Human Factors Integration into the Facility Design Process

Sam Ranasinghe 24th April 2009

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Aim of the presentation ?

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There is HF integration guidance available.

So, having implemented HF throughout a facility design process, what have we learned?

Case study: FPSO







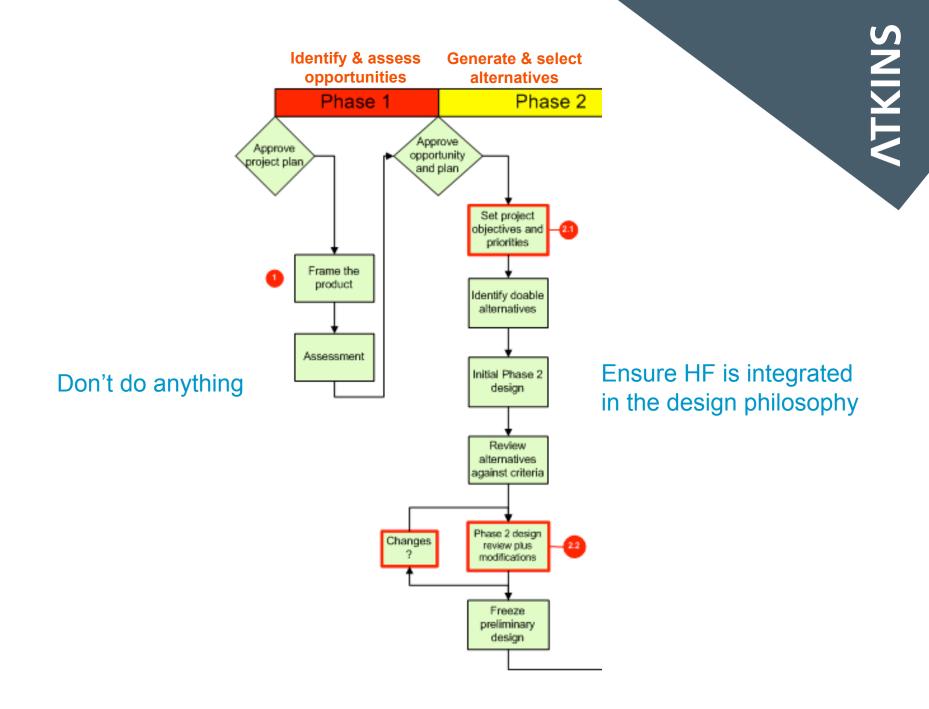
NTKINS 5 phase facility design process **Identify & assess Generate & select Develop preferred** Operate **Execute** opportunities alternatives alternatives & Evaluate Phase 2 Phase 3 Phase 5 Phase 1 Phase 4 , Approve Approve Operations Approve Approve design opportunity acceptance of projectplan preferred plan execution plan and plan com pleted and cost facility Develop project Finished definition design detail Factory Setproject drawings objectives and acceptance priorities Changes? process Pre construction Phase 3 Frame the activity design review product Identifydoable Close project alternatives scope Freeze P & IDs E quipm ent Fadility Assessment specs , control contruction narratives etc Initial Phase 2 Close design financials Projectdata Design scope ofservices Site management Review alternatives Design data CSOC againstoriteria Detailed design and construction Project drawings controls Changes Operating Phase 2 design proœdures Changes review plus Review by ? Tie in and m odifications discipline shutdown plans Issue for Freeze construction Pre-start up Training preliminary drawings safety checklist design freeze scope and action item s Detailed project Facilitystart execution plan up

