HFC - forum for human factors in control	HFC-møte 23-24 april 2008			
Postadresse: 7465 Trondheim Besøksadresse: S P Andersens veg 5 7031 Trondheim Telefon: 73 59 03 00 Telefaks: 73 59 03 30	SAK, FORMÅL **Oppsummering og presentasjoner fra HFC-møte 23-24 april 2008 i Stavanger**			ORIENTERING
	Går til Møtedeltakerne i HFC forum og medlemmer Kursdeltakere "Introduksjon til HF og IO"			X X

PROSJEKTNR.	DATO	SAKSBEARBEIDER/FORFATTER	ANTALL SIDER
	2008-06-27	Stig O. Johnsen	61

Vi vil med dette sende ut evaluering av HFC-møte, deltakerliste og presentasjonene fra HFC-forum den 23-24 april i Stavanger, hvor StatoilHydro var vertskap.

Vi minner om neste møte den 1.-2. oktober i regi av IFE.

Dessuten minner vi om mulighetene for å ta kurset "Introduksjon til Human Factors og integrerte operasjoner" nå til høsten. Samlinger: 2.-4.september, 14.-16. oktober, 10.-13. november 2008. Lenke til kurset vil dere finne på www.hfc.sintef.no under "Kurs".

Innholdsliste:

I det nedenstående har vi sakset inn korte punkter fra de evalueringene som deltakerne leverte inn.

1.1 Generell vurdering av formen på HFC-møtene

Generelt synes det som om de fleste er meget godt fornøyd med møtene og formen som benyttes. Kommentarene vi får er positive, med gode tilbakemeldinger på det faglige og sosiale utbytte.

En kommentar fra siste møte var at det ble for liten tid mellom presentasjonene og tid til refleksjoner. Møterommet, auditoriet, passet heller ikke godt til å få etablert en god og åpen stemning.

Ellers var deltakerne meget godt fornøyd med besøkene hos Hovedredningssentralen for Sør – Norge, ConocoPhillips og StatoilHydro- Sub-surface expert Centre. Foredragene fikk generelt gode tilbakemeldinger.

1.2 Tema som ønskes behandlet på de neste møtene

Forumet er bredt med mange forskjellige deltakere og utfordringen er å gi alle noe. Generelt synes møtedeltakerne at det har vært bra å konsentrere seg om 2-3 emner og behandle de skikkelig.

Det har vært nyttig for HFC-forum å ha tema som er en kombinasjon av praktiske erfaringer, metoder og retningslinjer. Det er viktig at en ikke låser seg opp mot IO men at en passer på å ivareta bredden i HF.

Det har vist seg å skape god delaktighet når man har etablert arbeidsgrupper under HFC-forum møtene som har diskutert aktuelle tema.

I forbindelse med evalueringen kom det opp flere tema en ønsket å følge opp senere, eks:

- Oppfølging av HYDRO's presentasjon i oktober 2006, hvordan gikk det når man benyttet "Metode for å identifisere HF utfordringer"?
- Reelle erfaringer fra IO løsninger. Med synspunkter fra de som anvender ulike løsninger og konsepter. Noen problemstillinger som ønskes belyst er om arbeidsoppgavene har blitt mer spennende, om det har blitt mer motiverende å jobbe eller om stressnivået er økt? Og hva med utfordringer knytte til "Remote Control" dvs. ekte fjernstyring, er det like aktuelt eller blir det nedprioritert?
- Hva er ledelsesutfordringer og utfordringer knyttet til implementering av IO?
- Hvordan jobber man i team under IO? Hvordan etableres og bygger man ut kunnskap og kompetanse i team som samhandler? Hvordan mobiliserer man i forbindelse med teamorganisering? Hvordan skal men trening på samhandling i forbindelse med IO?
- Det snakkes mye om teknologi og utforming, ikke hva vi samhandler om og hvordan. En bør derfor i sterkere grad ha fokus på de nye arbeidsformene i IO, en bør ikke bare se på design av rommene, men innholdet er like viktig.
- Diskutere endring i arbeidsprosesser i forbindelse med IO. Hvilke HMS-risikoer kan det medføre? Hvilke barrierer er viktige i et IO perspektiv?
- Det hadde vært fint med HF praktikere til å innlede metodediskusjon og analyser (Eks James Bunn/ StatoilHydro, noen fra Scandpower, HFS, Sintef, IFE eller HCD.
- Internasjonale erfaringer og innspill ønskes. Hva med erfaring fra "ekte fjernstyring?
- Kan vi på sikt få etablert en omvisning hos f.eks SAAB flyproduksjon eller i et CCR i et kjernekraftverk?

AGENDA

HFC Møte

StatoilHydro Stavanger

23-24 april
2 0 0 8

Praktisk erfaring fra ulike samhandlingsrom – MTO samspillet i distribuerte team

Konferansen arrangeres i Stavanger; StatoilHydro, Forus Øst, IB bygget

Dag 1-23/4		Ansvar/Beskrivelse
12:00-13:00	Registrering og lunsj	StatoilHydro
13:00-13:30	**Velkommen til møtet – rundgang rundt bordet**	HFC
13:30-14:15	**IO i StatoilHydro, eksempler fra boring**	K.Andersen/StatoilHydro
14:15-14:45	**Toolbox talk - basic introduction and tips and tricks about different HF tools and techniques – "What to look for today and tomorrow"**	M.Green/HCD
14:45-15:00	Busstransport til Hovedredningssentralen	
15:00-16:00	**Hovedredningssentralen for Sør –Norge Fokusområde, Demo, Refleksjoner i plenum**	A.Viste/HRD
16:30-16:30	Refleksjoner*: Human Factors issues, experiences, suggestions, best practice, leading edge? Issues during normal operations, handling of unwanted incidents - locally (how collaboration and exception handling is performed between offshore and onshore CCR.) Other themes of interest to HFC?	Panel (A. Drøivoldsmo, M.Green, E.Bjerkebæk)
16:30-17:00	**CRIOP – Før og nå**	J.Monsen/Scandpower
17:00-17:30	**CRIOP – Fremover: MiniCriop, Criop for samhandlingsrom?**	Plenumsdiskusjon
17:30	Busstransport til Thon Hotel Maritim	
19:00-20:00	**Omvisning på Oljemuseet** (fottur fra hotellet)	
20:00-…	**Middag på Bølgen og Moi (Oljemuseet) musikk**	
Dag 2-24/4		
08:30	Buss henter på Thon Hotel Maritim	
08:45-09:00	Kaffe	
09:00-10:00	**ConocoPhillips –Onshore Operations Center og Onshore Drilling Centre - Fokusområde, Demo, Refleksjoner i plenum**	I.Trane/ConocoPhillips
10:00-10:30	Refleksjoner* - ConocoPhillips	Panel
10:30-10:45	Busstransport til StatoilHydro	StatoilHydro
10:45-11:45	**StatoilHydro- Sub-surface expert Centre Fokusområde, Demo, Refleksjoner i plenum**	Sølvi Løwen/StatoilHydro (T.I.Throndsen)
11:45-12:15	Refleksjoner* - StatoilHydro	Panel
12:15-12:30	**HF Kurs – erfaringer, innspill**	I.Wærø/SINTEF
12:30-13:00	**Arbeidssystemenes formelle og uformelle dimensjoner.**	V.Hepsø/StatoilHydro
13:00-14:00	Lunsj - StatoilHydro	StatoilHydro
14:00	Flytaxi	StatoilHydro

Deltakerliste

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Classification: Internal Status: Draft

IO in StatoilHydro - Drilling and Well

Ketil Andersen
Discipline Advisor Drilling & Well, Process Owner D&W

StatoilHydro

Integrated operations:

”New way of planning, organizing and performing tasks, made available by use of modern information- and communication technology. The goal is increased value creation through increased collaboration across disciplines, licenses, corporations and geography”.

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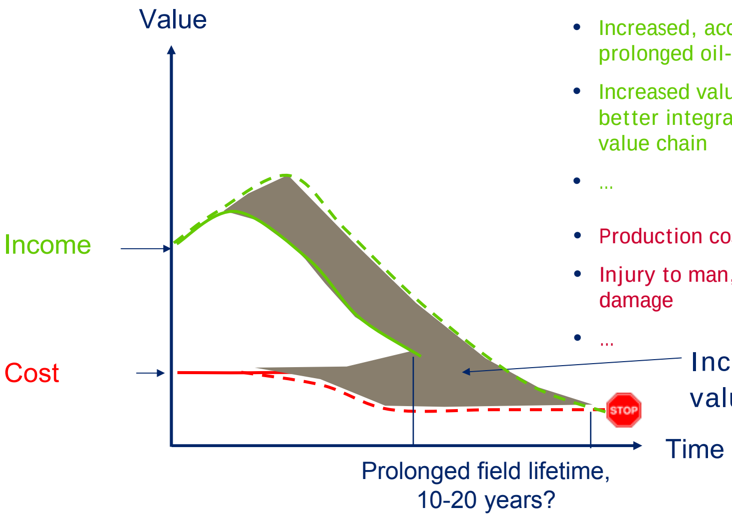
Goal: Increased value creation



- Increased, accelerated and prolonged oil- and gas production
- Increased value creation through better integration (totality) in the value chain
- ...
- Production cost
- Injury to man, and environmental damage
- ...

Increased potential for value creation

StatoilHydro

IO Changes the Way of Working

Before	After
Serial way of working	Parallel way of working
Single discipline	Multidiscipline teams
Dependent on physical location	Independent of physical location
Decisions based on experience data	Decisions based on real-time data
Reactive	Proactive

A balanced combination of M, T and O enable us to improve work processes so that we have faster, more efficient and safer operations.

