

# Application of HSE Management Tools in Station Management

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**Abstract**—HSE management system is a part of enterprise management system. The stand or fall of HSE management has a close relationship with the employee's safety and health conditions, the company's assets operation condition, enterprise's external image, market competition situation and so on. At present, the existing HSE management tools have more than ten kinds, but lack of classification, when selecting managers in the blind, delay the optimal time. Aiming at the situation, according to the theory of human - machine - environment, classifying the existing HSE management tools, and to study the relationship between the three categories. There are 3 types of HSE management tools in the management have the same importance, hence need to take all tools into consideration. A case study a yard-station of West-East Gas Pipeline, this paper introduces the correct and quick selection of HSE management tool, and the best time for the accident treatment.

**Index Terms**—HSE management system, Process safety management tool, Management related security management tools, Equipment safety management tool.

## I. INTRODUCTION

According to the health, safety and environmental management system standards, the company's existing management methods and management system, to establish a healthy, safe and environmental management system, called the HSE management system.

In the HSE system, according to the elements of operation system are the HSE system management tools, including resources, training, equipment and facilities integrity evaluation, HSE management program, hazard identification and risk assessment, inspection, testing and internal audit and management review are system running tool [1].

Tools for specific HSE at the specific scene of the production is to use the hazard identification and risk assessment tools, including job hazard analysis safety inspection table, etc.

## II. INTRODUCTION OF EXISTING HSE MANAGEMENT TOOLS

The core concern of Enterprise management is the grass-roots level. HSE management has no exception, the issue of how to promote the management methods of HSE system, tools and grass-roots work closely, has become the urgent need to consider.

At present, because of their wide variety, lack of systematic classification, how to quickly find categories

involved in numerous management tools of management tools caused confusion in the reasonable select and use for the corporate executives. Therefore, according the theory of the human - equipment - environment, the existing HSE management tools are divided into three aspects: process security management, management related security management and equipment safety management in this paper.

Operating procedures and related safety management tools include: process safety information management, process and equipment change management, process safety analysis, work cycle analysis, operating license management, lock listing, pre-work safety analysis, safety inspection, safety visual management, territorial management. And Process safety information management is the safety management of the relevant information on the basis of the material damage, process design and equipment design. Process safety information is the basis for the implementation of process safety information management. Process and equipment change management refers to the need to change the process of safety information management in the change process which have being introduced of uncontrollable risk. Process safety analysis is a kind of safety management method, which can be used to identify, evaluate and control the process operation by the method of system safety analysis. System security analysis is to use a variety of safety analysis method to identify the risk factors of the system, to lay a good foundation for the follow-up risk management [2].

Pre work safety analysis and safety inspection of pre boot are all reflected the application of safety analysis method .Pre work safety analysis is the process of using appropriate safety analysis method to carry out hazard identification, risk assessment and the development of control measures in the process of carrying out the work. The security check before the start is the process using the appropriate method to check all the related factors before the start of the process equipment, and making all will-changing items to correct、approval to start.

The operating license management and lock listing are set up for a specific process, some homework activities. The operating license management is a kind of management method. It orders to submit an application in advance by its organizers or operators for some dangerous activities, then to review and approval by the safety production management department of business operation unities. The right to engage in this kind of activity can be haven after the issuance of work permits. Lock listing is the management measure for reducing the risks. It orders the activities in which the dangerous energy may accidentally release to cause personnel injury or property damage to install the locking device and hang tag for identification.

Work cycle analysis is a kind of management method. It

orders the managers and operators to make analysis and evaluation for the old operation procedure and the actual operation behavior. Management related safety management tools include behavior safety management tools and HSE safety management tools. Behavior safety management tools have four kinds: personal safety behavior plan, safety observation and communication, the safety analysis before working start and safety check before the start. Among them:

Individual safety behavior plan and safety observation and communication are all safety management strategies which are put forward for managers. Individual safety behavior plan requires leaders to perform the HSE management responsibilities and to make a personal phase of the security plan at the same time. Safety observation and communication are the safety management measures, which require the direct leaders to observe safe behavior and unsafe behavior, communicating with the employees and make intervention.

Management related HSE management tools include: HSE training management, "two books, and one card" management, security visual management, territorial management, HSE performance management, HSE audits management. Among them, HSE training management, performance appraisal management, audit management are all the document evaluation management tools; "two book one card " management, security visual management, territorial management all belong to the site safety management tools.

HSE training management refers to the management standard, procedure and operation procedures as the main content, on-the-job coaching, exercise as the main form of flexible management of continuous learning behavior or process. Ensure sustainable, system of HSE training, and training to improve employee job specification unit risk identification and control ability, meet the needs of the post production safety.

