HFC møte 3. og 4.mai 2022 "New technology, emerging risks – What capabilities and competence do we need to resolve new challenges?" hos Petroleumstilsynet i Stavanger.

Hei – veldig hyggelig å kunne møtes igjen fysisk hos Petroleumstilsynet i Stavanger, som stilte opp med møterom og god bevertning.
Takk for god og engasjert deltakelse i møtet med tema: "New technology, emerging risks – What capabilities and competence do we need to resolve new challenges?".

Kopi av presentasjoner og relevante "papers"/rapporter ligger på www.hfc.sintef.no under menyen "Møtereferat", ref www.sintef.no/projectweb/hfc/moetereferat/
En samlet oversikt over deltakere med kontaktinformasjon ligger som en del av materialet.

Vi var ca. 60 deltakere fra ABB AS, DNV, Equinor, Gard AS, IFE, Kongsberg Maritime , Nord universitet, Norwegian Hydrogen AS, NTNU, Oslo School of Architecture, Petroleumstilsynet, Roth Cognitive Engineering, Safetec, Siemens Energy, SINTEF, Sjøfartsdirektoratet, UKOM – Statens undersøkelseskommisjon for helse- og omsorgstjenesten, Universitetet i Oslo, Universitetet i Stavanger, og Vår Energi

Vedlagt følger referanse til "papers", materiale og rapporter som ble nevnt i møtet:

1 - M. Berling & A.J. Ringstad/Equinor - Storulykke og HOP - Human and organisational performance & Functional human – machine teaming in safety critical systems

- Conklin, T. (2019). The 5 Principles of Human Performance: A contemporary update of the building blocks of Human Performance for the new view of safety. Pre-Accident Investigation Media.
- https://www.vectorsolutions.com/resources/blogs/5-principles-of-human-and-organizational-performance-hop-with-dr-todd-conklin/
- From CHIEF (2022) White paper - Human Factors in Highly Automated Systems https://ergonomics.org.uk/static/b1f30fc8-5e44-4610-b19122a70b1735f7/HF-in-Highly-Automated-Systems.pdf
- Referanse til prosjektet – «MAS - Meaningful Human Control of digitalization in safety critical systems», se https://www.sintef.no/projectweb/hfc/mas/

2 - L. I. Vestly/PTIL - Human Factors and Digitalization

- Et menneskesentrert perspektiv på kognitiv teknologi i petroleumsindustrien https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2022/et-menneskesentrert-perspektiv-pa-kognitiv-teknologi-i-petroleumsindustrien/
- Rapportering av hendelser i automatiserte systemer i boreoperasjoner https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2022/rapportering-av-hendelser-i-automatiserte-systemer-i-boreoperasjoner/

- Automatisering og autonome systemer: Menneskesentrert design i boring og brønn https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2021/automatisering-og-autonome-systemer-menneskesentrert-design-i-boring-og-bronn/
- IKT-sikkerhet – robusthet i petroleumssektoren II https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2021/ikt-sikkerhet--robusthet-i-petroleumssektoren-ii/

3 - O.A. Alsos/NTNU - NTNU – Kapasitetsløft innen Human Factors

- Veitch, E., & Alsos, O. A. (2021). Human-Centered Explainable Artificial Intelligence for Marine Autonomous Surface Vehicles. Journal of Marine Science and Engineering, 9(11), 1227. ref https://www.mdpi.com/2077-1312/9/11/1227
- Veitch, E., & Alsos, O. A. (2022). A systematic review of human-AI interaction in autonomous ship systems. Safety Science, 152, 105778. https://www.sciencedirect.com/science/article/pii/S0925753522001175
- NTNU Shore Control Lab se https://www.ntnu.edu/shorecontrol
- Beskrivelse av MIDAS prosjektet – se https://www.sintef.no/globalassets/project/hfc/documents/2022-kapasitetsloft-mennesket-i-fremtidens-havromsoperasjoner-2.pdf

4 - C. Bjørkli/UiO - Perspektiver fra utdanningssektoren

- Zhang, B. Y., Rantanen, E. M., & Chignell, M. (2021). Student Perspectives on Changing Requirements for Human Factors Engineering Education. In Proceedings of HFES Annual Meeting (Vol. 65, No. 1, pp. 1579-1583). Sage CA: Los Angeles https://journals.sagepub.com/doi/abs/10.1177/1071181321651087
- https://bcpe.org/wp-content/uploads/2020/03/BCPE_Core-Competencies-2019.pdf
- Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., ... & van der Doelen, B. (2012). A strategy for human factors/ergonomics: developing the discipline and profession. Ergonomics, 55(4), 377-395. https://www.tandfonline.com/doi/pdf/10.1080/00140139.2012.661087?casa_token=WcVe1r0qFIoAAAAA:Jkw8Rwj2N5ff5ma4UIuO8TAMCKgRySrDnyEUQkB-OOXYHcog6OjyTej19ihN4CwFsCgqkqmXT4SiyQ