Enabled by sensors, bandwidth, …., automized KPI analysis of work processes

StatoilHydro

IO comprises both M(an), T(echnology) and O(rganisation)

M	A work process is a set of tasks needed to be done for the organization to reach specified goals.
T	**The work processes are the 'glue' that ties M, T and O together**
O	

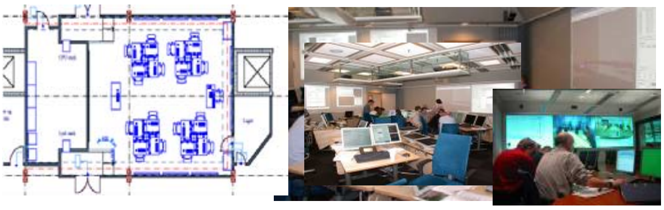
Way of working: The way we do the job

i.e.

Work process = **what** we do, which tasks to be done

Way of working = **how** we do it, how the tasks are done

The evolution of efficient cross-functional teamwork



many to many

(permanent work place)

M — Synchronized action; Common understanding of main goals and tasks

T — Real time data; Virtual arena; Applic. with shared models; Operation room

O — Independent of physical location; Cross-functional teamwork

action

action

The ideal combination of MTO-elements is determined by the work process

Different work processes require different competencies, tools, arenas and forms of interaction

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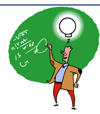
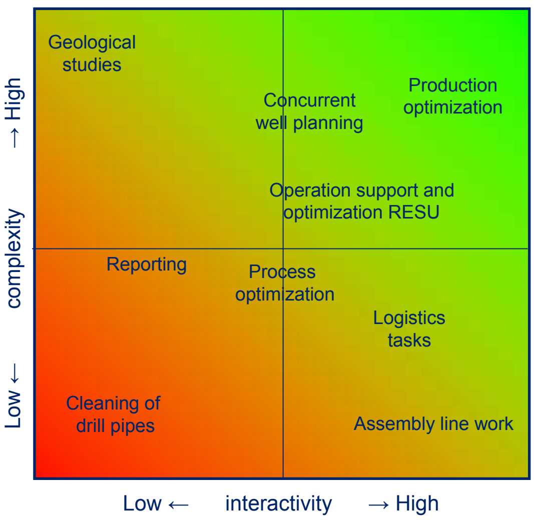
IO does not aim to improve all work processes



Cross-functional (multi-disciplinary) teams are most required when the single tasks are complex and characterized by a high level of interactivity.

Interactivity (*x-axis*) refers to how closely related single tasks are.

Complexity (*y-axis*) refers to how difficult it is to perform the single tasks.



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Working arenas and different tasks

The operation support room will be the main working arena…

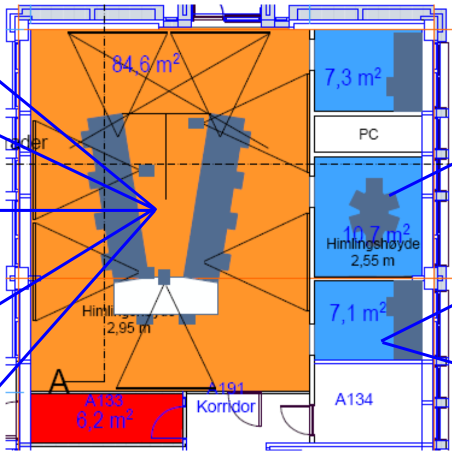
Planning

Monitoring

Operative problem solving

Emergency response

Individual tasks



Various meetings (e. i. sensitive issues)

Personal calls

Very concentration demanding individual tasks

…but through the day operators will move back and forth between different arenas depending on the task

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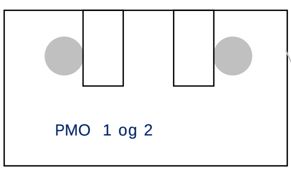
Production optimization at the Heidrun/Stjørdal field

Before

- 2 PMO's
- Limited possibilities for collaboration
- Restricted access to RT production data
- Individual well focus
- Producing according to overall schedules and plans

PMO room



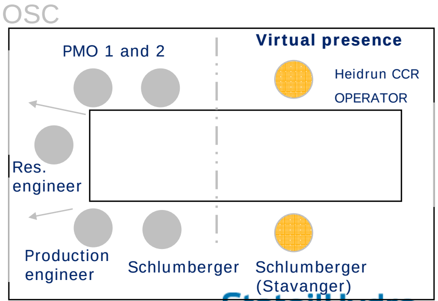
CCR Heidrun

PMO: Production, monitoring and optimization engineer

After

- Focused experienced resources in new facilities
- New collaborative possibilities
- Increased focus on details and analysis work
- Access to RT production data
- Increased integrated asset awareness
- Challenge stable schedules and plans

OSC



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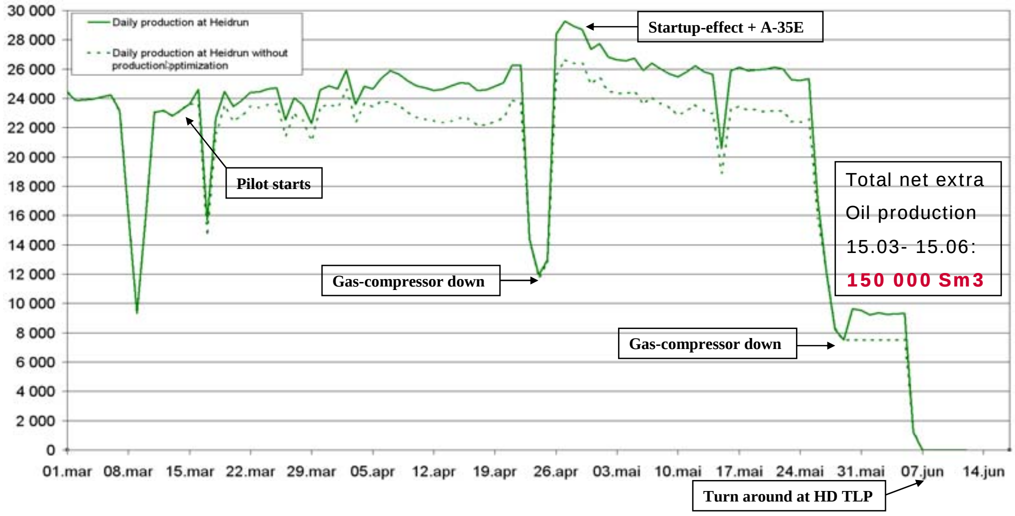
Effect on the daily production



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Production optimization at the Heidrun/Stjørdal field

What has been achieved?

- Increased focus on production technical analysis, challenging the controlling criteria for individual wells and optimization of the total system
- Increased production (5-7%): 400 - 600 000 Sm3 per year
  = 2.5 – 3.8 million barrels per year
- Estimated value ($65/barrel): Approx. $200 mill. per year

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Examples of increased value creation:

- Production optimization at the Heidrun/Stjørdal field:
  - accelerated production by 400-600 000 Sm³ per year (~ $ 200 mill. per year)
- Use of real time data at the Statfjord field:
  - All non-productive engineering time freed up (70%)
  - More efficient use of the engineering resources onshore
- Drilling of development wells at the Heidrun/Stjørdal field:
  - OPS-factor increased from 81% to 95%
- Concurrent planning at the Gullfaks field:
  - Faster and better decisions
  - Planning operation accomplished in two weeks (instead of 4-5 weeks)

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Summary of Integrated operations

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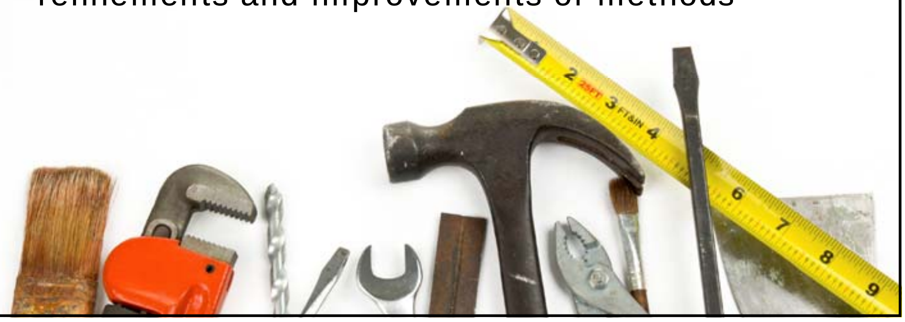
Toolbox Talks

Aim of these talks:

- Provide short, practical overview of a technique or approach for non-HF specialists
- Promote exchange of practical experience and 'tips and tricks'.
- Promote discussion on relative usefulness refinements and improvements of methods



Path to enlightenment...

Step 3: Getting experience yourself ✗

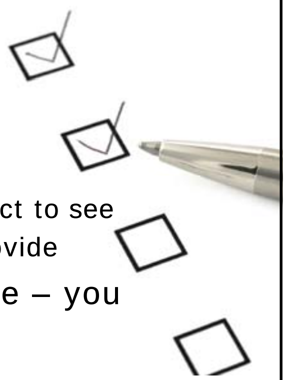
Step 2: Learning from others – experience exchange ✓

Step 1: Learning the Theory ✓

Toolbox Talk 1 :
Control Room Evaluation

A control room needs evaluating from a HF perspective. What should be done?

