	

Table: 35 Project Safety Culture Score Card Summary for the Month of Jan-24

PROJECT SAFETY CULTURE INDEX - SCORE CARD SUMMARY			
Project Name	200 TPD REFINERY	Date of Assessment	01-02-2024
Client	SIKOF	Manpower	490
Month	Jan-24	Contractor Associated	8
ELEMENT	SCORE (%)	ELEMENT	SCORE (%)
Leadership Involvement	70%	Health Hazards & Chemical Hazards	70%
Employee Involvement	77%	Welding, Cutting & Grinding	74%
Management System Compliance	83%	Pressure System / Testing	70%
Human Behaviour	76%	Office Work Environment	77%
Housekeeping & Sanitation	77%	Environmental	73%
Fall Protection & Prevention	80%	Confined Space Entry	60%
Scaffold, Ladders & Stairways	77%	Emergency Response	78%
PPE Usage	70%	Control of Hazardous Energy	78%
Excavation	67%	Permit to Work System	67%
Hoisting & Rigging Equipment/Cranes	67%	Competent Person Designation	75%
Vehicle & Mobile Equipment	64%	Critical Lifts	75%
Tools & Equipment	72%	Medical Monitoring	83%
Fire Prevention	80%	Contractor HSE Management	67%
Manual Material Handling & Ergonomics	80%	Documentation & Record Keeping	71%
Electrical	60%	Radiography	78%
TOTAL PSCI SCORE	73%	EVAULATION PERFORMANCE CODE	3
ASSESSED BY	NAME & SIGNATURE		
HSE MANAGER	NAME & SIGNATURE		
RESIDENT CONSTRUCTION MANAGER	NAME & SIGNATURE		
Evaluation Performance Code	PSI Score	Score Grade	
1	95 - 100%	Excellent	
2	80 - 94.99 %	Very Good	
3	65 - 79.99 %	Good	
4	50 - 64.99 %	Average	
5	Below 50	Needs Improvement	

Table: 36 Project Safety Culture Score Card Summary for the Month of Feb-24

PROJECT SAFETY CULTURE INDEX - SCORE CARD SUMMARY			
Project Name	200 TPD REFINERY	Date of Assessment	01-03-2024
Client	SIKOF	Manpower	496
Month	Feb-24	Contractor Associated	8
ELEMENT	SCORE (%)	ELEMENT	SCORE (%)
Leadership Involvement	93%	Health Hazards & Chemical Hazards	93%
Employee Involvement	93%	Welding, Cutting & Grinding	89%
Management System Compliance	94%	Pressure System / Testing	89%
Human Behaviour	95%	Office Work Environment	87%
Housekeeping & Sanitation	90%	Environmental	90%
Fall Protection & Prevention	92%	Confined Space Entry	93%
Scaffold, Ladders & Stairways	90%	Emergency Response	94%
PPE Usage	97%	Control of Hazardous Energy	89%
Excavation	90%	Permit to Work System	93%
Hoisting & Rigging Equipment/Cranes	90%	Competent Person Designation	92%
Vehicle & Mobile Equipment	92%	Critical Lifts	83%
Tools & Equipment	90%	Medical Monitoring	94%
Fire Prevention	93%	Contractor HSE Management	87%
Manual Material Handling & Ergonomics	93%	Documentation & Record Keeping	92%
Electrical	80%	Radiography	89%

TOTAL PSCI SCORE	91%	EVAULATION PERFORMANCE CODE	2
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ASSESSED BY	NAME & SIGNATURE
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HSE MANAGER	NAME & SIGNATURE
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RESIDENT CONSTRUCTION MANAGER	NAME & SIGNATURE
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Evaluation Performance Code	PSI Score	Score Grade
1	95 - 100%	Excellent
2	80 - 94.99 %	Very Good
3	65 - 79.99 %	Good
4	50 - 64.99 %	Average
5	Below 50	Needs Improvement

6.4 Management Review

Outcome of Project Safety Culture Index assessment was presented with the Site Leadership team as given,

Table 34			
Description	Dec-23	Jan-24	Feb-24
PSCI Cum. Score	59 %	73%	91%
PSCI Score Code	4	3	2
PSCI Score Grade	Average	Good	Very Good

Element wise score, focus areas was also presented to the management during the review meeting.