5 - E. Roth/Cog. Eng. - Considerations in Designing and Evaluation of Intellig. Decision Aids

- Roth, E., Depass, B., Harter, J., Scott, R., & Wampler, J. (2018). Beyond levels of automation: Developing more detailed guidance for human automation interaction design. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting

(Vol. 62, No. 1, pp. 150-154). Sage CA: Los Angeles, CA: SAGE Publications. https://journals.sagepub.com/doi/pdf/10.1177/1541931218621035?casa_token=DeApqcQGNY8AAAAA:SUpNFkrMO4512VX1eUgGMnzqkKugUr6sSufHzQ8BDzbE7LhRfE7hCui9tlAHSlA4qmufchhB88mi1A

- The National Academies «Human-AI Teaming: State of the Art and Research Needs (2021)» - http://nap.edu/26355

7 - O.A. Engen/UiS - Risikostyring i en usikker fremtid

- Kronikk i SA om st. melding om samfunnssikkerhet https://www.aftenbladet.no/meninger/debatt/i/pAAve6/fremtidens-beredskap-er-du-og-din-bedrift-klar-til-aa-ta-ansvar
- Reguleringsmodellarfor helse, miljø og tryggleiki høgrisikoverksemdProfessor dr. juris Ernst Nordtveit, Det juridiske fakultet, Universitetet i Bergen (Se vedlegg)
- Røyksund, M., & Engen, O. A. (2020). Making sense of a new risk concept in the Norwegian petroleum regulations. *Safety science*, *124*, 104612. https://www.sciencedirect.com/science/article/pii/S0925753520300096?casa_token=43OE6O3cFI0AAAAA:Mi995wC0i91GUL_X7AGkD4zScr6PQLwIYrip_-IEOvNSkQR9J1W5QReHS7FpiIgtvfBh3GHim1E

8 - J. Emblemsvåg/NTNU - The risks of Nuclear energy

- Emblemsvåg, J. (2021). Safe, clean, proliferation resistant and cost-effective Thorium-based Molten Salt Reactors for sustainable development. International Journal of Sustainable Energy, 1-24. https://www.tandfonline.com/doi/pdf/10.1080/14786451.2021.1928130
- Jan Emblemsvåg «Kjernekraft eller energi-økonomisk sjakkmatt?» Publisert i Universitetsavisa 7. januar 2022 (Se vedlegg)

9 - K. Nerem/Norsk Hydrogen - Sikkerhet i Hydrogenproduksjon

- https://nh2.no/
- https://www.budstikka.no/nyheter/kjorbo-anlegget-ble-aldri-behandlet-politisk/204285!/

10 - T. Relling/NTNU - A systems perspective on maritime autonomy

- https://www.researchgate.net/profile/Tore-Relling – se «A systems perspective on maritime autonomy: The Vessel Traffic Service's contribution to safe coexistence between autonomous and conventional vessels»

11 - K. Nordby/AHO - Open Remote

- https://www.researchgate.net/profile/Kjetil-Nordby
- https://www.youtube.com/channel/UCefJp_IkaIggYvqArLE7QuA
- https://medium.com/ocean-industries-concept-lab

12 - M. Eitrheim/NTNU - Opportunities and barriers for truck platooning

- Eitrheim, M. H. R., Log, M. M., Tørset, T., Levin, T., & Pitera, K. (2022). Opportunities and Barriers for Truck Platooning on Norwegian Rural Freight Routes. Transportation Research https://doi.org/10.1177/03611981221076438
- Vi har også gjort en feltstudie i Nord-Norge (ref. siste slide, ekstra materiale). Her er en video som gir en kort forklaring på platooning, hensikten med studien og filmklipp fra kjøreturen: https://www.youtube.com/watch?v=DtBbjHxi7-M

MvH Frøy Birte Bjørneseth/ Kongsberg & NTNU, Andreas Bye/ IFE, Jan Tore Ludvigsen/ Equinor, Marie Green/ HCD, Georg Giskegjerde/ DNV, Stig Ole Johnsen/ SINTEF

(PS: Gi beskjed via HFC@Sintef.no om du vil bli fjernet fra denne distribusjonslista)

PPS: De som er interessert i vedlagte – ta kontakt med Hilde.Ferevik@sintef.no

https://www.sintef.no/prosjekter/2021/riskoff-arbeidsmiljo-arbeidsrelaterte-helseproblemer-og-belastninger-i-kvinnedominerte-arbeidsplasser-i-offentlig-sektor/

Thank you for your attendance at the HFC meeting the 3rd and 4th of May 2022 "New technology, emerging risks – What capabilities and competence do we need to resolve new challenges?" at the Petroleum Safety Authority in Stavanger.