2 perspectives:
- Those who would do an evaluation
  - Tips on how to prepare & carry it out
- Those sponsoring the work
  - Realistic idea of what you should expect to see
  - What resources you might need to provide



Not just clipboard & question exercise – you could do that via the net

Today's Talk

- WILL NOT give you a 'complete HF' question set
- WILL:
  - give you tips on 'good practice' for before, during & after the visit
  - give you useful 'none standard' questions many of which are not found in HF question sets
  - Help you create the right conditions for a good & useful evaluation

1. Have a clear goal

"Why am I here & what am I trying to achieve"

- General evaluation
  - Operational Experience Review – reuse?
  - Feedback after start up - what changed in commissioning?
  - Upgrading programme – what can we improve?
- Specific issue
  - System not working
  - Users not happy

2. What to do Before

- Get understanding of main functions & tasks before you go
  - This will help select questions to ask
  - Ideas for scenarios, situations
  - Identify challenging areas/tasks
- Don't be too ambitious
  - fit scope to time you have (more about that later)
  - allow time for
    - everyone to settle down
    - interruptions
- Try to get pictures before you go - not surprised

Lystbåter Aftenposten 20 April

«På sjøen har vi fått stadig flere ulykker og uhell, og mange av disse skyldes enten for liten kunnskap om elektronikken eller at vi ikke klarer å bruke den rent praktisk.»
Jan H. Syvertsen, forbundsleder i Kongelig Norsk Båtforening

- Touch-skjermer
- Kartplotter.
- Radar,
- GPS + VHF:
- VHF-radio
- AIS (automatisk identifikasjonssystem).
- Alarm:
- Autopilot
- Computer:
- Powertrim:
- Vinsjer:
- Rulleseil:
- JoysticK:

2. What to do Before

- Prepare your question set (remember functions & tasks
  - Use terms people can relate to - not jargon
  - questions are 'openers' you need enough knowledge to fill them out and give examples if necessary.
  - be prepared to hop about, change order & emphasis
- Plan to cover as many variations as possible
  - New & experienced users
  - Day & night shift
- Get an understanding of the Culture
  - dress code
  - behaviour code – church or wild west?
  - current issues in the organisation – improvements, downsizing, conflicts?
- Prime the audience
  - Get a trusted member of the organisation to explain what you want to get out of the visit to the users in advance

3. What to do During

- Social skills
  - relax people - 'they' are the experts
  - not evaluating the Operators but the tools & systems they have been given. **Make this clear!**
  - Don’t be critical while there
  - Be equally sensitive to what is not said
- Not too many people - two should be enough.
  - 1 for questions & 1 for notes
  - pass the baton, help each other
  - gives one chance to look around
- Take time
  - take breaks with them - lunch, coffee, smoke, informal chats away from work

3. What to do During

- Take Pictures
  - check its ok and take lots
  - note what you take pictures of
  - try to confirm content while you are there
- Agree you can send things to confirm you understood things correctly
  - pictures
  - notes
- Prepare to be flexible
  - Have a back up plan
  - Don’t slavishly follow question set
  - If things happen - pull back!
  - don't interrupt BUT DO WATCH
- Say ‘thanks’

Human Centred Design

4. What to do After

- Relax – you survived!
- Thank them again
- Check back and get confirmation or addition information if needed
- Send them feedback & final product

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Human Centred Design

5. None standard questions

- Design process
  - Users involved? HF used?
- Anything you couldn't fix during design
  - What done about it afterwards? live with it? changed it?
- **Look for temp & operator changes**
  - Post-it notes, tape, 'graffiti'
  - NOTE: with IT can't add tape: harder to find, harder to change (none standard additions to interfaces)
- 5 good things, 5 bad things about your control room
- What would you change if you could & why?
- Have things drifted away from design standards after come in operation?
- Have you tried to collect 'lessons learnt' since came in to operation?
  - Questionnaires, comments/suggestions?
- Has how you do your job changed (How have work processes changed)
- Have social aspects changed- teams?

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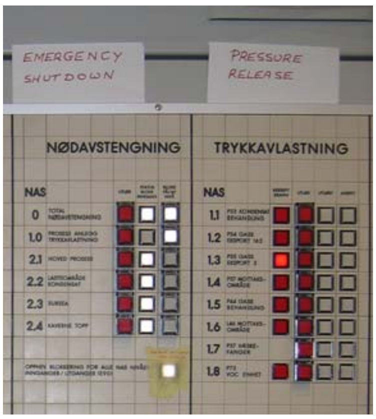
Operator graffiti



Operator modifications…

6. How to go further

- Dozens of question sets.
  - CRIOP
  - NUREG 0700
  - ISO 11064
  - HFAM
  - Company specific: HFAST, StatoilHydro 'Nå' analysis
- Key is to pick out the relevant questions for THIS job.
  - What's the problem?
  - Functions and tasks

Summary

- Toolbox talks: Practical emphasis
- Control room evaluation
  - Before
  - During
  - After
  - Tips and tricks

- Idea is to share experiences… so over to you

Topics for other Toolbox talks

- How to use tasks analysis to identify training needs?
- How to document CCR functions and requirements?
- How to carry out a CRIOP?
- How to get end users involved in display design?
- How to present HF arguments to non HF people?
- Choose a topic related to the theme for the meeting?

And to finish…

A **hot** water dispenser

Thank you

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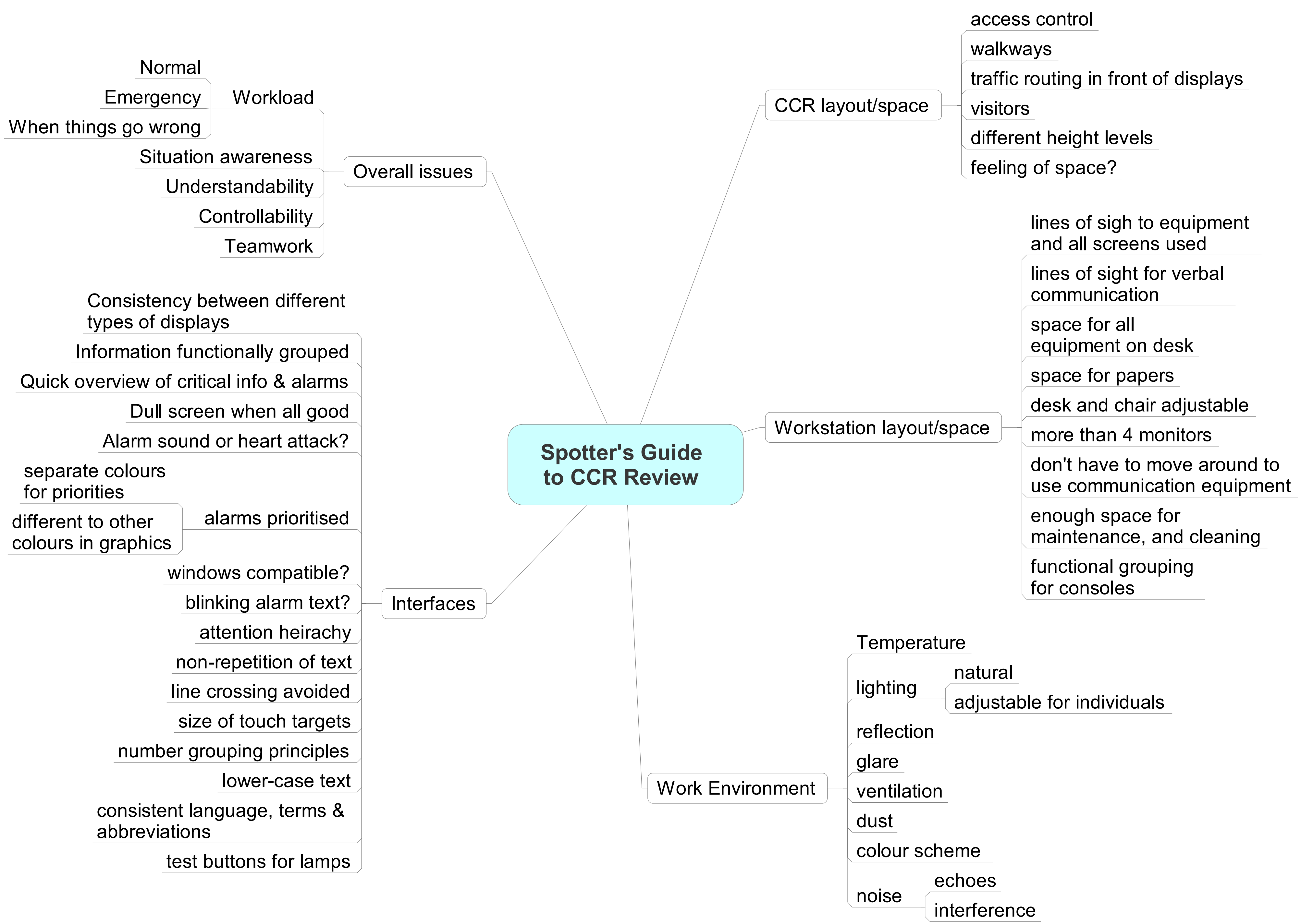


Spotter's Guide to CCR Review
Overall issues
Workload
Normal
Emergency
When things go wrong
Situation awareness
Understandability
Controllability
Teamwork
CCR layout/space
access control
walkways
traffic routing in front of displays
visitors
different height levels
feeling of space?
Workstation layout/space
lines of sigh to equipment and all screens used
lines of sight for verbal communication
space for all equipment on desk
space for papers
desk and chair adjustable
more than 4 monitors
don't have to move around to use communication equipment
enough space for maintenance, and cleaning
functional grouping for consoles
Interfaces
Consistency between different types of displays
Information functionally grouped
Quick overview of critical info & alarms
Dull screen when all good
Alarm sound or heart attack?
alarms prioritised
separate colours for priorities
different to other colours in graphics
windows compatible?
blinking alarm text?
attention heirachy
non-repetition of text
line crossing avoided
size of touch targets
number grouping principles
lower-case text
consistent language, terms & abbreviations
test buttons for lamps
Work Environment
Temperature
lighting
natural
adjustable for individuals
reflection
glare
ventilation
dust
colour scheme
noise
echoes
interference

Notes and pictures from the visit by the HFC group, Stavanger, 23-24th April 2008

1 Hovedredningssentralen for Sør Norge

Host: Asbjørn Visit

23rd April 2008

The visit comprised;

- Presentation of a film of the rescue services in Norway
- Presentation of services provided by Hovedredningsssentral and the main software used to support the service
- Visit to the control centre

Key points & notes:

The centre is staffed by two people on a 24/7 basis. Response time for additional support is 1 hour.

Staff rotate on a 13 week cycle.

Emphasis is on communication and facilitation

Respond to 5000 incidents per year: 50-100 incidents that require 2 or more controllers.

For larger incidents, support and coordination done with Bodø as well as fire, medical and police services.

Regular exercises and training drill are held for the centre.

