ROYAL NORWEGIAN
MINISTRY OF TRANSPORT

European Commission - DG Mobility and
Transport
BE-1049, Brussels
Belgium

Your ref	Our ref	Date
	15/1583-	4 March 2024

Incorporation of Commission Regulation (EU) 2016/1199 into the EEA Agreement – Helicopter offshore requirements

1. Background

On Monday 13 November 2023, a VTC meeting took place between representatives from the European Commission and the EEA EFTA States to discuss potential incorporation of Regulation (EU) 2016/1199 (the HOFO Regulation) into the EEA Agreement. The meeting was held in a positive atmosphere, with both parties expressing an interest in advancing on this important matter.

During the deliberations, the Commission and the EFTA States reiterated their diverging positions on the EEA relevance of the Regulation based on the geographical scope of the agreement. Nevertheless, Norway, representing the EEA EFTA States, conveyed a readiness to engage in discussions regarding a voluntary incorporation of the Regulation into the EEA Agreement. Both parties then expressed willingness to look at pragmatic solutions in order to progress on the matter.

2. Safety requirements

A pragmatic solution must respect the need for safety in light of the extreme weather and climate conditions prevalent on the Norwegian continental shelf, which gives rise to a need for particular measures. Stringent safety requirements are imperative due to these conditions.

Currently, Norway adheres to the provisions in the HOFO Regulation, supplemented by some additional safety related requirements. As promised in the above-mentioned meeting, please find enclosed an overview of the existing Norwegian safety requirements exceeding the requirements specified in the HOFO Regulation.

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The primary purpose of the enclosure is to explain why adhering to the safety requirements in the HOFO Regulation alone will not result in an equal level of safety for helicopter operations on the Norwegian continental shelf compared to helicopter offshore operations in the EU Member States.

Point 2 of the enclosure is an account of the general meteorological conditions in the various parts of the Norwegian continental shelf and their impact on helicopter operations offshore. The account documents a substantial difference between the conditions in the Northern Atlantic compared to more southern waters. The main features are polar low pressures, strong winds, high waves, fog, low temperatures, polar nights, icing, helicopter triggered lightening and combined effects of all these phenomena.

In point 3 of the enclosure, the substance of the additional safety requirements is presented in more detail, the reference to the related HOFO Regulation requirements is indicated and the reason for each additional requirement is given separately.

We fully acknowledge that additional requirements to the harmonised safety requirements of the HOFO Regulation must be based on empirical data. At the same time, we urge the Commission to recognise that no exact 'reference acceptable risk level' was identified during the preparation of the HOFO requirements. To quantify the exact extra risk related to HOFO operations on the Norwegian continental shelf is hardly possible. But the difference is no doubt substantial and must be compensated for.

The main helicopter operators in the Norwegian offshore market are branches of global actors. There is no risk that the additional requirements would favour Norwegian operators. Additional safety requirements are based on the need for sufficient level of safety under the particularly harsh conditions on the Norwegian continental shelf, as demanded by the offshore petroleum operators (purchaser of the services) and their employees.

3. National preparedness and the role of the Norwegian Civil Aviation Authority

Stable and continuous operation of the Norwegian petroleum installations offshore is paramount. Continuity of supply is indispensable both for the Norwegian society and for the EU as purchaser of natural gas.

A more challenging security environment during the last few years has revealed operative vulnerabilities in possible scenarios of crises and war. Both accessibility of helicopters, ability to supervise safety requirements and capacity to maintain aircrafts within the framework of Norwegian Total Defence concept are critical factors to control such situations.

If the HOFO Regulation is implemented in Norway, with its standard EASA obligation to recognize certificates (AOC) issued by competent authorities in other Member States and full freedom for helicopter operators to choose their principal place of business, it threatens to have as a consequence a severe reduction of the Norwegian Civil Aviation Authority's ability to fill its role in times of crises. As a general principle, even scenarios with relatively low probabilities are unacceptable when the consequences may be interruptions of offshore petroleum operations.

Therefore, the Norwegian Government does not see a way of including the HOFO Regulation into the EEA Agreement without a solution ensuring the Norwegian Civil Aviation Authority's ability to uphold national preparedness also in the future. We have no wish to complicate the deliberations between us by formulating absolute and detailed requirements, but these concerns need to be addressed.

Yours sincerely

Øyvind Ek
Deputy Director General

This document is signed electronically and has therefore no handwritten signature

Enclosure: Account for meteorological conditions and additional safety requirements

