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EDITORIAL

La revue de l'Algerian Petroleum Institute, IAP est à son troisième numéro qui est soumis naturellement à l'appréciation de la communauté scientifique et technique du secteur de l'énergie et des mines.

Pour rappel, l'édition de cette revue s'inscrit dans la politique de la Formation nouvelle qu'entreprend l'Institut, laquelle se fixe comme objectif de former les professionnels de l'Industrie Pétrolière et Gazière de demain. Dans le cadre de cette politique, la communication constitue l'un des éléments de la stratégie du redéploiement des activités de l'IAP.

Aussi, elle participe à l'effort de R&D dans le secteur pour faire connaître les potentialités de nos cadres à tous les niveaux et révéler ainsi ceux qui, par leurs efforts, leurs travaux et leurs publications, sont à même d'apporter des solutions aux problèmes que rencontrent les structures opérationnelles dans l'Exploration, la Production, le Transport et la Transformation des Hydrocarbures liquides et gazeux .

Dans ce troisième numéro, les thèmes touchent le HSE, la sécurité industrielle, le Risk management, l'Environnement, le Management et la Formation des hydrates. Notre objectif demeure la couverture des thèmes touchant aux préoccupations de notre secteur de l'énergie et des mines.

Il reste entendu, que la contribution de tous les acteurs énergétiques, chercheurs, industriels et autres est vivement souhaitée, car cette revue constitue le cadre idoine pour l'expression de réflexions et d'actions qui doivent accompagner les efforts de mutation pour répondre aux nouveaux défis.

Dr. Salah KHEBRI

Président Directeur Général

BEST PRACTICES FOR CONTROL OF MAJOR FIRE ACCIDENTS AT THE CENTRAL PROCESSING FACILITY (CPF) IN IN AMENAS. QUANTITATIVE RISK ASSESSMENT STUDY.

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Abstract- In recent years there have been many spectacular accidents when working in hydrocarbon processing sites which have resulted in major fires and explosions causing the loss of lives and damage to property.

For this reason Sonatrach has to address these problems by looking for potential weaknesses in all aspects of its regulations, procedures and risk assessment which are the heart of the HSE management systems.

In this modest work we have dealt with those weaknesses in a way that can assist Sonatrach to reduce the potential for major fire accidents.

We have completed a comparison between the UK and Algerian legislation which allowed us to come out with a gap analysis that can help to narrow the gap between them.

We have stayed at site for a long period and we have talked with many operators in different divisions which allowed us to find out the best practices existing at the plant regarding fire protection.

We have also looked for the best practices that should be in place which can help to reduce the occurrence of major accidents in the site.

The most important part of my work is the achievement of quantitative fire risk assessment studies for two real case studies, Off-specification condensate storage tank and On-specification LPG storage bullet, which can give the site line- management an idea about the frequency and the consequence of such events.

We have found that the risk of these events taking place of such major fires is acceptable and therefore no control measures are envisaged at the current time.

Keywords: Quantitative Risk Assessment-Best Practices

THE ANALYSIS AND MANAGEMENT OF HSE PROACTIVE REPORTING SYSTEM WITHIN IN AMENAS OPERATIONS

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Abstract-: The reactive reporting system is widely used to introduce HSE performances and to notify the robustness of management aspects in place. However, lagging indicators are not sufficient to measure employees' perception and to demonstrate organisational efforts or leadership commitment to HSE requirement.

Being proactive throughout leading indicators is the most appropriate way to perform reporting process and to assess HSE performance measurement. Hence, proactive reporting system contributes effectively to explain the attitudes and to establish essential attempts to improve the whole HSE features.

This paper examines both the existing Tr@cker findings and the HSE performance measurement linked to In Amenas Operations with a further benchmarking assessment of leading and lagging indicators.

In addition, a survey has been carried out to gauge both HSE culture on site and familiarity of employees with the elements of proactive reporting system in place. And while the human factors take an immense part when conducting the reporting process, a human reliability analysis was pursued to evaluate such contribution.

The findings show that the management targets are not achieved as a whole; for this reason more effort must be focussed within the reporting practices, regarding procedures, defining responsibilities and allocating crucial resources with no blame culture and contractors' involvement.

The current study serves as a baseline reference to evaluate forthcoming progress effort and to weigh against prospect improvement areas.

Keywords: Proactive reporting system, performance measurement, leading indicators, lagging indicators, Tr@cker

INTEGRATING WHOLE LIFE COSTING IN OUTSOURCING MANAGEMENT- THE CASE OF GSA-

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Abstract: Unlike the simple procurement of good or services, decisions to outsource results from a management choice to rely on another company. A company that will assume risks and take management responsibility for the requested service.

This choice may result in a long-term, mutually-beneficial relationship between the two companies. Outsourcing has grabbed headlines, it is proclaimed as a necessary, effective, and inevitable strategy to reduce costs, focus on the core business, maintain competitiveness, and obtain needed capabilities. Even though the idea of outsourcing is to achieve the optimal performance within a company and a supply chain. Outsourcing decisions, therefore, require life cycle analysis of anticipated changes concerning all relevant costs, including indirect ones, to avoid undesired surprises.