The centre typically interacts with the local operations centre rather than the incident leader.

The service has to interface with many different organisations who use different methods and languages- an important aspects o f the service is the ability to act as an interface between these bodies and to coordinate them in to a coherent response.

It provides resources and people covering land, air and sea, on a national and sometimes international basis

Recruitment process: testing, interview followed by 1 year probation. Staff often placed out with other organisations so that they are familiar with the methods and languages used and have experience of the conditions in to which they, as controllers, will be asking the rescue services to go in to.

Workload: Operators need to be self-aware and know their own limitations. Co-operation and communication are important. When receiving initial calls they may only get 1 chance to gather the information they need to evaluate the situation and make the appropriate response.

Single biggest challenge is to change from a small to a large team. Need to brief others and support people; giving the detailed information while stepping back and keeping an overview. IT can help with this.

A typical workstation has 5 screens: 3 for search and rescue application (SARA), logging and resource location and allocation: 2 screens free for using for internet access to many databases and net services.

Extensive communications equipment is available. Able to run an air sector from the centre.

Desks have a Plexi-glass covering so important documents and numbers can be stored leaving desk space on top for other files etc. (See figure 4=

Diesel provide back up power supply, telecom by 3 redundant providers.

There is also a cetre desk with a flat top for opening maps, etc. (See figure 6)

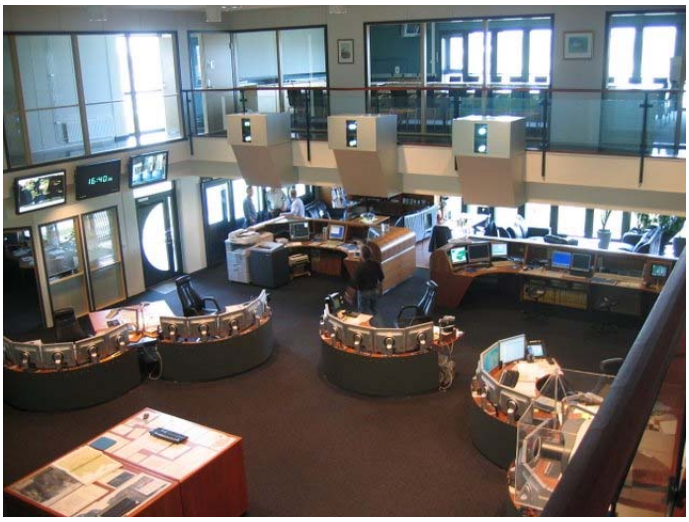


Figure 1: General view of the centre

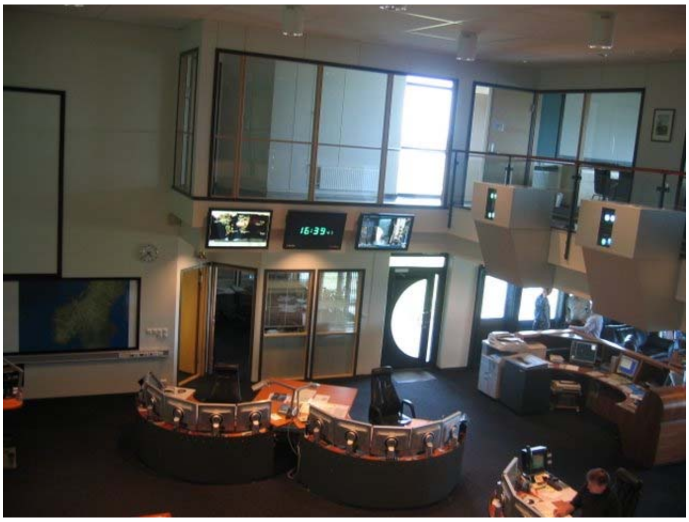


Figure 2

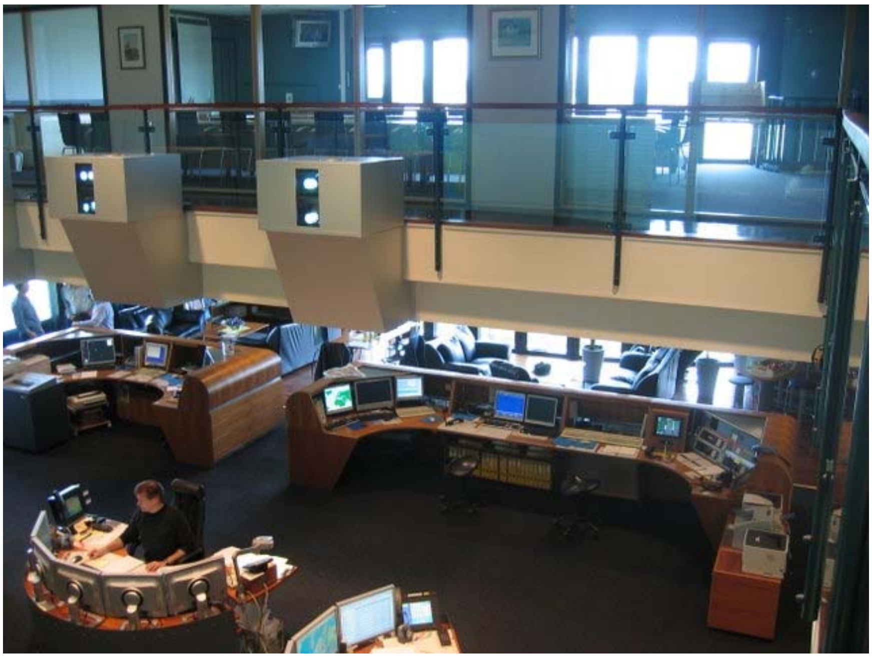


Figure 3

Figure 4: typical station

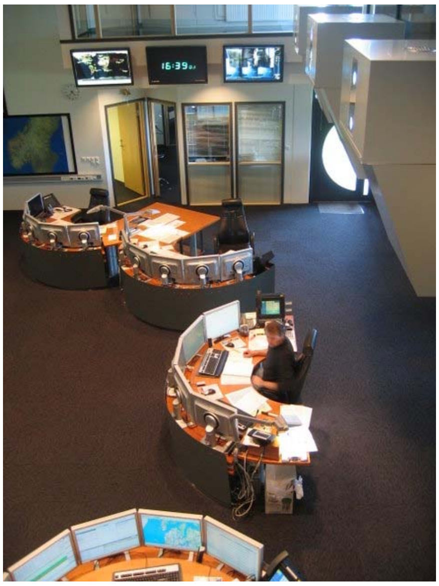


Figure 5

Figure 6: Overview screens and back up whiteboards

Figure 7

Figure 8: Access control

2 Conoco Phillips –Onshore Operations Centre and Onshore drilling Centre

Host: Ivar Saga Trane

24th April

The visit comprised;

- Short introduction;
- Visits to the drilling centre, onshore operation centre and Production optimisation centre.

Collaboration Room:

Board Room table. Video, data sharing, UHF, visi-wear

Drilling Centre

Drilling expertise moved from offshore to onshore.

Remote operations

Operating down hole equipment

Not two way video communication via CCTV system only offshore to onshore. This will be changed in the future

5-6 drilling operations can be controlled. Operations involve the Ekofisk field, Conoco Phillips onshore and Halliburton offices and other sub contractor sites

All data on display, displays are reasonably traditional, projects are being carried out looking at new visualisation methods, e-drilling and more extensive use of simulators.

The centre is being moved and extensive changes being made to; lighting, carpets, desks size being increased, space allowed from training, moving from back projection to LSD displays to create more space 4 22inch screens.

Drillers don't share information on the LSDs to coordinate operations but rather to support each other.

Figure 9: Drilling Centre

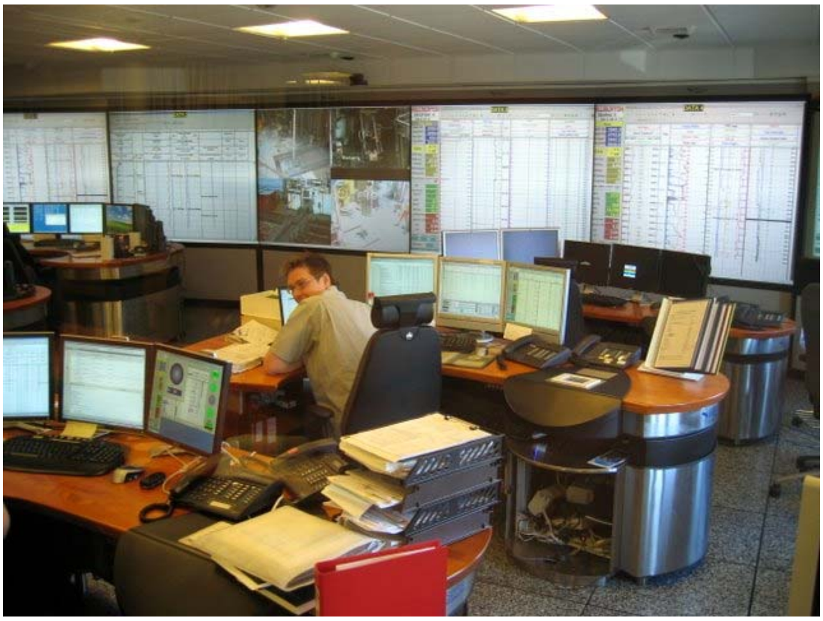


Figure 10

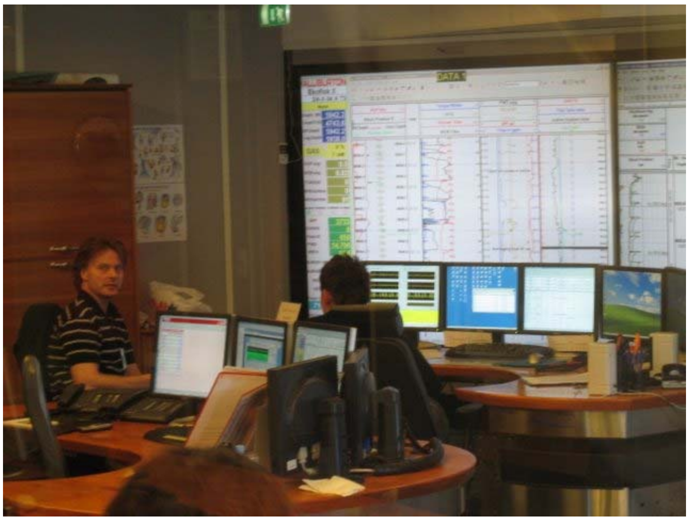


Figure 11

Onshore operations room

Built after the original centre had been operated and this experience used as input to the new centre. Example Production optimisation will be moved to a separate room, small team, not need large screens. The original design put many functions together but the new design will split them up.