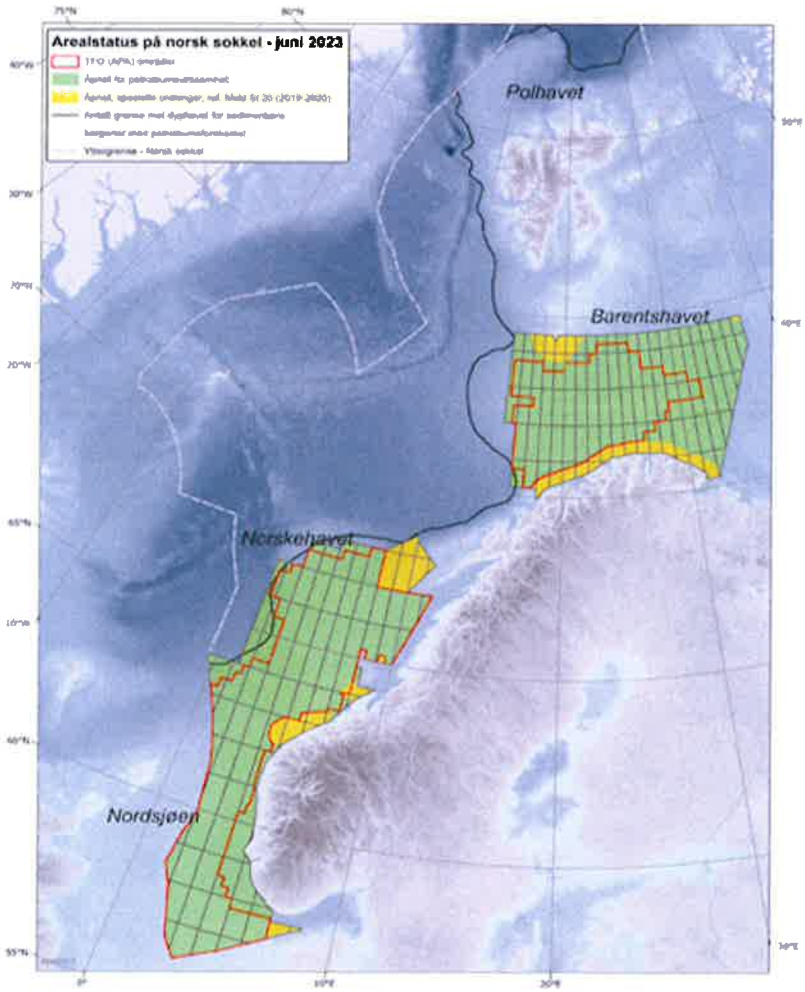
Enclosure

Offshore helicopter operations on the Norwegian Continental Shelf

1. Overview - offshore helicopter operations in Norway

The combined Norwegian sea areas are almost 6 times larger than mainland Norway, Svalbard and Jan Mayen. The map indicates the current land status for the Norwegian continental shelf. The green areas on the map show the areas the Government has opened for oil and gas activities. The yellow areas are areas that have been opened for oil and gas activities, but which are subject to special arrangements, cf. Meld. St. 20 (2019-2020) Norway's integrated ocean management plans — Barents Sea–Lofoten area; the Norwegian Sea; and the North Sea and Skagerrak — Report to the Storting (white paper).

The government has opened for new exploration areas in 2024 on the Norwegian continental shelf. These areas are of great interest from the oil and gas operators and increased exploration activity is expected. This activity will lead to increased helicopter activity on the Norwegian shelf, both in the North Sea and the Barents Sea.



Area status on the Norwegian continental shelf - June 2023

Green areas - opened for petroleum activities. Yellow areas - special arrangements, ref. Meld. St.20 (2019-2020)

The map shows an overview of the large geographical areas from approximately 75 degrees north to 57 degrees south. The climate in the Barents Sea, the Norwegian Sea and the North Sea is very different and varies with the seasons – summer and winter.

There is a high level of activity in all three areas, and especially in recent years there has been an increasing level of activity in the northern areas and the Barents Sea. For helicopter operations, the operational and meteorological conditions could be quite different depending on whether the flight will take place at 72 degrees north (Johan Castberg) or at 56 degrees north (Ekofisk).

The operational requirements for offshore operations in Norway have been developed over several years in a cooperation between the CAA-N, the offshore helicopter operators and the oil and gas industry's interest organizations both on the employee and employer side. These stakeholders have since 2003 cooperated in a Forum for helicopter safety on the Norwegian continental shelf.

Up to the water shed accident in 1997 the risk level was less than impressive, and the Fatal Accident Rate FAR (Fatalities per 100 million flight hours) was in the period 1990-1998 43 % higher than on the UK side (230 in Norway vs. 160 in the UK). Initially the requirements were national regulations based on ICAO Annex 6 Part III. Following several helicopter safety studies (HSS) and white papers (such as HSS-1 & 2[1] and NOU 2001:21 [2]& 2002:17[3]), to a certain extent regulations, but mainly guidelines for customer additional requirements (NOROG guideline # 066[4]), were established. The safety requirements for these operations have therefore been established through national regulations and industry standards, based on experience and further, periodic helicopter safety studies (HSS-3[5], HSS-3b[6] and HSS-4[7]). Together, these requirements and practices have resulted in, what is believed to be, a reduced risk level in the following years, indicated by a FAR of 90 in Norway vs. 340 on the UK side in the period of 1999-2019, despite the challenging operating environment.

The guiding philosophy behind these safety efforts has mainly been to reduce the probability of accidents, and less on mitigating the consequences of accidents that have happened.

From latest published Norwegian State Safety Program (SSP) 2017-2021:

An offshore helicopter accident with 13 fatalities occurred on the 29 April 2016. Just over a month later, another accident occurred that resulted in material damage to an offshore helicopter, but without any people being injured. There were no accidents within offshore helicopter operations between 2002 and 2016, and the previous fatal accident was in 1997. The accidents of 2016 made it clear that improvements are still needed in the sector; aviation safety cannot be taken for granted. However, history has shown that it is fully achievable to avoid accidents within offshore helicopter

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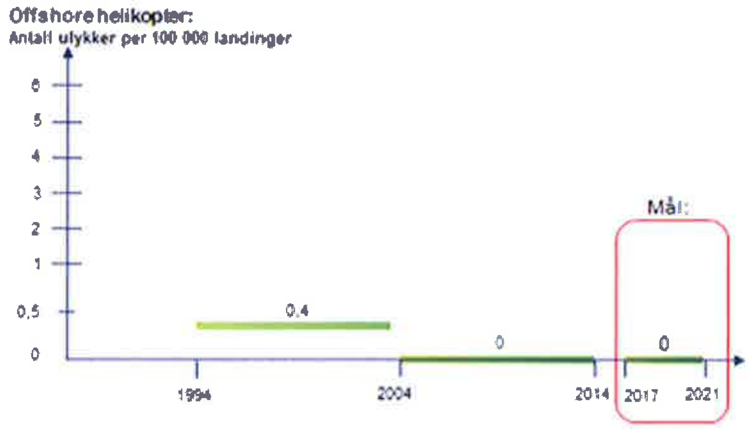
[1] Helicopter Safety Study 1 and 2, by SINTEF
[2] Official Norwegian Report (NOU) 2001:21 on Helicopter safety on the Continental Shelf part 1, by the Ministry of Transport and Communications
[3] Official Norwegian Report (NOU) 2002:17 on Helicopter safety on the Continental Shelf part 2, by the Ministry of Transport and Communications
[4] NOROG 066 Recommended guidelines for flights to petroleum installations, by Norwegian Oil and Gas
[5] Helicopter Safety Study 3, by SINTEF
[6] Helicopter Safety Study 3b, by SINTEF

[7] Helicopter Safety Study 4, by SINTEF

operations for long periods. Based on the number of accidents/accident frequency, the goal is therefore to avoid accidents over the next five years (2017-2021).



