UNIVERSITI PUTRA MALAYSIA

EVALUATION OF THE OPERATION INSTALLATION MANAGER EMERGENCY MANAGEMENT TRAINING AND ASSESSMENT (OIM-EMTA) PROGRAM OF SARAWAK SHELL BERHAD / SABAH SHELL PETROLEUM COMPANY USING THE TRAINING PROGRAM QUALITY INDEX (PQI) METHODOLOGY

EDWARD UN KAH LOCK

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BY

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Project Paper Submitted in Fulfillment of the Requirements for the Degree of Master of Science (Emergency Response and Planning) In The Faculty of Engineering University Putra Malaysia

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ABSTRACT

Abstract of thesis presented to the Senate of University Putra Malaysia in fulfillment of the requirements for the Degree of Master of Science (Emergency Response and Planning).

EVALUATION OF THE OPERATION INSTALLATION MANAGER EMERGENCY MANAGEMENT TRAINING AND ASSESSMENT (OIM-EMTA) PROGRAM OF SARAWAK SHELL BERHAD / SABAH SHELL PETROLEUM COMPANY USING THE TRAINING PROGRAM QUALITY INDEX (PQI) METHODOLOGY.

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October 1999

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Faculty: **Faculty of Engineering**

Safety training programs must be relevant and effective because they are expensive and involve much efforts and resources. To achieve this, evaluations must be effectively conducted and analyzed to determine their strengths and weaknesses, and provide quality improvements.

The primary objective of this project was to test a training program evaluation tool, the Program Quality Index (PQI) System. The aim here was to test this tool for practicality, ease of use and implementation. If it is confirmed as such, the intention is to evaluate all the existing training programs of SSB/SSPC to compare their priorities and importance to business impact. The training program selected for the evaluation is the OIM-EMTA program because it is a high priority and HSE critical training program

involving senior OIMs and their Deputies. It has not been formally evaluated since its implementation two years ago.

The PQI method was based on the measurements of four evaluable dimensions of training; Instructional Merit, Learning, Usage of Learning, and Strategic Value. The performance of the overall program and each component could be interpreted from the total and individual components 'scores'.

A survey was conducted using questionnaires consisting of two sections: Demography Variables and Training Categories. The questionnaires were sent to all the OIM/SA/WS who had undergone the training program. From the responses, the data were processed based on PQI system methodology. The overall findings were:

- the PQI evaluation tool was indeed a simple and practical evaluating tool. The calculations of the measurements of the PQI Index and component 'scores' do not require complex mathematics or any software applications.
- as for monitoring the quality of the program, the strong and weak components could be easily identified from the variation in PQI scores, "flagging" potentially important issues so that further evaluation inquiry can be targeted to improve the overall training program quality.

In conclusion, the training PQI evaluation tool is recommended as a program quality monitoring and improvement system, and as an objective measure to prioritize training programs.

(330 words)

CHAPTER 1

INTRODUCTION

The Problem and Its Context

The rapid changes taken place in Malaysia over the past decade have created a growing need for every staff, especially the Operations related staff in the Shell organizations to have extensive Health, Safety and Environment (HSE) training in order to respond to all these changes. Petroleum operations started in Malaysia as early as 1909, with first discovery of crude oil by Sir Charles Hose of Shell International Group of Companies in Miri in 1910. The land production of crude oil depleted gradually, and operations moved offshore of Miri, Sarawak, in the early 1970s where large reserves of oil and gas were discovered and produced. Today, Sarawak Shell Berhad/Sabah Shell Petroleum Company (SSB/SSPC) operates as Production Sharing Contractor to PETRONAS[1], operating nine offshore oil and gas fields and two crude export terminals, presently employing 1600 staff, with almost the same number of contractor staff working in their operations.

This move from land to offshore operations of the petroleum industry has great impact and significance in all aspect of working environment. The land operation was purely production of low pressure crude oil, whereas, the offshore operations are production and processing of associated hydrocarbon (oil and gas combined) condensate[2] and high pressure gas. The onshore terminal operations were upgraded as well to

[1] *PETRONAS is the Malaysian national owned Corporation set up to manage and operate the Hydrocarbon and related industries in Malaysia, for which Shell is a Contractor.*
[2] *Condensate – light volatile condensed crude oil.*

accommodate the incoming production of oil, condensate and gas from the offshore complexes.

