

# Developing Safety Behavior Practice Suitable for Thai Industrial Operators

Lertchai Ratana-Arporn, Aphisith Angkhanit

**Abstract**—The objective of this study was to develop safety practices which is suitable for Thai industrial operators from Incident and Injury Free, IIF to create safety behavior and reduce the un-safe records in the petroleum industry. A number of 310 technicians i.e., 295 males and 15 females, in service maintenance section participated in this program. The safety attitude level and safety behavior level for pre-attended and post-attended the developed safety practices of the technicians were evaluated using questionnaire procedure and on-site observation. After applied the developed practice program, both of the safety attitudes and safety behavior were increased to be at very good level and good level, respectively. Evaluating the follow-up unsafe records, it was found that the injury was reduced from 0.11 to 0 case/month, the medical treatment case was reduced from 0.22 to 0 case/month and the first aid case was reduced from 1 to 0.33 case/month. The developed safety working practice was successfully implemented to Thai industrial operators.

**Keywords**—Incident and Injury Free; safety practices; Thai industrial operators, "WeCare".

## I. INTRODUCTION

**S**AFETY in the workplace is now one of the most important considerations of any organization and particularly in industry which operates in risky environment. The Incident & Injury Free (IIF) program is a program to encourage a positive health and safety culture by creating a workplace committed to eliminating worker injury. This tool is being used in many companies such as Chevron, Shell etc. with satisfied results. The core of IIF concept related to organizational culture totally committed to the elimination of workplace injury, coupled with an ongoing personal and organizational inquiry into the subjective and objective challenges of safety. According to the accident records of service maintenance technicians in the petroleum industrial company studied during the year 2005-2007 indicated that there were 4 cases of injury, 14 cases of medical treatment, 57 cases of first aid, and 3,328 cases of un-safe incident and behavior. Whenever the accidents occurred, losses always expected. Therefore preventing the accidents occurrences would be the best way to save the operator and also the expense in the industrial plant. The effective working practice would be the essential tool to prevent accidents occurrences. It was revealed that 95% of the overall accidents caused by un-safe action of the workers and 5% was from un-safe condition [1]. Thus, the objective of this study was to create and develop a safety management program that is suitable for Thai operators by focusing on human factors, especially to develop the safety attitude, intention and concentration at work and to create relationship among staffs in the organization.

Lertchai Ratana-arporn (corresponding author) is an Associate Professor in Faculty of Engineering Kasetsart University, 50 Ngamwong Rd. Chatuchak, Bangkok Thailand. (phone:662-9428555; fax:662-5798610; e-mail: fengler@ku.ac.th).

Aphisith Angkhanit., was former student at Kasetsart university, 50 Ngamwong Rd. Chatuchak, Bangkok Thailand.

The development of personal attitude was able to be achieved via communication and conversation.

## II. MATERIALS AND METHODS

### A. Data Collection

Three hundred and ten service maintenance technicians were used as group sample in this study and 9-month (January to September 2009) duration time were implemented for IIF and 3-month (October to December 2009) for the developed safety practices ("WeCare" practices) implementation. The safety attitude and behavior data were collected before and after "WeCare" implementation using questionnaires. The accident records during the year 2005 to 2007 was collected and used as initial number of incidents to compare with the accident records collected after IIF and "WeCare" practices implementation.

### B. Implementation of Safety Practices and Development Procedure

IIF program was introduced to operators by training to provide basic understandings before implemented to actual practice work for 9 months as illustrated in Fig. 1.