Figur 6: Historiske verdier for ulykkesfrekvensen, og mål for neste femårsperiode, for norsk, kommersiell luftfart med offshore helikopter.

The figure shows historical values for the accident frequency and our latest goals for Norwegian commercial aircraft for offshore helicopters. These goals still apply.

When SPA.HOFO became applicable in the EU, Norway considered these provisions to fall outside the scope of the EEA Agreement and therefore not to be adopted as EEA law. However, Norway decided to adopt the requirements as a national regulation with some additional requirements. These additional requirements originated from the existing national regulations and guidelines in the industry standards. Incorporation of the additional requirements was considered necessary to compensate for the more demanding operating conditions as well as to prevent a reduction in the hard achieved level of safety.

Several of these additional requirements are, as mentioned in the text below, reflected in the recommendations in the report: "Helicopter North Sea operations management current practices safety review Rev. 2 of 2016-10-19" (EASA CPSR) which was commissioned by EASA and delivered by DNV GL.

Today's safe aviation system is built on experience gained over decades, and it is crucially important to use this experience to continuously improve the safety.

Meteorological conditions in Norway are an important element that must be considered when assessing the safety of helicopter operations. It is necessary to describe climatological conditions, and these must be considered in connection with national additional requirements.

2. Climate conditions for offshore helicopter operations in Norway

Conditions in the northern region are characterized by a long winter season with low temperatures. During the winter months (October through March), this region is enveloped in the darkness of the polar night all or most of the day, and in the cold temperatures, icing, heavy snow, polar low pressures and turbulence are frequent weather phenomena. Dense fog is a phenomenon characteristic for the area, particularly during the summer months. Helicopter traffic operating in the northern regions must plan and fly under demanding meteorological conditions for long parts of the year.

The most significant meteorological conditions which face helicopter operations in the northern region are the following:

Polar Low Pressures

Polar low pressures are most often formed over the sea areas in the Arctic Ocean where there is a large gradient in the temperature at the sea surface. They are most common from the 0 meridian to Novaya Zemlya, and from 75 degrees and south to the Trøndelag coast, but they occur as far south as the coast of the North Sea. There is a concentration of polar low pressure in the area of the island of Bjørnøya to the sea area Tromsøflaket which is probably due to the convergence zone that is common south of the Spitsbergen archipelago in the northerly air flow. There are gradually fewer low pressures in the east of the Barents Sea, which is due to the fact that the sea temperature is lower, and the temperature gradients are smaller here.

The weather in a polar low pressure is characterized by strong winds with rapid increases and turns. The average observed maximum wind is 42 kts, i.e., a severe gale. About one in four lows has gusts of 50 kts or more, and the strongest on record had 70 kts over a 12-hour period.

The increase in wind combined with heavy snowfall causes drifting snow, low visibility and generally bad weather. The wind also often changes direction quickly, which can lead to rough seas from several directions at the same time, with a lot of sea spray. Combined with low temperatures, there is a great danger of icing on vessels. In some cases, thunder has also been observed in connection with the polar low pressures.

In relation to the point of formation, most polar low pressures move in a path with a southern component. Normal propagation speed is from 7 to 15 m/s. The lifespan of a polar low pressure can last from a few hours to several days. The average lifespan is approx. 18 hours. Polar lows occur from October to May.

On average, it is approx. 14 events with one or more polar low pressures throughout the season. In recent years, there have typically been 10–15 polar low pressures tracking towards the Norwegian coast during the winter, and most cases occur in January–March.

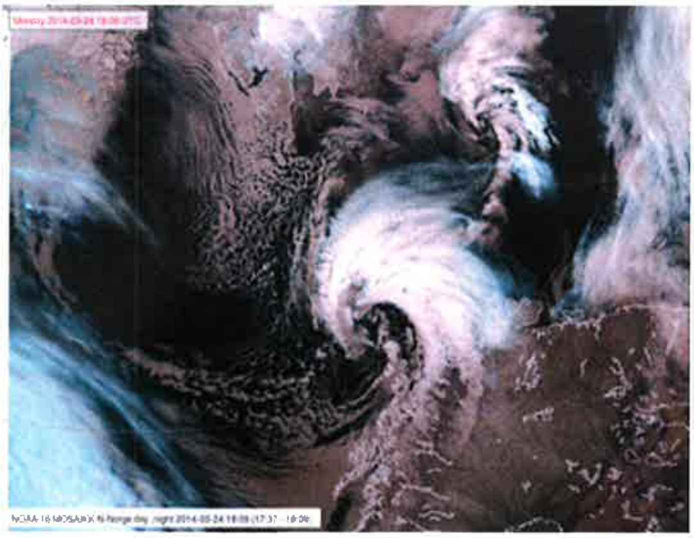


Illustration: Gunnar Noer, MET institute

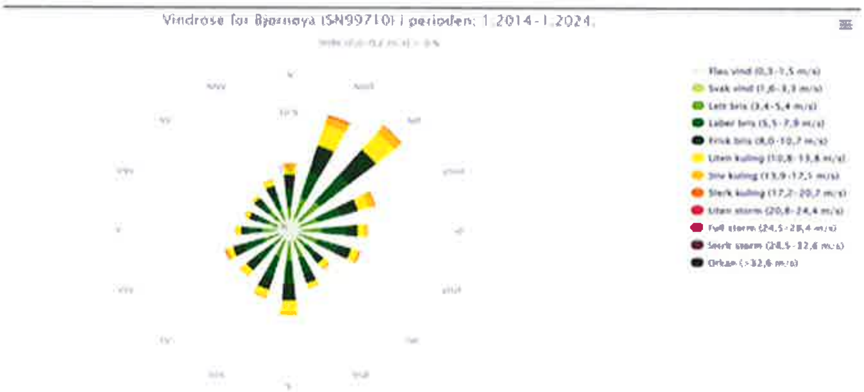
Formation areas for polar low pressures from 2000 to 2018 is shown with blue triangles. Monthly mean sea temperature for February in blue shading gives a good picture of the surface temperature in the winter season. Altogether there were approx. 240 events with polar low pressure in these years.

