

Informasjon til Sikkerhetsforum etter møtet i Bergen 26.-27.09.2024. Om konferansen Aircraft Cabin Air, London 17.-18. 09.2024. Historikk om «MS-saken Statfjord», bakgrunn, underlagsdokumentasjon, innlegget om aeroderivative turbiner offshore, samt henvisning til viktige foredrag på konferansen.







The unknown health threat offshore: Chemical exposure from aeroderivative turbines. The oil and gas industry must learn from aviation!



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Halvor Erikstein Organizational Secretary, Certified Occupational Hygienist www@safe.no

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Hva har passasjerer, flymannskap og oljearbeider felles? De er eksponert for turbinoljer med organofosfater.





https://www.ge.com/power/gas/gasturbines/Im2500





Bakgrunn

www.youtube.com/watch?v=AZqeA32Em2s
www.youtube.com/results?search_query=aerotoxic&page=1

«MS-saken på Statfjord» i «Informasjon til Sikkerhetsforum» første gang 5. desember 2002

Bakgrunn

Halvor Erikstein Yrkeshygieniker/Org.Sekretær Oljearbeidemes Fellessammenslutning OFS 6. januar 2003

Informasjon til Sikkerhetsforum etter innlegg 5. desember 2002 om helsefare fra organofosforforbindelser i turbin- og hydraulikkoljer.

Innledning

Industrioljer¹ blir tilsatt mange forskjellige stoffer for at de skal få de rette egenskapene. For turbin- og hydraulikkoljer er det krav til spesielle smorende, temperaturbestandige og brannhemmende egenskaper. Til dette formalet er det en utstrakt bruk av en gruppe kjemiske forbindelser som går under samlebetegnelsen organofosforforbindelser.

Helseeffekter

Dessverre har mange organofosforforbindelser vist seg å være svært helsefarlige ved hudkontakt, innånding og opptak gjennom mage og tarm. Helseskadene² er svært sammensatte, men de alvorligste effektene er at stoffene ødelegger nervesystemet ved å blokkere/kutte det fine ledningsnettet som overfører nerveimpulser til kroppens muskler.

Eksponering kan gi en rekke ulike symptomer, som hodepine, kvalme, smerter i mageregion, nummenhet og lammelser i føtter og hender. Enkelte tilsetningstoffer kan gi en forsinket reaksjon som først gir lammelser og nedsatt førlighet flere uker etter eksponering¹. Det kan derfor godt tenkes at eksponering for turbin- og hydraulikkoljer⁴ er blitt oversett når folk som har jobbet med disse stoffene har utviklet sykdom.

Multippel sklerose (MS)

Statfjord-feltet har den såkalte "MS-saken". Her har folk som har vætt eksponert for turbinoljer nevrologiske symptomer som har gitt flere personer diagnosen MS. Dette har ikke blitt satt i sammenheng med eksponering for organofosforforbindelser". Vi har også fått meldinger om at det finnes folk på andre felt som har jobbet med turbiner og fått nevrologiske symptomer.

Organofosfater innen luftfart⁶

I dag er det særskilt oppmerksomhet fra flygere og cabinmannskap på episoder hvor oljelekkasjer har ført til alvorlig forgiftning av flymannskapet. Den norske flyhavarikommisjonen har nettopp frigitt en rapport⁷ om en hendelse for to år siden med røyk-/oljelukt i et SAS fly. Fartøysjefen ble senere beskrevet som alvorlig skadd, og har ikke lenger helseattest for å fly. Mens kapteinen valgte å sitte uten maske for å kunne følge med i gassutviklingen, berget styrmannen helsen fordi han benyttet åndedrettsvern. Tilsvarende hendelser er rapportert over hele verden⁹.⁹.

Flammehemmere og tekstilimpregnering¹⁰

Ulike organofosforforbindelser har meget stort anvendelsesområde. Eksempelvis tilhører flammehemmende tekstilimpregnering (Pyrovatex) og mange sprøytemidler mot insekter denne kjemiske gruppen. Det er også omfattende bruk av organiske fosforforbindelser som flammehemmende midler i polyuretanskum.

Termisk dekomponering av organofosforforbindelser

Det er vist at kraftig opppvarming (termisk dekomponering)¹¹ av organofosforforbindelser kan utvikle kjemiske forbindelser som virker som nervegasser utviklet for kjemisk krigføring. Det er blant annet slike mekanismer en tror kan ha medvirket til akutt forgiftning av flymanskap.

Hva må gjøres?

På OFS kongressen november 2002 ble det vedtatt følgende resolusjon;" OFS krever at det blir full gjennomgang av arbeidsmiljø og helsekartlegging av personer som har vært' er eksponert for turbin- og hydraulikkoljer som inneholder organofosforforbindelser."

Vi stiller gjerne opp på årsmøter, verneombudssamlinger eller møter med HMS-avdelingen i de forskjellige selskapene.

Vi vil også jobbe aktivt for at problemstillingene skal etableres som eget forskningsprosjekt, og gjennomføres sammen med det svenske forskningsmiljøet (Skarping og Dalene) på isocyanater.

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² Tricresyl phosphate (mixed isomers). Right to Know Program. NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES. http://www.state.ni.us/health/eoh/tikweb/3130.pdf

³ "Environmental health criteria for tricresylphosphate." WHO rapport 1990. http://www.inchem.org/documents/ehc/ehc/ehc110.htm Denne rapporten gir en god beskrivelse av helseeffekter, kjemi og historikk.

⁴ Toxic Hazard From Synthetic Lube Oil Venting in Gas Turbine Modules. US NAVY General Gas Turbine Bulletins (GGTBs) # 15. http://www.navygasturbines.org/ggtb.asp

³ Møte 31. oktober 2002 med Statoils bedriftslege Reidunn Ulland von Brandis om nye opplysninger, og med spørsmål om ikke eksponering for organofosforforbindelser kunne ha betydning i den såkalte MS-saken på Statfjord. Fikk bekreftet at denne type kjemiske forbindelser ikke hadde vært vurdert.

⁶ Aviation Organophosphate Information Site. <u>www.zopis.org</u> Hiemmeside for en interessegruppe knyttet til skader fra organofosfater innen luftfart. Her finnes også HMS-

Hjemmeside for en interessegruppe knyttet til skader fra organofosfater innen luftfart. Her finnes også HMS datablad og opplysninger om en rekke oljeprodukter.

⁷ Den norske Flyhavarikommisjonens gransking av alvorlig forgiftning av SAS-flyger september 2002. http://www.aaib-n.org/rapporter%202002/rapport%2045-02.htm

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¹⁰ "Toxicological Risks of Selected Flame-Retardant Chemicals". Subcommittee on Flame-Retardant Chemicals. National Academy Press (2000).<u>ISBN</u> 0-309-07047-3. Pyrovatex (CAS 20120-33-6) tilherer også gupppe, organofosfater.

¹¹ The Airliner Cabin Environment and the Health of the Passengers and Crew. Committee on Air Quality in Passengers Cabins and Commercial Aircraft. National Research Council. National Academy Press. 2002. ISBN 0-309-08289-7

Søketips

Eksponering for organofosforforbindelser gir utslag som bl.a. omtales som OPIDN (OrganoPhosphorous Compound Induced Delayed Neuropathy). Spesielt forbindelsen Tri-ortho-cresylfosfat (TOCP) (CAS 78-32-0) gir effekter. Dette er resultatet av et enkelt sok i PubMed på OPIDN og TOCP. http://www.ncbi.nlm.nih.gov/entrez/ouer.fr.zi?CCAD=search&DB=PubMed



Den lange lange veien 2002 – 2024 "MS-saken på Statfjord".



rettrendig arbeidsliv

SAFE Magasinet

Nr. 7/8 - 2002

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Rydd opp! Alarm om helsefare fra turbin- og hydraulikkoljer Skrevet av: Halvor Erikstein

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Hva må gjøres?

På årets OFS kongress ble det vedtatt følgende resolusjon; "OFS krever at det blir full gjennomgang av arbeidsmiljø og helsekartlegging av personer som har vært/ er eksponert for turbin- og hydraulikkoljer som inneholder organofosforforbindelser."

Vi har informert om denne helsefaren i Sikkerhetsforum 5. desember. Vi stiller gjerne opp på årsmøter, verneombudssamlinger eller møter med HMS-avdelingen. Vi vil jobbe aktivt for at problemstillingene skal etableres som eget forskningsprosjekt, og gjennomføres sammen med det svenske forskningsmiljøet (Skarping og Dalene) på isocyanater. Vi oppfordrer medlemmer og andre om å ta kontakt både med spørsmål - og med mistanke om helseskader. Nærmere opplysninger vil finnes på www.ofsa.no/oljer





https://www.safemagasinet.no/wpcontent/uploads/2016/05/SAFE-Magasinet-2008-Nr-02.pdf



Informasjon til Sikkerhetsforum. Oppfølging etter møte 26. januar 2010 Aerotoxic Syndrome = samme som "MS-saken" offshore?





https://www.havtil.no/contentassets/728fdd853baa4a 43b80ce03c7cdce658/informasjon-tilsikkerhetsforum---halvor-erikstein.pdf



Hva har fly- og oljebransjen felles? Problemer med turbinolier

Helsefare fra turbin- og hydraulikkoljer. Den lange saken 2002 - 2021

Av Halvor Erikstein, Yrkeshygieniker SYH, SAFE

Nå lanseres kampanjen «Clean Air Campaign» for å få ansvarlige myndigheter til å pålegge flyselskapene å måle og overvåke luftkvaliteten i fly. I tillegg kreves det fliter som fjerner de helseskadelige kjemikaliene som lekker fra turbinmotorene www.gcaqe.org/cleanair

Global Cabin Air Quality Executive er en internasjonal sammenslurning av pilot- og kabinfagforeninger. Den ble etablert for å hindre forgiftning av flymannskap og passasjerer fra turbin- og hydraulikkoljer fra flyets aircondition system. Forgiftning av piloter er en alvorlig risiko for flysikkerheten. En gassturbin offshore er i realiteten en ombygd flymotor (aeroderivative turbin). De samme stoffene som kan forgifte flymannskap og passasjerer, gir tilsvarende helseskader hos oljearbeidere når de utsettes for turbinoljer med organofosfater.

