

# Hazardous Area

## SafeEx – White Paper



**HAZTECH SOLUTIONS**



# CONTENTS

|  |          |
|--|----------|
| <b>Executive Summary</b> .....               | <b>3</b> |
| <b>Who, what &amp; why?</b> .....            | <b>3</b> |
| <b>Issue analysis</b> .....                  | <b>3</b> |
| <b>How the problem was solved</b> .....      | <b>4</b> |
| User-friendly .....                          | 4        |
| Efficiency.....                              | 4        |
| Reporting .....                              | 4        |
| Trackability.....                            | 4        |
| Streamline.....                              | 5        |
| Human error .....                            | 5        |
| Source of truth .....                        | 5        |
| <b>Results, benefits &amp; savings</b> ..... | <b>6</b> |
| Other benefits.....                          | 6        |
| Other savings .....                          | 6        |
| <b>Audit success</b> .....                   | <b>7</b> |
| 3rd party verification inspection.....       | 7        |
| Australian Offshore Regulator .....          | 7        |
| <b>Summary and Conclusion</b> .....          | <b>7</b> |

## EXECUTIVE SUMMARY

This case study has been undertaken to review the findings and results following the implementation of the SafeEx inspection system aboard a floating production storage and offloading (FPSO) facility of one of Australia's largest resource companies, and to provide information on further improvements to safety, compliance, productivity and cost.

The case study will compare the digital management solution rolled out in late 2017 versus the manual paper based and spreadsheet approach from the previous years.

## WHO, WHAT & WHY?

HazTech Solutions (company) have worked closely with the client for 3+ years to provide EEHA management. Earlier inspection campaign's required inspectors to complete EEHA inspections using the paper based and excel approach.

The FPSO referred in the case study has been producing oil for almost 10 years in the Carnarvon Basin approximately 45 kilometers northwest of Exmouth, Western Australia, it is capable of handling 96,000 barrels of oil per day, and has roughly 5500 Ex rated items of electrical equipment that undergo periodic inspection in a 3-year cycle as recommended by IEC 60079.17:2013 cl 4.4.2

To achieve a full 3-year inspection cycle and maintain compliance, 1833 items are required to be inspected per year, which is estimated to require 176 man-days each year.

Although the paper and excel system is functional, the process itself seemed very inefficient by today's industry standards. With this system, the client's critical control owner (CCO) had little transparency over the asset condition, this was due to long lead times from the inspection being carried out to receiving reports. Therefore, at any given time the CCO could not immediately establish the current level of Ex integrity within the installation he is responsible for.

## ISSUE ANALYSIS

The current Hazardous Area management approach wasn't meeting the requirements of the client and require a more efficient approach utilizing technologies available to align with the fast pace industry it was designed to serve.

The company listened to the issues and set about looking at different solutions that could be implemented, with the following criteria in mind:

- A **user-friendly** system for all involved (inspector, supervisor, engineer and auditor);
- Improve **efficiency** by maximising the inspection time in the field;
- Close the gap on **reporting** time improving transparency;
- Create a clear path for **trackability** of equipment inspection and rectification closeout status;
- **Streamline** by removing the need for labour intensive printing, scanning and filing of inspection records;
- Remove the need for manual updating of excel spreadsheets subject to **human error** and inconsistencies in data input;
- Create one **source of truth** for asset integrity status.

## HOW THE PROBLEM WAS SOLVED

In late 2017, the company rolled out a digital EEHA management system aboard the FPSO. This involved uploading the existing Ex Register and other supporting documentation into the selected software program (SafeEx). The documentation includes certificates of conformity, classification drawings, data sheets etc.

### User-friendly

Both the desktop view and tablet application of SafeEx are designed with a simple customizable view for human interface, allowing the user to navigate through the system with ease and get up to speed quickly, often only requiring an hour of familiarization.