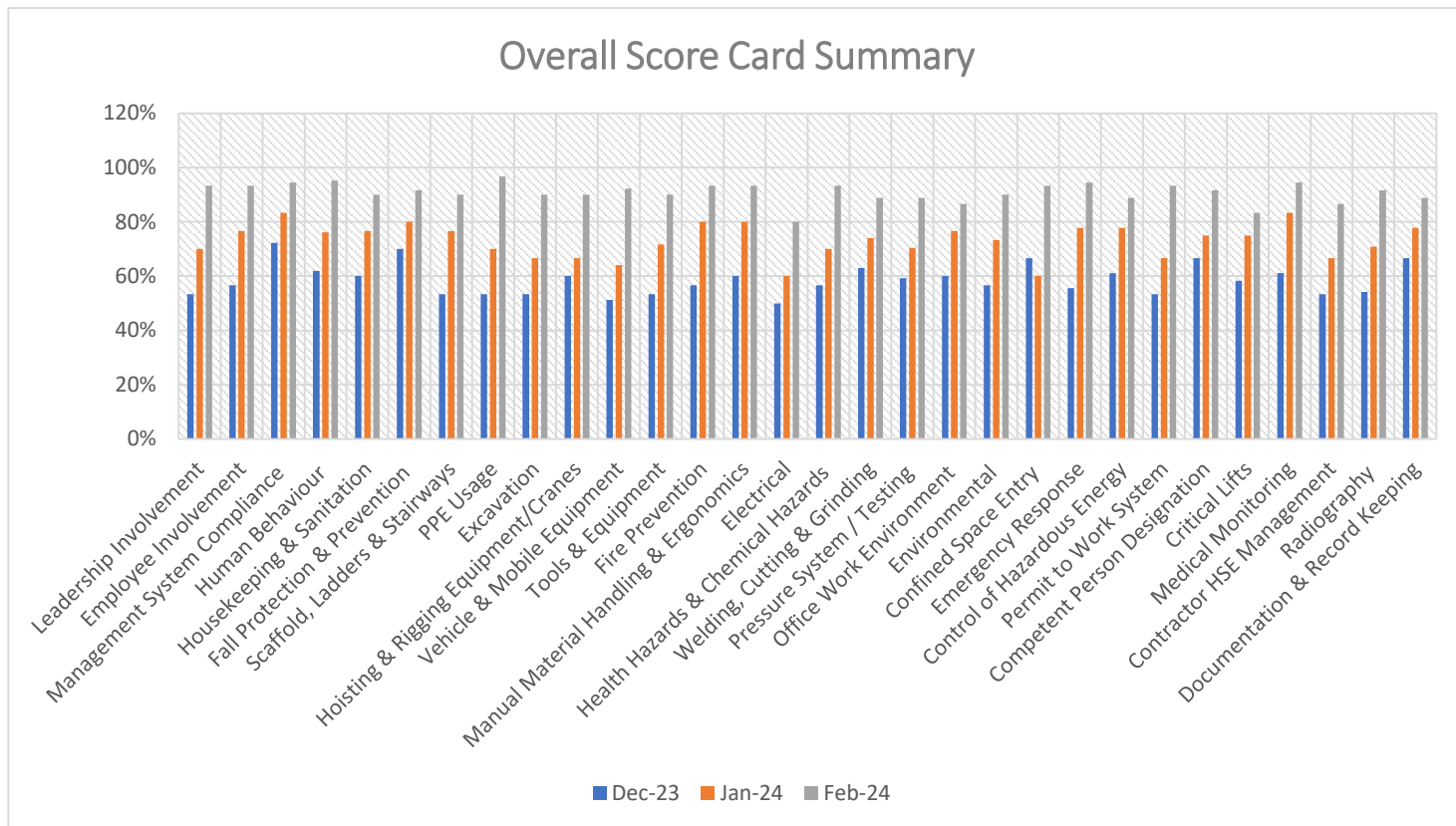


Chart. No. 04 Overall Score Card Summary for the Month of Dec-23, Jan-24 and Feb-24

6.5 Corrective Action Plan

Following actions were discussed in reference to the above PSCI score,

- Install suggestion box in the isolated location and promote the awareness and get the suggestion form all workers.
- Develop the Unsafe act and Condition, near miss communicating mechanism.
- Develop Digital/software system for monitoring and updating the Safety Identification and corrections.
- Involvement of leadership team in the HSE matters w.r.t PPE compliance needs to be enhanced. Timely intervention and counselling by the Leadership team.
- Individual HSE targets to be framed for all employees and it must be reviewed on monthly basis.
- Employees must participate in the risk assessment specific to their activity.
- Develop Investigation team, Incident Reporting Mechanism, the learnings to be captured in the risk assessment document and same needs to be revised and communicate to all concerned.
- Develop and form a Health and Safety Committee and Conduct the meeting in frequent Intervals and address all the Suggestions and Improvement Points.
- Identify Internal and External Issues and arrive the possibility of Emergency and conduct various training as per the schedule for all the workers.
- Develop Onsite Emergency Response plan and Team, the team must undergo training on project emergency response plan
- Competency screening records must be updated and all the Food handlers must undergo medical examination once in 6 months as per FSSC guidance.
- Permit to work tracking register must be developed and updated on daily basis.
- Scrap yard need to defined and keep all the waste with segregation and dispose in the frequent intervals.
- Developed Contractor Guidelines document and implement and communicate the requirement before deploying.

7. CONCLUSION

Though many of the industries have their own robust system in place for HSE Inspection of Individual systems like Electrical Equipment, Portable Tools, Mechanical Equipment like Cranes, Man lift, etc., Tools & Tackles, Fire Extinguishers, Hygiene, Personal Protective Equipment, etc. It is very important to update the outcome of the same to Management. In ideal conditions only the imminent dangers and the inspection numbers are only presented to the management as a part of Monthly HSE Performance report. And these inspection reports are standalone documents.

Moreover, a typical inspection matrix won't address the areas like Leadership Commitment, Employee engagement, HSE Documentation etc., These elements play a significant role in the HSE Management System implementation. This gives a positive result in terms of Safety performance in any organization.

Considering the above aspects, this Project Safety Culture Index assessment tool is prepared by reviewing the ongoing activities specific to this project and evaluation criteria was set assess the performance. Hazard topics can be further added based on the activities being performed at the project site. The combination of all these parameters into a single score will give a brief

outcome of the Safety compliance level and an overall picture to the Management and the topic score shall also give an idea where the project team needs to focus and to take appropriate measures to overcome the non-compliance thereby to enhance the safety performance.

Overall performance and element wise score will be discussed in detail with action parties. This will create a benchmark to compare their compliance level within the project and across different project sites. In my project, I will be implementing this assessment tool within the project across different areas and score will be given for each contractor. On way forward this PSCI system will be proposed as an assessment to implement in the other projects of SIKOF.

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