Wind

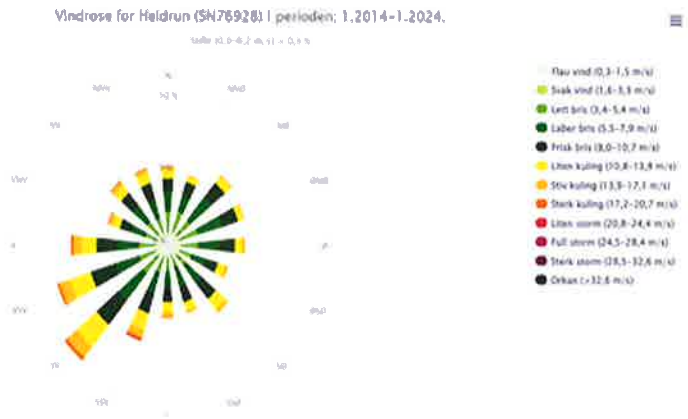
Overview is shown for the location Bjørnøya (Barents Sea), oil rig Heidrun (65 N) and oil field Ekofisk (56 N).

Statistics show that there is less occurrence at location Bjørnøya of the strongest wind force compared to the North Sea. In return, the annual average percentage (10-15%) of gale to severe gale is significantly higher in the Barents Sea compared to the North Sea.

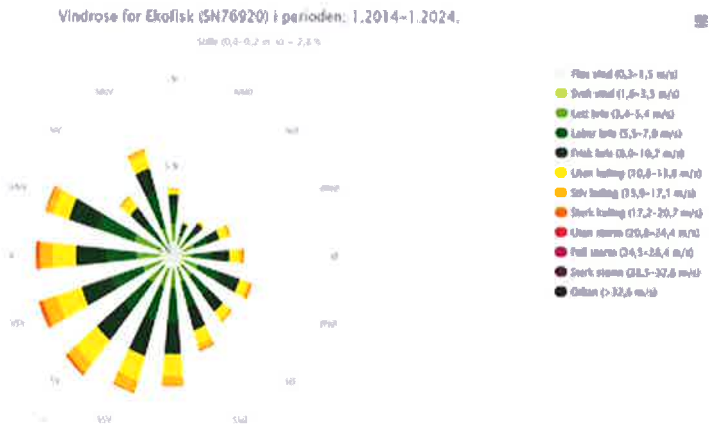
Annual average of the wind conditions for Heidrun and Ekofisk shows that Ekofisk in the south is the location with the largest proportion of strong winds/ severe gales. Heidrun has a on the whole less wind during the year compared to Ekofisk, but strong winds from the southwest.



Wind rose for Bjørnøya in the period 01.2014 to 01.2024.



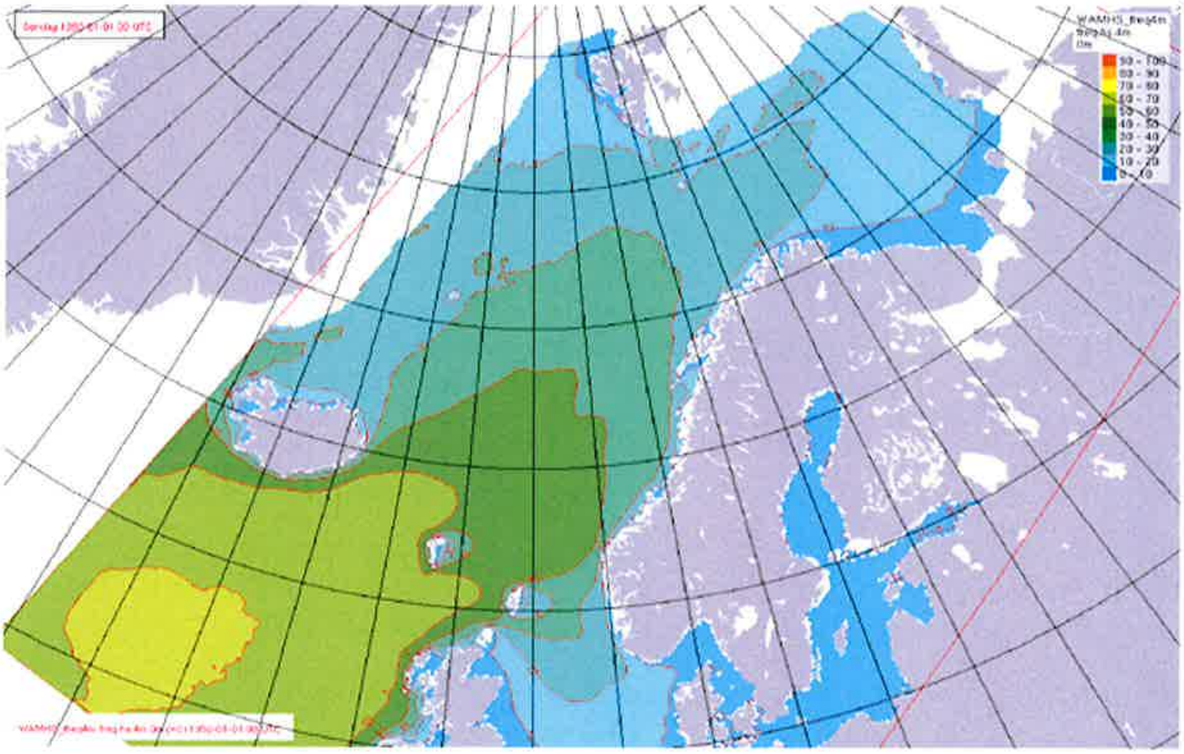
Wind rose for Heidrun in the period 01.2014 to 01.2024.



Wind rose for Ekofisk in the period 01.2014 to 01.2024.

<u>Waves</u>

In general, there is a lower occurrence of large wave heights in the Barents Sea, compared to the Norwegian Sea, as illustrated below.