### Efficiency

Efficiency has been vastly improved by tailoring the inspection questions to the equipment type and grade of inspection being performed. For example:

- If you are performing a visual or close inspection you won't be asked questions relating to a detailed inspection;
- If you are inspecting Ex e equipment you won't be asked questions associated to Ex d, i, n, p, etc;
- If you are inspecting a motor, you won't be asked questions on lighting such as EOL effects of lamps.

*(Note, all questions are based on the inspection tables 1 2 & 3 found in IEC or AS/NZS 60079.17:2017 cl 6)*

With certificates of conformity, classification drawings and data sheet documents available to be viewed on the portable Ex-rated tablet whilst in the field, the inspector has all the information he needs at his finger tips to complete the inspection, eliminating the need to search for certificates to check special conditions of safe installation or classification drawings to identify the zoning requirements of a particular area.

### Reporting

With every synchronization of the tablet by the field inspector, facilities' supervisors, engineers and CCO have an instant overview of what equipment has been inspected, its condition and any non-conformances highlighted. This allows land/office-based staff to have a real-time view of their hazardous area management system. This also expedites the ordering of materials, planning and allocation of resources needed to rectify and close any 'critical' issues found during the inspection in a shorter time frame. Instant reporting has now reduced the window of time from a fault being identified to being rectified, ensuring a higher level of compliance, integrity and safety in a shorter amount of time possible.

### Trackability

The system allows an open and clear visual log of the history of all activities that have been performed on any item of equipment throughout its life span. This includes initial detail inspection, periodic inspections, sample inspections, remediations and any maintenance tasks.

## Streamline

With the old approach, one of the following two things would occur:

- The inspector would fill the paper ITR in field leaving a rough, messy and often illegible report, or;
- The inspector would take field notes and complete ITRs in a controlled environment at the end of the day to be able to produce a satisfactory and neater report.

This was identified as a poor-quality service of a deliverable, resulting in a waste of valuable productive inspection time.

Now with all inspection activities being 100% performed digitally in the field at the time of inspection, the need for printing, scanning and filling of paper ITRs and double handling has been mitigated.

## Human error

The updating of field equipment data plate information such as serial & model numbers, certificate numbers and Ex protection techniques is done at the time of inspection. Changes must be reviewed and approved by a supervisor before the database can be updated with the new information. This 'quality assurance' process ensures the validity and consistency of the data contained in the electronic database. Far too often due to human error, Ex registers of major hazardous facilities do not correctly reflect information of what is installed in the field.

Although the SafeEx system does provide the ability to import and export data via excel, this process is limited only to a higher level of user access, thus maintaining the integrity of data input.

