SPE 86631

'SEEING THE WOOD FOR THE TREES'

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This paper was prepared for presentation at The Seventh SPE International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production held in Calgary, Alberta, Canada, 29–31 March 2004.

Abstract

This paper describes the innovative approach taken by ENSCO International Inc. (a leading international offshore drilling contractor), supported by Risktec Solutions (an international safety and risk management consultancy), to consolidate a wide variety of worksite safety controls (e.g. Work instructions, Risk Assessments, Job Safety Analysis, Competence, Work Permits etc) into a single integrated system - the Safe System of Work (SSoW).

The program used existing foundations of Work Instruction and Job Hazard Analysis systems to move forward to a structured system that clarifies the differences between information to define the quality of the work and that relating to the management of the hazards associated with the work activity. The program provided further clarity over the management of hazards relating to the ***TYPE*** of work being performed, hazards relating to the ***LOCATION*** work was being performed and hazards relating to the ***TIME*** (i.e. conflicts with other work) when work is being conducted.

ENSCO International Inc. has been working with the SSoW for approximately 18 months in the Gulf of Mexico and, given the very positive feedback from the workforce, has established the SSoW as a minimum worldwide company standard. Expectations, purpose and relevancy of all worksite safety controls - both individually and collectively - are now clear, leading to a marked improvement in the communication of expectations at the worksite.

The SSoW provides an effective platform for communicating a wide range of requirements from such sources as HSE Cases, Environmental Management Systems (EMS), Preventative Maintenance routines, etc. through a 'one stop shop' for the workforce.

i) Introduction

Where's the JSA?
Did they complete a risk assessment?
Was it a permitted activity?
Did they follow the work instruction?
Did they have competent people before they set out?
Was the worksite different from what they expected?

These are all too often questions asked after an incident, but before the accountability gets firmly placed at the worksite, it may be time to step back and see how effective the objectives, application and relevance – in other words the when, where and how - of some familiar procedural worksite safety controls have been communicated and understood by the workforce. While Work Instructions (WI), Task Hazard Information (THI), Job Safety Analysis (JSA), and Permit to Work (PTW,) have long been established and supported by the E&P industry, this paper describes the innovative approach taken by ENSCO International Inc. and supported by Risktec Solutions, to consolidate such controls into a single, user-friendly integrated system.

The benefit: A clear 'line of sight' for ENSCO offshore personnel to meet ever-rising industry SHE expectations by improving effectiveness, communication, and removing duplicated effort at the worksite.

Achieved by:

- Revisiting the objectives, application and operational definitions, of key procedural worksite safety controls - not as standalone programs, but as part of an integrated approach;
- Addressing both the quality of work as well as the management of hazards;
- Managing worksite hazards as a dynamic as well as a static process;
- Ensuring worksite management is system, rather than people, dependant;
- Designing roll-out and implementation via a formal structure;
- Effective integration into the overall SHE management system and by provision for system maintenance;
- Establishing a sound platform from which to create a clear 'line of sight to communicate ever rising industry and social expectations.

ii) Company Background, Culture and Drivers for Change

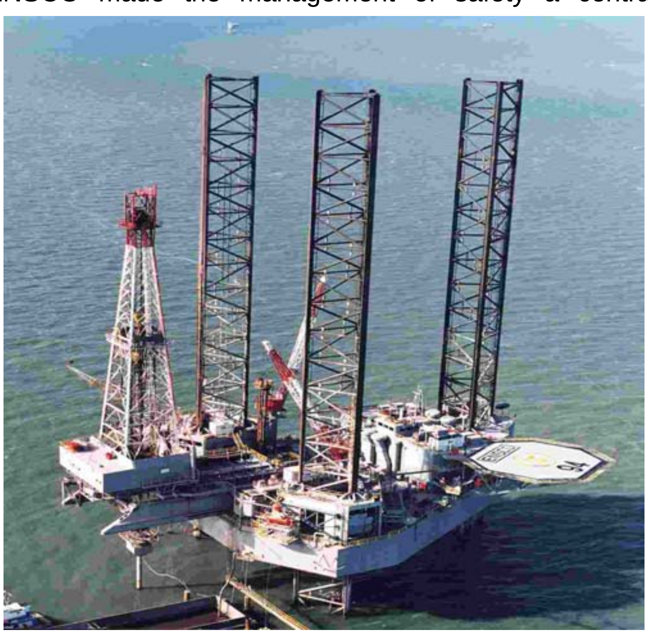
ENSCO International is a leading offshore drilling Company based in Dallas, Texas. It currently operates a total fleet of 56 offshore drilling rigs comprising thirteen 250ft jackups, nine 300ft jackups, twenty-one >350ft high specification jackups. In addition, the Company also operates seven barge rigs, five platform rigs and in December 2000, introduced its first ultra deep-water semi-submersible. The Company operates in most international offshore locations through three Business Units:

- Europe / West Africa, which covers both the UK and Dutch sectors of the North Sea as well as West Africa;
- North America, which primarily covers Gulf of Mexico (GoM) operations; and
- Asia Pacific, which covers the Middle East, Asian Sub-Continent, as well as Australia and New Zealand.

In addition, the Company also supports two Business Regions, in Venezuela (Lake Maracaibo) and Trinidad.

The Company was formed in the mid-eighties as a small, predominantly land based drilling operation. By 1987 it had entered the offshore drilling industry and soon established a demonstrable track record for managing a well-disciplined and efficient operation, sufficient to facilitate rapid growth and expansion. During the 1990's ENSCO acquired PENROD, Lauritzen, Dual, and in 2001 acquired Chiles Offshore. ENSCO now has the second largest and youngest* premium jack up fleet in the industry. *(* Source – Petrodata)*

While ENSCO has been highly successful, rapid growth has not always been supported by a systematic way of working. Like most companies in the oil and gas arena, ENSCO made the management of safety a central theme from day 1. Today, the management of SHE is a Company core business value. This has brought very aggressive targets for SHE performance, with increasing recognition that for those targets to be realized, the Company must adopt the goal of thinking, acting and improving systematically.