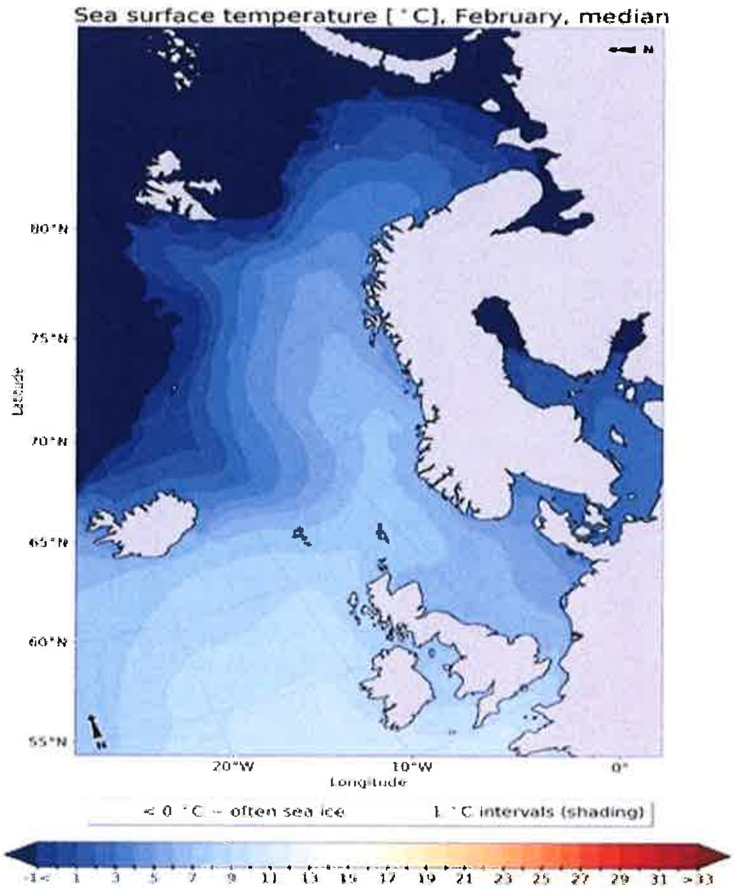


<u>Fog</u>

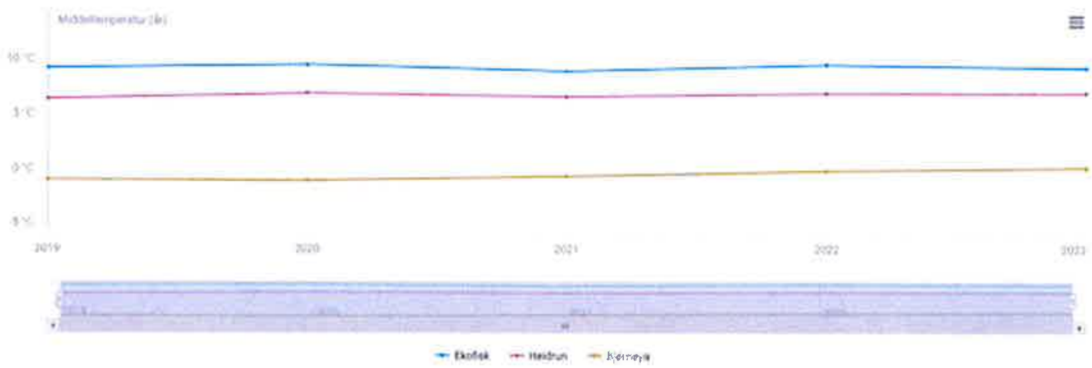
Fog (advection fog) with visibility below 1000m and often much lower occurs frequently in the months of June to September in the Barents Sea and down to the Norwegian Sea. Statistics show that fog occurs up to 27% of the time in these sea areas in the months of June to September. For the rest of the year, the occurrence of fog ranges between 4-8 per cent in this area.

<u>Low temperatures</u>

The temperatures in the Barents Sea are significantly lower compared to both the Norwegian Sea and the North Sea. In the northern and eastern part of the Barents Sea, temperatures can occasionally be extremely low, even below 0°C occasionally.



The average temperature is approx. 10 degrees in the North Sea, compared to Bjørnøya (Barents Sea), which has an average temperature of approx. 0 degrees.



Polar Nights

During long periods in wintertime, it is dark nearly all day and night in the northern regions. For example, in the city of Hammerfest where one of the northern offshore helicopter bases is located, the sun is completely gone in the period from 22 November to 20 January, for Bjørnøya in the period 7 November to 4 February. In general, it is dark during most of the day in the period from October to March. In combination with darkness and reduced visibility in precipitation in winter, there are several elements that are challenging for helicopter operations.

Icing

The probability of icing increases with increasing latitude. In the northernmost areas, strong icing occurs approximately 1.3 % of the time on an annual basis. Light icing occurs on average approximately 17 % of the time in the northernmost positions, while corresponding values in the three positions further south are 14-16 % on an annual basis. In comparison, there are few situations with strong icing on the installations Goliat about 50 nm north of Hammerfest, but moderate icing occurs in approximately 10.5 % of the time on an annual basis.

In general, there is a high risk for icing conditions for helicopters during flights from land to facilities both in the North Sea, Norwegian Sea and the Barents Sea. Ice of different intensity is a common phenomenon even for flights at relatively low altitude during winter season. Distribution and intensity are closely linked to the geographical conditions and the large-scale air masses. The airflow is normally from the west. In mountains terrain like in Norway, exposed to this wind direction will often be experiencing conditions favourable for icing.

Icing in mountainous areas in Norway is often more severe than in other areas. This is described in the textbook *"Flymeteorologi" [Aircraft meteorology]* that has been used at Norwegian flying schools (*Dannevig, P. 1969*). The "Flymeteorologi" book was written for Norwegian pilots and deals with Norwegian flying conditions which are often linked to more extreme winter conditions than might be encountered in other countries. *"Many cases of icing having led to difficulties are known from the region from the Bodø area down to Namdalseid, close to Stadlandet and around Folgefonnen..."*

"...On the windward sides of mountains, stationary icing zones can be quite extensive. Ice can form at the same height over a longer time; the intensity is usually light to moderate. But when warm, unstable air rises, it can release large volumes of water leading to severe icing".