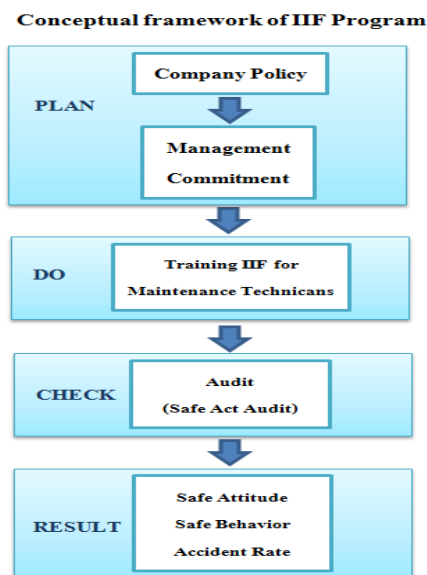


Fig. 1 Conceptual frame work of IIF Program(JMJ Consulting Associates, Inc.2002 [2])

The new safety practices developed in this study was considered on the basis of adjusting the successful safety program like IIF by including the human factors driven from Thai culture of "caring as the same family" into the existed program. The developing method composed of setting a working staffs of senior maintenance supervisors, analyzed the IIF program and brainstorm of accident causes and weak point of the IIF program when implemented were widely discussed through the meeting. Such factors were integrated into the IIF program and named as "WeCare" practices, the

procedure as shown in Fig. 2. The “WeCare” practices were developed with the aim of achieving the suitability for Thai Operators. Subsequently, after “WeCare” practices were fully established it was transfer to operators by training before implementation.

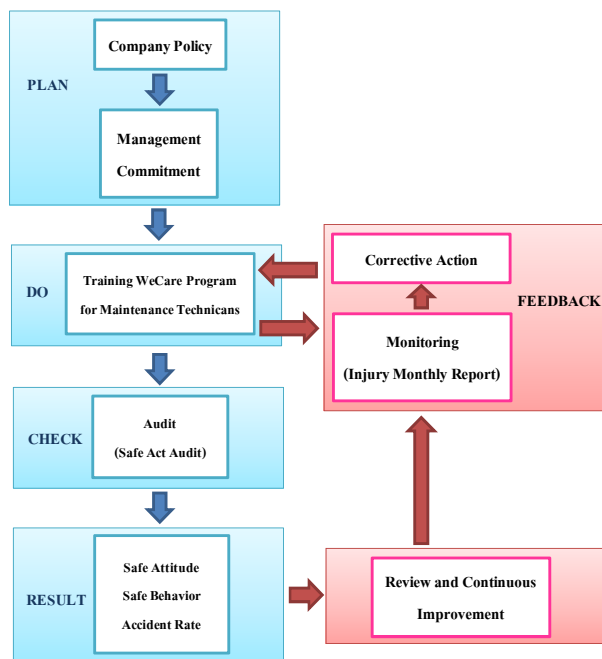


Fig. 2 Conceptual frame work of developing “WeCare” Practices.

### III. RESULTS AND DISCUSSION

#### A. Development of “WeCare” Practice

Cares and concerns among colleagues were considered to be advantages in Thai culture. The human factors related to Thai culture including carefulness and awareness in safety among the staffs in the organization were the most essential factors to achieve the safety program. The meaning of the name “WeCare” are as followed:

**W** represented for Welcome (Warm feeling, respectful and Speak up)

**E** represented for Engagement (Deep relationship to the organization)

**C** represented for Caring everyone as family members

**A** represented for Awareness in safety

**R** represented for Relationship with others

**E** represented for Everyone goes home safely every day

#### B. Evaluation of the Developed Practices (“WeCare”)

According to the questionnaires and on-site observation, it was found that:

1. Before attending the “WeCare” practices, 32% of the service maintenance technicians had the safety attitude at good level and 33% at very good level. After the program was implemented, the safety attitude was improved as the good level was reduced to 22% while at very good level was increased up to 76%, as shown in Fig. 3.