Stavanger is the Conoco Phillips largest user of video conferencing and this will rise in the future. HD video is to be installed.

Figure 12: New Ops centre

Figure 13

Production Optimisation Centre

Move back to a more traditional open landscape office which allows easy communication.

Figure 14: Production Optimisation Centre

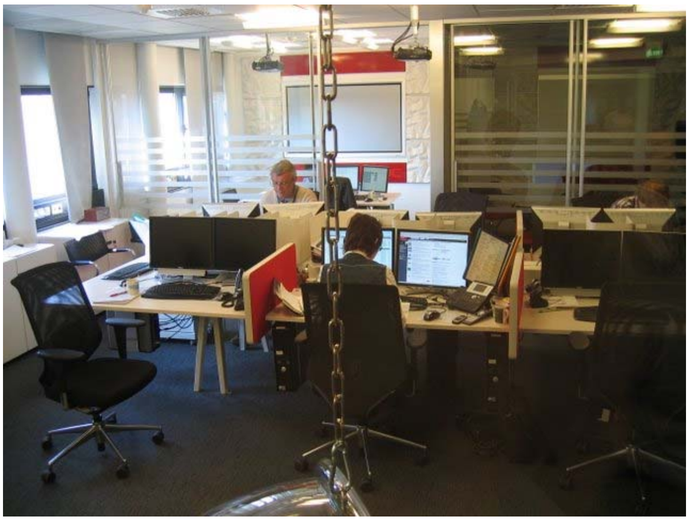


Figure 15

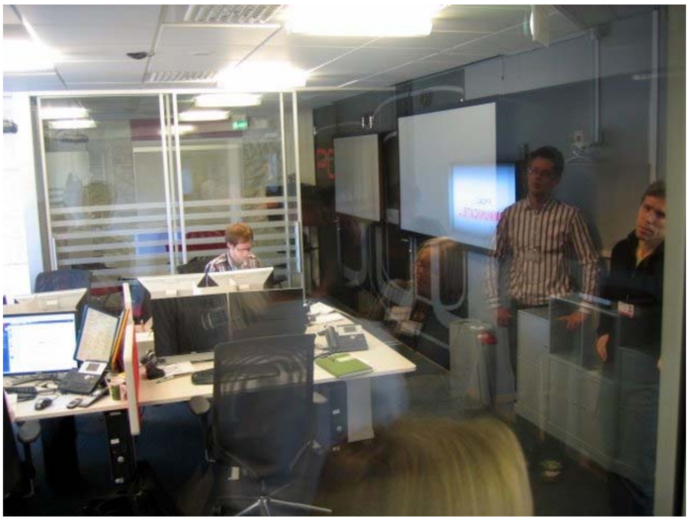


Figure 16

3 StatoilHydro Sub-surface expert centre

Host: Sølvi Løwen

The visit compromised of;

- Visit to and presentation of the services and functions carried out at the centre

(see presentation from StatoilHydro)

Figure 17

Figure 18

Classification: Internal   Status: Draft

Subsurface Support Centre

TNE SST DT

StatoilHydro

Official opening of Subsurface Support Centre, September 2007

susu@statoilhydro.com

StatoilHydro


StatoilHydro


StatoilHydro

Subsurface Support Centre

A hub for communication between the discipline networks and the operating units

Official opening of Subsurface Support Centre, September 2007

susu@statoilhydro.com

Subsurface Support Centre

A hub for communication between the discipline networks and the operating units

Official opening of Subsurface Support Centre, September 2007

Discipline Networks

Operating Units

Subsurface Support Centre

Duty list available on BOB Extranet

FIXED UNITS
ST-FO H-1644
52 87 14 30

Drilling and Well Superintendent
Steinar Heggen

Drilling Plan Manager
Ståle Østensen

Well Plan Manager
NN

Analysis engineer
Dana Kazbekova

Operational geologist
Torger Lund

Discipline Duty –

SST Well Technology and SSC Drilling Technology

- •Well Control
- •Drilling Technology
- •Rock Mechanics
- •Fluids
- •Well Completions
- •Sub sea
- •Rig Equipment

- •Process Owner D&W on Duty
- •Technical Engineer on Duty
- •Subsurface Support Centre on Duty

MOBILE UNITS
ST-FO H-1641
52 87 14 29

Drilling and Well Superintendent
Bjørn Risvik

Drilling Plan Manager
Børge E. Nygård

Well Plan Manager
NN

Analysis engineer
Harish Pillai

Operational geologist
Torger Lund

Subsurface Support Centre

A hub for communication between the discipline networks and the operating units

Discipline Networks

Official opening of Subsurface Support Centre, September 2007

Operating Units

susu@statoilhydro.com

StatoilHydro

Presentasjon torsdag

- Om dere er fornøyd
  - Noe stort, virker "avskrekkende" for de på andre siden, Er Dere Så Mange?
  - Ikke god kontakt med deltakerene fra SSC på videokonferasne (mørkt bilde, deltakerene sitter langt fra, bak svarte skjermer….)
  - Mye sterkt lys under videokonferanse rettet mot de som sitter og jobber
  - Kamera ser rett inn i de svarte skjermene
  - Tastatur bråker mye, ikke mulig å jobbe mens møtet pågår
  - Mye lys inn fra vinduet
  - Bonkersfølelse om vinteren
  - Smartborarden kan ikke brukes til å tegne på logger grunnet tykke streker

StatoilHydro

Presentasjon torsdag

- Hensikten med rommet – utstyret
  - Analysere erfaringer på tvers av selskapet samt formidle ekspertisen i TNE ut til de operative enhetene
- Hvordan det brukes
  - Fast ansatte i SSC samt vakter sitter permanent
  - Arrangerer morgenmøte med deltakelse fra Bergen
  - Gjør felles analyser og diskusjoner med logger på bordet
  - Jobber individuelt
  - Har møter med operative enheter

The Sub Surface Support Centre contributes to experience transfer between the operational units

We work closely on operational issues together with all of the StatoilHydro operational units, both on the Norwegian shelf and globally - This give us a unique opportunity to evaluate experiences and spread the knowledge

The goal is to work proactive and reduce incidents and non productive activity by doing things right at the first time

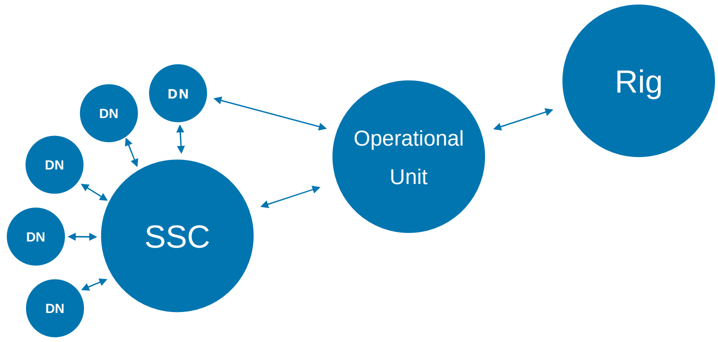
The Sub Surface Support Centre promotes collaboration between the different disciplines within drilling and well technology

The work processes in the centre ensure high quality multi discipline discussions and recommendations, also within the limited time frame on ad- hoc operational issues

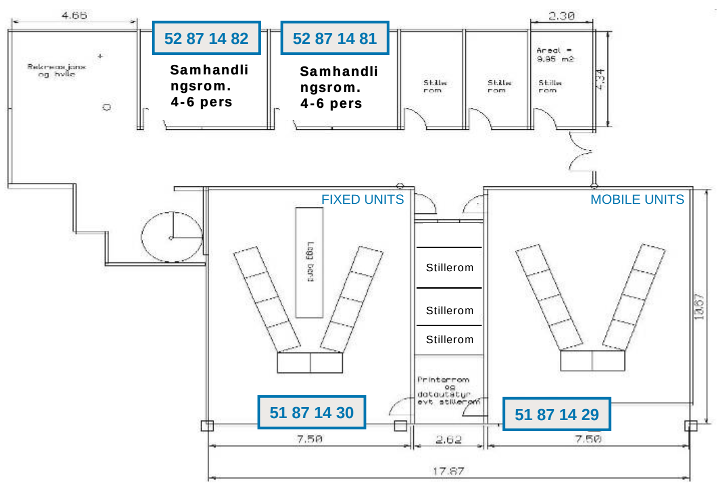
The discipline networks become more operational contributing through the Subsurface Support Centre

The Sub Surface Support Centre are a contact point between the discipline networks and the operational units and with our help it is easy to get hold of the required expertise

Communication Lines



Subsurface Support Centre – Facilities and Phone Numbers



Spread the knowledge!