Lov om yrkesskadeforsikring overlater bevisbyrden til den som er blitt yrkesskadd. Underrapportering av melding om mistanke om yrkessykdom setter en effektiv stopper for at den skadde får et forsikringsoppgjør. Det er arbeidstakeren som må bærer all risiko og påføres alle tap ved eksponering som er ny, er ukjent eller bare ikke blir registrert. De syke har ingen mulighet til å dokumentere helseskader fra nye kjemiske forbindelser og prosesser. Mens Spesialvallsforskriften gir produsenten ansvar for avfallet «fra vugge til grav», kan arbeidsgiverne tegne yrkesskadeforsikring og overlate de skadde til forsikringsindustrien.

•MS-saken på Statford» startet med at jeg ble kontaktet av turbintekniker Harry Stiegler Brevik. Han representerte en gruppe av oljearbeidere som hadde fått nevrologiske skader som på den tiden ble mistenkt være multippel sklerose (MS). Noen hadde blitt utredet og gitt MS-diagnose, mens andre ble arbeidsuføre uten diagnose. Arbeidsmiljøloven krever at mistanke om yrkessykdom skal meddes. De skadde bød om at tilfellen ble meldt, men



dette ble avvist av Statoil og en pågående undersøkelse ble brått stoppet.

Det har lenge vært kjent at eksponering for organofosfater kan gi nevrologiske helseutfall som gjerne Kan forveksles med MS når yrksesksponering ikke blir vurdert i årsakssammenhengen. Meg bekjent har ingen fra gruppen videre utviklet MS, og har mest samsynlig levd med feil diagnose siden slutten av 1980 tallet. Til dags dato har Statoil/Equinor valgt å avvise de skadde og overlate de til sin egen skjebne uten yrkesskadeerstatning og yrkesskadetrygd.

I arbeidet med å finne ut årsaken til den såkalte «MSsaken på Statfjord», kom jeg i kontakt med yrkeshygienikere og luffartens pilot- og kabinfagforeninger i inn og utland. I 2005 ble jeg bedt om å holde et foredrag på den amerikanske yrkeshygienikerforeningen om offshore turbinoljeeksponering og MS-saken. Dette gav videre personlig kontakter med ulike grupper som jobbet med problemstillingen innen luffarten.

1 2006 ble jeg også invitert med på arbeidet for å etablere en internasjonal sammenslutning. Global Cabin Air Quality Executive (GCAQE) ble en internasjonal allianse av fagforeninger innen luffarten hvor også SAFE har fårt delta aktivt. I perioden 2007 til 2015 var jeg valgt inn i styret som representerte 30 pilotfagforeninger og kabinansatte. Siden 2015 har jeg representert Norge i CEN/TC 436 som utarbeider en standard som skal forebygge helse- og sikkerhetsrisiko fra forgiftning i luffarten. MS-saken fra Statiford er et eksempel på hvor ansvarlig oljeselskap Statoil/Equinor har nektet å anerkjenne at denne eksponeringen påfører arheidstakerne alvorlige helseskader. Turbintekniker Harry Stiegler Breviks utrettelige kamp for rettferdighet viser hvor rettslos en arheidstaker er når det introduseres nye kjemiske forbindelser i arheidsmiljøet, samtidig som oljeselskapet møter ny kunnskap med taushet.

Dette er kunnskap som kunne forhindret alvorlige kjerniske helseskader hos de som er eksponert for turbinoljer. Så langt er det heller ingen erkjennelse hos Equinor at turbinoljer med organofosfater kan gir alvorlige skader på nervespstemet. Fortsatt i dag har ikke Equinor klart å risikovurdere og merke avluftingspunktene (ventene).

Hva må vi gjøre?

Det er kanskje på tide at Norsk Yrkeshygienisk Forening (NYF) tar diskusjonen? Er vi en faglig sammenslutning av yrkeshygienikere som bare følger ordre? Som akseptere at det er arbeidstakerne som tar all risiko når arbeidsmiljøet er helseskadelig og eksponeringen ukjent?

Er det mulig for NYF å diskutere om det er moralske og etiske sider ved denne asymmetriske (urettferdige) fordelingen av risiko? Er det OK at arbeidsfolk som er blitt arbeidsuføre av

helsefarlig arbeidsmiljø, selv må bevise årsakssammenheng, samtidig som arbeidsgiver har forsikret seg mot å bistå den skadde i å få innfridd yrkesskadeerstatning og trygdeytelser?

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Bakgrunn

Innlegg på SAFE HMS konferanse 5.-7. september 2023

TWO SIDES OF THE SAME COIN. HEALTH DAMAGE FROM TURBINE OILS IN OFFSHORE WORKERS AND FLIGHT CREW. HOW TO INVESTIGATE THOSE WHO ARE INJURED? INTERNATIONAL CONSENSUS ON ASSESSMENT OF HEALTH DAMAGE

DR SUSAN MICHAELIS - PHD, MSC, ATPL, BCA HON

HONORARY SENIOR RESEARCH FELLOW, UNIVERSITY OF STIRLING, HEAD OF RESEARCH, GLOBAL CABIN AIR QUALITY EXECUTIVE, MICHAELIS AVIATION CONSULTING

PROFESSOR VYVYAN HOWARD - CENTRE FOR MOLECULAR

BIOSCIENCES, UNIVERSITY OF ULSTER, COLERAINE, NORTHERN IRELAND, UK.

CAPTAIN TRISTAN LORAINE - ATPL, BCAI

SPOKESPERSON, GLOBAL CABIN AIR QUALITY EXECUTIVE

HMS KONFERANSE «GRENSELØST ARBEIDSLIV» OG OMRÅDESAMLING 5. – 7. SEPTEMBER 2023

https://safe.no/wp-content/uploads/2024/03/Two-sides-of-the-same-coin-SAFE-Presentation-S.-Michaelis-T.-Loraine-V.-Howard-Sep-2023.pdf

Bakgrunn «MS-saken på Statfjord» Særuttalelse i NOU 2022:19 NOU Norges offentlige utredninger 2022: 19 Hvem tålte det – Oljepionerene hvem tålte det en kompensasjonsordning Kommisjonen var uenige om; ikke? Hva skulle defineres pionertiden? Hvem skulle ha rett til å søke kompensasjon? SAFE tok særuttalelse på pionertidens varighet (1995), samt krevde alle yrkesgrupper skulle ha rett til å søke kompensasjon. Her er det mange olje rør og slanger. som det ofte drypper olje i fra. Det kan fra tid til annen gå hull på rør og slanger. Olje blir liggende på dørken, og dampe p.g.a høy

temperatur fra turbinen.

Kommisjonen var delt både når det gjelder hva som skal regnes som pionertid og hvem som skal ha rett til å søke kompensasjon.

- 1. Tid:
 - Arbeid i petroleumsvirksomheten offshore i perioden 1966–1985/1990/1995
- 2. Gruppe:
 - Arbeid innenfor aktivitetsområdene «boring og brønn» og «produksjon og vedlikehold» og spesifikke grupper innenfor disse områdene
- 3. Medisinsk:
 - Dokumentert varig sykdom eller skade som har mulig sammenheng med kjemisk eksponering for boreslam, hydrokarboner og/eller benzen i arbeidet offshore.

Alle tre kriterier må være oppfylt og dokumenteres.

Flertallet i kommisjonen, medlemmene Riise, Risa, Ikdahl, Nilsen, Karlsen og Solheim støtter modell 2 med hensyn til gruppekriterier og medisinske kriterier, men er delt med hensyn til tidsperioden som anbefales, se kapitlene 10.5.1 og 10.5.2.

Modell 2 A: Kommisjonens medlemmer Riise, Risa og Solheim foreslår at pionertiden i petroleumsvirksomheten offshore defineres som perioden 1966–1985.

Modell 2 B: Kommisjonens medlemmer Ikdahl, Nilsen og Karlsen foreslår at pionertiden i petroleumsvirksomheten offshore defineres som perioden 1966–1990.

Flertallet i kommisjonen, medlemmene Riise, Risa, Ikdahl, Karlsen, Nilsen og Solheim viser i denne forbindelse til kunnskapsgrunnlaget beskrevet i kapittel 8.