Combined with mountains and mountains ranges the result is orographic lifting, condensation and super cooled droplets. The lifting of moist air, which typically has been heated from the sea below as it moves east, will form clouds and aircraft are most likely to encounter icing in these regions since super cooled droplets freeze as they collide with an aircraft.
Clouds tops with temperatures between 0 and -4 generally consist of super cooled droplets resulting in icing. In cloud top temperatures of -10 there is about 50% probability of encountering ice.

Helicopters flying on the Norwegian continental shelf, both in the south and in the north are exposed to icing conditions. Furthermore, when helicopters are approaching to land on onshore airports they encounter mountainous terrain all along the Norwegian Coastline from south to north which facilitate icing conditions.

In summary the assessment is that the possibility of icing is greater in the areas on the Norwegian continental shelf and the Norwegian Coastline, compared to further south in Europe due to the temperatures and the topography.

Helicopter trigged lightning

Helicopters are sometimes hit by lightning when flying offshore or inshore close to the coastline along the coast of Norway and in the North Sea. Often, the helicopter's presence is what triggers the lightning strike, and this phenomenon is called Helicopter Triggered Lightning (HTL). These lightning strikes present both a safety risk and an economic risk to offshore operations. The current forecast system for HTL in Norway was introduced in 2016 and named Helicopter Trigger Index. Review of incident data from the UK and Norwegian Continental Shelves indicate that HTL occurs mainly in the temperture band around 0°C (± 2°C) in dry or mixed phase precipitation. The incidents have occured in the period October to April most in the North Sea and the Norwegian Sea, fewer in the southern areas, and very rarely in the Barents Sea.

Less predictable weather forecasting

The Norwegian Meteorological Institute prepares warnings and weather forecasts for helicopter flights on the Norwegian Continental Shelf. The Norwegian authorities have set requirements for both observations and weather forecasts for all areas on the Norwegian continental shelf to ensure that there is sufficient material for planning and carrying out safe flights. IPPC - Norwegian Aerodrome Info

Numerical weather forecasts for the Barents Sea have been shown to have a somewhat lower quality/score compared to the other areas. This is related to the fact that the observations for these large areas are fewer and more scattered, and that the weather systems in these areas vary from systems in areas further south for which most of the meteorological models have been developed. Furthermore, it has been shown that it can be particularly difficult to warn of dangerous weather situations that can occur with short notice.

In recent years, the sea ice has receded more and more, so that larger areas have become available for activities related to, among other things, oil and gas exploration, tourism, transport and scientific research. This gradual increase in ice-free water exposed to cold air bursts leads to more frequent extreme convective events, with heavy hail, snow and storm-force gusts. These are weather phenomena that can be dangerous, but it is potentially possible to issue warnings, given the right parameters in the models.

Continuous research is carried out on the meteorological processes in the Nordic areas to understand them better, and to improve the warning of dangerous weather. At the same time, methods for using observations from satellites are being developed, while other methods for obtaining observations from the area are being tested.

The temperature in the Arctic is increasing more than twice as fast as the global average. The sea ice in the Arctic sea areas has decreased sharply in recent decades, and especially in the Barents Sea the temperature has risen rapidly. In the period 1971–2019, precipitation in the Arctic in the form of rain increased by 25 per cent. In the Arctic as a whole, annual precipitation is expected to increase. Most of the increase will come as rain. The increase in rainfall will primarily affect the coastal areas in winter and autumn. The climate changes are particularly noticeable in the northern regions. Increased temperatures, higher humidity and increased precipitation, melting of iced areas will have consequences for aviation weather forecasting and operational conditions for helicopter operations.

Summary

The Norwegian continental shelf is a large geographical area from approximately 75 degrees north to 57 degrees south. The climate in the Barents Sea, the Norwegian Sea and the North Sea is very challenging for operations in these areas. The climatic conditions, with low temperatures, darkness, snow, wind conditions, polar low pressures and icing, are undoubtedly more severe than in other locations in Europe and represent additional risks to offshore helicopter operations.

The national requirements which have been adopted in addition to the requirements i SPA.HOFO are there to compensate for this additional risk. Some requirements are established to ensure a higher level of competence, skill and capacity for pilots to handle these challenges. The requirement for additional simulator training, the limitations on operations at night and the requirement for a two-pilot crew fall under this category. Other requirements such as anti-icing equipment, ACAS II, HTAWS and tail camera, are equipment requirements which serve to mitigate risks such as more severe icing conditions, reduced visibility due to darkness and more severe and frequent bad weather. These additional requirements are considered necessary for achieving a necessary and adequate safety level similar to HOFO operations in other parts of Europe.

Taking account of the harsh conditions for operating helicopters off the Norwegian coast compared to other regions in Europe, a relaxation of the national additional requirements imposed by Norway is considered detrimental to flight safety.

3. Additional requirements for offshore helicopter operations in Norway

This section describes the additional requirements for offshore helicopter operations which has been adopted as a national regulation BSL D 2-3 (FOR-2018-06-20-923). Each requirement is presented in a table consisting of:

- Reference to the specific national requirement

- Reference to the corresponding requirement in Re. 965/2012 on air operations, when relevant.

- Description of the difference between the national requirement, and the requirement in Reg. 965/2012, when relevant.

- The reason for the adoption of the national requirement.

3.1 Additional simulator training

Reg. reference	Text
BSL D 2-3 § 3	Additional simulator training: Simulator training carried out in accordance with provision ORO.FC.230 in Regulation (EU) No 965/2012, must consist of at least eight hours of crew time, and at least three of these hours must be developmental training.
ORO.FC.230	(a) Each flight crew member shall complete recurrent training and checking relevant to the type or variant, and associated equipment of aircraft on which they operate.
SPA.HOFO.170(a)(3)	Crew requirements The operator shall establish: a flight crew training and checking programme that each flight crew member shall complete successfully. Such programme shall be adapted to the offshore environment and include normal, abnormal and emergency procedures, crew resource management, water entry and sea survival training.