Subsurface Support Centre, Tasks

- Involvement in defined challenges
- Participate in
  - Method selection
  - Risk assessment
  - Peer review
  - Peer assist
  - Drilling Review Board
  - Experience Search
- QA/QC of operation plans and risk analysis
- Evaluation of time- and depth based drilling and formation evaluation data
- Perform analysis
- Respond to other requests from operational units
- Give input to discipline advisors on best practice and governing documentation

susu@statoilhydro.com

Drilling and Well - business critical for StatoilHydro

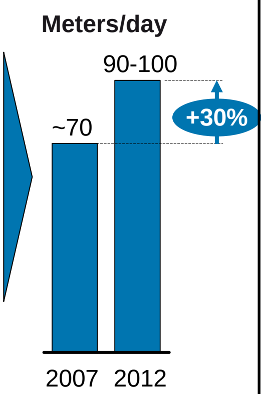

Slik skal Statoil-Hydro lykkes

Prisen trekkes oppover

...strand foran en tur... olve-feltet, skisserer han derfor svært detaljert hvordan StatoilHydro skal øke sin norske produksjon:

Boreeffektiviteten, eller antall meter en rigg borer per dag, skal økes med 30 prosent. De siste årene har effektiviteten falt markant, også på grunn av mer kompliserte brønner.

Driftsregulariteten, eller oppetiden på plattformene, skal økes fra et snitt på 88 prosent i retning til rundt 90 prosent.



StatoilHydro

StatoilHydro

StatoilHydro
Chief Executive Officer
(Lund Helge)
Stavanger

CEO CEO OFFICE (Eitrheim Pål) Stavanger	INT INTERNATIONAL EXPLORATION & PRODUCTION (Mellbye Peter) Oslo
CFO ØKONOMI & FINANS (Sætre Eldar) Stavanger	M&M FOREDLING & MARKEDSFØRING (Jacobsen Jon Arnt) Stavanger
COA KONSERNREVISJONEN (Næss Stein Egil) Stavanger	NG NATURGASS (Bjørnson Rune) Stavanger
CSO KONSERNSTABER & TJENESTER (Aasheim Hilde Merete) Stavanger	PRO PROSJEKTER (Ruud Morten) Oslo
EPN UNDERSØKELSE & PRODUKSJON NORGE (Torvund Tore) Stavanger	TNE TEKNOLOGI & NY ENERGI (Øvrum Margareth) Bergen

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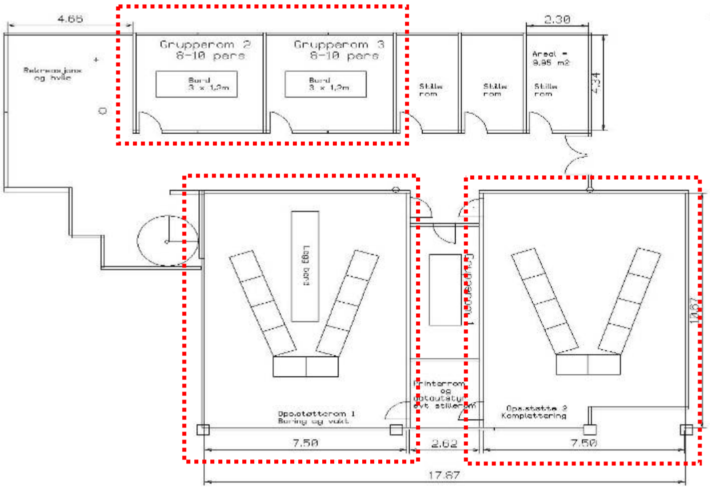
StatoilHydro

Subsurface Support Centre – Facilities and Phone Numbers



susu@statoilhydro.com

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Arbeidsprosesser

StatoilHydro

HFC	**NOTAT**
	SAK, FORMÅL **Status – Kurs "Introduksjon til Human Factors og Integrerte Operasjoner"**

HFC - human factors in control

Postadresse: 7465 Trondheim
Besøksadresse: S P Andersens veg 5
7031 Trondheim
Telefon: 73 59 03 00
Telefaks: 73 59 03 30

DATO	FRA: Stig O. Johnsen/SINTEF,
25/6-2008	

1 Innledning

Basert på innspill fra HFC-forum har vi gjennomført kurset "Introduksjon til Human Factors og integrerte Operasjoner" ved NTNU i Trondheim i vårsemesteret 2008. Beskrivelsen av kursopplegget kommer til slutt i dette notatet.

Kurset har gått over 10 kursdager og har gitt kursdeltakerne 15 vekttall. Emnet kan inngå i en mastergrad i organisasjon og ledelse ved NTNU.

Vi har hatt 3 samlinger:

- Første samling: 12. - 14. februar,
- Andre samling: 31. mars - 3. april,
- Tredje samling: 6. - 8. mai.

Alle samlinger foregår ved NTNU på Dragvoll og vi fikk forelesere fra HFS, NTNU, IO senteret, SINTEF og IFE. Kurset ble i hovedsak levert fra HFS ved A.Balfour.

Det var 15 engasjerte deltakere med bred og lang erfaring fra olje og gass næringen som deltok. Deltakerne var fra Sintef Teknologi og samfunn, ConocoPhillips Norge, StatoilHydro, Aker Kværner Elektro, Kongsberg Intellifield, National Oilwell Varco, Proactima AS, ABB AS og NTNU. Mye av grunnen til den brede deltakelsen var interessen for Human Factors og Integrerte Operasjoner i kombinasjon.

Kurset ble gjennomført som en pilot for å teste ut konseptet - og vi har lært mye fra kursdeltakerne. Kurset og opplegget har blitt videreutviklet og har fått en faglig forankring hos NTNU ved Psykologisk institutt under styring av Karin Laumann. De vil ha nært samarbeid med HFC forum og andre aktører som er opptatt av Human Factors.

Den nye kursbeskrivelse ligger på: http://videre.ntnu.no/link/nv10734
Kurset er justert og vil basere seg på forelesninger i samarbeid med HFS, NTNU, IO senteret, SINTEF og IFE. Neste kurs vil arrangeres i høstsemesteret:

- Første samling: 2. - 4. september 2008
- Andre samling: 14. - 16. oktober 2008
- Tredje samling: 10. - 13. november 2008

APPENDIX. Description of training curriculum - Introduksjon til Human Factors og integrerte operasjoner/ Introduction to Human Factors and integrated operations (Arrangert vårsemesteret 2008).

1 Goals

The aim of the course is to provide an introduction and overview of human factors approaches, methods and techniques that can be applied in the Norwegian oil and gas industry, with a focus on Integrated Operations. The framework for the course is to be the ISO 11064 standard. After completing the course, participants should have a working knowledge of what human factors is, different human factors approaches and how and where human factors methods and techniques can be applied in the design process.

2 Scope

The course plan is for the further education of personnel who already hold a degree/have a professional background.
The course plan is for 10 days (@ 6 hours @ 45 minutes effective teaching per hour). The 10 days are offered in three sections (gatherings) - Section 1 through 3.
The plan is to include topics to be presented, practical exercises and some course work. Literature sources for the different themes are to be identified.

3 Course Plan

The table below contains the proposed course plan with adjustments. Each day is split into two halves, each containing a topic or set of topics relevant to the human factors in the offshore industry. The "ISO 11064 Steps" column identifies which steps of the ISO 11064 design process each day covers. The "Literature" column identifies the relevant chapters in the book "An Introduction to Human Factors ", "Handbook of Control Room Design"" and the ISO 11064 part number and any other relevant publications.

Day	Topic	ISO 11064 Steps	Literature
1	**Introduction** Morning: •1 Goals and expectations for course, Definition of HF and IO *Get to know each other* •2 Why Human Factors? •3 Examples of good/bad designs •4 The legal requirements for human factors •5 Overview of syllabus + reading material •6 Basic principles of good design •7 Planning for human factors involvement •8 Exercise: Afternoon: •9 Man-Machine models •10 User-centered design principles •11 ISO 11064 aims and design process	Part One General Principles Part One General Principles + Framework for design process	•1 Intro to Human Factors Engineering, Chapter 1, 3 •2 ISO 11064-1 Principles for the design of control centres •3 PSA HSE Regulations – Facilities Regulations § 20 •4 Handbook of Control Room Design, Preface + Introduction •6 Intro. to Human Factors Engineering, Chapter 3, 15 •7 Handbook of Control Room Design, Chapter 2

	•12 Usability •13 Exercise:		
2	**Analysis 1** Morning: •14 Clarify goals / Background material •15 System/Goal Analysis •16 Function analysis and allocation •17 Job and work analysis •18 Exercise: Afternoon: •19 User analysis •20 Stakeholder analysis •21 Exercise:	1, 2, 3	•8 Intro. to Human Factors Engineering, Chapter 3 •9 ISO 11064-1 Principles for the design of control centres •10 Handbook of Control Room Design, Chapter 7
3	**Analysis 2** Morning: •22 Task analysis •23 Exercise: Afternoon: •24 Communication analysis •25 Link analysis •26 Exercise:	4	•12 Intro. to Human Factors Engineering, Chapter 3 •13 ISO 11064-1 Principles for the design of control centres •14 Handbook of Control Room Design, Chapter 7 •15 Kirwan – A Guide to Task Analysis
4	**Perception and information processing** Morning: •27 Perception •28 Attention •29 Exercise: Afternoon: •30 Memory •31 Decision making •32 Exercise:	3	•17 Intro. to Human Factors Engineering, Chapters 4, 5, 6, 7 •18 Chapter 3, Human Factors Engineering •20 Handbook of Control Room Design, Chapter 8
5	**Integrated Operations / recap first session** Morning: •33 Recap: Course goals + preconditions •34 Integrated Operations: Definitions + outcomes •35 Course recap + feedback •36 Relevance of course for IO •37 Exercise: HF + IO Afternoon: •1 Visit to IO-centre or CCR at STATOIL •2 Overview of IO relevant projects •3 Video conference with IFE - discussion with IFE related to IO - more relevant cases •4 Exercise: HF + IO	Steps 1 - 6	•21 All previous •22 Henderson J., Wright K., Brazier A, 2002, *Human factors aspects of remote operations in process plants,* Health and Safety Executive (HSE). •23 Johnsen, S.O., Lundteigen, M.A., Fartum, H., Monsen, J., 2005, Identification and reduction of risks in remote operations of offshore oil and gas installations, SINTEF.
6	**Interaction design + Displays + controls**		•24 Intro. to Human Factors