By 2000, the Company had made some significant in-roads towards this goal. A team called 'Jumpstart' was formed to achieve a step change in the Company's SHE performance. This team gained first hand feedback from offshore employees, identifying strengths and weaknesses in all areas. It identified best practices, obstacles for gaining greater consistency, non-value added work for elimination, and ways of increasing the effectiveness of the SHE programs. In the end the team arrived at over fifty key recommendations including the world-wide adoption of some 24 SHE programs / best practices.

Implementation of recommendations from the 'Jumpstart' initiative and the adoption of more formalized SHE programs such as competence assurance, behavioral modification, work instructions etc, required a significant cultural shift at the coalface for these tools to provide the much sought after benefits.

Adding to the challenge of implementation was the absence of a formalized process for roll-out, such as that based around the commonly known Plan-Do-Check-Feedback cycle. This was now recognized as a major hindrance to efficient operations due to the low number of Business Unit initiatives requiring systematic implementation across the whole rig fleet.

The fact that the fleet already had a low SHE incident rate despite the relatively few recognized tools and techniques established was credited, in part, to the competency of the offshore personnel on the rigs. This relied very much on long experience on specific rigs assigned, with some senior supervisors having served on the same rigs in the same position for more than 10 years. This over reliance on personnel – particularly within the North American Business Unit (NABU) - was not in line with ENSCO's desire to work more systematically at all levels across the Company. Therefore, accelerated cultural changes at the worksite were needed within the NABU if a systematic way of working was to be established to realize the Company's vision of attaining an incident free workplace.

1.0) Safe System of Work (SSoW) - Business Driver

In April 2000, ExxonMobil (Exxon in 2000) had just conducted a gap analysis between ENSCO's North America Business Unit's SHE management system and their own documented safety systems. The aim was to gain a better understanding of each company's SHE programs, thereby promoting better communication in order to jointly improve safety performance. One of the gaps identified was the absence of a formal Permit to Work (PTW) system for ENSCO GoM operations. The

'Jumpstart' team had recommended the adoption of a formalized PTW system, but within the NABU, given the changes and challenges already impacting the local culture at that time, other important initiatives were given precedence.

However, the need to gain alignment with a much valued customer meant that the design, development and implementation of a Permit to Work (PTW) System now became a priority.

2.0) Safe System of Work (SSoW) – Existing Challenges:

From the outset, it was recognized that the success or failure of PTW System implementation within the NABU would be dependent on the acceptance of offshore personnel and that this, in turn, would be dependent upon the system design. It was considered imperative to steer away from the temptation to simply import an 'off-the-shelf' PTW system, recognizing that the Business Unit had historically little or no previous experience with such systems. The PTW system would have to be tailored to reflect the existing culture and support existing worksite controls (such as the JSA program) which would need to be fully incorporated into the systems structure and operation. However, if PTW system effectiveness was to rely in part on the effectiveness of existing worksite controls, it would first be necessary to ensure these controls were 'fit for purpose', effectively communicated and used effectively.

For the NABU, operating a fleet of 25 offshore rigs within the GoM, the Job Safety Analysis (JSA) program had been established as one of the principal procedural tools for worksite hazard control. The first step towards implementing the revised SSoW was to evaluate this program, which had been in effect since 1993. Initial formal classroom training had been provided, but this had never been systematically integrated into the Company's training matrix. The intent had been that the skills set would grow from a core of key trained people, being passed onto others via On the Job Training (OJT). Field visits to rigs and interviews with key personnel identified the following strengths and weaknesses in the JSA program:

- +) Program well supported and incorporated into day-to-day work;
- +) Used to support and complement pre-job meetings;
- -) Understanding of the process not fully grasped;
- -) Hazard recognition (and hence value) of JSA's variable;
- -) No documented guidance regarding where, when and how a JSA should be raised;
- -) Job steps to execute work often confused with the steps to establish safe work controls;
- -) Master (pre-written / library copies) JSA's not routinely reviewed / revised at the worksite to address any deviations from the original work scope.

Clearly then, while the JSA program was accepted as part of day-to-day work, much further work was needed to turn the program into an effective and reliable tool providing consistent support to the PTW system. The intent was that, wherever possible, worksite hazards and controls should be referenced through other procedural controls (such as the JSA) and not duplicated on the Work Permit. The Work Permit was then being left the sole objective of formerly authorizing the 'suitability and sufficiency' of the controls proposed.

All this in turn meant that the work scope was starting to significantly expand from the original aim of simply designing, developing and implementing a PTW system, to now undertaking a complete overhaul of all NABU procedural worksite safety controls. Only when these had been demonstrated to be effective, robust and reliable could the Permit to Work (PTW) System then be designed around this foundation.

(At this time the services of Risktec were sought and secured. Risktec is a consultancy specializing in risk management services to the exploration and production and other hazardous industries.)

The work scope now became: to design, develop and implement a system that would pull together key procedural worksite controls (including a PTW system) into a single integrated approach – 'a one stop shop' for ensuring workplace and rig safety.

3.0) Safe System of Work (SSoW) – System Design

3.1) Overhauling Procedural Worksite Safety Controls

3.1.1) Work Instructions (WI)

Work Instructions had mostly been developed within the Europe / West Africa Business Unit. As one of the 'Jumpstart' best practice recommendations, Work Instructions had then been disseminated to all other Business Units. Within the NABU however, they had not been widely adopted, partly due to the absence of documentation providing guidance on their use. *(For a successful JSA program, job steps need to be determined. These are contained within the Work Instructions. The fact that this hadn't been recognized led to further concerns that the application of the JSA process had some fairly major gaps and perhaps was not as well established and understood as at first thought).*

3.1.2) Job Safety Analysis (JSA) Program:

Within a JSA program hazards should be identified from a number of sources:

1. i. Hazards relating to the ***TYPE*** of work being performed;
2. ii. Hazards relating to the ***LOCATION*** where work is being performed;
3. iii. Hazards relating to the ***TIME*** (i.e. conflicts with other work) when work is being conducted.