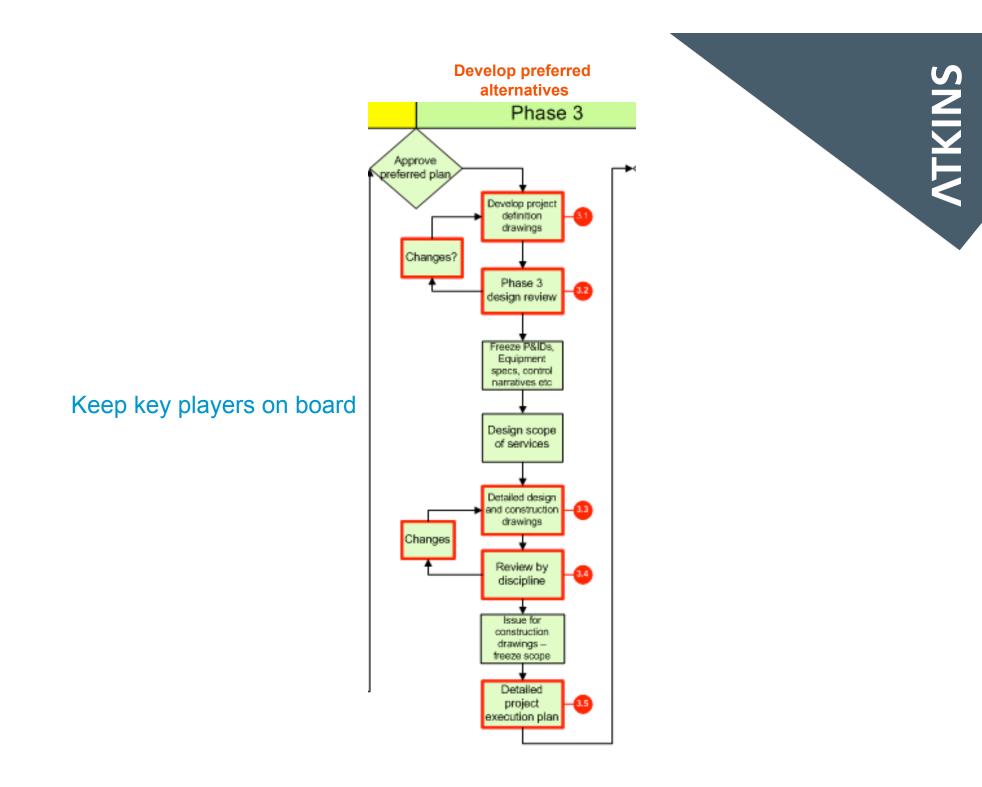
Where does HF fit in?

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"If an HF issue is not dealt with early enough, problems found downstream will be more expensive to resolve. Conversely, if detailed HF activities proceed too early, they may miss out on technical constraints that only emerge as technical developments unfold."

HSE RR001

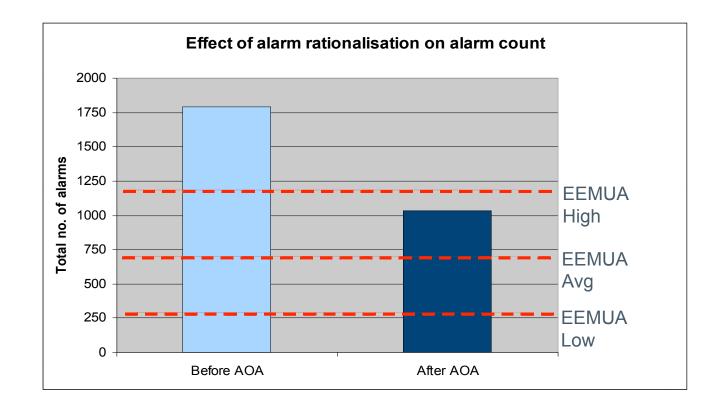




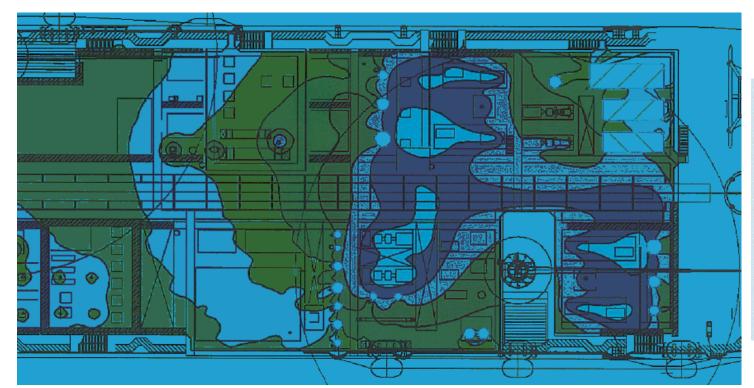
HFE successes: Alarm rationalization

- Alarm objective analysis
- Eliminate unnecessary alarms
- Optimize operator workload especially under abnormal conditions