HSE performance appraisal management is the management method, which evaluates the organizations at all levels, and their working conditions, reflecting the relative value or contribution of people in organizations through the evaluation, so as to improve their performance. HSE audit management is an evaluation method to meet the level of the file that an objective to access relevant facts of statement of information and to be evaluated to determine the health, safety and environmental management system related to its set of guidelines for the organization.

Two books a card management is through the operating instructions, work plan and in the form of safety checklist, to manage the operational activities [5]. Security visual management is use of intuitive image and suitable for a variety of visual color perception information to organize the site of production activities, to improve a management method for producing security. Local management is in accordance with the work area, assets, functions, size of the risk duties will be divided, use visual means of publicity card, will implement specific duties to the job, to achieve the management tools that "who is in charge, who is responsible for" [6]. Equipment and facilities security management tools include wellbore integrity management, pipeline integrity management, and station integrity management. Integrity management is a new model of security management. Integrity management is a prevention-oriented management model, is a major change about traditional incident response

management. Integrity management is essentially a dynamic management process, through real-time risk factors faced by the various stages of evaluation system, the corresponding management and maintenance activities to make optimal management, to ensure the integrity of the process in the life of equipment and facilities.

Pipeline Integrity Management refers to pipeline operators according to the relevant factors of changing pipeline, to identify and evaluate the risks faced by pipeline operating, develop appropriate risk control measures, continue to improve the adverse effects of the factors recognized, so that control the level of operators risk to the reasonable and the acceptable process within the range [7]. The paper talks about the pipeline refers to be used to transport the media equipment, including piping and components, as well as another appendage court independent of valve stations and other facilities. Do not include station a short distance of each pipe, vent pipe and a pig receiver and other equipment inside the facility.

There is no clear definition about Station Integrity Management at home or abroad, the paper will define temporarily the Station Integrity Management venue for the parts of the station (including station piping and various equipment and facilities) equipment and facilities remained stable in structure and function, and under the specified operating conditions, each part can be coordinated, ability to work safely and reliably. Wellbore integrity management is a service for managing the entire process of wellbore integrity management system. It refers to using of effective technical and management measures to reduce mining risk and ensure safety of oil and gas wells during the whole front of abandoned mining success.

### III. RELATIONSHIP BETWEEN HSE MANAGEMENT TOOLS

According to the classification of HSE, the relationship between three types of management tools has been given, referred to as "security triangle" (Figure 1). Through researching safety triangle and management practices of HSE supervision, you will find that all have equal importance in safety management. And they contract and interdependent with each other. We hope to guide the work of the staff using these management methods and tools and to change the safety conception of the staff and develop good work habits, which will enhance the overall level of safety management. Safe production must eventually reach equipment well maintained, operators of safe behavior and reasonable operating procedures.

### IV. APPLICATION EXAMPLES ON HSE MANAGEMENT TOOLS

Take a work in the oil field in Xinjiang as an example, to illustrate the application of HSE management tools in the assignments section. Oil area is wide and have jurisdiction over four oil and gas fields. There is oil water well with crude oil transfer, centralized treatment station and gas treatment station. Behavior safety observation and communication method, the changing management method of process and equipment ,safety inspection methods before starting, the methods of HSE management training, HAZOP analysis method, JSA( safety analysis method before work),

post training needs matrix method, the method of work cycle checking and so on.

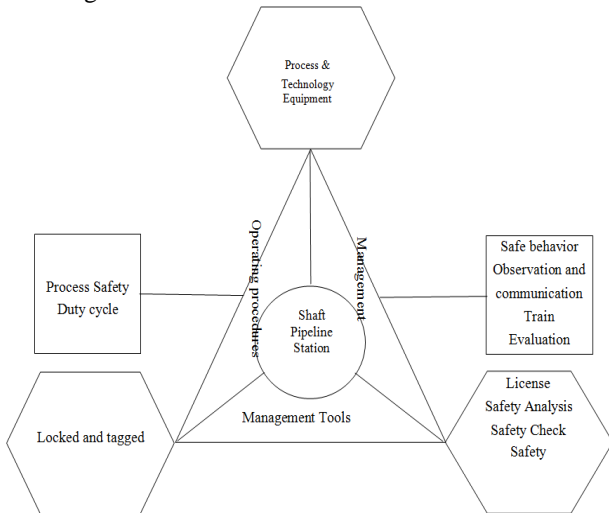


Figure 1 Security triangle of management tools

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