Disse medlemmene foreslår derfor at målgruppen for en kompensasjonsordning for oljepionerene defineres som personellgrupper innenfor arbeidsområdene boring og brønn og produksjon og vedlikehold som har blitt eksponert for hydrokarboner, boreslam og benzen i forbindelse med arbeid offshore, og som har fått varige helseskader som kunnskapsmessig kan føres tilbake til disse eksponeringene.

12.1.4 Modell 4

- 1. Tid:
 - Arbeid i petroleumsvirksomheten offshore i perioden 1966–1995
- 2. Gruppe:
 - Ingen yrkesgrupper som har arbeidet offshore utelukkes
- 3. Medisinske:
 - Relevante helseskader er utvidet betydelig.

Kommisjonens medlem Erikstein foreslår denne modellen.

SAFE Forbundsstyre og områdeutvalg stiller seg bak særuttalelsene gitt av kommisjonsmedlem Halvor Erikstein om hva som skal være pionertiden (til og med 1995) og at <u>alle</u> <u>yrkeskategorier som har arbeidet offshore skal</u> <u>ha anledning til å søke kompensasjon for</u> <u>yrkessykdom forårsaket av kjemisk</u> <u>eksponering.</u>

Bakgrunn

Høringsuttalelse fra SAFE Forbundsstyre og SAFE områdeutvalg

Bakgrunn



Arbeids og Inkluderingsdepartementet

safe@safe.no, www.safe.no Et rettferdig arbeidsliv

Postboks 145, 4001 Stavange

24.05.2023

Høringssvar på NOU:19 Oljepionerene – en kompensasjonsordning fra SAFE sitt Forbundsstyre og sine områdeutvalg.

- Forbundsstyre
- Operatør Sokkel
- Operatør Land
- Rigg
- Brønnservice
- Flerbruksfartøy
- > Sjø
- Konstruksjon og vedlikehold (har utarbeidet eget høringsnotat).

SAFE Forbundsstyre og områdeutvalg stiller seg bak særuttalelsene gitt av kommisjonsmedlem Halvor Erikstein om hva som skal være pionertiden (til og med 1995) og at alle yrkeskategorier som har arbeidet offshore skal ha anledning til å søke kompensasjon for yrkessykdom forårsaket av kjemisk eksponering.

Kommisjonsmedlem Halvor Erikstein har som yrkeshygieniker i oljeindustrien siden slutten av 1980- tallet fulgt opp arbeidsmiljøet for alle våre yrkesgrupper offshore.

SAFE mener at de som er rammet av yrkessykdom fra kjemisk eksponering offshore må få sin sak vurdert av et partoppnevnt utvalg med medlemmer som har spesielt stor innsikt i arbeidsmiljøeksponering offshore.

Vi har nettopp hatt et medlem som er mekaniker med myelomatose (beinmargskreft) til vurdering av yrkesbetinget kreft.

Med bakgrunn i en målerapport fra oljeselskapet på generelt selskapsnivå, ikke basert på lokal kartlegging, konkluderte yrkesmedisineren med at kreften ikke var yrkesbetinget. Ved bruk av rapporter for å identifisere eksponering, må lokale forhold legges til grunn. Den generelle målerapporten har verdier som tilsvarer at den kreftsyke måtte ha «jobbet 150 år offshore» for å oppnå kreftfremkallende benzendose. Dette er ikke vår erfaring! Det er direkte fell at den syke blir avspist med en rapport som tar utgangspunkt i fell fakta og ikke reflekterer hva den ansatte har vært eksponert for. Slik kan vi ikke ha det, dette Må endres!

Skiftordningene er 14 dagers sammenhengene arbeid med 12 timers arbeidsdag. Det er i tillegg anledning til 4 timers overtid pr. dag. Helikopter er eneste tilkomstmulighet. En offshore installasjon er bygd svært kompakt og alle om bord en oljeboringsenhet eller en enhet for oljeog gassproduksjon vil være eksponert for kjemikalier som kan gi helseskade.

Boring som medfører bruk av mange kjemiske stoffer med ukjent helserisiko. I tillegg vil

boreslammet bli forurenset av en kjemisk cocktail fra undergrunnen hvor det i tillegg skjer nye kjemiske reaksjoner under de ekstreme trykk- og temperaturforholdene i brønnen.

Det er installert aeroderivative turbiner i lukkede rom hvor smøremidlet er organofosfatholdige oljer. På installasjoner for olje- og gassproduksjon vil det være mange områder hvor de som jobber i prosessområdene med drift og vedlikehold vil være eksponert for hydrokarboner. Boligkvarteret og helikopterkapasitet settere store begrensninger på hvem som kan få tilgang til installasjonen. Vanskelig tilgang for fagfolk innen helse, miljø og sikkerhet. Ekstra vanskelig for leverandører og underleverandører.

Boligkvarter er svært nær utslippspunkter fra prosess- og forbrenningsmotorer.

En skiftordning med 14 dager på betyr at i hver posisjon er det tre forskjellige personer og en kan si at i praksis er det tre forskjellige organisasjoner som drifter plattformen offshore. De som jobber offshore er bosatt over hele landet, og har i motsetning til de som jobbet på landanlegget i liten grad kontakt med de som jobber på andre skift.

Isolasjon fra arbeidsplassen i fritiden kan være en viktig faktor ved at helseskader fra kjemisk eksponering ikke blir knyttet til arbeidsmiljøeksponering. Vi er kjent med at forespørselen «er det andre som er blitt syke?». Er blitt møtt med at det kan ikke besvares på grunn av personvernhensyn.

SAFE har som eneste fagforbund i energisektoren i mer enn 20 år hatt ansatt yrkeshygleniker som organisasjonssekretær. Forebygging av helseskader fra kjemisk og fysisk arbeidsmiljø er tillagt stor vekt i vår organisasjon og vi er sterkt engasjert i å bistå våre medlemmer når de rammes av yrkessykdom som eksempelvis kreft, nevrologiske utfall, allergi, astma og overfølsomhet.

Det er i den sammenheng viktig å påpeke at det fortsatt er store mangler offshore når det gjelder arbeidsmiljølovens krav om forsvarlig arbeidsmiljø. Fortsatt rammes arbeidstakere av kreft forårsaket av benzen.

Vi mener at saken med eksponering for turbinoljer (MS-saken på Statfjord) er et talende eksempel på hvor vanskelig en arbeidstaker kan få det når vedkommende rammes av sykdom forårsaket av spesialkjemikalier benyttet offshore. Vi velger i den forbindelse å legge ved rapporten som vi bestilte om tema; «*Science behind turbine engine contaminated air»*, som er med i særuttalelsen fra vårt kommisjonsmedlem.

Vil legger den vitenskapelige publikasjonen som ble gitt ut under «Open Access» den 16.05.2023 på det store konsensusarbeidet på helseeffekter fra turbin- og hydraulikkoljer. Dette arbeidet er absolutt relevant for å dokumentere at disse helseskadene fra eksponering for turbinoljer fra aeroderivative turbiner ikke lenger kan møtes med taushet og feles under teppet.

Med hilsen

Hilde-Marit Rysst SAFE Forbundsstyre og Forbundsleder

Vedlegg med lenker

Vedlegg 1: Arbeidsmiljøbilder Drift Vedlikehold Boreslamsbehandling Vedlegg til høringssvar fra SAFE https://safe.no/wp-content/uploads/2023/05/Vedlegg-1-Arbeidsmiljobilder-Drift-Vedlikehold-Boreslamsbehandling-Vedlegg-til-horingssvar-fra-SAFE.pdf

Vedlegg 2: HISTORISK EKSPONERING. Universitetet Bergen. Gjennomgående kommentarer Halvor Erikstein SAFE

https://safe.no/wp-content/uploads/2023/05/Vedlegg-2-Rapport-fra-PETROLEUMSTILSYNET-Gjennomgaende-kommentarer-Halvor-Erikstein-SAFE.pdf

Vedlegg 3: Rapport fra PETROLEUMSTILSYNET. Gjennomgående kommentarer Halvor Erikstein SAFE.

https://safe.no/wp-content/uploads/2023/05/Vedlegg-3-HISTORISK-EKSPONERING-Universitetet-Bergen.-Gjennomgaende-kommentarer-Halvor-Erikstein-SAFE.pdf

Vedlegg 4: SAFE bestilt rapport 04.2022. Science behind turbine engine contaminated air.

https://safe.no/wp-content/uploads/2023/05/Vedlegg-4-SAFE-bestilt-rapport-04.2022-Science-behindturbine-engine-contaminated-air.pdf

Vedlegg 5: Health consequences of exposure to aircraft contaminated air and fume events: a narrative review and medical protocol for the investigation of exposed aircrew and passengers. Open Access. Publisert 16. mai 2023

https://ehjournal.biomedcentral.com/articles/10.1186/s12940-023-00987-8

https://www.regjeringen.no/no/dokumenter/horing-nou-2022-19-oljepionerene-enkompensasjonsordning/id2959849/?uid=65ae22ab-b2f4-4339-9d7d-29021b33ea50



Kommentarer lagt inn av Halvor Erikstein, SAFE. Kommentarfrist var satt til 10. august 2022. Kommisjonsleder avviste i møte 22. august at kommentarene skulle oversendes rapportforfatterne for avklaringer og rettelser.