Difference/ gap:	The additional requirement is a specification of the minimum amount of training that needs to be performed during recurrent training and checking. The national requirement is intended to help ensure the amount, standard and quality of already required training to address the extra challenges posed by offshore operations on the NCS.
Reason:	Flight crew training is by most considered the singular most important factors in achieving and maintaining an acceptable risk level in any flight operation. The provision in the national requirement supplements the requirement for periodic simulator training that follows from the common European rules in Regulation (EU) 965/2012, with a requirement for a minimum duration and that parts of this time must be used for training to develop the pilot. This is in addition to the training elements that follow from regulation 965/2012. The requirement in the additional provision is considered important to not only maintain, but also contribute to the continuous development of, the skills of pilots to perform tasks in the helicopter and the environment they normally operate. Complex operations in a demanding environment using helicopters equipped with sophisticated systems and subject to not only regulatory but also a significant amount of customer requirements, require more in the way of standard (quality and quantity) of training than other helicopter operations. Considering the challenging environment operations are performed in, such as darkness during autumn and winter season, frequently low visibility, wind and precipitation, winter conditions with snow and inflight icing for significant parts of the year, and on-shore airports often located in mountainous/fjord landscape/ terrain with a challenging obstacle environment. Further development in training philosophies and methods such as EBT are not yet fully developed, adapted and implemented in the requirements in Re. 965/2012 for helicopter operations. Use of FSTD/simulator is yet not fully embraced by the helicopter community as the invaluable tool it is to develop handling skills, navigation and system management specific for the helicopter type. The specification of number of hours in the national regulation may also partly have an effect in preventing that competition lead to cost-cutting by reducing training in order to support underbidding, as indicated in the latest Helicopter Safety study (HSS-4 ch. 10.5.9, M15, M16) and earlier studies.

3.2 Evacuation training with EBS

Reg ref	Text
BSL D 2-3 §3a	Crew and passengers must be given the necessary instruction and training in using emergency breathing apparatus (EBS) safely in an emergency situation.
SPA.HOFO.165 (c)	All persons on board shall carry and be instructed in the use of emergency breathing systems.
Difference/ gap:	The additional requirement in BSL D 2-3 § 3a, mandates that users of EBS-equipment also must perform training on how to use this equipment. This is different from the requirement in SPA.HOFO to be instructed e.g. shown how to use the equipment.
Reason:	The additional requirement is to ensure that all persons on board not only is instructed in the use of EBS, but also undergo adequate training in how to use the EBS system during an emergency situation. Such training requirements have been omitted from SPA.HOFO, and the responsibility is left to operators. CAA-N is of the opinion that it is unacceptable to not include requirements for training in use of such complex emergency equipment that is required by regulation to be carried on board for use by passengers. This is also a recommendation (#6) from CAP 1145 which is the origin of the requirement for EBS in HOFO.

3.3 Anti-icing equipment

Reg ref	Text
BSL D 2-3 § 4	Helicopters used for offshore operations must be equipped with anti-icing equipment in the period 1 September to 1 May. The Norwegian Civil Aviation Authority can nevertheless allow flights without such equipment to be carried out south of 60 degrees north.
CAT.OP.MPA.255 (b).	The commander shall only commence a flight or intentionally fly into expected or actual icing conditions if the aircraft is certified and equipped to cope with such conditions.
Difference/ gap:	The additional requirement is to specify that anti-icing equipment already required for flights to be performed in icing conditions, is required to be installed on all helicopters used on the Norwegian Continental Shelf in winter when the probability of encountering icing conditions is at the highest.
Reason:	There is a high risk for icing conditions and unforeseen icing on helicopters during flights from land to offshore destinations both in the North Sea and the Barents Sea. Ice of different intensity is a common phenomenon in flights at relatively low altitude, especially during winter season. After years of experience with helicopter operations on The Norwegian Continental Shelf it is found necessary that the helicopters have anti-ice equipment installed to

	ensure safety. Such equipment allow the flight-crew to prevent, and to remove, build-up of ice when flying in icing conditions. Icing was identified in the risk register in NPA 2013-10 (#64 Loss of control due to icing). The conclusion was that this should be left to operators to control, according to AFM limitations and general CAT/NCC/SPO requirements. One mitigating measure was for operators to: -Define icing prone areas and use rotor anti-icing equipment for operations conducted in defined icing prone areas. This is not considered sufficient for safe and regular passenger transport operations on the Norwegian Continental shelf, as the conditions are often borderline for icing and flights may possibly be carried out by attempting to circumnavigate or rather fly below the icing conditions. This could mean cancelling the IFR flight plan and descending below IFR minimum altitudes, to press on VMC using the "legacy" method, which tends to put undue pressure on pilots to perform flights in borderline conditions to fulfil contractual requirements and expectations. This was a necessity and acceptable for operations in the pioneering days with helicopter types where anti-icing equipment was not available. In 2024 relevant helicopter types are all certified for flight in icing-conditions. Anti-icing equipment enables safe IFR flight in icing conditions, including choosing alternates that are not always available along the coast within realistic range, and leading to diversions that may require climbing to altitude and crossing mountain ranges. In addition to the safety benefit of such equipment, the requirements do improve the regularity of offshore operations. The dependence on helicopter transport to offshore installations, e.g. during controlled de-manning/evacuation of oil and gas installations as well as during search and rescue missions and for the transport of persons in need of medical care, implies that the helicopters should be able to operate regardless of icing conditions. In 2015 EASA accepted the need to require pressurised aeroplanes for all operators conducting scheduled passenger flights over mountainous areas in Norway to mitigate the risk of an accident due to icing and possible loss of control. The arguments accepted by EASA for the need to require pressurised aeroplanes in the arctic coastal climate encountered on the west coast of Norway is equally valid for offshore helicopters departing from and arriving at the heliports on the coast and especially when diverting to alternate airports following routes along the coast or even crossing land and mountains. Anti-icing capability is not an integral part of helicopter configurations as it is for aeroplanes, it is not available for all helicopter types and it is expensive to install and maintain. The simpler and cheaper method of limited icing certification has not been found useful on the Norwegian Continental Shelf, as it relies on a band of temperatures above freezing over the sea for natural de-icing. That is not the case in parts of the operating area over the Norwegian Continental Shelf where the temperature is sometimes below 0°C down to the

	sea surface (icing on ships), and especially for any overland sectors to alternates. The main rule is that anti-icing equipment is required in the months when icing conditions normally occur. In areas south of 60 degrees north, icing conditions occur somewhat less frequently, and the topography is more benign. The provision does therefore allow operators to apply for a permit to conduct operations without anti-icing equipment dependant on having procedures for such operations. This provision is intended to allow for introduction of new helicopter types where experience shows that certification of anti-icing equipment tend to lag behind certification of the basic aircraft by several months, if not years.