The offshore working environment is exposed to the natural hazards of weather and open seas. Machinery and equipment are more compact and complex as compared to those of land operations. To supply extra manpower for offshore operations is very costly, therefore there are less supports from shore, which means higher exposure of the regular crews to more types of work; higher risks due to travelling by boats and helicopters, and many others. This change to more hazardous offshore water operations has a direct impact in the management of Health, Safety and Environment (HSE) in operations, which includes managing HSE at different levels, operationalisation of HSE at the work places, and safety training. Courses syllabi and contents are designed to meet the requirements of the offshore petroleum operations safety standards; training approaches and methodologies are adapted to train people to handle the requirements and needs of major offshore installations crisis and emergencies response management procedures. One such program is the OIM Emergency Management Training and Assessment (OIM-EMTA) Program.

This OIM-EMTA program is specially designed for the OIMs, potential OIMs, and their deputies, all of whom are holding very critical positions and are responsible for the "effectively maintaining a state of readiness and of controlling real incidents or emergencies" (UKOOA, 1997). For all the Oil & Gas Production and Terminal locations, the highest level of management on site is the OIM who handles all crisis and emergencies response management at his site.

This study has two primary objectives:

1. to test the Programme Quality Index (PQI) evaluation tool which was developed by Robert O Brinkerhoff of Western Michigan University for tracking and reflecting training program performance on several critical variables.

2. to evaluate and measure the important and critical OIM-EMTA program to determine the effectiveness of this program, and evaluate the program quality as part of training program quality improvement system.

It is important to know if this program is indeed effective and that the OIMs and their Deputies who have undergone and certified as Competent are able to carry out their expected roles and responsibilities with full confidence and abilities, which is handling all crisis and emergencies response management at his site to protect the well being of all his personnel and integrity of the plant.

Hopefully this study would be able to answer some of the questions such as:

Is the PQI tool complicated or easy to use? Is the concept easy to understand and apply, with the results easy to analyze and interpret? Is it able to evaluate individual training programs and also to compare numerous training programs to determine their importance and priorities?

Does the OIM-EMTA program help the OIMs and their Deputies to be more prepared and ready to face crisis and emergencies at their work sites? Are the course contents relevant? Are the scenarios created during the program and assessments realistic and practical? Is this sort of training and assessment effective? Are the trainers effective in their deliveries? Are the trainers able to communicate effectively with his participants? Does the program help the OIMs and their Deputies to increase their knowledge, skills and attitudes in the element of emergency and crisis management at their work sites? Can they apply the knowledge and skill learnt during the training sessions into practice? Is the assessment methodology proper and fair? Is the assessment process effective? Can the assessment process be improved? Can the program be improved? Do they consciously want to apply their knowledge and skill learnt during the program or still prefer their own ways and methods in handling and dealing with emergencies and crisis? To learn about Emergency Response in the classroom and using a simulator,

and able to pass the assessment test at the end of the training is one thing, wanting to use and apply the techniques, steps, co-ordinations and co-operations with other related parties and personnel, with the right frame of mind and attitude is another matter altogether. This is important for those involving in safety training to comprehend and understand, so that the process of training will not result in the waste of time, resources and projecting false assurance.

The feedback from the survey should reveal certain concerns and suggestions about the program from the respondents that can be used as recommendations to improve the program, the assessment process and trainers' effectiveness and efficiencies.

Statement of the problem

Training is expensive and involve much efforts and resources, particularly safety training programs because they require specialist trainers and resources, equipment and very often customized facilities, for example, swimming and rescue facilities, safe driving facilities, fire fighting pits, smoke rooms, real equipment and resources, customized simulators such as for drilling operations and Emergency Response Management training and assessments and so on.

