

SIMOPS, Permits & Isolations Management: System & Personnel

The commissioning activities for massive, technically complex offshore facilities often requires years of 24/7-project involvement by hundreds of workers. There is an abundance of time and ample opportunity for accidents to happen with the rapid increase in risk exposure.

Although preventing accidents is the responsibility of every individual worker, HSSE (health, safety, security and environmental) systems employing the right methodology, robust management tools and relevant experience are critical to safety during every work process. Although computers and software cannot produce oil or gas directly, they can help a project team make informed, timely decisions.

Decision making follows a process that begins with the gathering of data of current and upcoming work activities planned (risk rated – medium to high). To be effective, the collected data has to be transferred and stored appropriately. Data must also be retrieved and analyzed with mounds of other information (references to other activities in the same work area, isolations that could affect job scopes, etc.). Proper interpretation of this data translates to knowledge, which should lead to a level of understanding sufficient for good decision making. The right digital workflow can provide faster and better decisions; reducing losses from operating at less than optimum conditions. Better decisions reduce risk; therefore, implementation of a robust digital workflow program is essential to safety.

What is PIMS?

The concept for the PIMSystem was developed over years of experience with medium to large scale commissioning projects. Lessons learned on these projects since then have been used to enhance the process, functionality and proprietary software.

The Permit and Isolation Management System (PIMSystem)- Designed to integrate all of the elements of a successful digital work flow process into one project management tool, PIMS flags any activity that represents a potential SIMOPS conflicts and forces those activities to become priority items of further discussion and potential conflict management. Proper use of the program ensures that careful consideration is given to all potential project hazards and that suitable precautions are taken to minimize risk. This process has been recognized as a "Best Practice" by multiple operators.

PIMS uses powerful relational database technology to enforce HSSE control; cross-referencing information databases such as personnel training, individual certifications/qualifications, detailed work permit data, work authorization data, system and subsystem information, criticality, work status, LOTO details and more. It can quickly provide a comparison of work planned at a level of detail that promotes decision making and expedites safe execution. Specifically, PIMS and the project specific PTW and LOTO processes provide: 1) identification and effective control of high risk, non-routine activities; and 2) an effective interface management tool between all groups when performing medium to high risk, non-routine activities simultaneously.

If multiple medium to high-risk, non-routine tasks are to be performed, the software and project specific control of work processes are designed to provide greater visibility to work activities that are incompatible with other simultaneous operations (SIMOPS). Using the PIMSystem SIMOPS report function with a project SIMOPS matrix, the project team can easily identify when incompatible high risk activities are planned concurrently. Then, armed with this knowledge and through pre-established PTW channels, the work can be suspended and then rescheduled at a later time or additional controls and safeguards can be put in place so that the work is no longer incompatible and can continue safely as planned.

To achieve control across all discipline interface areas, a comprehensive safety system must provide a robust report function. PIMSystem, along with the project specific HSE procedures, (such as PTW, JSEA and LOTO procedures) offer the project team an internally cohesive and externally coherent process for collecting, analyzing and distributing critical decision intelligence at all levels. The software system incorporates easily-generated reporting documents necessary for project reviews. This facilitates rapid decision making by providing a basis for understanding project options.

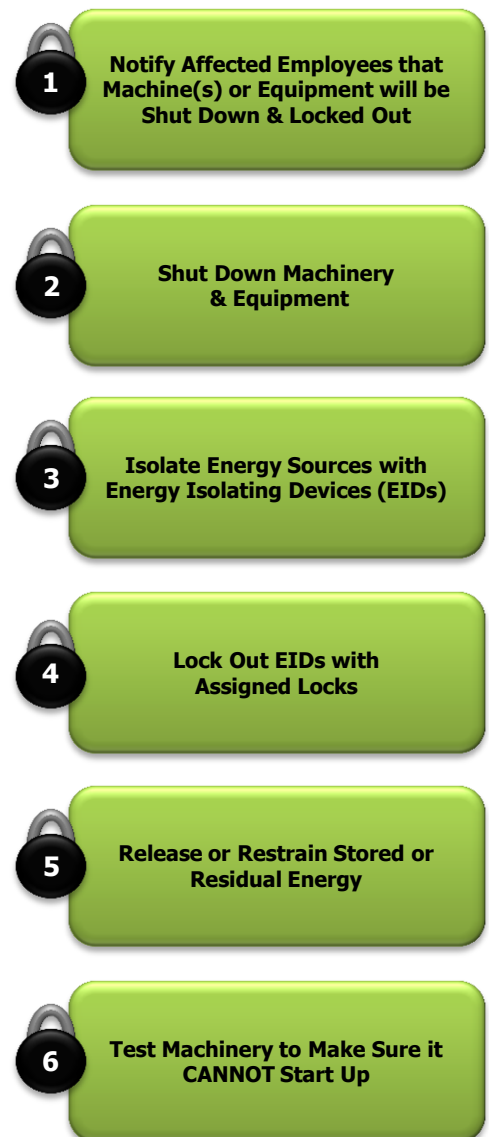


Figure 1: Lock-Out / Tag-Out Process Per OSHA Standard 1910.147

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The Personnel

In addition to the PIMS software, a large portion of commissioning success falls under the responsibilities of three specific job functions assigned at the beginning of every project: SIMOPS Manager, PTW Administrator and LOTOA's (Lock Out and Tag Out Energy Isolation Administrators). The above positions, proper communications and coordination between them are critical to safety control over large projects.