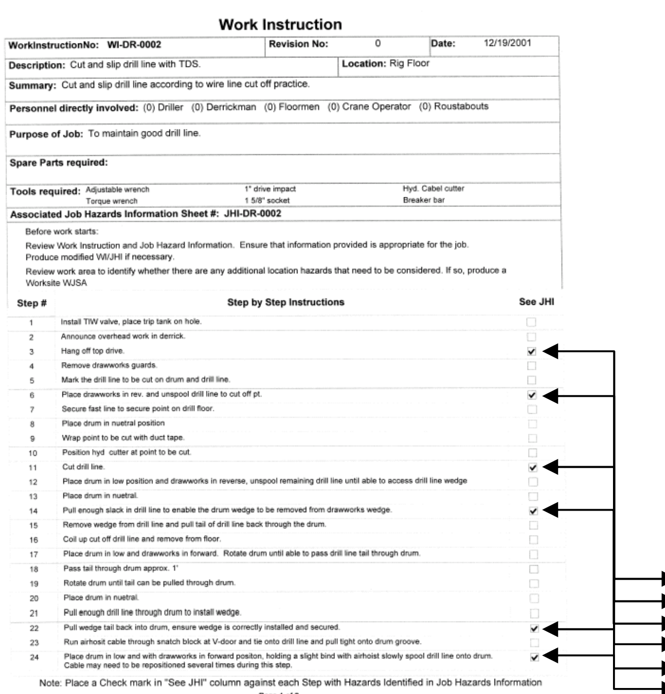
However within the existing NABU JSA program only work ***type*** hazards were nominally captured, with ***location*** and ***time*** hazards often missed.

Work ***type*** hazards when combined with the either ***location*** or ***time*** hazards can escalate to become far more hazardous. e.g. an ignition source (work ***type*** hazard) in the presence of flammables (work ***location*** hazard). This shows that the whole process of worksite hazards control is a dynamic process with hazards - and more importantly their potential to do harm - being situation and context dependant. This contrasted with the historical approach to JSA's which were often pre-written and reviewed away from the worksite. While this was acceptable in communicating the generic hazards associated with the ***type*** of work activity, e.g. welding, it did very little to address the dynamics of worksite hazard management due to either the ***location*** of the work or the ***time*** it was being performed.

This led to three key design objectives for a Safe System of Work that would bring all elements of worksite hazard management together, as described below:

Safe System of Work (SSoW) Design Objective #1: Work Steps and Work Instructions (WI)

Establish an operational definition for Work Instructions and design a user-friendly WI template. Design the WI template to highlight the distinction between steps associated with the work activity and the steps for establishing safety controls (a key shortfall identified with the JSA program). Design the WI to establish the job steps that impact the quality of the work **only** and not information relating to the management of the hazards associated with the **type** of work.



Work Instruction

WorkInstructionNo: WI-DR-0002	**Revision No:** 0	**Date:** 12/19/2001
Description: Cut and slip drill line with TDS.	**Location:** Rig Floor	

Summary: Cut and slip drill line according to wire line cut off practice.

Personnel directly involved: (0) Driller (0) Derrickman (0) Floormen (0) Crane Operator (0) Roustabouts

Purpose of Job: To maintain good drill line.

Spare Parts required:

Tools required: Adjustable wrench, Torque wrench, 1" drive impact, 1 5/8" socket, Hyd. Cabel cutter, Breaker bar

Associated Job Hazards Information Sheet #: JHI-DR-0002

Before work starts:

Review Work Instruction and Job Hazard Information. Ensure that information provided is appropriate for the job. Produce modified WI/JHI if necessary.

Review work area to identify whether there are any additional location hazards that need to be considered. If so, produce a Worksite WJSA

Step #	Step by Step Instructions	See JHI
1	Install TIW valve, place trip tank on hole.	☐
2	Announce overhead work in derrick.	☐
3	Hang off top drive.	✓
4	Remove drawworks guards.	☐
5	Mark the drill line to be cut on drum and drill line.	☐
6	Place drawworks in rev. and unspool drill line to cut off pt.	✓
7	Secure fast line to secure point on drill floor.	☐
8	Place drum in nuetral position	☐
9	Wrap point to be cut with duct tape.	☐
10	Position hyd cutter at point to be cut.	☐
11	Cut drill line.	✓
12	Place drum in low position and drawworks in reverse, unspool remaining drill line until able to access drill line wedge	☐
13	Place drum in nuetral.	☐
14	Pull enough slack in drill line to enable the drum wedge to be removed from drawworks wedge.	✓
15	Remove wedge from drill line and pull tail of drill line back through the drum.	☐
16	Coil up cut off drill line and remove from floor.	☐
17	Place drum in low and drawworks in forward. Rotate drum until able to pass drill line tail through drum.	☐
18	Pass tail through drum approx. 1'	☐
19	Rotate drum until tail can be pulled through drum.	☐
20	Place drum in nuetral.	☐
21	Pull enough drill line through drum to install wedge.	☐
22	Pull wedge tail back into drum, ensure wedge is correctly installed and secured.	✓
23	Run airhosit cable through snatch block at V-door and tie onto drill line and pull tight onto drum groove.	☐
24	Place drum in low and with drawworks in forward positon, holding a slight bind with airhoist slowly spool drill line onto drum. Cable may need to be repositioned several times during this step.	✓

Note: Place a Check mark in "See JHI" column against each Step with Hazards Identified in Job Hazards Information