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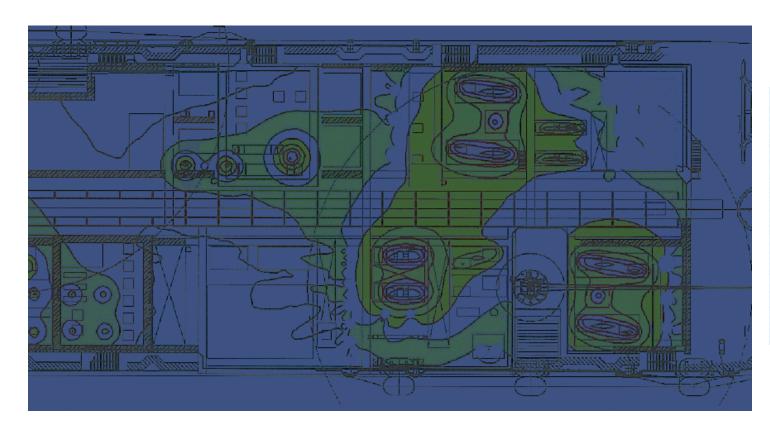


HFE successes: Noise attenuation



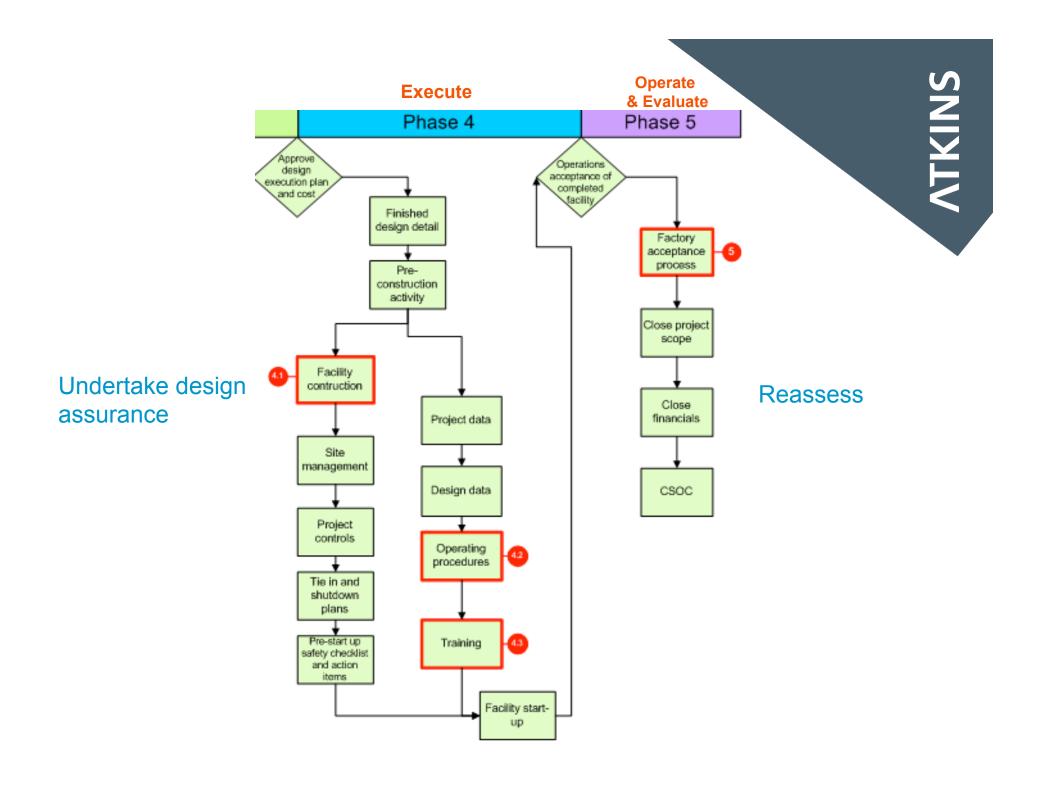
Noise Level in dB(A)				
97.5 <				
95.0 <		<=	97.5	
92.5 <		<=	95.0	
90.0 <		<=	92.5	
87.5 <		<=	90.0	
85.0 <		<=	87.5	
82.5 <		<=	85.0	
80.0 <		<=	82.5	
77.5 <		<=	80.0	
		<=	77.5	