The training fraternity is constantly seeking ways and means to evaluate, improve and upgrade their training programs contents, process, methodologies and trainers. This belief and direction is supported by Buckley & Caple (1992) that competently conducted training can expedite the acquisition of specific job-related knowledge, skills and attitudes. The high level safety related training program such as this OIM-EMTA program commands a higher level of importance because the well being of the workers and integrity of the plants depend on the competency and attitudes of the OIMs. Therefore there is a real need for the training fraternity and its trainers to continuously evaluate their training programs effectively – which is a difficult process by itself, identify

strengths and weaknesses, align training plans, strategies, search for newer, more effective and appropriate ways of enhancing training. Learning principles, theories, research, findings, knowledge, innovations and methodologies need to be regularly revisited and tested for their relevance in the designs and implementations of training programs. This is especially real in safety training because teaching safety is quite different from teaching an academic subject. It is not just providing information, and ensuring demonstrations and practical are being done properly in the training sessions. It involves changing participants' mental attitude and their behaviors, which is difficult at times in SSB/SSPC, because it involves dealing with adult workers, especially on safety related topics which is so often seen to be 'mere common sense', yet in real working environment is so dynamic, unpredictable and real. Almost all the participants for the OIM-EMTA programs are senior personnel, in terms of age and experience, holding managerial positions in the Company heirachy.

Objectives

The objectives of the study is to evaluate and measure the OIM-Emergency Management Training and Assessment (OIM-EMTA) program using the training Program Quality Index (PQI) System:

1. to test the PQI on trial basis as a evaluation tool developed by Dr Robert O Brinkerhoff of Western Michigan University for assessing and reflecting training program performance based on several critical variables,
2. to evaluate the program quality as part of training program monitoring and improvement system using the four PQI components, namely, Instructional Merit (Reactions), the Achievement of Learning Objectives (Learning), the Usage of Learning (Utility), and the Value Weight (Strategic Value) incorporated in the survey instrument.

Significance of Study

This study would reinforce the cognition of the effectiveness and value-addedness of the OIM-EMTA program, and that the candidates who have undergone the training and assessment, with those certified as Competent are able to carry out their expected roles and responsibilities with full confidence and abilities, which is handling all crisis and emergencies response management at his site to protect the well being of all his personnel and integrity of the plant. Therefore it is not just an individual OIM's issue, but the organisational's concern.

It would help the individual OIM to be aware of the effectiveness, criticality and relevancy of the training program in relationship to his HSE roles and responsibilities at his work place. The findings would be able to demonstrate if the training and assessment he had undergone is indeed transferred and is used on the job.

The PQI tool is, according to its developer Robert Brinkerhoff, was used to evaluate a large government agency and a Fortune 200 corporation, and is still in the development stage (Brinkerhoff, 1992). This tool was chosen for this project because upon studying the paper by Brinkerhoff, the concept was easy to understand and seemingly simple to apply. The project will test and confirm it was complicated or easy to use, with the concept easy to apply and implement, results easy to analyze and interpret. It should be simple to apply and implement, results easy to analyze and interpret in the evaluation of specific training programs, and whether it can be recommended to be used for comparing numerous continuous training programs to determine each program's importance and priority.

The findings would be able to illustrate the strategic importance of the program in the form of "score". This score can be used to compare the importance and strategic position in relation with other training programs using the same PQI method.

The feedbacks and results from the findings from the survey responses would offer suggestions to the training fraternity for improving the on-going OIM-EMTA programs in terms of planning, contents, effectiveness of trainers, practical case studies and scenarios, assessments, and other training-related issues.

Assumptions

The primary assumption in this study was that all the participants undergone the same mode and standard of training, regardless of whether they are OIMs or their Deputies, and are all referred to as OIMs.

Since this is an after-training event evaluation, and many of the individuals were trained and assessed as far back as 2 years ago, while others may be quite recent. It is assumed that all of them are able to remember and recall the training events to be able to respond accordingly in the survey questionnaires.

This training program is for senior and experienced Managers who are managing and operating the oil and gas installations/plants, therefore consider important and critical to the well being of personnel, integrity of the plant and productivity of the organization, for the program to be effective, the Value Weight of the PQI as determined by the candidates is assumed to be able to achieve a minimum of 0.8.

Scope and Limitations

Organizationally, reference is made to both the companies of SSB/SSPC- Sarawak Shell Berhad/Sabah Shell Petroleum Company, which is under the Shell Malaysia Group of Companies (SMC). Geographically, the reference made will be referring to operational complexes and plants at onshore and offshore locations under all the four geographical locations that is, Lutong-Miri, Bintulu, the Federal Territory of Labuan and Sabah, (Figure 2). The scope of this study will be limited to the OIMs and their deputies

of SSB/SSPC and PETRONAS organizations who have undergone the training and assessment of this OIM-EMT program.