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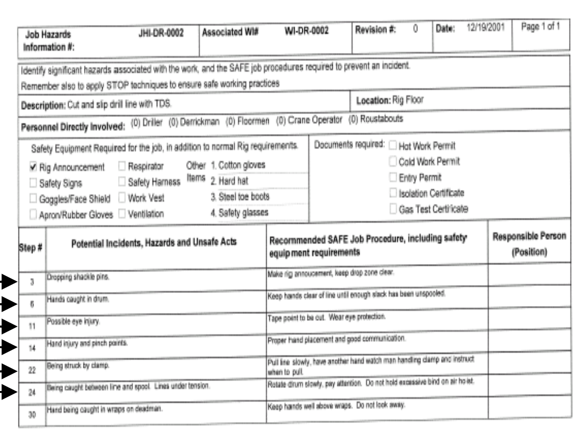
For example: if the work activity was to change the wheel on a car, the Work Instruction is designed to ensure the old wheel is removed and stored, and the new wheel is correctly fitted such that driving can continue and the destination reached. Note: the objective is to continue driving - not to safeguard persons from being injured. This is an important distinction from other Work Instruction formats established but one deemed critical for the offshore personnel to start to recognize the existence of two very separate objectives – completing the work to the standard required (WI) and also ensuring that no incidents occur during the execution of the work.

Safe System of Work (SSoW) Design Objective #2: Management of Worksite Hazards associated with the TYPE of work – Job Hazard Information (JHI)

Develop a template - deemed the Job Hazards Information or JHI - to establish and deliver hazard information associated with the **type** of work being performed. Design it to ensure it supports the work steps contained in the Work Instruction but segregate generic work **type** hazards arising from the work activity from the dynamic hazards generated from the work **location** or the **time** of the work. *Example: If the activity is again changing the wheel on a car the aim of the JHI would be to ensure that no injuries or damage to equipment is sustained during the actual execution of the work activity of changing the wheel (given an ideal environment with no other prevailing hazards presented by location or time).*

Marrying the Work Instruction (WI) and the Job Hazard Information (JHI) in this manner meant these could be used over and over (library copies) while also acting as reference material for more complex, less frequently performed work. Each set of paired WI and JHI would contain the job steps to help ensure the work was completed to the required level of quality (i.e. the purpose of doing the job in the first instance - the WI) while supported by relevant hazard information and corresponding safety controls - the JHI. (See Figure 1).

Figure 1: Work Instruction supported by the Job Hazards Information



Job Hazards Information #: JHI-DR-0002	**Associated WI#** WI-DR-0002	**Revision #:** 0	**Date:** 12/19/2001	Page 1 of 1

Identify significant hazards associated with the work, and the SAFE job procedures required to prevent an incident.

Remember also to apply STOP techniques to ensure safe working practices

Description: Cut and slip drill line with TDS. **Location:** Rig Floor

Personnel Directly Involved: (0) Driller (0) Derrickman (0) Floormen (0) Crane Operator (0) Roustabouts

Safety Equipment Required for the job, in addition to normal Rig requirements.

✓ Rig Announcement ☐ Safety Signs ☐ Goggles/Face Shield ☐ Apron/Rubber Gloves ☐ Respirator ☐ Safety Harness ☐ Work Vest ☐ Ventilation

Other Items: 1. Cotton gloves 2. Hard hat 3. Steel toe boots 4. Safety glasses

Documents required: ☐ Hot Work Permit ☐ Cold Work Permit ☐ Entry Permit ☐ Isolation Certificate ☐ Gas Test Certificate

Step #	Potential Incidents, Hazards and Unsafe Acts	Recommended SAFE Job Procedure, including safety equipment requirements	Responsible Person (Position)
3	Dropping shackle pins.	Make rig annoucement, keep drop zone clear.	
6	Hands caught in drum.	Keep hands clear of line until enough slack has been unspooled.	
11	Possible eye injury.	Tape point to be cut. Wear eye protection.	
14	Hand injury and pinch points.	Proper hand placement and good communication.	
22	Being struck by clamp.	Pull line slowly, have another hand watch man handling clamp and instruct when to pull.	
24	Being caught between line and spool. Lines under tension.	Rotate drum slowly, pay attention. Do not hold excessive bind on air hoist.	
30	Hand being caught in wraps on deadman.	Keep hands well above wraps. Do not look away.	

Safe System of Work (SSoW) Design Objective #3 – Management of Worksite Hazards associated with the Location or Time of work: Worksite Job Safety Analysis (WJSA)

Develop a separate template - deemed the Worksite Job Safety Analysis or WJSA - that would address both ***location*** and ***time*** hazards (separate from work ***type*** hazards contained within the JHI). This would be in addition to, but still support the Work Instruction and the JHI. However whereas the work steps and associated hazard information seldom change, this template would reflect the dynamic process of constantly changing conditions at the worksite and would be an important check and balance ensuring the work package is complete and correct before and during work execution.

The WJSA review would normally be conducted after the pre-job meeting review of the WI and the JHI and importantly, only at the worksite. It would be performed on the day of the work only and information contained would no longer be relevant upon completion of the job. The WJSA could, therefore be archived with an associated permit and subsequently destroyed.