Copies of presentations and papers is available at www.sintef.no/projectweb/hfc-e under the tab Meetings – www.sintef.no/Projectweb/HFC-E/Minutes-of-meeting/ … A list of participants with contact information is at the same place.

There were approximately 60 participants from: ABB AS, DNV, Equinor, Gard AS, IFE, Kongsberg Maritime , Nord universitet, Norwegian Hydrogen AS, NTNU, Oslo School of Architecture, Petroleumstilsynet, Roth Cognitive Engineering, Safetec, Siemens Energy, SINTEF, Sjøfartsdirektoratet, UKOM – Statens undersøkelseskommisjon for helse- og omsorgstjenesten, Universitetet i Oslo, Universitetet i Stavanger, og Vår Energi

Attached, you will find papers, references to the material and relevant material mentioned in the meeting:

1 - M. Berling & A.J. Ringstad/Equinor - Storulykke og HOP - Human and organisational performance & Functional human – machine teaming in safety critical systems

- Conklin, T. (2019). The 5 Principles of Human Performance: A contemporary update of the building blocks of Human Performance for the new view of safety. Pre-Accident Investigation Media.
- https://www.vectorsolutions.com/resources/blogs/5-principles-of-human-and-organizational-performance-hop-with-dr-todd-conklin/
- From CHIEF (2022) White paper - Human Factors in Highly Automated Systems https://ergonomics.org.uk/static/b1f30fc8-5e44-4610-b19122a70b1735f7/HF-in-Highly-Automated-Systems.pdf
- Referanse til prosjektet – «MAS - Meaningful Human Control of digitalization in safety critical systems», se https://www.sintef.no/projectweb/hfc/mas/

2 - L. I. Vestly/PTIL - Human Factors and Digitalization

- Et menneskesentrert perspektiv på kognitiv teknologi i petroleumsindustrien https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2022/et-menneskesentrert-perspektiv-pa-kognitiv-teknologi-i-petroleumsindustrien/
- Rapportering av hendelser i automatiserte systemer i boreoperasjoner https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2022/rapportering-av-hendelser-i-automatiserte-systemer-i-boreoperasjoner/

- Automatisering og autonome systemer: Menneskesentrert design i boring og brønn https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2021/automatisering-og-autonome-systemer-menneskesentrert-design-i-boring-og-bronn/
- IKT-sikkerhet – robusthet i petroleumssektoren II https://www.ptil.no/fagstoff/utforsk-fagstoff/prosjektrapporter/2021/ikt-sikkerhet--robusthet-i-petroleumssektoren-ii/

3 - O.A. Alsos/NTNU - NTNU – Kapasitetsløft innen Human Factors

- Veitch, E., & Alsos, O. A. (2021). Human-Centered Explainable Artificial Intelligence for Marine Autonomous Surface Vehicles. Journal of Marine Science and Engineering, 9(11), 1227. ref https://www.mdpi.com/2077-1312/9/11/1227
- Veitch, E., & Alsos, O. A. (2022). A systematic review of human-AI interaction in autonomous ship systems. Safety Science, 152, 105778. https://www.sciencedirect.com/science/article/pii/S0925753522001175
- NTNU Shore Control Lab se https://www.ntnu.edu/shorecontrol
- Beskrivelse av MIDAS prosjektet – se https://www.sintef.no/globalassets/project/hfc/documents/2022-kapasitetsloft-mennesket-i-fremtidens-havromsoperasjoner-2.pdf