	Morning: •38 Principles of interaction design •39 Relationship goals and principles •40 Applying principles in practice •41 Exercise Afternoon: •42 Displays •43 Controls •44 Requirements for displays + controls •45 Approaches to selection of controls + displays •46 Exercise:		Engineering, Chapter 15 •25 ISO 9241 – 10 •26 EN 894 Parts 1 •27 ISO FDIS 11064-5 •28 Intro. to Human Factors Engineering, Chapter 9 •29 ISO DIS 11064-5 Displays and controls •30 EN 894 Parts 1 – 4 •31 Handbook of Control Room Design, Chapter 3 + 4
7	**Workstation and (Control) Room Design** Morning: •47 Prototyping •48 Workstation layout •49 Control room layout •50 Environmental factors Afternoon: •51 Exercise: Workstation / room design •52 Assignment/homework •53 Next time	7, 9	•32 Intro. to Human Factors Engineering, Chapter 10 •33 ISO 11064-2 Principles for the arrangement of control suites •34 ISO 11064-3 Control room layout •35 ISO 11064-4 Layout and dimensions of workstations •36 ISO 11064-6 Environmental requirements for control centres •37 NORSOK S-002 •38 Handbook of Control Room Design, Chapter 5, 6
8	**Organisation, Training and Procedures** Morning: •54 PSA requirements on Competence and Assessment •55 Organisational Design •56 Design of procedures •57 Design of training system •58 Exercise: To be agreed Afternoon: •59 Competence assessment •60 Design of organisation •61 Exercise:	5, 9	•40 Intro. to Human Factors Engineering, Chapter 18, 19 •42 Competence and Training for Offshore Control room Operators. Sintef & HFS report. 2005 •43 Checklist for Competence and Training Requirements for Offshore Central Control room operators. Sintef & HFS report. 2005
9	**Verification and Validation** Morning: Validation •62 Principles •63 When, where, how? •64 CRIOP Checklists •65 CRIOP Scenario Analysis CRIOP and IO •66 Usability testing •67 Exercise: Afternoon: Verification	6, 8, 10, 11	•44 ISO 11064-7 Principles for the evaluation of control centres •45 CRIOP handbook: http://www.criop.sintef.no

	•68 Human Factors Assessment Method (HFAM) •69 Exercise:		
10	**Human Error + Summary** Morning: Human Error •70 News Headlines / Examples •71 PSA / Norsok requirements •72 Definitions (slides 47/8) •73 Human Factors Approach •74 Consequences •75 Root causes •76 Exercise: •77 Taxonomy •78 Systems approach •79 Methods and techniques •80 Exercise: Afternoon: Summary •81 Recap of course •82 Recap of ISO 11064 design process •83 Course assignment – practical issues	All	•48 PSA Regulations – Human Error •49 Intro. to Human Factors Engineering, Chapter 14 •50 Handbook of Control Room Design, Preface • ISO 11064 -1 • PSA HMS Regulations

Literature

Pensum

- Wickens, Lee, Lui and Gorden-Becker, 2003, *Introduction to Human Factors Engineering,* Prentice Hall.
- Kirwan, 1992, *A Guide to task analysis,* Taylor and Francis.
- Ivergård, 1989*, Handbook of Control Room Design and Ergonomics,* Taylor and Francis.
- Johnsen & al. *CRIOP*
- Johnsen, S.O., Lundteigen, M.A., Fartum, H., Monsen, J., 2005, *Identification and reduction of risks in remote operations of offshore oil and gas installations, SINTEF.* (Alternativt Norsk versjon *"Sikrere fjerndrift med CRIOP"* Stig.O.Johnsen, Mary Ann Lundteigen)
- *ISO 11064: Principles for the design of control centres, International Organization for* Standardization. Kan bestilles via http://www.pronorm.no/ Består av:

NS-EN ISO 11064-1:2000 Utgave: 1 (03.04.2001) Språk: Engelsk, Ergonomisk utforming av kontrollsentre - Del 1: Prinsipper for utforming av kontrollsentre (ISO 11064-1:2000)
NS-EN ISO 11064-2:2000 Utgave: 1 (03.04.2001) Språk: Engelsk, Ergonomisk utforming av kontrollsentre - Del 2: Prinsipper for utforming av kontrollrommets støttefunksjoner (ISO 11064-2:2000)
NS-EN ISO 11064-3:1999 Utgave: 1 (09.05.2000) Språk: Engelsk, Ergonomisk utforming av kontrollsentre - Del 3: Utforming av kontrollrom (ISO 11064-3:1999) (innbefattet rettelsesblad AC:2002
NS-EN ISO 11064-4:2004 Utgave: 1 (11.10.2004) Språk: Engelsk, Ergonomisk utforming av kontrollsentre - Del 4: Utforming og størrelse på arbeidsstasjoner (ISO 11064-4:2004)
ISO/CD 11064-5 Utgave: 1 () Språk: Engelsk , Ergonomic design of control centres - Part 5: Displays and controls 0,00 - Har ikke kommet ut enda
NS-EN ISO 11064-6:2005 Utgave: 1 (01.11.2005) Språk: Engelsk, Ergonomisk utforming av kontrollsentre - Del 6: Krav til arbeidsmiljø i kontrollsentre (Ikke del av obligatoris pensum)
NS-EN ISO 11064-7:2006 Utgave: 1 (01.08.2006) Språk: Engelsk, Ergonomisk utforming av kontrollsentre - Del 7: Prinsipper for vurdering av kontrollsentre (ISO 11064-7:2006)

Optional

- Salvendy, 2006, *Handbook of Human Factors and Ergonomics*, John Wiley and Sons.

- Henderson J., Wright K., Brazier A, *2002, Human factors aspects of remote operations in process plants,* Health and Safety Executive (HSE).

Classification: Internal Status: Draft

Arbeidssystemenes formelle og uformelle dimensjoner

Praktisk erfaring fra samhandlingsrom – MTO samspillet i distribuerte team
-HF-seminar Stavanger 24.04.08

Vidar Hepsø vihe@statoilhydro.com

StatoilHydro F&U og Handelshøyskolen BI

StatoilHydro

Noe av mitt arbeid med arbeidssystemer de siste 15 årene

UPN ISO 9001

BRA SAP forprosjekt

Beste praksis kran og løft

Kristin-Tyrihans inn I framtiden

D&V strategi Troll A

Tjeldbergodden arbeidsprosesser

Industriens beste driftsoperatør

Beste praksis anker håndtering

Innføring av POG I HNO

DPO I Gullfaks

F&U arkitektur og bedriftskultur

Integrasjon av intern subsea org.

DPO i Snorre

Norne arbeidsprosesser

D&V strategi Heidrun

Subsea D&V strategi Snøhvit

Utvikling av DPO I HNO

1992 1996 2000 2004 2008

Kartlegging og beskrivelse av arbeidsprosesser (TQM og BPR)

CORD MTO

Nettverk og samhandlings analyser

Etnografi og aktør nettverksteori

BI HANDELSHØYSKOLEN

StatoilHydro

Hva er arbeid?

"Antropologer! Antropologer!"

"…studies of workplace practice indicate that the ways people actually work usually differ fundamentally from the ways organizations describe that work in manuals, training programs, organizational charts, and job descriptions. Nevertheless, organizations tend to rely on the latter in their attempts to understand and improve work practice."

John S. Brown, CEO-Research XEROX

"Work has a tendency to disappear at a distance such that the further we are removed from the work of others, the more simplified often stereotyped our view of their work becomes"

Lucy Suchman

Arbeidssystemer som "Frontstage" og "Backstage"

- Frontstage: Det som presenteres/utøves i et arbeidssystem og er synlig for de som står på avstand og observerer
  - Skriptbasert og regissert
- Frontstage: De handlinger og aktiviteter som er nødvendige for at arbeidsystemene skal klare å prestere på scenen
  - Hva er viktige egenskaper?

Arbeidsystemer som koordineringsmekanismer

- Hierarki->autoritet
  - Arbeidsdeling
  - Kontrakter
  - Rapportering
- Marked->pris
  - Samarbeid med leverandører
  - Måling og oppfølging av tjenester
- Fellesskap-> tillit
  - Uformell samhandling for å få en frag- mentert organisasjon til å samhandle
  - Kunnskapsutvikling og erfaringsoverføring
  - Tillit mellom selskaper
  - Tillit gir muligheter for større kunnskapsutvikling gjennom reduksjon av transaksjonskostnader
  - Siden mye kunnskap er taus er tillit en viktig forutsetning for å få til kunnskapsoverføring
  - Høy motivasjon og godt samarbeid har tillit som basis

Hierarki

Fellesskap

Primærarbeid og artikuleringsarbeid i forhold til avstandsarbeid

- Primærarbeid: Det arbeidet som adresserer det spesifikke arbeidet som skal utfører ->prosedyrer, funksjonsbeskrivelser og beste praksis
- Artikuleringsarbeid: det sosiale arbeidet man utfører for å få å primærarbeidet til å virke, eller limet som får primærarbeidet til å henge sammen under skiftende behov og endrede betingelser og gjør

Arbeidsmetodikk som ikke tar artikuleringsarbeidet på alvor og finner måter å addressere det på er lite nyttige

For å få til primæroppgavene utvikler man:

- Tilpasningsarbeid når man er nødt til å endre måten arbeidet foregår på eller strukturere på grunn av feil eller uventede egenskaper ved systemene
- Forøkningsarbeid er å gjøre tilleggsarbeid for å veie opp for feil eller upassende egenskaper ved systemet
- Å arbeide seg forbi betyr å bruke systemer på en måte det ikke var tenkt, eller å unngå å bruke det for å benytte seg av alternative måter å fullføre arbeidet på

Uten disse strategiene ville samarbeidet vært stivbent fordi det er umulig å lage systemer som passer til alle situasjoner som kan oppstå på en arbeidsplass

MTO analysefokus på arbeidssystemer

- Formelle arbeidsprosesser
  Fokus på funksjoner, oppgaver ansvar, dekomponering/komponering av disse
  - Menneske-maskin
  - Menneske-menneske
  - Hav-land