*Example: Taking the wheel changing example one last time, this Worksite Job Safety Analysis template would be designed to ensure no injuries or damage to equipment are sustained when changing a wheel due to additional hazards from conditions such as an inclined road, passing traffic (**location hazards**) poor visibility (nightfall), or poor weather conditions (**time hazards**).*

3.2) SHE Competence

For the NABU, the three components of work and hazard management:

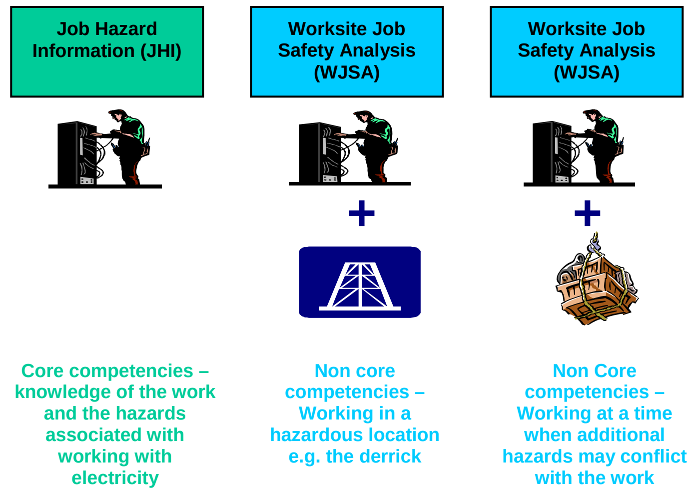
1) The job steps arising from the work activity itself (WI),
2) Hazards resulting from the work activity (JHI), and
3) Hazards resulting from the location of the work activity or the time it is taking place (WJSA).

had all previously been attempted to be managed through the JSA program. Separating these gave a much clearer understanding of specific objectives, application and relevance – the when, where and how - of worksite hazard management and its controls.

A basis for core competencies could now be established and supported. With a clearer definition of the process of worksite hazard management - both static and dynamic, a distinction between core / non-core competencies for each offshore position could be determined. This was especially beneficial in supporting incident investigations when questions were often raised regarding an individual's competence. "Competence to do what?" was often the answer.

For example a welder would be expected to know about the hazards of heat, electricity, light, fumes and the existence of an ignition source etc, because it is directly related to the activity of welding. Or, an electrician would be expected to know about the hazards of HV / LV electrical equipment / switchgear, but if their work ***location*** was up in the derrick, these location hazards were more like the core competencies of the derrickman, rather than the welder or the electrician. A picture was beginning to form. See Figure 2.

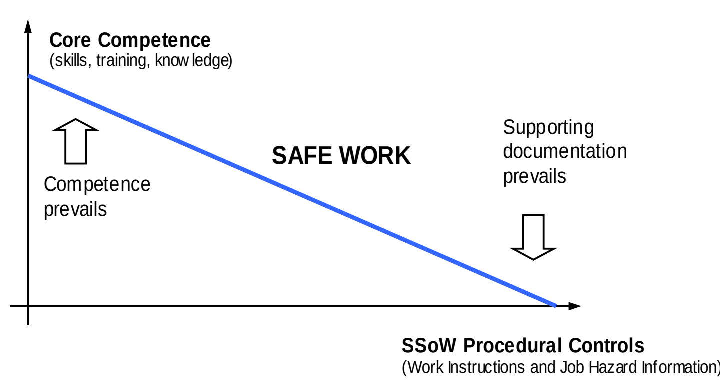
Figure 2: Core / Non-Core Competencies (Electrician)



With the absence of a formal SHE competence assurance system, predicting performance at the worksite couldn't be demonstrated. Now, with the design of the Safe System of Work (SSoW) and supporting information contained within the Work Instructions (WI) the Job Hazards Information (JHI) and the Worksite Job Safety Analysis (WJSA), performance expectations could be established for all offshore positions.

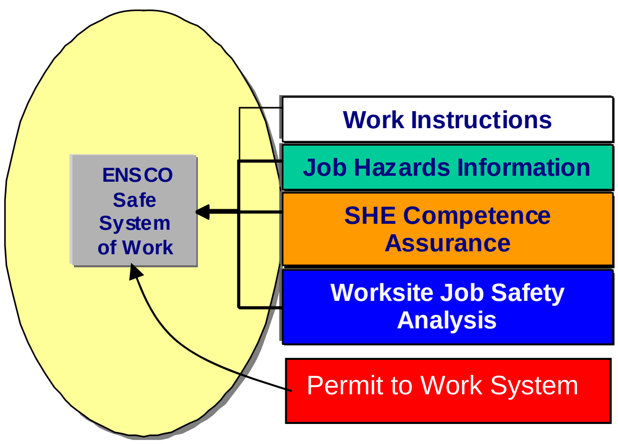
This meant irrespective of the competence of the crews, the SSoW had established a barrier of minimum operating standards. For routine tasks where competence was assured, less reliance on SSoW documentation was needed, but in other cases the SSoW would provide minimum operating expectations to support safe working where competencies were not fully established. See Figure 3.

Figure 3: Core Competence vs SSoW Procedural Controls



With the constituent components of WI, JHI, SHE Competence and WJSA established, along with their operational definitions (providing the when, where and how) the foundation of the SSoW was in place. See Figure 4. With these components assured, the Permit to Work (PTW) System could now designed not as a standalone system, but as a system that would incorporate, support and harness these other components, thereby freeing up the Work Permit itself to be far more effective - rather than duplicating information contained in the WI, JHI, and WJSA.

Figure 4: Establishing the foundation of the Safe System of Work (SSoW)



3.4) Permit to Work (PTW) Design

Since 1989, the NABU had worked with a combined Hot Work / Confined Space Certificate. Like the JSA program it had been accepted by the offshore crews and integrated into day-to-day work. Again, as with the JSA program, interviews with key offshore personnel were conducted to determine the strengths and weaknesses.