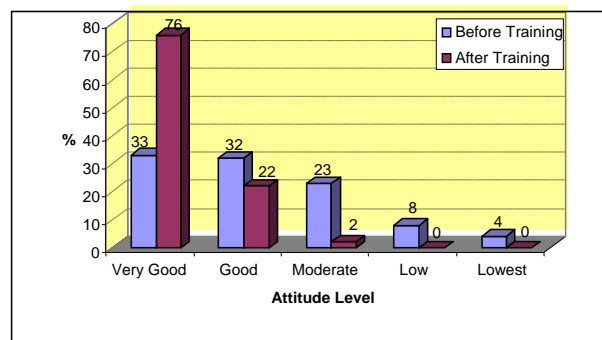


Fig. 3 Safety attitude of the technicians before and after attending the “WeCare” Practices

2. For safety behavior, 49.3% of the service maintenance technicians had the safety behavior at moderate level and 28.4% at good level before attending the “WeCare” practices. After the program was implemented, the safety behavior was improved as at moderate level was reduced to 18% while at good level was increased to 81%, as shown in Fig. 4.

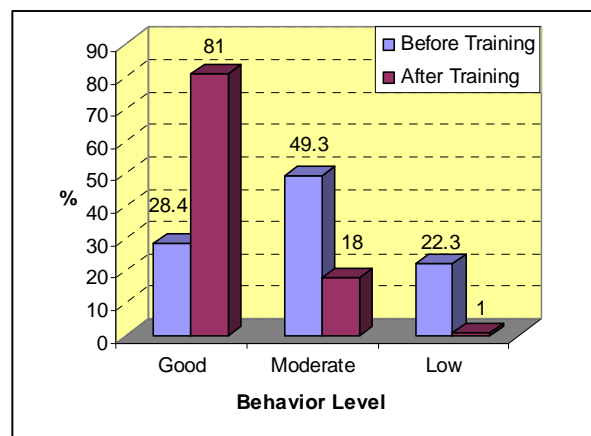


Fig. 4 Safety behavior of the technicians before and after attending the “WeCare” Program

3. The un-safe records before and after implementing IIF and “WeCare” practices was shown in Fig. 5. For injury rate, it was found that implementing “WeCare” practices resulted in reducing the injury cases from 0.11 to 0 case/month, while the IIF program itself could not reduce the injury case at all from the initial. Initial medical treatment was 0.38 cases/month decreased to 0.22 case/month after IIF implement and further reduce to 0 after “WeCare” practices implement. Similar findings of the first aid cases which was reduced from initial of 1.55 to 1 and to 0.33 cases/month by IIF and “WeCare” respectively. It was noticed that IIF could reduce the un-safe records including medical treatment and first aid cases to a certain number but the “WeCare” practices could possibly reduced even lower to satisfaction.

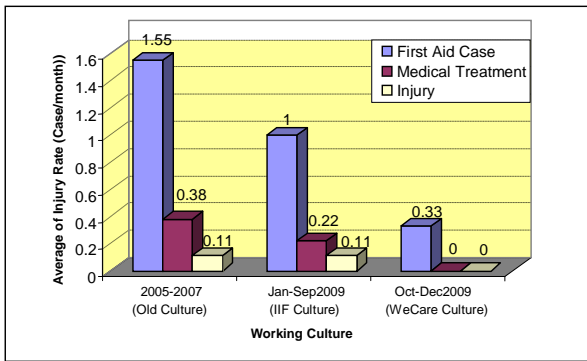


Fig. 5 Incident records of the technicians before and after attending the IIF and “WeCare” Practices

#### IV. CONCLUSION

The present study could be concluded that adjusting the successful safety program like IIF by including the human factors arising from Thai culture resulted in satisfaction of reducing the incident records better than implementing IIF alone. The “WeCare” practices developed in this study was well suited to Thai industrial operators and can possibly be applied to any other industry in Thailand and may also in other Asian countries.

#### ACKNOWLEDGMENT

The author would like to thank Faculty of Engineering, and The Graduate School Kasetsart University for their financial support.

#### REFERENCES

- [1] DuPont. 2000. Management Safety Techniques that Work For Line Supervisor. DuPont de Nemours and Company.
- [2] JMJ Consulting Associates, Inc. 2002. Incident and Injury Free.