GSA (Groupement SONATRACH AGIP) like many companies in the oil and gas industry uses outsourcing broadly across many activities, but devoid of a clear procedures and strategies to monitor and control the outsourcing operations.

A review of literature has been undertaken to identify key elements of outsourcing management, how outsourcing decisions are made, and most importantly, how the company can be more successful in achieving their goals for outsourcing. Then, a survey questionnaire has been driven to understand how practical process works within the company. From the results of the survey, it has been revealed that decisions are rarely made within a long-term perspective, and cost consciousness within the company is often quite poor; whereas, Life Cycle Costing has good alignment with outsourcing objectives and it is a potential tool for outsourcing decision making.

The barriers to progress on the company where identified, and a best practice outsourcing management model is presented and described on how it can be used to achieve superior results .Besides, an evidence has been shown on how crucial is life cycle costing on outsourcing decision making .Recommendations for further studies based on contract management , cost management and cost information are finally proposed.

Keywords: life costing, Outsourcing management

APPLICABILITY OF HAZOP TO UNDER-BALANCED DRILLING SURFACE FACILITIES IN HMD FIELD.

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Abstract: Throughout the carrying out of drilling and testing operations, several of the activities have the potential for negative impact on the health and safety of workers, on the environment and on the equipment or installation being used. The potential for HSE troubles rises whenever a new process that is different from the ordinary activity is introduced. Such is the case of reduced head or under-balanced operations on a drilling site. These operations are considerably different from the conventional drilling approach. This was primarily because they involve working in a live well, and because of the specialized nature of the additional equipment included. To ensure a safe and efficient operation, the supervisors and crews executing these operations have to be familiar with the process, the equipment and more importantly with the HSE procedures. Therefore, in setting up an Under-balanced Drilling (UBD) project, it is critical that HSE issues are considered and safety critical systems are tested and investigated.

It was felt that a systematic hazard study would be very likely to lead to Improvements in equipment design and in operating procedures which would significantly improve safety. Such consideration lead to the Initiation of a Hazard Evaluation program to identify and control system hazards related to the process of under-balanced drilling. However, the main challenge when testing safety-critical systems is to decide what to test. At the top level the answer to this question is straightforward – we should test that nothing dangerous can happen when we use the system. From this, it follows that in order to test for safety we need to know and understand what can go wrong –That is identifying and evaluating the system's hazards. HAZOP is one of the most comprehensive and systematic methods for identification and evaluation of hazards in process systems. It is believed that such an approach could be as effective in identifying safety and operability problems for underbalanced drilling systems as it proved to be for topsides process equipment and for chemical-type plants.

Keywords: Hazop, Uderballanced Drilling, HMD Field

THE ROLE OF WHOLE-LIFE COSTING IN THE ACQUISITION OF ASSETS - A CASE STUDY

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Abstract: Whole life costing is well developed on theory while it still does not affect the decision on assets acquisition an d management. The reason for that is r elated to fact or s such as the la ck of under standing, motivation for its application and un cert ain ties on whole life costing (WLC) analysis.

In this con text the present work aims to identify the main components of an efficient WLC framework for it s implementation , and to carry out a detailed WLC analysis to identify the best option amongst alternatives.

A seven steps iterative process is identified to allow the feed back to the design phase.

Some important factors are identified and some particular emphasise has been made on the conflicts and barriers that can deviate the implementation from its stated objectives and goals. The uncertainty and risk framework has been revised to develop a tool to build a confidence level on the decision .

A road map ha s been developed to reach the excellence level towards the best practices of WLC implemen tation .

Finally; the present work has shown the significance of adopting WLC as a decision -making tool for a big company like SONTARACH.

Besides, it has given good implementation guidance.

Keywords: Whole life cycle; long term investments, cost benefit , confidence level, CAPEX an d OPEX

MODELISATION DES CONDITIONS DE FORMATION D'HYDRATES

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Résumé - La formation d'hydrates présente des problèmes sérieux dans l'industrie gazière lors du développement des champs ou, même, pendant le transport et le traitement du gaz naturel. Le calcul des conditions d'équilibre (hydrate= gaz +eau) revient à déterminer les conditions (T, p) qui satisfont à l'égalité des potentiels chimiques de l'eau présente dans les différentes phases en se basant sur le modèle de ***Van der Waals* et *Platteeuw***. Les résultats de la modélisation thermodynamique s'avèrent très satisfaisants lorsque il s'agit d'un gaz pur ou un mélange binaire.

Dans le but d'améliorer la prédiction des conditions de formation d'hydrates d'un mélange de plusieurs constituants, nous avons rajouté à la pression prédite un terme correctif qui a été approximé par l'application de **Réseau de Neurones Artificiels**. Un test de validation de ce couplage sur une base de données constituée de 4380 points, a donné une erreur de calcul globale de 4.613%.

Mots-clefs: hydrate de gaz, modèle de *Van der Waals et Platteeuw*, réseau de neurones artificiels.