These are summarized as:

- \+ Easy to use
- \+ Integrated into day to day work
- \- Not systematic - No formal recognition of risk by work type, location or time
- \- Minimal added value for personnel executing the work
- \- Could be considered adequate for a less complex rig – less so when working on a production platform or on more sophisticated rigs such as a deep-water semi-submersible.
- \- Fairly inefficient – authorization lasted for a maximum of 12 hrs (one shift).
- \- Identification of work conflicts dependent solely on OIM's memory
- \- No interfaces with lock out / tag out systems

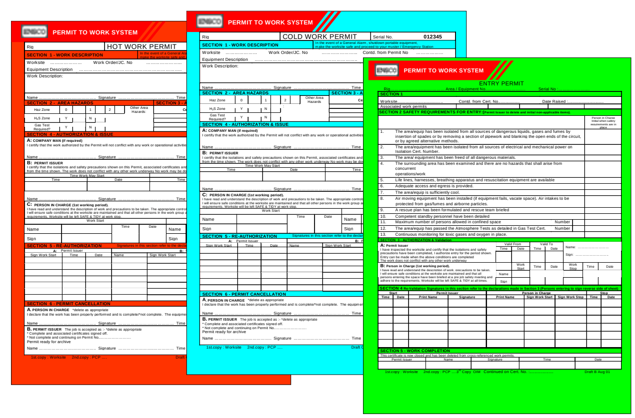
It had already been recognized and accepted that the PTW system designed for the NABU must reflect the existing culture and reinforce existing worksite safety procedural controls. Besides these principal requirements other key design objectives were:

- Meet the most stringent international regulatory requirements for a PTW system
- Be sufficiently robust to support integration with major international Operator's PTW systems, in particular with regard to bridging documents supporting an HSE Case culture
- Meet requirements of ever more sophisticated rigs
- Support a highly effective isolation procedure (also to be designed)

In line with the principle of segregating hazards to keep focus on the situation and the context of hazard management, three permits were developed (see Figure 5):

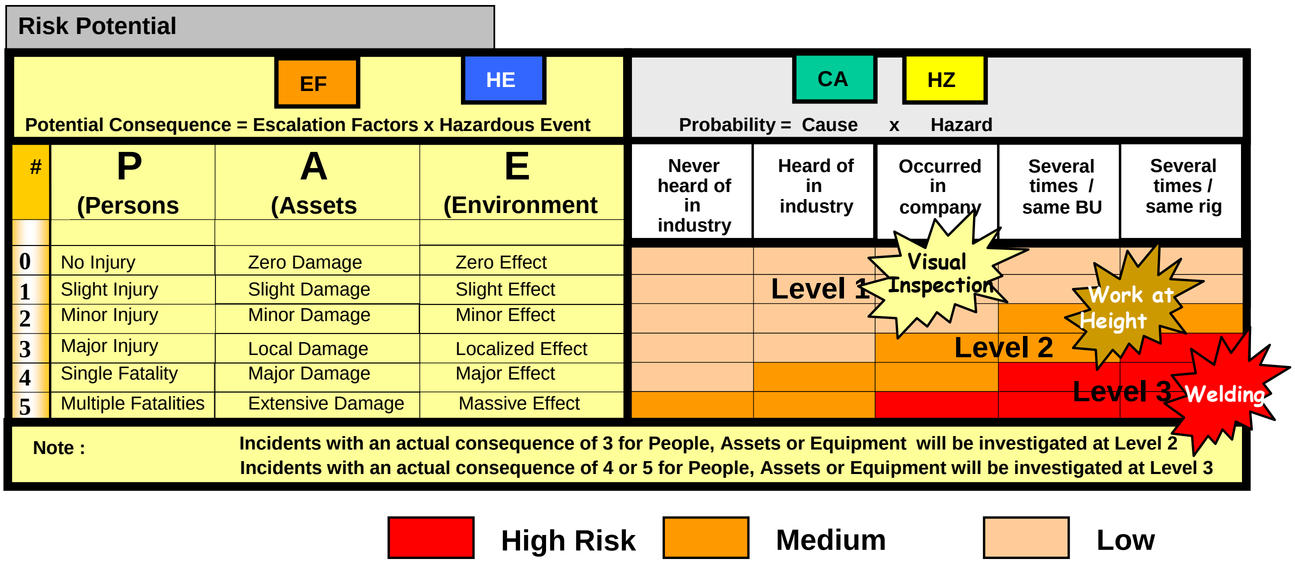
- Hot Work Permit
- Cold Work Permit
- Confined Space Entry Permit

Figure 5: Ensco Permits to Work



Risks associated with drilling operations were brainstormed, and assessed for consequence and probability using the ENSCO Risk Matrix (see Figure 6). Those activities that fell into the Level 2 and 3 categories (based on the hazards of the work activity only) were identified as activities requiring a permit. These activities would also require supporting work instructions (WI), and job hazard information (JHI). Depending on type, some work would also require assessment at the worksite for location and time hazards using the Worksite Job Safety Analysis.

Figure 6: ENSCO Risk Potential Matrix



3.5) Permit to Work (PTW) Co-ordination

In the existing Hot Work / Confined Space Entry Certificate system, co-ordination of worksite activities relied solely on the memory and competence of the OIM. This approach had traditionally been deemed 'fit-for-purpose' given the combination of very competent supervisors, relatively low risk working environment and traditional rig designs.

With ever more complex rigs being introduced, simultaneous drilling operations, interfaces with production platforms and society's general ongoing expectations for major international E&P companies (and their contractors) to be able to demonstrate effective SHE practices, the permit co-ordination process required to be significantly upgraded to support the SSoW approach.

To achieve this, PTW location boards were developed for each rig (similar to that shown in Figure 7) along with permit rack and magnetic markers showing permit activity (valid, suspended, isolations etc).