One of the greatest limitations faced in this study is the sensitivity of HSE issues, which are linked to the performance of management and individuals in the organization. Safety performance is considered top priority in the organization, because it is one of the measures of business performance of the organization. Therefore, it is imperative that HSE performance must be good and keep improving, to keep up with the very high and demanding organizational goals and targets. Results from the survey may not be able to reflect a true picture of the OIM-EMTA program because the respondents may not wish to give their exact and frank opinion via the survey questionnaires, which may 'tell" on their attitude and commitment in the area of HSE in SSB/SSPC and PETRONAS.

Another limitation is the on-going movements of OIMs and their deputies. Currently SSB/SSPC is undergoing re-organizations within the Business Units (BU), affecting job changes, location changes, roles and responsibilities re-visited and modified and many other initiatives affecting many people, including the OIMs. Therefore, there are problems in terms of identifying, locating, communicating and convincing some individuals to take part in this survey. This is because they would be busy with their new jobs and roles, new organizations, and most probably see no benefits of having to 'waste' their time on the program that would be of no value to them in their new jobs.

Another limitation would be the responses from the PETRONAS group of OIMs, who works under different working cultures and expectations from their organization. Depending on the number of respondents from this group, decision will be made later whether to analyze this group differently.

Background to SSB/SSPC

It is important for the reader to know and understand the organizational set-up of SSB/SSPC because this study is directly related to this organization. This project paper will relate to the Health, Safety & Environment (HSE) Unit, Learning and Development Team (LND), and the Operation Units of the Company. Certain areas will be highlighted, such as, the role of training, its direction, and some of the key challenges for safety training in the organization, not forgetting the commitment of the management in the area of HSE in terms of seriousness and priorities.

SSB/SSPC are wholly owned subsidiaries of the Royal Dutch/Shell Group of Companies, operating largely in the Exploration and Production (E&P) sectors of the Petroleum business in the East Malaysian states of Sarawak and Sabah. The head office of SSB/SSPC's E & P operations in Malaysia is situated in Lutong, 11 kilometers North of the coastal town of Miri in the northern region of Sarawak (Figure 1).

The management of the two Companies is headed by a Managing Director (MD) based in Lutong, who directs both companies' business activities in both states of Sarawak and Sabah. The MD of SSB/SSPC reports to the Chairman of the Shell Companies in Malaysia (SCM), based in the SCM's Head Quarter, Kuala Lumpur, Malaysia, who in turn reports to the Committee of Managing Directors (CMD) in the Shell International Head Office in the Hague, Holland.