Arbeidsmiljøbilder TURBINOLJER Se lysark 50 til 75

Vedlegg 1: Arbeidsmiljøbilder Drift Vedlikehold Boreslamsbehandling Vedlegg til høringssvar fra SAFE

https://safe.no/wp-content/uploads/2023/05/Vedlegg-1-Arbeidsmiljobilder-Drift-Vedlikehold-Boreslamsbehandling-Vedlegg-til-horingssvar-fra-SAFE.pdf

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Vedlegg 5: *Health consequences of exposure to aircraft contaminated air and fume events: a narrative review and medical protocol for the investigation of exposed aircrew and passengers.* Open Access. Publisert 16. mai 2023

https://ehjournal.biomedcentral.com/articles/10.1186/s12940-023-00987-8

AGENDA DAY 1

07:45-08:50	REGISTRATION AND REFRESHMENTS	
SESSION (ONE:	
08:50-08:59	CONFERENCE INTRODUCTION	
	Baroness Bennett of Manor Castle Green peer - UK House of Lords	
09:00-09:25	OPENING KEYNOTE SPEECH	
	Captain Tristan Loraine BCAi Conference Director	
09:26-09:36	OUR FIRST 18 YEARS	
	GCAQE Board	
09:37-10:11	RECENT RESEARCH IN BLEED AIR CON- TAMINATION DETECTION	
	Professor Byron Jones Professor of Mechanical Engineering, Kansas State University	
10:12-10:36	THE UNKNOWN HEALTH THREAT OFFSHORE: CHEMICAL EXPOSURE FROM AERODERIVATIVE TURBINES. THE OIL AND GAS INDUSTRY MUST LEARN FROM AVIATION!	
	Halvor Erikstein Organizational Secretary Certified Occupational Hygienist SAFE - Norwegian Union of Energy Workers	
10:37-10:59	Q&A	
11:00-11:29	REFRESHMENTS AND NETWORKING	
SESSION '	TWO:	
11:30-12:00	DEALING WITH CABIN ODOUR EVENTS	
	Ricardo Pavia TAP Engineer	
12:01-12:39	ORGANOPHOSPHATE TOXICITY PATTERNS: A NEW APPROACH FOR ASSESSING ORGANOPHOSPHATE NEUROTOXICITY AND RELEVANCE FOR AVIATION LUBRICANTS	
	Grégoire Herve Scientific & Technical Director NYCO	
12:40-12:59	Q&A	
13:00-13:59	LUNCH AND NETWORKING	

Subject to change

SESSION THREE: 14:00-14:09 THE ITF PERSPECTIVE Gabriel Mocho Rodríguez Civil Aviation Secretary International transport workers' federation (ITF) 14:10-14:30 CONTAMINATED AIR LITIGATION Judy Cullinane 14:31-14:56 WHY DO WE NEED A PROTOCOL FOR AEROTOXIC SYNDROME? Dr Jonathan Burdon Consultant Respiratory Physician 14:57-14:17 AVIATION MEDICINE - AEROTOXIC SYNDROME: FACT OR MYTH? Dr. med. Denis Bron Chef Flugmedizin, Head of AeMC Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport VBS Luftwaffe Fliegerärztliches Institut FAI / AMC Schweiz 15:18-15:34 Q&A 15:35-15:59 REFRESHMENTS AND NETWORKING *

SESSION FOUR:

16:00-16:20	INDOOR AIR QUALITY IN AIRCRAFT THE IMPACT OF INCREASED MOBIUTY ON HEALTH EFFECTS AND THE INFLUENCE OF BLEED AIR
	Assistant Professor Seunghon Gachon University Gil Medical Center, Department of Occupational and Environmental Medicine Graduate School of Public Health, Occupational and Environmental Health, Gachon University, Republic of Korea
16:21-16:40	AN AIRBUS PILOT'S PERSPECTIVE
	Thorsten Busch Airbus A320
16:41-16:59	CLEARING THE AIR, SAFETY MANAGEMENT RESPONSIBILITIES RELATED TO CAQ
	Captain Rudy Pont Belgian Cockpit Association (BeCA)
17:00-19:00	CONFERENCE NETWORKING EVENT WITH MUSIC

7:45-08:45	REGISTRATION AND REFRESHMENTS			
ESSION F	FIVE:	SESSION	SEVEN:	
18:45-08:46	CONFERENCE INTRODUCTION Captain Philippe Amman AEROPERS	14:00-14:25	CONTROLLED VOC OZONE CONVERTER TESTING Robert C. Gleason, PMP Vice President: Engineering and Programs	
8:47-09:07	AIR QUALITY ON DASSAULT FALCON AIRCRAFT Bernard Baldini	14:26-14:51	PTI Technologies Inc. CONTROLLED VOC OZONE	
9:08-09:33	Dassault Aviation BENEFITS OF A HUMIDIFICATION SYSTEM WITH ACTIVE CARBON FILTER		Richard Fox, PhD, ASHRAE Fellow Environmental Control Solutions Manager AeroParts Manufacturing	
	Ola Häggfeldt Chief Commercial Officer (CCO) CTT Systems AB. Sweden	14:52-15:17	and Repair, Inc. Collins Bleed-Free ECS	
9:34-09:59	LEAVE CATALYSIS TO THE EXPERTS - FLY WITH VOZCI		Lance K. Bartosz Advanced Technology Manager Power and Controls – Environmental & Airframe Control Systems Collins Aerosnace	
	Ms Olivia Cromwell Global Business Manager, Aerospace BASF	15:18-15:34	Q8A	
0:00-10:25	LESSONS LEARNED FROM FOUR MORE YEARS OF FUME EVENTS REPORTED TO THE FAA	15:35-15:34	REFRESHMENTS AND NETWORKING	
	Industrial Hygienist, Association of Flight Attendants - CWA	-	N EIGHT:	
0:26-10:40	Q&A REFRESHMENTS AND NETWORKING	16:05-16	40 DEVELOPMENT OF A BIOMARKER OF EXPOSURE	
			Professor Clem Furlong & Associate Professor Dale Whittington University of Washington. Seattle, WA	
ESSION S	SIX:	16:41-17	01 30 YEARS LATER	
1:10-11:35	OPERATIONAL ASPECTS OF CONTAMINATED AIR EVENTS AND THE BENEFITS OF USING PEER- SUPPORT PROGRAMS FOR FLIGHT CREWS: AN		Marcus Diamond Australian Federation of Air Pilots	
	AEROMEDICAL PERSPECTIVE, Captain Rondeau Flynn Aeromedical Chairman for Allied	17:02-17	Dr. Susan Michaelis BCA(hon) PhD, ATPL	
	Pilots Association	17:30-17	45 Q&A	
1:36-12:01	ORGANOPHOSPHATE DOSE AND AIRCRAFT CABIN AIR		DELEGATES DINNER	
	Emeritus Professor C. V. Howard. MB. ChB. PhD, FRCPath. Professor of Pathology (taxicology) - University of Ulster			
2:02-12:32	NEUROPSYCHOLOGICAL ASSESSMENT:			
	THE MOST SENSITIVE MEANS OF EXAMINING THE EFFECTS OF TOXIC EXPOSURE			
	Professor Sarah Mackenzie Ross Chartered Clinical Psychologist & Clinical Neuropsychologist and Dr. Leonie Coxon		https://www.aircraftca	
	Clinical Psychologist and Forensic Psychologist		air com/schedule	
	and the second sec		an.com/schedule	

13:00-13:59 LUNCH AND NETWORKING

Konferansen

Konferansen



Den norske deltagerne kom både fra luftfart og fra oljeselskap.



Den store gode nyheten! Den franske fabrikken NYCO har utviklet en ny turbinolje.



https://www.sciencedirect.com/science/article/pii/S030438942400815X



https://davidlearmount.com/author/davidlearmount/page/2/





Viktige foredrag

Organophosphate dose and aircraft cabin air

Prof Vyvyan Howard v.howard@ulster.ac.uk Prof David Johnson djohnson1@udayton.edu



OPs show no concentration threshold

• "However the very nature of the reaction of OPs with their main targets, serine hydrolases, invites the proposal of **cumulative effects**. This reaction is a progressive, covalent adduction of the organophosphate to the active site serine, and as such is dependent on both concentration **and** time. Hence, unlike the reversible binding that determines most toxicant-target interactions, **OPs show no concentration threshold**, and an infinitely low concentration would produce an effect given infinite time. Fortunately bio-inactivation of the OP and spontaneous reactivation of the adducted enzyme ensure that this infinitely long time is not available, and the biological actions of OPs are effectively limited in vivo. This covalent reaction does however cause problems when it is necessary to evaluate actions in specific tissues, since knowledge of both tissue concentration and tissue half-life is needed. **OPs are a good example of agents where concentration is not equivalent to dose**". (My emphases added).







Viktige foredrag

6

CO Participantes

Uncovering a biomarker of exposure to tri-aryl phosphates (TAPs) *** Toxicology Environmental Research 2 artio G. Costa**, Clement E. Purkseg** Exposure to organophosphate esters and maternal-child health Servenez Shehin * A 25. Electron Althour Ghasseblan ** Madley³, Moutoin Vesidu³, Latentreto Tetrande ³ V

Over 5,000 publications in PUBMED referencing organophosphate to health effects from exposure

Imperial College London

Livestreaming and photograph are taking place

W

What is a biomarker? A measurable substance in an organism whose presence is indicative of some phenomenon such as disease, infection, or environmental exposure.