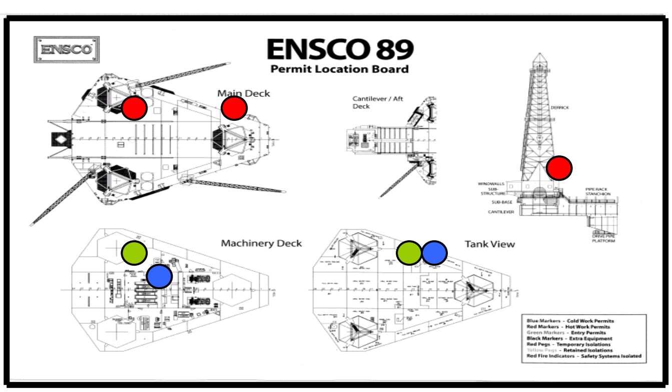


Figure 7: Permit Location Board

4.0) Safe System of Work (SSoW) Implementation

With the SSoW finally complete, the next step was to pilot the new system to test the roll-out process and then proceed to full implementation. Previous efforts to achieve consistent implementation of initiatives had struggled in the absence of a systematic structure for roll-out. In 2002, however, ENSCO developed and issued the Management System Framework (MSF), a template to assist all functions and disciplines to align themselves with a more systematic way of working. This document uses the familiar plan-do-check-feedback process to ensure systematic roll-out of new initiatives.

4.1) Training

Successful implementation of the Safe System of Work (SSoW) required the wholesale revision of existing worksite controls. In recognition of this, a training course was developed to ensure offshore personnel understood the changes and recognized that they saved time and added value in managing hazards, but could also feel confident to act as system champions to assist an effective changeover.

A two-day classroom based course was developed:

- **SSoW Day 1: Foundation of Worksite Control –**
  This established hazard management objectives and defined the application of WI, JHI, WJSA and SHE Competence within the context of the overall SSoW.
- **SSoW Day 2: Permit to Work (PTW) and Permit to Work (PTW) Co-ordination -**
  This gave a detailed understanding of the application of the PTW system, including, work permits, gas testing, isolation practices and PTW co-ordination

Subsequent training was then supported by Computer Based Training (CBT) technology (See Section 6).

4.2) Offshore Implementation Support

With personnel trained, piloting of the SSoW required implementation support through a rig based helpdesk during the first 48 hrs of system changeover - a time period thought to be critical to achieving line buy in and support. Changeover from the existing system was managed effectively with no real communication issues resulting.

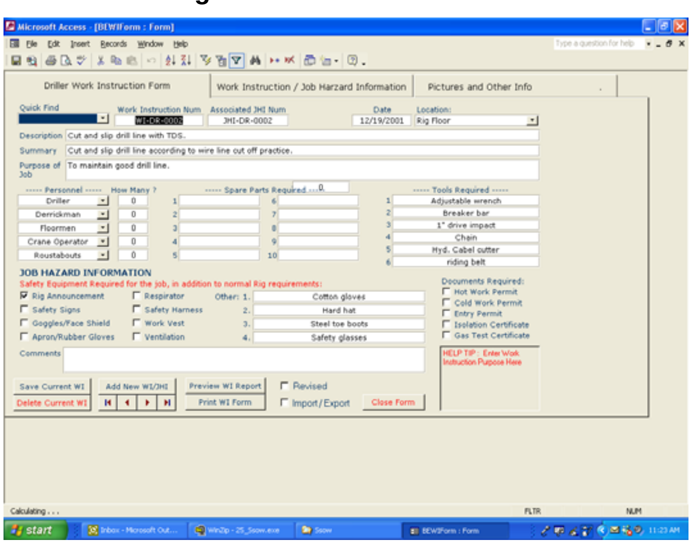
As expected, the more experienced of the offshore personnel, who had worked the same way for many years, often had a harder time learning the new procedures than the younger crew members. But by the end of the first 48 hrs, the SSoW had been embedded, providing a major step change improvement in worksite management – especially in relation to high-risk work which could now be managed and co-ordinated far more systematically and effectively.

5.0) Establishing Consistent Expectations via a WI / JHI Database

The standard procedural worksite safety controls of Work Instructions, Job Hazard Information represent the foundation of the SSoW. In the early stages of implementation the crews were often impatient to start developing their own WI and JHI's to replace the large numbers of JSA's previously maintained. While personnel now had improved understanding of the objectives of these controls, inconsistencies were introduced as the WI and JHI were only as good as the core competencies of the crews, which varied from one rig to another as no formal competency program had yet been established.

It was recognized that if a single comprehensive set of WI and JHI's could be developed, these could be used as a basis for core competence for all key offshore positions (see Section 3.2). Therefore, it was decided to build a WI / JHI database for all permit activities. Teams of offshore employees were consulted to provide input to the quality of information and style of language used.

Figure 8: WI / JHI Database



The database (See Figure 8) was designed for access on line from all rigs via the Business Unit's server.

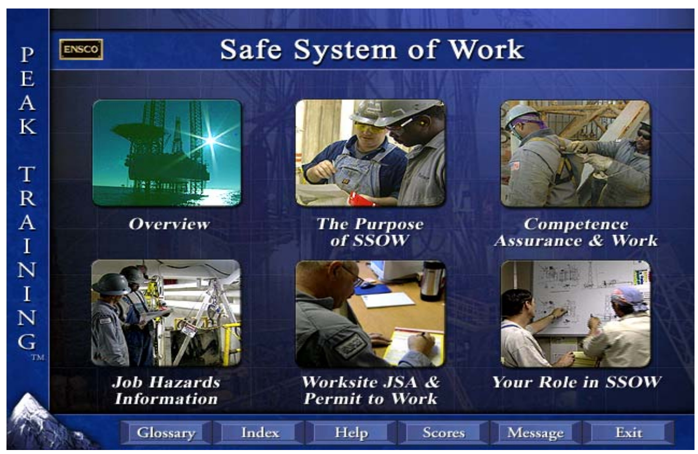
This database assured greater consistency and predictability for worksite hazard management with a clear, single set of expectations documented for each position and each permitted work activity.