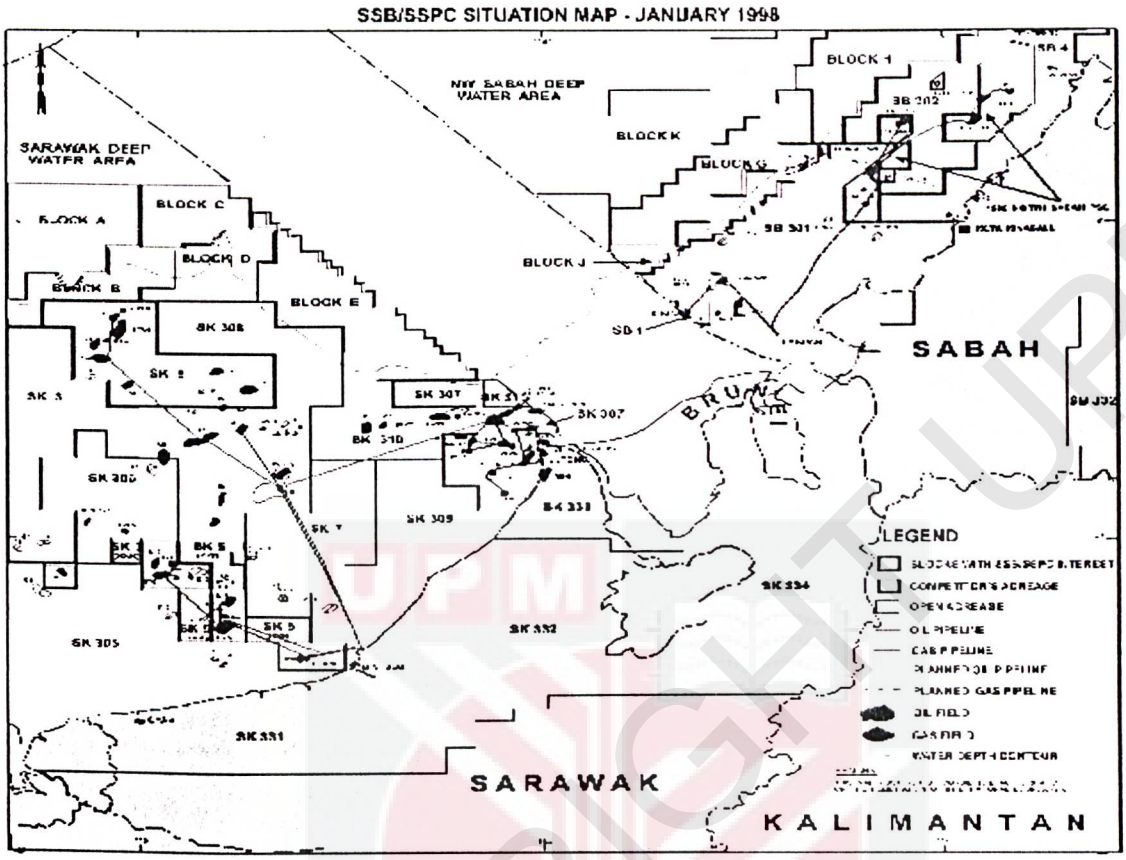

Fig.1 SSB/SSPC SITUATION MAP

SSB/SSPC's New Organization Set-Up

In January 1996 the Organizational Review (OR) was initiated. The decrease in oil price and increase of explorations and productions costs due to the move into deep seas forced the company to review the organizational structure and operations of the company, with the objective of increasing efficiencies and reducing operating and capital costs. The key challenges imposed on the Company are to be able to ensure business continuity and in handling potential security, all without compromising HSE risks. This OR exercise has given rise to a new organizational structure based on multi-disciplinary Business Units with other supporting units (Figure 2).

