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Human Factors in Control Room Design & Effective Operator Participation

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Abstract

Human Factors Engineering aims at optimizing work systems. The short definition "*user-centred design*" expresses a focus on both human beings and design. In a control centre design project several related topics need to be addressed: 1) job content and operator workload, 2) workplace arrangement and design, 3) process graphics and interaction design, 4) alarms, and 5) CCTV. Experienced operators have an extensive knowledge of the processes. Therefore, they should be considered a valuable asset. They act adequately in case of unexpected events, provided they have an excellent overview of the process status.

A Human Factors (HF) approach is well documented in ISO 11064 - *Ergonomic Design of Control Centres*. It requires professional HF skills to carry out this approach, including a task analysis, job design, and functional workplace design. In addition, a HF professional may fill the gap between engineering disciplines and operations. The aim of this paper is to show the impact and benefits of a systematic HF involvement in control centre design in oil & gas. Topics are:

- How to include HF in systems design.
- The move from off-shore to on-shore control centres, including changing operator tasks.
- Good process graphics design and developing powerful process overviews.
- Organizing effective operator participation and change management.
- Outcomes and lessons learned from HF interventions.

Introduction

Engineering projects require the input of many disciplines, including Human Factors Engineering. The aim of Human Factors (HF) / Ergonomics (both terms are used interchangeably) is to optimize the work system. A short definition is *user-centred design*, expressing a focus, both on the human being and engineering. Job design, operator workload, control centre layout, workplace layout, instrumentation, information display, environment, and many more topics have to be addressed. The value of HF Engineering is beyond occupational health and safety (Pikaar, 2007), or to phrase it differently: HF is a step ahead of minimum legal requirements and regulations.