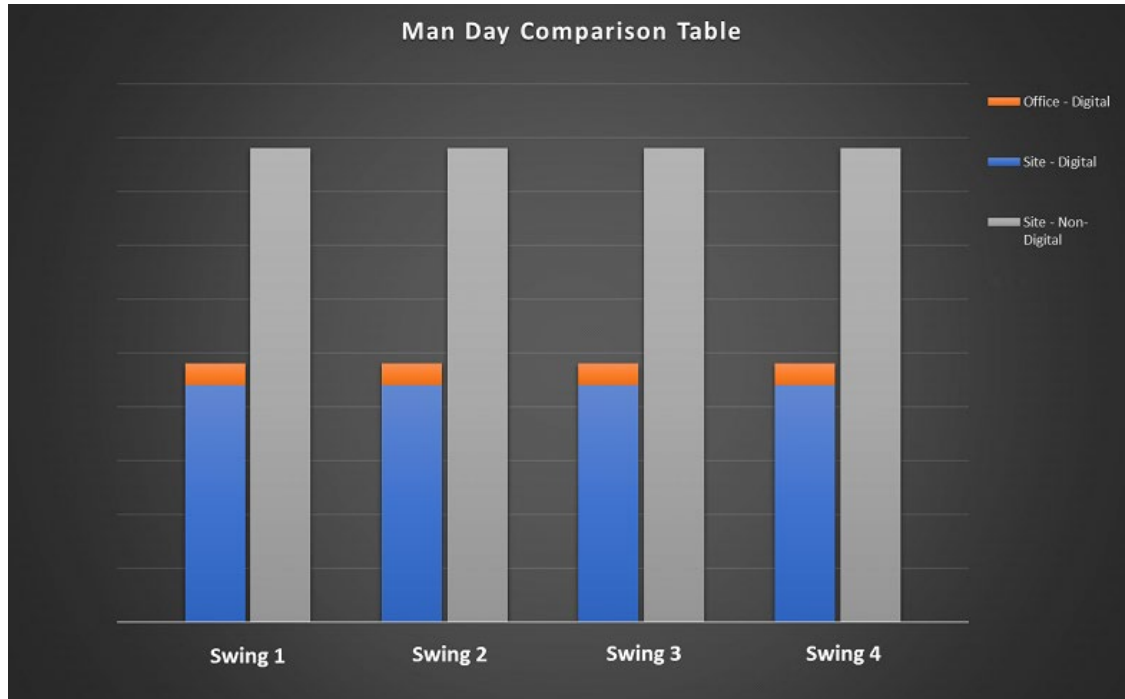
## Source of truth

As the system runs and is backed up on servers strategically located for data security, multiple users from different locations can login and view the current real-life condition of the asset as it stands. Condition reports can be run and exported within minutes, as opposed to excel spreadsheet which limits access to one user at a time. Multiple uploads from tablets can happen simultaneously so no more 'read only' messages if someone else is editing a file. This also stops duplicate copies being edited, ending in loss of valuable information or duplications.

## RESULTS, BENEFITS & SAVINGS

With the above improvements and changes to the Hazardous Area Management System, we have been able to reduce the on-site man-days by up to 50%. A small addition of Coordinator office hours has been added to support the field inspector. Taking this into consideration, a saving of 80 man-days per year (45%) has been achieved. This equates to approximately AUD\$150,000 per year for our client.

This is not only a direct cost saving in labour and other associated costs of having personnel on a facility, but also frees up bed and helicopter space for other operational requirements.



Reporting that would take time to compile after the inspection had finished is now instantaneous and of a higher quality, with day-by-day progressive updates as it occurs.

### Other benefits

- Less time spent in office and more time spent in the field inspecting;
- Flexibility and nimbleness to change scope of inspection;
- Reducing number of personnel exposed to offshore hazards.

### Other savings

- Paper and printing (over 5000 sheets of paper per year);
- Mobilisation costs (flights, accommodation, food).

## AUDIT SUCCESS

Two independent audits have been undertaken on the client's FPSO since the implementation of the new system, with EEHA management the focus of the audit.

1. Independent 3<sup>rd</sup> party verification & inspection - March 2019;
2. Australian Offshore Regulator – May 2019.

### 3rd party verification inspection

Below are two abstracts from the 3<sup>rd</sup> party verification inspection report in relation to the new EEHA management system:

*“The SafeEx tool was reviewed at the client's offices with the CCO and demonstrated offshore by the HazTech supervisor. The tool constitutes a great improvement in the management of the inspection of EEHA equipment.”*

*“Although the management of portable EEHA was found generally satisfactory, it is recommended to fully utilise the SafeEx system for the management of EEHA inspection.”*

### Australian Offshore Regulator

The digital EEHA management system went under detailed scrutiny by the regulator. All findings met and, in most cases, exceeded the expectation of the regulator with no recommendations or negative observations related the EEHA management system provided at the closeout meeting and stating it was best in class.

## SUMMARY AND CONCLUSION

The implementation of the digital solution to hazardous area management has proven itself to be a valuable and cost-efficient tool to the client, and a great example of continuous improvement striving to be best in class. This approach has set the bar for management of electrical equipment in hazardous areas within the Oil & Gas industry.