6.0) System Maintenance – SSoW Computer Based Training (CBT) Module

Effective maintenance of training objectives to ensure continuing compliance with system requirements had historically been one of the obstacles to implementing new initiatives within the NABU. The classroom environment is very effective for delivering training to large numbers of people in quick order. However, in an industry which is often cyclical, and has sometimes less than desirable turnover rates, training must be an ongoing process. ENSCO therefore decided to use CBT onboard each drilling rig to support the maintenance of system compliance requirements.

Figure 9 shows a menu page illustrating some of the modules of the SSoW CBT that was developed.

Figure 9: SSoW CBT Menu Page



The NABU had previously used CBT as an innovative way of delivering and managing regulatory compliance training, and it had proved highly successful for often quite "dry" subject areas. Offshore crews could study and progress through the training modules in their own time and at their own speed.

The SSoW CBT contains self-assessment questions, which the individual must pass to be able to progress onto the next module. Failing to meet the pre-determined required level results in the need to revisit and study the relevant section again until the desired pass result is attained. In this way competence levels are maintained and assured. This has proven invaluable in maintaining understanding of the SSoW. It has also proved very useful following incident investigation, where corrective actions sometimes require individuals to undergo SSoW refresher training.

7.0) Success of the Implementation

The SSoW has now been operating in the Gulf of Mexico for approximately 18 months and has achieved very positive feedback from the workforce. ENSCO has now established the SSoW as a minimum worldwide company standard. Expectations, purpose and relevancy of all worksite safety controls - both individually and collectively - are now clear, leading to a marked improvement in the communication of expectations at the worksite.

The successful introduction of the SSoW was a watershed event for the NABU, with a complete overhaul of procedural worksite safety controls, a cultural step change achieved by adopting a world-class system, all coupled with the systematic approach to piloting and roll-out. The SSoW now had to become embedded within the overall framework of the SHE-MS to ensure that it was not seen as just another worksite safety program.

8.0) The Future - Integration of the Safe System of Work (SSoW) into ENSCO's SHE-MS

The acceptance of the SSoW at the worksite by the offshore personnel was seen as a successful platform that could potentially be used as a vehicle for communicating expectations from a wide variety of sources - and not just those relating to safety - such as the Company's Environmental Management System (EMS).

Increasingly, line managers and offshore personnel had expressed concern regarding potential information overload resulting from too many programs being directed at the rig-site in quick succession. "Too many programs - too many expectations - all contained within too many documents" was often the cry.

A plan for integration was then developed so that personnel would not need to interface directly with other SHE programs / tools within the SHE-MS, but could extract their requirements and expectations, by position, as they would be embedded within either WI's or JHI's.

The objective was to create a 'one-stop shop' for crews by migrating the SSoW to a (SHE)SoW where each offshore position could access definitive SHE requirements via the WI and the JHI for each task / work activity being undertaken - anytime, anywhere.

The rationalization process could result in a single database supporting the following SHE programs:

- Environmental Management System (EMS)
- Dropped Objects program
- HSE Cases
- SHE Competence
- Preventative Maintenance Routines
- Personal Protective Equipment (PPE) requirements
- New hire / offshore orientation program requirements

The key point is that offshore personnel crews would only ever see one system - the (SHE) SoW. (See Figure 10). While this is very much still work in progress it supports the Company's vision and values that an incident free workplace comes from managing the causes of incidents. And managing the causes of incidents often starts from having clear, consistent, expectations for all offshore positions such that predictable performance can mostly be controlled and pre-determined. It is anticipated that maintenance of such a database will be likely to be a full-time job. But by minimizing duplication of requirements through rationalization, while still ensuring over 90% of all expectations are satisfied, and by providing an easy to use 'clear line of sight' for offshore personnel, this could ultimately allow the Company to achieve a far more consistent and systematic approach. This would then enable worksite activities to be effectively managed with controls demonstrated, irrespective of rig, irrespective of Operator, irrespective of location - a truly 'one-stop shop' indeed.

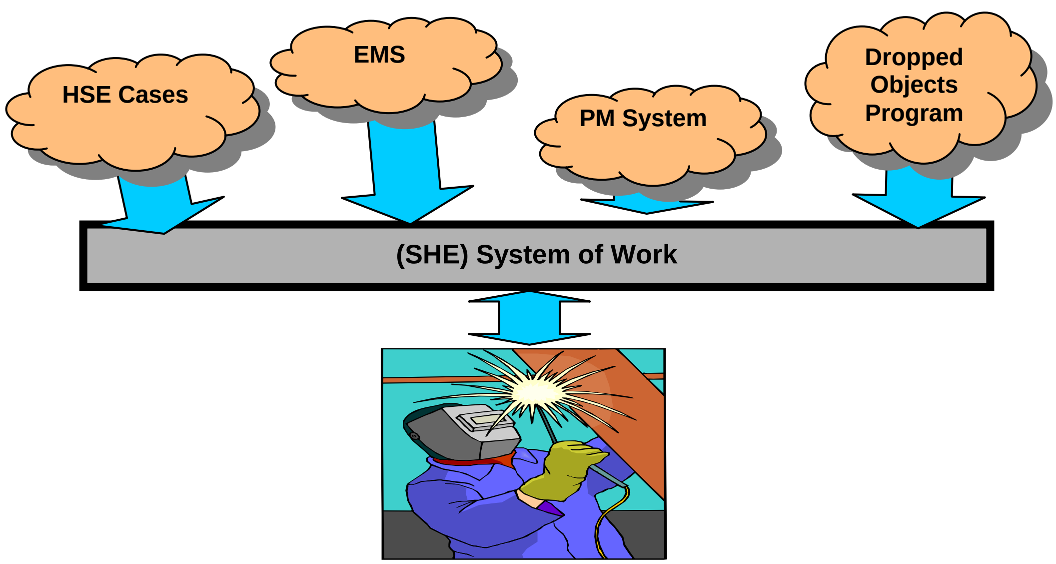


Figure 10: (SHE) SoW as a platform for communicating a wide range of expectations