HFE successes: Noise attenuation

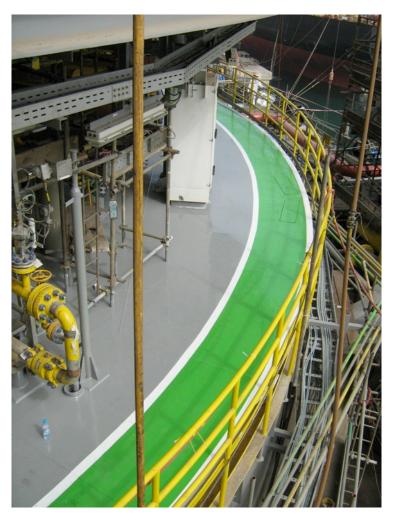


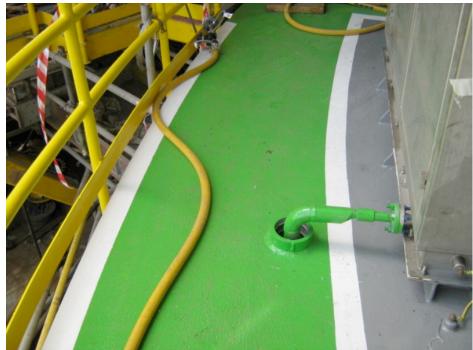
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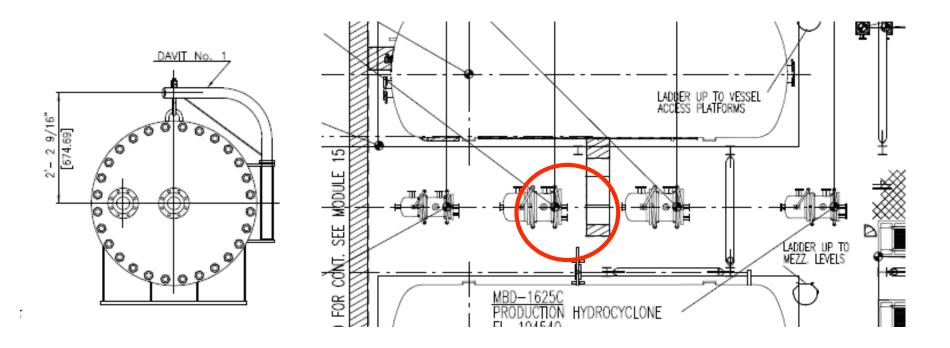


Issues to resolve: escape routes

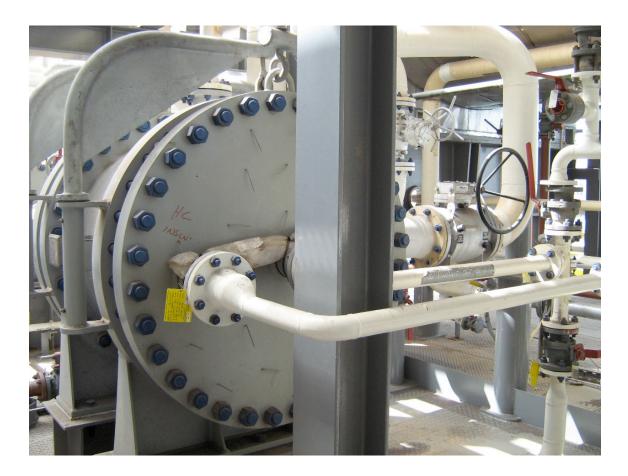




From design to construction: Production Hydrocyclone



From design to construction: Production Hydrocyclone



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Important points to consider

- Project team must buy into the HF process
- HF must proceed in parallel to technical development

- Apply HF where it is most needed and can achieve most added value
- Contracts with contractors and vendors must consider HF requirements

Thank you

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