BChE (butyryl cholinesterase) is a plasma protein that has high sensitivity to inhibition by organophosphates and has been used for many years to document exposure to organophosphate insecticides, nerve agents.

https://medgen.uw.edu/people/clement-furlong

tige





2024/25 AFAP Pilot blood sampling – Furlong blood test //

The AFAP will now support the final development of the Furlong blood test.

The Furlong blood test to detect PCPs (organophosphate derivatives) in a pilot's blood is now laboratory proven. Final international certification and blood spot detection is being finalised by Dr Furlong's team

A cohort of AFAP pilot members will provide samples to help finalise this blood test.



Viktige foredrag









for-sussex-based-aviation-consultant-dr-susan-michaelis-4802403



GCAQE - WHO ARE WE?

A Bit of Background

The Global Cabin Air Quality Executive (GCAQE), established in 2006, is now a UK registered not profit limited company. The GCACE is the leading organization representing air creve (plotd, each crew and engineers) and consumers, that deals specifically with contaminated air issues and cabin air quality. We currently represent 33 organisations, and over one hundred bhusand works around the world.

The primary purpose of the GCAQE is to effect the changes in the aviation industry that are necessary to prevent crewmembers, passengers and ground workers exposed to turbine emissions from being exposed to oil and hydraulic fluid in the ventilation air supplied to the cabin and flight deck.

We are the credible, unlifed voice of airline workers, engineers and consumers regarding the hazards posed by exposure to contaminated ventilation supply air on aircraft. We offer practical tools to assist our member unions, and we connect our members across the globe to work together to prevent exposure to toxic fumes on aircraft.

The GCAQE structure can be reviewed here.

https://www.gcaqe.org/



https://www.gcaqe.org/health



https://www.gcaqe.org/flightsafety



The unknown health threat offshore: Chemical exposure from aeroderivative turbines. The oil and gas industry must learn from aviation!



International Conference 2024 17th & 18th September Imperial College London South Kensington www.aircaftcabinair.com

Halvor Erikstein Organizational Secretary Certified Occupational Hygienist www@safe.no







The unknown health threat offshore: Chemical exposure from aeroderivative turbines. The oil and gas industry must learn from aviation!



International Conference 2024 17th & 18th September Imperial College London South Kensington www.aircraftcabinair.com

Halvor Erikstein

Organizational Secretary/ Certified Occupational Hygienist www@safe.no

What do passengers, flight crew and oil workers have in common? They are exposed to turbine lubricants





https://www.ge.com/power/gas/gasturbines/Im2500





www.youtube.com/watch?v=AZqeA32Em2s
www.youtube.com/results?search_query=aerotoxic&page=1





Same lubricants are used on aircraft turbines and aeroderivative turbines

- High exposure offshore from unmarked oil ventilation systems (vent).
- So far absolute denial from oil companies on toxic effects from exposure.
- Aeroderivative gas turbines
 - OFFSHORE: Used on oil and gas production platforms
 - SHIPS: Used for propulsion and for electrical power production
 - POWERPLANTS: Used for electrical power production.

Offshore production platform: Turbines for power generators and turbines for pumps/compressors Could be around 10 turbines Synthetic oils containing organophosphates are used in both aviation and aeroderivative gas turbines. If the manual specifies MIL SPEC 23699, you can expect the presence of organophosphate additives.



An A3 poster was sent offshore. The reason was that very few emission points were mapped and marked regarding health hazards.



- Om merking av utslippspunkt: Den hvite dampen og den rare lukten. Det du ikke vet kan du bli syk av



Tekst og foto: Halvor Erikstein

Over alt på en plattform eller et landanlegg er det avlufting (venter) fra maskineri og prosessutstyr. Det er gjort lite for at det skal bli tatt hensyn til slike forurensningskilder selv om det som forurenser kan gi alvorlige helseskader. Kanskje er det avlufting fra tetningsoljene til gasskompressorene, smøresystemet til turbinene, avlufting fra tanker eller avsug fra en eller annen prosess hvor det benyttes kjemiske forbindelser. Ventene er gjerne plassert med utblåsing i «ubemannede områder» og det er alltid en vind som fjerner forurensningen. Det er lite tatt hensyn til at også slike områder trenger inspeksjon og vedlikehold, og det medfører et lengre opphold i forurenset område. Det kan også være at utblåsingene skjer på områder som

en må passere til og fra arbeid.



Halvor Erikstein

Hva kan komme ut fra «ventene»? Der det benyttes gasskompressorer med tetningsoljesystem må det ventileres store mengder av eksempelvis den meget kreftfremkallende forbindelsen benzen. Det er i tillegg mange andre helsefarlige forbindelser som kan utsette omgivelsene for skadelig eksponering. Fra turbinene luftes det ut ulike nevrotoksiske organofosfater samt en cocktail av forbindelser fra den syntetiske smøreoljen og nedbrytningsprodukter.

Regelverket er helt klart når det gjelder kartlegging av kjemisk eksponering. I Aktivitetsforskriftens §38 «Kjemisk helsefare» vises det til arbeidsgiveren spliktet: Arbeidsgiveren skal sikre at helseskadelig kjemisk eksponering ved lagring, bruk, håndtering og avhending av kjemikalier, og ved arbeidsoperasjoner og prosesser som avgir kjemiske komponenter, unngås, jf. innretningsforskriften § 15.



Vi mener mangelen på kartlegging av utslippsmengder og mangel på risikovurdering av kjemisk helserisiko hvor det også blir tatt hensyn til de reelle arbeidsoppgavene i et område, er uholdbar. Når en ikke kjenner sammensetningen og konsentrasjonen av arbeidsmiljøforurensningen betyr det at en heller kan vite hva slags verneutstyr som gir rett beskyttelse. Vi mener at alle avlutningspunkter må merkes og volum av utslipp og konsentrasjon av forurensingen bli kartlagt.

Halvor Erikstein halvor@safe.no

Telefon: 928 10 398



https://safe.no/wp-content/uploads/2021/01/Plakatavlufting-SAFE-A3_korr.pdf

Et rettferdig arbeidsliv SAFE









Turbine hood and generator layout



One of the major exposure source will be the oil vapor/oil mist from the oil vent system.



OIL



Thermal degradation of lube oil

Some areas may reach temperatures exceeding 500°C. At these temperatures, thermal decomposition of oil components will occur. Some of the degradation products will become much more volatile and will be vented out through the sump vent. It is to be expected that new compounds will form through various chemical reactions.



In the Norwegian offshore industry, shift work is arranged with 14 consecutive days of work on the offshore installation, with a 12-hour workday. This is followed by 4 weeks of time off. Up to 4 hours of overtime is allowed. There are no adequate systems for assessing chemical health risks in relation to the

extreme working hours.

Restitution deficit: Function of (working hours, work load, working intensity, chemical exposure, noise exposure, circadian rhythm, restitution quality) → Different health effects?





From now on, we must look forward and correct the injustice.

My hope with this lecture is to show how and why things could go so wrong when workers were chemically injured while working with new and unfamiliar technology.

Unfortunately, a decision was made that what was called the 'MS case at Statfjord' should not be reported as suspected occupational disease.

These decisions lead to that workers who very suffering were met with silence.

I hope that this presentation can be the start of putting the mistakes of the past behind us, and that those who have fought the long battle for justice can be heard and have their case treated in a fair manner.

What can be done to correct it? I believe none of the people involved in the original decisions still work in the industry.

NYCO.

No company has done more to study the effects of organophosphates. SAFE has supported a research project at Washington University. Even though Statoil (now Equinor) uses Turbonnycoil, they refused to contribute to this research on health effects.

Please note that many lubricating oil brands have changed names.





The conclusions are:

- (1) Commercial TCP (as used in most jet engine oils) presents a non-negligible potential of BChE inhibition in the test, comparatively with TOCP (tri-*ortho*-cresyl-phosphate), a potent neurotoxic, albeit this isomer is not detected in commercial TCP.
- (2) TIPP (anti-wear used in "Turbonycoil 600") does not present a significant improvement over TCP within the repeatability of this test.
- (3) General rules between the chemical structure and BChE inhibition have been found, and specific organo-phosphates inducing a much lower inhibition have been identified.



Equinor påsto at turbinoljene de bruker i dag ikke er nervegiftige. Nå beklauer olieselskanet

ASLEHANSEN

i bruker på våre turr i dag inneholder ikke len typen organofosfarer om er mistenkt for å kun-

ne gi nevrologiske effekter. Der skadde olje ran alls som jobber på våre anlegg Statoil har en dyster histodag være trygge på. rikk med arbeidere ved gass-Dette uttalte pressetalsperson turbinene offshore som plutisle Ledel Johannessen i Equinor selig ble alvorlig syke på jobb.