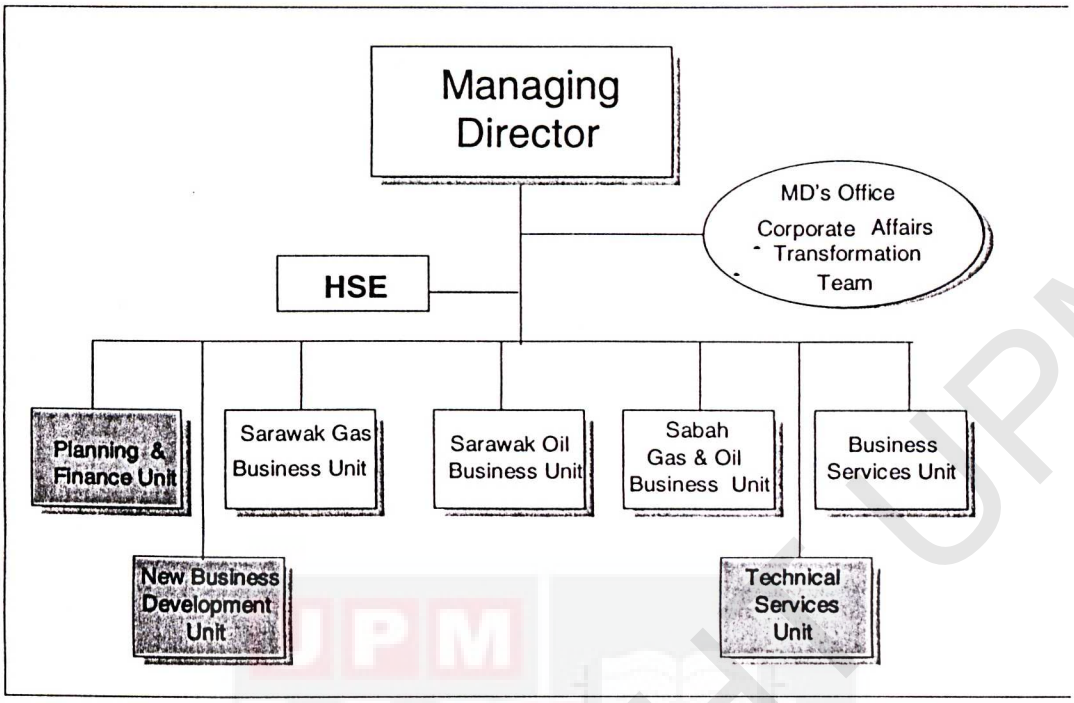

Figure 2 SSB/SSPC New Organization Structure

The three business units are Sarawak Gas, Sarawak Oil, and Sabah Oil & Gas Business Units (BU), supported by the other Service Units (SU). The business units are primarily the most important units in the company because they are the core units that produce and export oil & gas, generating income for the company. The OIMs are the key personnel managing the plants and resources at the frontline, whose competency in their job is most important and crucial in terms of productions and minimizing of down time of their complexes or plants. If they are not able to manage crisis or emergencies in their plants, they may costs the whole Company to lose not only the complex or plant, but the economical loss in production and sale of the valuable oil and gas, clean-up, any eventual re-building costs, injuries or loss of lives of his personnel. Their yearly tasks and targets are set and measured against their performance revolving around such business continuity and handling of potential security risks (E & P Business Plan Summary, 1996) in their operations.

The HSE Team helps the MD to control and maintain the HSE-MS (HSE-Management System) as the Management Representative. The Team is responsible for providing advice, monitoring, auditing and guidance to line departments on HSE aspects of their work, helping them to identify risks and reduce hazard & effects at the worksites for existing facilities and new projects. It also provides guidance in investigating accidents/incidents to identify core causes for evaluation and prevention of recurrence. The Learning and Development (LND) team, which is part of the business SU, is delegated to assist in the HSE training and any HSE related training activities, which previously was undertaken by the HSE Department. This strategy capitalizes on the expertise of SSB/SSPC's professional trainers to assist the HSE team in implementing the training sessions effectively. This would enable the HSE advisors to concentrate and focus on its core activities, which are advisory and consultancy of HSE in the organization (Figure 3).

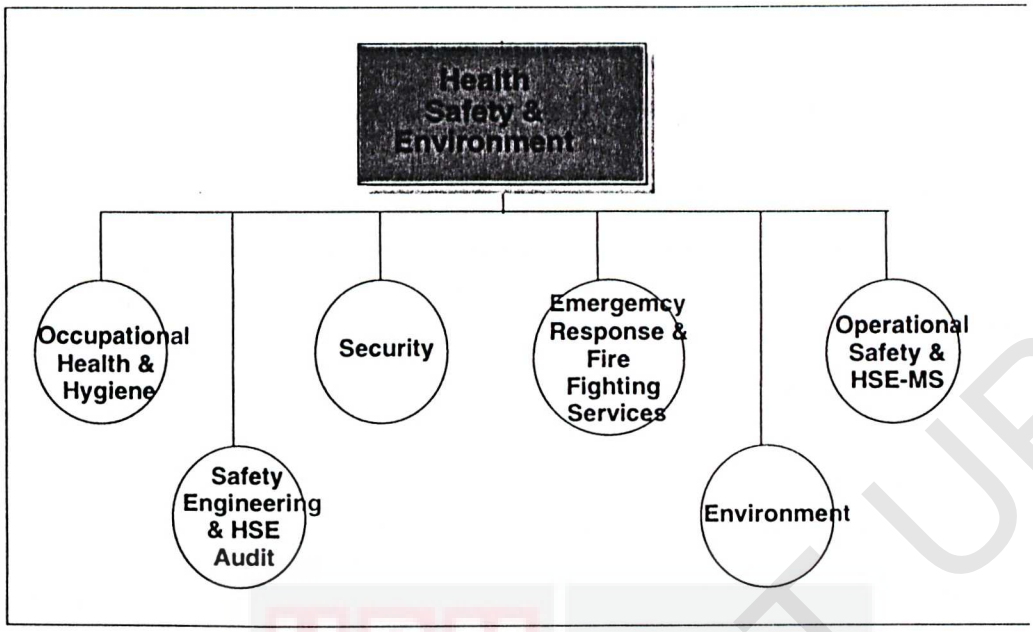

Figure 3 SSB/ SSPC's HSE Team Organisation

Significance and Challenges of Safety Training in the Organisation

A well managed organization normally have better incident/accident records, and the way HSE is managed reflect and is used as a 'barometer' of an efficient business. The statistic in HSE aspect of the business reflects the management of the company, and for Shell, this is very important. Shell worldwide promotes a management philosophy of caring for its employees in terms of welfare, health and safety. Overall, such concern for the employees resulted in good relationship, harmony and respect from employees, government and other competitors. This is why SSB/SSPC's HSE-MS is so important and commands a high priority in the overall management of the company. The challenge is to maintain the values of HSE policies and system, upgrading of HSE standards and requirements, and improving the attitude and behavioral change of employees and contractors by consistent monitoring, maintenance, positive reinforcements and continuous training.

