HSE Challenges in the Arctic/Northern Areas

Joint Meeting

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Contents

• Limitations of this presentation - geographical and topics covered
• The arctic and subarctic environmental challenge
  • Some common misconceptions
• Cold injuries and cold related injuries
• Protecting the worker
• Emergency preparedness
Some of the serious topics not covered by this presentation

- The melting of polar ice/global warming
- Effect on global climate
- Provide access to areas previously inaccessible (Greenland)
- Allow longer season for O&G activities
Arctic waters
Petroleum activity in northern Norwegian waters - as stipulated by the Norwegian parlament
Access to new acreage in northern parts of the Norwegian shelf

- OLF strategic goal: **Access to prospective acreage**
- OLF works to promote a licensing policy which provides attractive opportunities **in both frontier and mature areas**
  - Opening of the **North-Eastern Norwegian Sea** (near the Lofoten islands)
  - Future opening of the **new areas in the Southern Barents Sea** (near the Russian border), the **Northern Barents Sea** and the areas around **Jan Mayen**
  - Expansion of the areas that are included in the bi-annual frontier licensing rounds
  - Expansion of the areas that are covered by the system of annual awards in pre-defined areas (APA)
Sea water temperature

- The gulf stream carries warm water from the Gulf of Mexico along the Norwegian coastline
- Makes Northern Norwegian water warmer than commonly expected
- Eastern and Northern Barents sea remains cold
Water currents

- Parts of northern waters have strong surface currents. Makes sea-water survival more physical demanding
Drifting ice

- Drifting ice a challenge in the circumpolar area
The subpolar climate

- Low pressure, precipitation, Low temperature
- Icing conditions
Cold injuries

- Frostbites/blisters
- Non-freezing cold injuries
Cold related illnesses

- As ambient temperature falls
  - Incidence of cardiovascular disease and cerebrovascular disease increase (~1% per deg C)
  - Cold induced asthma
  - Peripheral blood vessel constriction (Raynaud)
  - Cold urticaria
  - Musculoskeletal problems
Telemedicine

- Implementation of telemedicine solutions will probably accelerated
Psychological aspects

- Significant seasonal changes in daylight
  - At 69°N
    - Two months in winter and summer with no/total daylight resp.
  - Frequently cited to suggest increased risk of seasonal affective disorders
- Light therapy, Melatonin
- Limited scientific support
Effect of cold on work safety

- Work accident frequency increase as ambient temperature falls
Protective clothing

- Thick clothing - good thermal protection
  - Bulky
  - Difficult to move

- Icing of respiratory protective devices
Sheltered worksite/Winterization

- Normally manned working areas kept indoor
- Heat tracing of escape routes, safety equipment, muster areas
- Insulation
Limiting factors

- North Sea O&G production has traditionally short down-time due to environmental factors

- Subarctic petroleum activities will need to adjust to the environment
Life craft and emergency equipment

• Evacuation alternatives
  • The traditional + evacuation to ice

• Challenges
  • Temperature
  • Ice
  • Sustainability
Cold water survival

• A question of insulation and protection
  • Protective underwear
  • Water ingress (<500 ml)
Cold water survival

- A question of time and use of protective clothing (survival suit)
A question of rescue resources

• Short distance to multiple public and commercial rescue assets in Southern Norway

• Long distance to limited public rescue resources in subarctic areas
Contingency/evacuation capacity

- All weather SAR (AWSAR)
Seabirds

- Seabirds may react aggressive in Northern waters
  - Attracted by stomach content/vomiting
  - Attacks the shipwrecked eyes
Hyperbaric reception facilities

- North Sea (Saturation) divers are supported by dedicated hyperbaric lifeboats

- Reception facilities in Aberdeen and Bergen
Hyperbaric reception facilities

- Traditional hyperbaric reception facilities are fixed and expensive
- Alternative (mobile?) reception facilities have been designed for use in remote areas
Thank you for your attention!