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Dagblader fortalte historien om

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ORGANOFOSFATER. GISLE LEDEL JOHANNESSEN etalsperson i Equino

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Beklager usannhet a spet ble også tilsendt brevet sine offshoremsatte o hadde sendt til europeisko – Offshoremsatte

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- Offshoreansatte i dag kan stallasjor



How saying **NO** to support research cost us years in assisting those harmed by exposure to turbine oils

Sendt: tirsdag 9. mars 2010 07:33 Til: Halvor Erikstein <halvor@safe.no>

Emne: RE: Letter from NYCO on Turbonycoil turbin oils to the European Aviation Safety Agency.

Halvor

Thank you for the information provided. For Statoil, it is important to choose products with the best possible HSE (Health, Safety, and Environment) properties. We strive to replace products that may pose an HSE risk with other products that carry a lower HSE risk, provided they have technically acceptable properties. Statoil also often chooses to apply stricter classification of products than what is required by the authorities.

Regarding this specific case concerning NYCO's work on developing new additives for turbine oils, we look forward with interest to the results of this work. However, it is difficult for Statoil to enter any binding cooperation with NYCO, as this would be perceived as support for a specific supplier in a competitive market and would conflict with our ethical guidelines and procurement policy. (My outline)

If NYCO comes to market with turbine oils based on new additives and can document better HSE properties than other suppliers, our view is that NYCO will recover its development costs through increased market share and company agreements. In such a case, NYCO could become a preferred supplier for Statoil, referencing our procurement policy, which commits us to using suppliers that maintain high standards concerning HSE.

Best regards, G..... EHS manager



https://www.dagbladet.no/nyheter/snakke t-usant-om-farlig-olje/81602648

March 2010

When illness strikes. The endless fight for justice.



31 years of struggle for justice (2019). Conference "Fullt forsvarlig".

Harry Stiegler Brevik with an appeal to CEO Eldar Sætre, Equinor.

https://www.youtube.com/watch?v=FVp2F179-j4&feature=youtu.be

20 years of struggle for justice (2019). (2008) Conference "Åpent lende"



https://safe.no/hms/apent-lende/

https://www.safemagasinet.no/wpcontent/uploads/2016/06/SAFE-Magasinet-2012-Nr-04.pdf

SAFE

RESIDENCE, SAND

25 års years of struggle for justice (2013) Conference "Ta ansvar!"

(June 2024).



36 ars years of struggle for justice

Commission Report: NOU 2022:19. The Oil Pioneers - A Compensation Scheme.



Oljepionerene – en kompensasjonsordning





Kommisjonsleder Geir Riise, lege, Oslo
Alf Erling Risa, samfunnsøkonom, professor emeritus, Bergen
Ingunn Ikdahl, jurist, professor, Oslo
Live-Merete Solheim, rådgiver , Offshore Norge og Norsk Industri
Ketil Karlsen, spesialrådgiver Industri Energi
Halvor Erikstein, yrkeshygieniker, organisasjonssekretær SAFE
Runar Nilsen, Ieder ALF avdeling offshore, Kvinesdal

Til Arbeids- og inkluderingsdepartementet

Kommisjonen ble oppnevnt ved kongelig resolusjon 3. september 2021 for å arbeide fram en kompensasjonsordning for oljepionerene. Kommisjonen legger med dette fram sin utredning.

Oslo 15. desember 2022

Geir Riise Leder Halvor Erikstein Ingunn Ikdahl Ketil Karlsen Runar Nilsen Alf Erling Risa Live-Merete Marjala Solheim Tone Kjeldsberg Sekretariatsleder Morten Gaarder Karl-Christian Nordby **Bodil Stueflaten** Sigvart Zachariassen **Ragnhild Beate Strand** Østrem

https://www.regjeringen.no/contentassets/d 50144a8c2454c418f7fae33cae1751d/no/pdfs /nou202220220019000dddpdfs.pdf

Who endured it – and who did not?

Commission Compensation for Oil Pioneers. Follow-up of NOU 2022:19.

- □ The commission disagreed on:
- What should be defined as the pioneer period?
- □ Who should have the right to apply for compensation?
- SAFE made a special statement regarding the duration of the pioneer period (1995) and demanded that all professional groups should have the right to apply for compensation.

Working Environmental images: Operations, Maintenance, Drilling Mud Treatment <u>https://safe.no/wp-content/uploads/2023/05/Vedlegg-1-Arbeidsmiljobilder-Drift-Vedlikehold-Boreslamsbehandling-Vedlegg-til-horingssvar-fra-SAFE.pdf</u>

Work environment images from insulation, scaffolding, and painting: Attachment to the consultation response from SAFE's Area Committee for Construction and Maintenance https://safe.no/wp-content/uploads/2023/05/Vedlegg-1a-Arbeidsmiljobilder-med-spesiell-vekt-pa-ISO.pdf

 NOU
 Norges offentlige utredninger
 2022: 1

 Oljepionerene –
 en kompensasjonsordning



Norges offentlige utredninger 2022: 19

5 turbine technicians from Statfjord

Three had lived with multiple sclerosis (MS) diagnoses for more than 20 years, but believe they were misdiagnosed.Two were sent for examination with suspected MS.All are certain that their job has caused the health damage.Dismissed as work-related because what we know today (but has not been implemented) was not known at the time.

«MS-case Statfjord»



Once you receive a diagnosis, regardless of new «MS-case Statfjord» knowledge, it is almost impossible for it to be reversed.

Multiple Sclerosis and Related Disorders 30 (2019) 51–56 Contents lists available at ScienceDirect



Multiple Sclerosis and Related Disorders

journal homepage: www.elsevier.com/locate/msard

Incidence of multiple sclerosis misdiagnosis in referrals to two academic centers



Marwa Kaisey (MD), Andrew J. Solomon (MD), Michael Luu (MPH), Barbara S. Giesser (MD), Nancy L. Sicotte (MD)

Cedars-Sinai Medical Center Department of Neurology, 127 S. San Vicente Blvd, A6600, Los Angeles, CA 90048, United States

ARTICLE INFO

ABSTRACT

Keywords: Multiple sclerosis Diagnosis Diagnostic errors Background: Multiple Sclerosis (MS) specialists routinely evaluate misdiagnosed patients, or patients incorrectly assigned a diagnosis of MS. Misdiagnosis has significant implications for patient morbidity and healthcare costs, yet its contemporary incidence is unknown. We examined the incidence of MS misdiagnosis in new patients referred to two academic MS referral centers, their most common alternate diagnoses, and factors associated with misdiagnosis.

Methods: Demographic data, comorbidities, neurological examination findings, radiographic and laboratory results, a determination of 2010 McDonald Criteria fulfillment, and final diagnoses were collected from all new patient evaluations completed at the Cedars-Sinai Medical Center and the University of California, Los Angeles MS clinics over twelve months.

Results: Of the 241 new patients referred with an established diagnosis of MS, 17% at Cedars-Sinai and 19% at UCLA were identified as having been misdiagnosed. The most common alternative diagnoses were migraine (16%), radiologically isolated syndrome (9%), spondylopathy (7%), and neuropathy (7%). Clinical syndromes and radiographic findings atypical for MS were both associated with misdiagnosis. The misdiagnosed group received approximately 110 patient-years of unnecessary MS disease modifying therapy.

Conclusion: MS misdiagnosis is common; in our combined cohort, almost 1 in 5 patients who carried an established diagnosis of MS did not fulfill contemporary McDonald Criteria and had a more likely alternate diagnosis. The study revealed that 18% had been incorrectly diagnosed with MS, and that it has significant consequences. Mogens and Charles have still been denied a change of diagnosis from MS to neurological injuries after exposure to turbine oils with organophosphates. *Lier 02.12.2021*



Desember 2021

https://pubmed.ncbi.nlm.nih.gov/30738280/

The Parliament requests the government, no later than in connection with the 2025 state budget, to follow up on the conclusions from NOU 2022:19, so that the recommended compensation scheme for those exposed to chemicals in the early period of the oil industry can be established.



Hearing statement to The Standing Committee on Labour and Social Affairs.



The Standing Committee on Labour and Social Affairs

https://www.stortinget.no/en/In-English/Standing-Commitees/The-Standing-Committee-on-Labour-and-Social-Affairs/

Hearing statement to The Standing Committee on Labour and Social Affairs from 6 of the workers involved in the "MS-case at Statfjord".

- I have received permission from the six oil workers to present their hearing statements at the Aircraft Cabin Air Conference.
- We have a strong desire and great hope that the experts in the room later will read the statements and consider whether the symptoms are consistent with exposure to turbine oil.
- Since so far it has only been workers on the Statfjord platforms who has demanded the doctors to report suspected occupational diseases according to Working Environment Act's requirement.
- We believe there is a significant underreporting of cases on the Norwegian continental shelf. Health effects from exposure to turbine oils have so far been considered UNWANTED KNOWLEDGE

****Hearing Statement from Harry Stiegler Brevik.****

I began working offshore on Statfjord A in 1978-79 as a turbine technician. It was a busy job, but I enjoyed it. I spent a lot of time in the turbines and was exposed to a great deal of loud noise and intense exposure to hot oil fumes in the modules/turbines. In addition, I worked many night shifts where I could be alone on the job.

Then the problems started: severe skin issues with rashes and blisters on my face and neck. I developed chronic severe headaches and was once sent onshore by the nurse due to an extremely strong headache. In my case, it was initially suggested that it could be multiple sclerosis (MS). Additionally, I had gastrointestinal problems with severe pain and diarrhea, which ultimately led to the removal of my entire colon.