As mentioned earlier, from the early 1970s, the petroleum production was shifted from the depleted land-based production to offshore-based discoveries and operations. In order to support the offshore oil and gas production, resources ranging from existing production supervisors, operators, technicians, and many new recruits ranging from front-line technicians and operators, graduate Petroleum Engineers and Maintenance engineers were required. The offshore production of gas together with crude oil involves working in more hazardous and risky environment - both from the production facilities and natural environment and conditions as compared with land operations. It also become necessary to employ high technology in the exploration and development of new reserves involving higher risks and costs, demanding competent technical professionals. The challenge to Shell is to have competent manpower and relevant technology in place to produce and export oil and gas under strict business, operating, and HSE guidelines and targets of ensuring the safety of employees, plants and environment.

This high-risk environment requires a greater demand from the employees for higher technical and safety knowledge and skills. Training and demands of offshore personnel become more complex and requiring new approaches, diverse managerial, technical and safety skills and knowledge coupled with correct attitudes and behavior. As demonstrated in Chapter 2, it would certainly enhance the effectiveness of safety training if the trainers are able to understand and apply the psychology and principles of learning theories to appreciate the potential of training as a tool for personal development and as an agent for change, especially in the development of safety training.

The training team (LND) primary role is to service the three BUs in the training and development of their human resources. It is responsible for the training and upgrading of the skills of the Operation Technicians (OTs) and specialist training for specific skills

requirements, consisting of the four operational disciplines - Mechanical, Electrical, Instrumentation and Process. Another important role of the LND team is the implementation and monitoring of the Competency Assessments of the technical staff in accordance to BTEC NVQ Award, of which the OIM-EMTA program is one of them.

Safety Training is now included in the LND's domain, responsible for some company In-house HSE training programs, monitoring and implementation. It is also responsible for reviewing, updating and improving training policies, materials, information and carrying out training programs. The LND team provides a very important and effective avenue for the dissemination of company HSE procedures, practices and initiatives to company and contractor staff, using training classes, workshop sessions and refresher courses, where HSE topics and issues are taught, discussed, understood, and expected to be implemented by all staff at their workplace.

Definition of terms

OIM: Operation Installation Manager, the overall person in charge of an offshore or onshore terminal operational complex or plant.

Effectiveness of the OIM-EMTA program: this program is deemed as effective if the PQI "score" exceed 240, which is 80% of the maximum range of 300 of the PQI, and mean Value Weight of not less than 0.8 as determined by the respondents of the survey.

Competence: The ability in terms of skill, knowledge and awareness to perform activities within an occupation or function to specified standards.

Utility: usage of learning during the training event and ability to transfer the learning to be used on the job.

Productivity Index: a ratio of PQI and total training costs, or training time to measure the Company's "outputs" to reflect productivity comparisons in terms of costs or timing.

LIST OF ABBREVIATION USED

CEO	- Chief Executive Officer
CMD	- Committee of Managing Directors
DOE	- Department of Environment
DOSH	- Department of Occupational Safety and Health
HR	- Human Resource
HRM	- Human Resource Management
HRD	- Human Resource Development
HSE	- Health, Safety & Environment
HSEC	- Health, Safety & Environment Committee
LND	- Learning and Development (training) Team
MD	- Managing Director
OIM	- Operation Installation Manager
OpCo	- Operating Companies
OR	- Organizational Review
OSHA	- Occupational Safety and Health Act
OT	- Operation Technician
PETRONAS	- Petrolium National of Malaysia
PSC	- Production Sharing Contract
SA	- Site Analyst

SCM	- Shell Companies in Malaysia
SSB	- Sarawak Shell Berhad
SSPC	- Sabah Shell Petroleum Company
SIEP	- Shell International Exploration & Production
SU	- Service Units
WS	- Work Supervisor

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