Understanding the Safety - Hazard-Risk Relationship in a Reactive Culture*  
(A comprehensive risk management system to evaluate and quantify risks associated with well construction in a post Macondo world)  

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Abstract: Safety is defined as a judgment as to the tolerability of RISK, having evolved from a judgment as to the acceptability of RISK. Here we see a definite move from the idealist to the realistic. Policies and Procedures, Law and Regulations, Codes and Standards, etc. dictate levels of acceptable risk (idealistic). The person doing the job ultimately decides what level of risk is tolerable, and as such, defines the level of Safety within the facility or operation (realistic). Our goal is to ensure tolerable never exceeds acceptable and that proper decision making is used to assess both. This paper shows how developing the proper balance of Proactive Controls (Risk Mitigation) and Reactive Recovery (Consequence Mitigation) leads to operational excellence/efficiency.

Keywords: risk, proactive control (risk migration), reactive control (consequence mitigation)

We find ourselves in an HPHT environment, and that's before the drilling even starts. Boots & Coots has been bringing risk under control for decades. Our hands-on experience as pressure control specialists, make us uniquely qualified to help you prepare for and prevent critical well control events and as a result of this we know a well-structured prevention plan can provide some much-needed relief from the pressure.

There are some significant events that have happened over the years that have caused major changes to the Oil & Gas Drilling Industry.

Ocean Ranger, Piper Alpha, and recently the Deep Water Horizon, are all industry changing events and have all contributed to the way we now do things. After each of these events, major changes came about that directly affect us all in how we safely perform the drilling of wells. After the most recent event at Macondo, all drilling operations were brought to a halt, while the government introduced new regulations and drilling safety rules. It's has become very expensive to comply with these new regulations and rules and its continuing to drive the cost of drilling up. When something goes wrong in our industry today and we fail to manage our affairs responsibly, legislators overreact and impose regulations that rarely have already pre determined and in place such things as fire fighting equipment, relief wells, hot tapping, cold eye reviews, blowout contingency plans, relief well plans, emergency response plans, snubbing operations, coiled tubing operations, valve drilling and dynamic freeze. The most important of these, the blowout contingency plan or BCP, can drastically reduce the time and effort needed to bring an event under control. All personnel from management on down should be well aware of and be practising drills based on your BCP. Your employees have to know what to do correctly when they have an incident and practising the drills is imperative to mitigating...
and fixing the problems.

Our Boots & Coots Safeguard System is a comprehensive system that gathers and analyzes objective evidence to evaluate the risks associated with well construction and is conducted by the worlds for most Subject Matter Experts.

Boots & Coots is a service line of Halliburton Energy and operates worldwide.

Fig. 1 SAFEGUARD Diagram showing relation between Proactive control and Reactive control.

安全はリスクの許容範囲に対する判断から展開する危険の許容範囲に対して判定されるものと定義できる。

ここで私達は理想主義から現実主義への明確な移りを見ることができる。それは方針およびプロジェクト、法律および規則、規約および基準など、受諾可能な危険の命令のレベルは理想主義的であり、実作業を行なっている人は、最終的に危険のどんなレベルが耐えられるか、それ自体を決定したり、設備または操作内の安全のレベルを定義したりするように現実的に考えるということである。

私達の目的は、リスクの許容範囲が、決して受諾可能な範囲を超えないようにすることであり、それらは上記の判断基準によって、査定されるということである。

今回の発表は、どのように Proactive Controls（Risk Migration）と Reactive Recovery（Consequence Mitigation）との間で適切なバランスをとるかということでお作業の品質および効率の向上をもたらしていくのかということを示す。