My ailments are chronic and will last a lifetime. Additionally, I struggle with hearing loss and use a hearing aid. This is a result of the intense noise on Statfjord A. I became disabled at 40 years old, with a family and young children. Even though I tried to make the best of it, my entire family was severely impacted by my illness.

Since Statoil denied that there was a connection between my illness and the extreme workplace exposure, I did not receive occupational disease compensation or occupational injury benefits. This made our financial situation extremely difficult.

Thus began the fight for recognition of my occupational injury. Over time, it became clear that several others who worked around the gas turbines and compressors and were exposed to turbine oils containing organophosphates were also ill. In this context, I refer to what has been called the "MS case on Statfjord A" and to the special statements on the MS case in NOU2022:19.

Eventually, we identified at least eight people with similar symptoms, where multiple sclerosis had been suspected. I demanded that Statoil comply with the Working Environment Act's requirement for doctors to report suspected occupational diseases in those who were exposed to turbine oils.

Despite my demand that the company obey the law, Statoil refused to report the suspected occupational disease. The Norwegian Petroleum Directorate was the supervisory authority for health, safety, and environment (HSE) offshore, but it was impossible to get support from them. I eventually became so desperate that I filed a complaint against the Norwegian Petroleum Directorate, led by then-Director General Gunnar Berge, for failing to act on the matter.

The complaint was dismissed by the Rogaland/Hordaland District Court without the possibility of appeal. It felt like a wall of resistance. Statoil would not admit or do anything. It is bitter to know that my own employer, Statoil, had knowledge of things they chose to hide. An employer should be someone you can trust, but that proved not to be the case here.

This has been many years of fighting for justice. I hope the case will have a fair conclusion and that we, the oil pioneers, will be seen and heard and receive the compensation and justice we deserve.

Sincerely,

Harry Stiegler Brevik



****Hearing Statement from Andrzej Boniukiewicz****

I started my journey in the oil industry in 1983, initially working as an engineer at Norwegian Rig Consultants, where I was involved in designing drilling modules for the Ekofisk and Gullfaks fields. After more than two years, my dream came true when I was hired by Statoil on the Statfjord A platform as an instrument technician in a sub-department focused on rotating equipment. In short, I worked with turbines that powered both gas compressors and electricity generators. Additionally, we had five reciprocating compressors and emergency generators.

Statfjord A was a very special platform that was not designed for the amount of gas and oil it produced. The platform was a closed type with artificial ventilation. In both the power station and the two gas compressor modules, the temperature was over 30 degrees Celsius, the noise was well above 100 decibels, and there was a constant smell of oil fumes.

When I started working there, I was surprised by the low standard of the equipment. Everything required an incredible amount of commitment and effort during the long-term preventive maintenance programs. We spent many days in those modules. In addition to that, we regularly needed to calibrate the control units for the turbines. Although this was done in the workshop, we were again exposed to oil fumes because the calibration was performed with hot oil. It was about a week's work with poor ventilation, which wasn't installed until sometime in the 1990s.

I experienced how toxic the oil was when it seeped through my glove and came into contact with a small scratch I had on one of my fingers. Overnight, my finger swelled to twice its size, and I developed a fever. Fortunately, this was my last shift day, so I went straight to the doctor. I had to undergo a course of antibiotics for this.

The maintenance program for hydraulic valves usually took about 10 long days, from 12 to 16 hours each day. We had to crawl for hours over uninsulated hot pipes soaked with hydraulic oil leaking from the actuators. The nights were not calm either, with alarms for various faults, gas alarms, etc.

In the 1990s, I began experiencing problems with the left side of my body. I became partially paralyzed, had severe headaches, and felt disoriented. I was sent home and referred to a neurologist. There, I was informed that they suspected either Lyme disease or multiple sclerosis (MS). As I mentioned, I was part of a sub-department of 11 people at that time. It turned out that I was the fourth person to have had similar symptoms. Initially, the matter was taken very seriously because Haukeland Hospital believed in an imminent breakthrough in their work on MS. Gradually, the issue faded away.

I have been very tired, suffered from headaches, lack of concentration, memory loss, and enormous difficulty in learning. Eventually, I was admitted to the hospital with a diagnosis of burnout and depression. I was hospitalized several times at various rehabilitation institutions. Today, I still struggle with headaches, poor concentration and memory, and mood swings. I am completely debilitated by the smell of fresh paint and motor oil fumes.

Today, there is a discussion about whether we should be awarded compensation as oil pioneers whose health was ruined. This is not the first time this has been talked about. The years go by, the State earns enormous sums, and there isn't even a serious investigation among those who sacrificed their health and lives.

Please don't forget that we are becoming fewer and fewer, and even with possible compensation, we will have less and less time to benefit from it if we even manage to at all



Similarity with the symptoms in aviation?

Sincerely, Andrzej Boniukiewicz

**Hearing Statement from Kjell Magne Fiskå **

I, Kjell Magne Fiskå, would like to thank you for the opportunity to provide input on the proposed compensation scheme for the Oil Pioneers.

The working environment in the oil industry from its inception is not comparable to work on land. A typical workday as an oil pioneer consisted of long hours, up to 16 hours a day, for 14-16 days. Even rest periods could be interrupted by, for example, gas alarms or other emergencies. I worked on Statfjord A from 1978-1991. Statfjord A is a platform with sealed walls that are not naturally ventilated, leading to high concentrations of gas and oil. This is unlike any other installations in the oil industry.

In the early years, protective equipment was inadequate or nonexistent. We could go weeks with oil-soaked cloth gloves that offered no protection. These oils were hydraulic and turbine oils containing highly toxic substances such as organophosphates. There is extensive research showing that these substances are both carcinogenic and harmful to the nervous system and lungs, both through direct exposure and inhalation. When oils are heated, they release more toxic gases. We worked in very high temperatures, requiring gloves to handle metal when working at heights. Effective breathing masks were not available. The work was carried out under high noise levels.

In my early years as an oil pioneer, I felt privileged and enjoyed my work very much. However, after years of exposure in a demanding work environment, symptoms such as headaches, nausea, fatigue, skin rashes, concentration difficulties, and personality changes began to creep in. These symptoms never led to time off work. In the early years, rest periods led to an improvement in symptoms.

Gradually, the symptoms worsened significantly, leading to hospitalization in 2002 due to severe confusion, intense pain, elevated CRP, and abnormal kidney and liver tests. No diagnosis was ever made, but it was concluded that I had a psychosis triggered by a physiological condition in the body. After this, I fully recovered and returned to work for two rotations. During both rotations, the symptoms returned, and I was sent home.

This led to the loss of my health certificate and resulted in me becoming disabled. Since then, I have been diagnosed with hearing damage with tinnitus caused by turbine noise, prostate cancer, and lung fibrosis. The symptoms that led to my disability have gradually improved. I have been evaluated for dementia and mental illness without any findings, and I believe that my difficulties are due to the work environment.

My family and I have wanted me to undergo an evaluation for years, as we believe I suffer from solvent damage. Both my GP and specialists have considered this possibility. I was referred to the Occupational Medicine Department at Haukeland Hospital for evaluation, but the referral was rejected. The reason for this is unclear. Based on all the knowledge I have gained about chemicals, turbine oils and their harmful effects; I believe I qualify for a thorough evaluation. Since I have not received a diagnosis, I have no basis for claiming compensation. As a result of my illness, I have lost the ability to earn an income and enjoy a good quality of life. This has also affected my wife and the rest of my family.

When I began my career as an oil worker on Statfjord A, we worked with substances and in environments that are not permitted today without approved protective equipment. We worked in this environment for time periods that are now limited by regulations. No one can be directly blamed for this, but we bear the consequences in the form of reduced quality of life and illness. If the committee decides on a compensation scheme, it will spare the pioneers from the additional burden of extensive evaluations. We, the oil pioneers, see it as a given that we should receive compensation for the fact that Norway has become wealthy at the cost of our health and economic losses.

Sincerely, Kjell Magne Fiskå



I worked at Alfsen and Gundersen in Oslo as a service engineer. The company then secured a contract to replace the control systems for the gas turbines and the equipment driven by the turbines on the Statfjord field. I was asked if I wanted to be part of this project. The old control system was relay-based with many faults, and the new one was to be fully digital.

I started in 1982-1983 on Statfjord A, dismantling the old equipment and installing the new. This work took place in closed modules with high temperatures and oil fumes inside the cabinets. This applied to the UM4 module for the compressors and UM5-6 for the generators. The air quality inside the switch cabinets was not good, and I often felt "heavy-headed" after working 12-14 hours a day in this environment.

In 1985, I was asked by Mobil if I would join them as an instrument technician, with primary responsibility for the turbines' programming and operation. I often exercised after work, but it started to become difficult. My limbs weren't responding as they should, and I began to stumble on stairs and on the treadmill. I then went to the nurse, who found that I didn't have proper sensation in my legs and sent me onshore. This was in 1987.



I was admitted to the neurology department at Drammen Hospital and diagnosed with MS. After being discharged from Drammen, I was sent to Haukeland and to Porsgrunn, where they also suspected it could be MS, but they were not certain.