- Samhandlings og arbeidsform
  Fokus på relasjoner, nettverk samhandling/ samarbeid, utvikle delt situasjonsforståelse og kommunikasjon
  - Dynamisk MTO allokering

Concurrent design

DPO-toolbox

CORD

Arbeidsprosess modellering

SINTEF

-K-T inn i framtiden

-OF Arena analyse

IO CRIOP

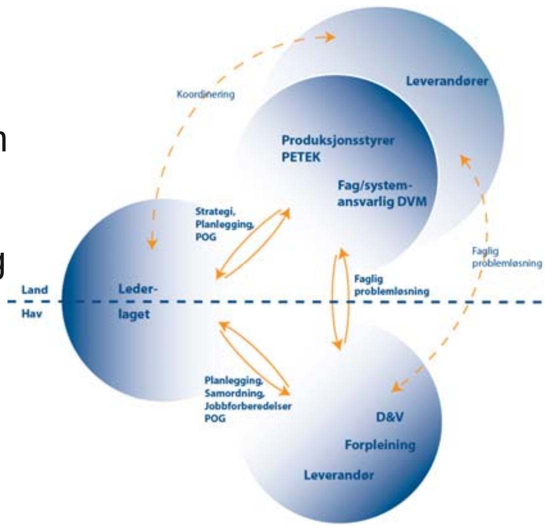
HAZID/HAZOP

Konsekvens analyser

Beste praksis/ sim.trening kran og løft

Arbeidsprosesser funksjoner/oppgaver vs. Samhandlings og arbeidsform

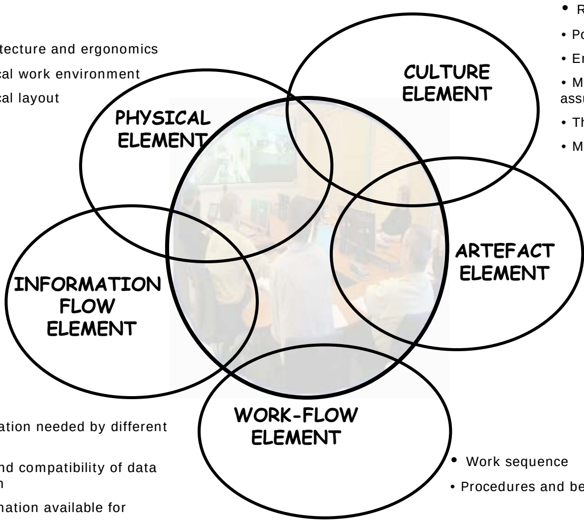
- Trenger arbeidsmetodikk som både håndterer funksjons/oppgave analyse/allokering og arbeidsform med basis i samhandling
- Forenkle prioritering av tiltak



Ulike perspektiver på arbeidsystemer i samhandlingsrom

- Architecture and ergonomics
- Physical work environment
- Physical layout

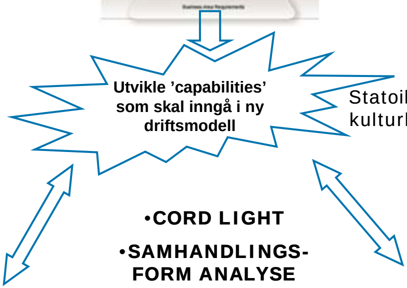
- Relations between people
- Power
- Emotions/feelings
- Major values and taken for granted assumptions
- The basis for trust
- Meaning of work



- Integrated network of tools and people (cooperative work)
- Articulation work
- Redundant integration of people and tools
- Meaning and interpretation of tools functions in collaboration
- Dynamic reallocation of activities

- What information needed by different roles?
- Integration and compatibility of data and information
- Making information available for decisions

- Work sequence
- Procedures and best practices



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INVITASJON

Human Factors in Control

23-24 april
2 0 0 8

StatoilHydro Stavanger

Praktisk erfaring fra ulike samhandlingsrom – MTO samspillet i distribuerte team

29. februar 2008

Kjære deltaker!
Vi vil med dette invitere til møte i HFC- forum (Human Factors in Control).

Møtet holdes onsdag 23. og torsdag 24.april 2008 i Stavanger. Vi starter kl 12:00 onsdag hos StatoilHydro, Forus Øst, IB bygget og avslutter etter lunch på torsdag.

Vi har reservert rom på Thon Hotel Maritim , frist for beskjed om rombestilling er 10.april. SINTEF kan bestille rom for dere – kryss av på siste side, direkte bestilling se www.thonhotels.no/maritim eller tlf: 51850577.

Program
Tema for møtet vil være ”Praktiske erfaringer fra ulike samhandlingsrom, MTO samspillet i distribuerte team, fokus på overgangene fra normal drift til driftsavvik eller beredskap. Vi skal besøke ConocoPhillips (Onshore Operations Center og Onshore Drilling Centre), StatoilHydro (Sub-Surface expert Centre) og Hovedredningssentralen. Vi vil også gå gjennom status for HF kurset.

Forumets visjon og hovedoppgave
Visjon: "Kompetanseforum for bruk av HF innen samhandling, styring og overvåkning i olje og gass virksomheten."
Hovedoppgave: "Å være et forum for erfaringsoverføring som bidrar til å videreutvikle HF metoder til bruk ved design og vurdering av driftskonsepter. "
(Mer informasjon og publikasjoner om HFC kan finnes på WEB-siden: http://www.hfc.sintef.no)

Vi håper du har anledning til å delta, og ønsker at du fyller ut og returnerer det vedlagte registreringsskjemaet innen 10.april. Vi ser frem til din deltakelse.

Neste HFC møte er planlagt til 1. og 2. oktober i 2008 hos IFE.

Vennlig hilsen

Thor Inge Throndsen /StatoilHydro, Geir Olav Hjertaker/StatoilHydro, Jon Kvalem/IFE, M. Green/HCD, Stig Ole Johnsen/SINTEF.

Vær vennlig og returner registreringen innen 10.april 2008 til:
Ingrid.Aalberg@sintef.no
Sintef Teknologi og samfunn
Tel: 93087720 Fax: 73592896

AGENDA

HFC Møte

StatoilHydro Stavanger

23-24 april 2008

Praktisk erfaring fra ulike samhandlingsrom – MTO samspillet i distribuerte team

Konferansen arrangeres i Stavanger; StatoilHydro, Forus Øst, IB bygget

Dag 1-23/4		Ansvar/Beskrivelse
12:00-13:00	Registrering og lunsj	StatoilHydro
13:00-13:30	**Velkommen til møtet – rundgang rundt bordet**	HFC
13:30-14:15	**IO i StatoilHydro, eksempler fra boring**	K.Andersen/StatoilHydro
14:15-14:45	**Toolbox talk - basic introduction and tips and tricks about different HF tools and techniques – "What to look for today and tomorrow"**	M.Green/HCD
14:45-15:00	Busstransport til Hovedredningssentralen	
15:00-16:00	**Hovedredningssentralen for Sør –Norge Fokusområde, Demo, Refleksjoner i plenum**	A.Viste/HRD
16:30-16:30	Refleksjoner*: Human Factors issues, experiences, suggestions, best practice, leading edge? Issues during normal operations, handling of unwanted incidents - locally (how collaboration and exception handling is performed between offshore and onshore CCR.) Other themes of interest to HFC?	Panel (A. Drøivoldsmo, M.Green, E.Bjerkebæk)
16:30-17:00	**CRIOP – Før og nå**	J.Monsen/Scandpower
17:00-17:30	**CRIOP – Fremover: MiniCriop, Criop for samhandlingsrom?**	Plenumsdiskusjon
17:30	Busstransport til Thon Hotel Maritim	
19:00-20:00	**Omvisning på Oljemuseet** (fottur fra hotellet)	
20:00-…	**Middag på Bølgen og Moi (Oljemuseet) musikk**	
Dag 2-24/4		
08:30	Buss henter på Thon Hotel Maritim	
08:45-09:00	Kaffe	
09:00-10:00	**ConocoPhillips –Onshore Operations Center og Onshore Drilling Centre - Fokusområde, Demo, Refleksjoner i plenum**	I.Trane/ConocoPhillips
10:00-10:30	Refleksjoner* - ConocoPhillips	Panel
10:30-10:45	Busstransport til StatoilHydro	StatoilHydro
10:45-11:45	**StatoilHydro- Sub-surface expert Centre Fokusområde, Demo, Refleksjoner i plenum**	Sølvi Løwen/StatoilHydro (T.I.Throndsen)
11:45-12:15	Refleksjoner* - StatoilHydro	Panel
12:15-12:30	**HF Kurs – erfaringer, innspill**	I.Wærø/SINTEF
12:30-13:00	**Arbeidssystemenes formelle og uformelle dimensjoner.**	V.Hepsø/StatoilHydro
13:00-14:00	Lunsj - StatoilHydro	StatoilHydro
14:00	Flytaxi	StatoilHydro

REGISTRERING

Human Factors in Control

StatoilHydro Stavanger

23-24 april
2 0 0 8

Praktisk erfaring fra ulike samhandlingsrom – MTO samspillet i distribuerte team

Ja, jeg vil gjerne delta:

Navn: __ ________________________________

Tittel / stilling: ____ ____________________________

Organisasjon: ___ _____________________________

Adresse: __ ________________________________

Kryss av for:

__Lunsj 23/4, __Middag 23/4, __ bestiller hotell 23/4 __ Lunsj 24/4

Tlf. : __________ Fax: ___________

E-post: _______________

For å være med må man betale inn medlemsavgift. Den er pr år:
- 25.000 for bedrifter med mer enn 15 ansatte (dekker 3 deltakere)
- 12.500 for mindre enn 15 ansatte (dekker 2 deltakere)
- 6.500 kr pr møte for ikke medlemmer (og overskytende deltakere)

Medlemsavtale, informasjon og publikasjoner om HFC kan finnes på WEB-siden:
http://www.hfc.sintef.no

Vær vennlig og returner registreringen innen 10.april 2008 til:

Ingrid.Aalberg@sintef.no
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