4 - C. Bjørkli/UiO - Perspektiver fra utdanningssektoren

- Zhang, B. Y., Rantanen, E. M., & Chignell, M. (2021). Student Perspectives on Changing Requirements for Human Factors Engineering Education. In Proceedings of HFES Annual Meeting (Vol. 65, No. 1, pp. 1579-1583). Sage CA: Los Angeles https://journals.sagepub.com/doi/abs/10.1177/1071181321651087
- https://bcpe.org/wp-content/uploads/2020/03/BCPE_Core-Competencies-2019.pdf
- Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., ... & van der Doelen, B. (2012). A strategy for human factors/ergonomics: developing the discipline and profession. Ergonomics, 55(4), 377-395. https://www.tandfonline.com/doi/pdf/10.1080/00140139.2012.661087?casa_token=WcVe1r0qFIoAAAAA:Jkw8Rwj2N5ff5ma4UIuO8TAMCKgRySrDnyEUQkB-OOXYHcog6OjyTej19ihN4CwFsCgqkqmXT4SiyQ

5 - E. Roth/Cog. Eng. - Considerations in Designing and Evaluation of Intellig. Decision Aids

- Roth, E., Depass, B., Harter, J., Scott, R., & Wampler, J. (2018). Beyond levels of automation: Developing more detailed guidance for human automation interaction design. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting

(Vol. 62, No. 1, pp. 150-154). Sage CA: Los Angeles, CA: SAGE Publications. https://journals.sagepub.com/doi/pdf/10.1177/1541931218621035?casa_token=DeApqcQGNY8AAAAA:SUpNFkrMO4512VX1eUgGMnzqkKugUr6sSufHzQ8BDzbE7LhRfE7hCui9tlAHSlA4qmufchhB88mi1A

- The National Academies «Human-AI Teaming: State of the Art and Research Needs (2021)» - http://nap.edu/26355

7 - O.A. Engen/UiS - Risikostyring i en usikker fremtid

- Kronikk i SA om st. melding om samfunnssikkerhet https://www.aftenbladet.no/meninger/debatt/i/pAAve6/fremtidens-beredskap-er-du-og-din-bedrift-klar-til-aa-ta-ansvar
- Reguleringsmodellarfor helse, miljø og tryggleiki høgrisikoverksemdProfessor dr. juris Ernst Nordtveit, Det juridiske fakultet, Universitetet i Bergen (Se vedlegg)
- Røyksund, M., & Engen, O. A. (2020). Making sense of a new risk concept in the Norwegian petroleum regulations. *Safety science*, *124*, 104612. https://www.sciencedirect.com/science/article/pii/S0925753520300096?casa_token=43OE6O3cFI0AAAAA:Mi995wC0i91GUL_X7AGkD4zScr6PQLwIYrip_-IEOvNSkQR9J1W5QReHS7FpiIgtvfBh3GHim1E

8 - J. Emblemsvåg/NTNU - The risks of Nuclear energy

- Emblemsvåg, J. (2021). Safe, clean, proliferation resistant and cost-effective Thorium-based Molten Salt Reactors for sustainable development. International Journal of Sustainable Energy, 1-24. https://www.tandfonline.com/doi/pdf/10.1080/14786451.2021.1928130
- Jan Emblemsvåg «Kjernekraft eller energi-økonomisk sjakkmatt?» Publisert i Universitetsavisa 7. januar 2022 (Se vedlegg)

9 - K. Nerem/Norsk Hydrogen - Sikkerhet i Hydrogenproduksjon

- https://nh2.no/
- https://www.budstikka.no/nyheter/kjorbo-anlegget-ble-aldri-behandlet-politisk/204285!/

10 - T. Relling/NTNU - A systems perspective on maritime autonomy

- https://www.researchgate.net/profile/Tore-Relling – se «A systems perspective on maritime autonomy: The Vessel Traffic Service's contribution to safe coexistence between autonomous and conventional vessels»

11 - K. Nordby/AHO - Open Remote

- https://www.researchgate.net/profile/Kjetil-Nordby
- https://www.youtube.com/channel/UCefJp_IkaIggYvqArLE7QuA
- https://medium.com/ocean-industries-concept-lab

12 - M. Eitrheim/NTNU - Opportunities and barriers for truck platooning

- Eitrheim, M. H. R., Log, M. M., Tørset, T., Levin, T., & Pitera, K. (2022). Opportunities and Barriers for Truck Platooning on Norwegian Rural Freight Routes. Transportation Research https://doi.org/10.1177/03611981221076438
- A video platooning and the purpose of the research: https://www.youtube.com/watch?v=DtBbjHxi7-M

Yours Frøy Birte Bjørneseth/ Kongsberg & NTNU, Andreas Bye/ IFE, Jan Tore Ludvigsen/ Equinor, Marie Green/ HCD, Georg Giskegjerde/ DNV, Stig Ole Johnsen/ SINTEF,