I started walking and "light jogging," which an MS patient typically cannot do. I was on sick leave until 1990, when Statoil asked if I wanted to join the Gullfaks C project, which was based in Sandvika near Oslo. It was an office job, which I accepted.

I wanted to return to the construction site, but the company doctor said no due to my medical history. After the project, I was stationed in Dusavik, and later in Verdal. I was then transferred to Sleipner West at Stord and participated in the startup in the North Sea.

I retired in 2008 after several years stationed at Sandsli, working on the Gullfaks field. It should be noted that the company doctor for Statoil in Stavanger would not clear me for work until Statoil had found a new job for me.

Sincerely

Mogens Pedersen

****Hearing Statement from Charles Aase****

From 1985, I worked as a process technician on Statfjord C with responsibility for the gas turbines. My operator's office was located very close to the gas turbines, and there were venting points from the turbines that spewed out foul-smelling oil fumes in areas where we had to stay. The workday was 12 hours long, but we often worked overtime.

In 1988, I suddenly became seriously ill at work. I was 31 years old at the time. I developed what were interpreted as symptoms of acute multiple sclerosis (MS), losing sight in one eye and experiencing paralysis that caused me to lose balance and need to support myself against the wall. I was immediately put on sick leave and sent home.

The doctor I saw onshore remarked, "Oh, so you're one of those who have developed MS?" This was a comment I didn't understand at the time, but later I learned that I was not alone.

After a month, my condition worsened significantly, with paralysis spreading across large parts of my body. I was urgently admitted to the Neurology Department at Haukeland Hospital. In 1990, I was diagnosed with multiple sclerosis (MS). I was also put on MS medication, but the side effects almost broke me, and the treatment was fortunately discontinued.

In 1992, I heard about an MS study conducted on the neighboring platform, Statfjord A, among those who worked with gas turbines. I asked Statoil to put me in contact with the sick workers on Statfjord A, but Statoil refused, citing privacy concerns. It wasn't until Dagbladet's series of articles that I was able to contact other sick individuals related to the "MS case on Statfjord."

Through contact with people like Harry Stiegler Brevik, I learned that we all had very similar medical histories and symptoms.

I have lived with an MS diagnosis for more than 30 years. My disease progression has not aligned with typical MS at all, but it has been impossible to have the diagnosis changed based on what we now know about the severe health damage caused by turbine oils containing organophosphates.

It is extremely serious to live with an incorrect MS diagnosis. You are wrongly medicated, and all possible symptoms are mistakenly interpreted as part of the MS diagnosis. Statoil also failed to report my illness according to the Working Environment Act's requirement for doctors to report suspected occupational diseases.

I have received neither occupational injury compensation nor occupational disease benefits. It is painful to know that so much could have been avoided if Statoil had chosen to be open about the fact that turbine oils with organophosphates posed a very specific health risk to those of us who worked around the turbines.

Sincerely,

Charles Aase



Hearing Statement from Leidulv Reigstad

I began working as an electrician for Mobil on Statfjord C in 1984 and was later transferred to Statoil. I represented the Oil Pioneers in the meeting with the Commission on Compensation for Oil Pioneers at the Oil Museum on March 7, 2022.

My occupational illness started with an acute poisoning in 1986 when I was exposed to extreme turbine oil vapor exposure while working inside a hot gas turbine. As I was leaving the turbine hood, I collapsed and experienced acute paralysis but eventually managed to reach the platform's nurse. I was then airlifted to shore by helicopter and received by the oil company's occupational doctor. After a conversation in his office, I was sent home. At that time, I lived in the Bergen area but was subsequently sent to Mobil's occupational health service in Stavanger.

There, I found it very strange that they wanted to evaluate me for multiple sclerosis (MS), especially considering what I had heard about this disease. A doctor told me there was a 99% chance that I had MS. This was an extremely brutal and traumatizing message to receive. I was aware of how this serious disease progresses and had to think about how my family and I could adapt our home for the few years I might have left.

From Stavanger, I was transferred to the Neurology Department at Haukeland Hospital, where they initiated extensive testing to diagnose MS. I underwent all possible tests without MS being confirmed. Eventually, the paralysis significantly subsided, and gradually, I was able to return to work as an electrician on Statfjord C. I never fully regained my mobility, but in my case, Statoil made accommodations that allowed me to continue working offshore until 2014. Due to my injury, the workday was often painful, but I have a strong will that forced me to keep going. I must also commend my colleagues, who were truly considerate of my difficulties.

In 2003, Dagbladet ran a series of articles about the MS case on Statfjord. Statoil had completely concealed the fact that a few oil workers who worked with and around the gas turbines had symptoms that were initially interpreted as MS. I discovered that I was not alone, but that the company had chosen to cover up the issue.

In November 2002, my union, OFS, issued a public resolution demanding a full review of the work environment and health assessment of individuals who have been or are exposed to turbine and hydraulic oils containing organophosphates.

Today, Statoil, at the time I was poisoned, was aware that the turbine oils contained organophosphates, which could indeed cause the health damage I suffered. A great injustice has been committed in this case by the company hiding the fact that we were exposed to extremely neurotoxic chemicals. It should also be noted that Statoil never reported the illness cases as required by the Working Environment Act's mandate to report suspected occupational diseases. Had this been done, I am certain that many would have been spared from serious illness.

Sincerely

Leidulv Reigstad



Hearing Statement from Halvor Erikstein, Occupational Hygienist, SAFE.

The MS case from Statfjord – exposure to turbine oils with neurotoxic organophosphates.

An offshore gas turbine is essentially a modified aircraft engine (aeroderivative turbine). The same substances that can poison aircraft crew and passengers cause similar health damages to oil workers when they are exposed to turbine oils containing organophosphates. The "MS case on Statfjord" began for me when I was contacted by turbine technician Harry Stiegler Brevik in 2001. He represented a group of oil workers who had suffered neurological damage that was at the time suspected to be multiple sclerosis (MS). Some had been diagnosed with MS, while others became disabled without a diagnosis. The Working Environment Act requires that suspected occupational diseases be reported. The injured workers themselves requested that the cases be reported, but this was denied by Statoil, and an ongoing investigation was abruptly halted.

The Occupational Injury Insurance Act places the burden of proof on the person who has suffered an occupational injury. Underreporting of suspected occupational diseases effectively prevents the injured from receiving insurance settlements. The worker bears all the risk and suffers all losses from exposure to new, unknown, or unrecorded hazards. The sicks have no means to document health damages from new chemical compounds and processes. While the Hazardous Waste Regulations hold producers responsible for their waste "from cradle to grave," employers can take out occupational injury insurance and leave the injured to deal with the insurance industry.

It has long been known that exposure to organophosphates can cause neurological health outcomes that can easily be mistaken for MS when occupational exposure is not considered in the causal relationship. To my knowledge, none of the individuals in the group have developed MS, and they have lived with an incorrect diagnosis since the late 1980s. To this day, Statoil/Equinor has chosen to dismiss the injured and leave them to their fate without occupational injury compensation and occupational disability benefits.

In the process of trying to determine the cause of the so-called "MS case on Statfjord," I encountered aviation pilot and cabin crew unions, both domestically and internationally, where poisoning from engine leaks was recognized as both a health and safety risk. An offshore gas turbine is essentially a modified aircraft engine (aeroderivative turbine). The same substances that can poison aircraft crew and passengers cause similar health damages to oil workers when they are exposed to turbine oils containing organophosphates. This contact led to the beginning of a close collaboration on common issues between SAFE, the oil workers' union, and the aviation pilot and cabin crew unions. Pilot poisoning is a serious risk to flight safety. In 2006, the Global Cabin Air Quality Executive (GCAQE) was established for international collaboration to prevent the poisoning of aircraft crew and passengers from turbine and hydraulic oils in the aircraft's air conditioning system. At that time, GCAQE consisted of 29 pilot and cabin crew unions. I was elected as a board member of GCAQE for the next seven years. From 2015, I was Norway's representative in CEN/TC 436 "Cabin Air Quality in Civil Aviation, Chemical Compounds."

The MS case from Statfjord is an example of how the responsible oil company, Statoil/Equinor, has refused to acknowledge that this exposure causes serious health damage to employees. Turbine technician Harry Stiegler Brevik relentless fight for justice shows how powerless a worker is when new chemical compounds are introduced into the work environment while the oil company meets new knowledge with silence.

This is knowledge that could have prevented serious chemical health damage in those exposed to turbine oils. So far, there is still no recognition from Equinor that turbine oils with organophosphates can cause serious damage to the nervous system. Even today, Equinor has not managed to assess the risk and properly label the venting points on turbines.

Sincerely Halvor Erikstein





HOPE

From now on, those affected must receive the help they need, and the knowledge must be used to prevent new health tragedies.



Organizational Secretary/ Certified Occupational Hygienist www@safe.no Attachment - SAFE and the Norwegian Pilots' Association conference in 2008

SAFE og Norsk Flygerforbunds konferanse "Åpent lende". Hotel Residence, Sandnes 6. - 7. og 8. mai 2008



Del 1 "Kjemisk helsefare – eksponering og tiltak" Del 2 "To sider av samme sak – turbin- og hydraulikkoljer innen luftfart og petroleumsindustri"

https://safe.no/hms/apent-lende/

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