SIMOPS Manager

These individuals are responsible for the effective implementation of all project SIMOPS procedures. They facilitate SIMOPS meetings and perform SIMOP conflict resolution (e.g.; declining new work permits and/or postponing planned work due to a SIMOPS conflict, temporarily suspending an open work permit until completion of a higher priority work permit, or requiring additional safeguards or resources to ensure safe operations). They have the authority and responsibility to support and utilize all project HSSE resources. Additionally, they encourage periodic capture and implementation of project HSSE Lessons Learned and Best Practices, which are critical for improving the success of future projects. SIMOPS Manager actively participates in all project HSSE audits.

PTW Administrator

Permit-to-Work Administrator ensures that all permit work packs are completed properly before they are presented at the daily SIMOPS/Work Coordination meeting. The work packs must include all relevant information so that the SIMOPS Manager, PTW Administrator, LOTO Administrator, SIMOPS Team members and OIM (UWA- Ultimate Work Authority) can properly assess all activities for approval of permits. Permit Administrator must insure that all terminated permits are properly closed out by the appropriate authority, and must follow up on any outstanding (or expired) permits that have not been properly terminated by the proper authority. Also, they assist project HSSE personnel by notifying the project Safety and Emergency Response team of all high risk activities prior to initiation. They verify that all Job Safety Analysis (JSEA's) reports are updated daily, and keep the status board in the PTW coordination room up-to-date with other relevant high risk work that the Construction, Commissioning or Operations Teams are performing (e.g.; heavy lifts, SIMOPS, abrasive blasting, leak testing, dynamic commissioning, etc.).

PTW Administrator ensure that all documentation is properly closed and filed in a central filing system prior to the commissioning team's formal "handover" of the facilities to the client/operator. Lastly, but of high importance, PTW Administrator should support the project Operations HSE personnel for an agreed upon time after the facilities commissioning is complete. This ensures that the transition to the Operations PTW process is seamless and relevant to continued operations.

LOTO Administrator

Immediately after an MC (Mechanically Complete report) has been issued on a piece of equipment or system, the appropriate LOTOA will personally mark the equipment or system specified with the proper signage, custody tags, custody locks, etc. This will ensure that there is a visual boundary of ownership to all craft. The LOTOA maintains the Custody Transfer log, as well as the field SIMOPS boards.

These boards identify all active Medium to High Risk Construction activities, Commissioning Permitted activities, Live Systems and all other SIMOPS activities. The LOTOA also assists project personnel with lock-out/tag-out (LOTO) procedures by verifying isolation devices are installed properly in or on any approved isolation point, and manage the site LOTO Program under the direction of the PTW Administrator. This specifically entails the daily/weekly monitoring of all LOTOs that are in place and their associated documentation. Finally, the LOTOA provides daily worksite monitoring to verify the accuracy of the Field SIMOPS and PTW boards.

Of additional significance to the overall safety process are daily scheduled SIMOPS/PTW meetings where all permits are reviewed. New permits must be submitted 24-48 hours in advance so that the activity can be reviewed, job site evaluations planned in order to understand the work scope and what it may or may not affect. The objectives of these meetings are:

- To provide an overview of all ongoing and proposed work activities under the control of the project SIMOPS and PTW plan order to review the performance of each activity.
- To accept and agree on the status of permits that are being completed (closed), ongoing permits, new permits, time scales and resource requirements required to achieve the upcoming 24 hour approved work plan (scaffolding, construction manpower, fire-watch, Commissioning manpower, etc.).
- To mediate, mitigate and provide SIMOPS conflict resolution.
- To provide a seamless handover to the night shift team (for 24 hour operations) detailing what activities have been approved for the next 24 hours (2 work shifts).
- To determine if uncontrollable situations, such as adverse weather conditions or seas, dictate a change in planned activity status and/or require issuance of additional permits.

Conclusion

Safe, seamless operations call for an effective risk management system that utilizes a balance of personnel to carry out crucial risk mitigation activities. Having the right mix of software and human interfaces can promote the ideal environment for the commissioning of challenging projects.

| Key Code | Description of Key Codes |
|----------|--|
| ● Y | Operations can be performed with valid permits. |
| ● Y1 | Operations only allowed in conformance with formal procedures. Need to restrict or suspend other activities on the location. |
| ● Y2 | Continue activities; manage total work in and around areas where SIMOPS take place. Evaluate through daily SIMOPS meeting. |
| ● Y3 | Restrict work in adjacent areas. Operation only allowed in conformance with formal procedures. |
| ● Y4 | Suspend work in adjacent areas. Operation only allowed to proceed in conformance with formal procedures. |
| ● Y5 | Suspend work in adjacent areas. Restrict work in all other areas. Operations only proceed in conformance with formal procedures. |
| ● Y6 | Suspend all other work on rig. Operations only allowed in conformance with formal procedures. |
| ● Y7 | Same as Y1 – Only to take place during daytime hours. |
| ● Y8 | Same as Y1 – Only to take place during appropriate weather conditions. |
| ● Y9 | Any fire – Suspend all activities except those required to handle the event. All other personnel evacuate and muster. |
| ● Y10 | Suspend all activities at a secure point. |
| ● N | Operations cannot be performed simultaneously. |
| ● N/A | Impossible or improbable that operations will be performed simultaneously. |

Figure 2: SIMOPS – Matrix Management



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- Offshore Risk Management
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