3.4 Limitations on operations at night

Reg ref	Text
BSL D 2-3 § 5	Landing on a ship with a bow-mounted helideck must not be carried out under night conditions, unless this takes place according to a special procedure approved by the Norwegian Civil Aviation Authority and the crew has completed special training for such landings.
No corresponding requirement in Reg. 965/2012	
Difference/ gap:	The additional requirement is that night operations to ships with a bow mounted helideck is subject to an approved procedure and associated training.
Reason:	Safety studies identify landing and take-off operations to helidecks at night or in reduced visibility among the elements with the highest inherent risk. The risk is further increased when considering moving helidecks (on a ship in rough conditions) and additionally with very limited visual references to surrounding structure as may be the case for bow mounted decks. The requirement for a separate procedure and special training contributes to reduce this risk. This type of operation has been considered to be comparable to low visibility operations in some respects, which require an approval (SPA.LVO) and additional procedures and training for crews. This risk appears not to have been identified and addressed in the NPA 2013-10 Risk register, and is subsequently missing in the HOFO regulation. AMC1 SPA.HOFO.110(a) Operating procedures RISK ASSESSMENT require the operator's risk assessment should include "(h) loss of control during operations to small or moving offshore locations;" but fails to highlight the need to assess the additional risks related to night conditions or lack of visual references. As described in the beginning of this document, such conditions are common on the Norwegian Continental Shelf.

	Short periods of daylight during winter necessitates operations in night conditions to all types of installations. Several FPSO[8]s is in use, and a new one is starting production in the Barent sea later this year (Johan Castberg, with a 1,5 D deck). The requirement appears to be effective, as no such serious incident has been reported since this regulatory requirement came into effect. It should also be mentioned that the additional requirement for larger helidecks (1,25 D) on the Norwegian Continental Shelf, is also a safety measure especially aimed at the risk when operating to helidecks on ships and is based on a helideck design study from 2000. The requirement is found in our national regulation on helidecks (BSL D 5-1). Regulation BSL D 5-1 additionally contains a recommendation to further increase the helideck size to 1,5 D if the deck is bow mounted and the ship is unable to turn sufficiently out of wind for helicopter night operations.

3.5 Public Address (PA) system

Reg ref	Text
BSL D 2-3 § 6	Helicopters used for offshore operations must be equipped with a fixed loudspeaker system. The loudspeaker system must be dimensioned so that messages from the crew can be heard clearly for all passengers on board. However, the requirement for a public address system does not apply when the passengers are connected to the helicopter's internal communication system.
SPA.HOFO.160(a)(1) (CAT.IDE.H.180)	(a) The operator shall comply with the following equipment requirements: (1) Public Address (PA) system in helicopters used for CAT and non-commercial operations with complex motor-powered helicopters (NCC): (i) Helicopters with a maximum operational passenger seat configuration (MOPSC) of more than 9 shall be equipped with a PA system. (ii) Helicopters with a MOPSC of 9 or less need not be equipped with a PA system if the operator can demonstrate that the pilot's voice is understandable at all passengers' seats in flight.
Difference/ gap:	The additional requirement is to extend the requirement for PA-system to all helicopters operated on the Norwegian Continental Shelf and to include a functional requirement. This means that also helicopters with 9 or less (MOPSC) require this to be fitted.
Reason:	The noise level in a helicopter is often high, and in an emergency, it is particularly important for the passengers to be able to receive instructions from the pilots. There may also be other important messages that the pilots need to communicate to the passengers. If passengers are able to clearly hear information from the crew it may also contribute to passengers' sense of reassurance and confidence. A suitable PA system will help ensure this.

[8] Floating production storage and offloading (FPSO) refers to a floating vessel located near an offshore oil field, where oil is processed and stored until it can be transferred to a tanker for transporting and additional refining.

	According to SPA.HOFO.160(a)(1), such a public address system is only required in helicopters with more than 9 passenger seats. Since helicopters with a smaller number of passenger seats also can be used for offshore helicopter operations, the additional requirement is necessary to ensure the same level of safety for all passengers, regardless of the type or size.

3.6 Helicopter terrain awareness warning system (HTAWS)

Reg ref	Text
BSL D 2-3 § 7	Helicopters used for offshore operations must be equipped with a helicopter terrain awareness warning system (HTAWS) that meets the requirements of Regulation (EU) No. 965/2012, SPA.HOFO.160 (c).
SPA.HOFO.160 (c)	Helicopters used in CAT operations with a maximum certificated take-off mass of more than 3 175 kg or a MOPSC of more than 9 and first issued with an individual CofA after 31 December 2018 shall be equipped with an HTAWS that meets the requirements for class A equipment as specified in an acceptable standard.
Difference/ gap:	The additional requirement is to specify that HTAWS already required, but only for newer, larger helicopters, is required to be installed on all helicopters used on the Norwegian Continental Shelf.
Reason:	Terrain awareness systems (HTAWS for helicopters) is an important safety barrier to prevent accidents from so-called "controlled flight into terrain". That is, accidents where, for various reasons, the flight crew does not realize that the aircraft comes dangerously close to or collides with the terrain. A requirement for HTAWS was not part of the original NPA for HOFO but was included based on a proposal from CAA UK and work done in the CRG. The justification for proposing a forward-fit requirement given in the CRD-2013 is "uncertainty regarding retro fitment for some helicopter types". This uncertainty no longer exists, and it is now merely a question of installing the equipment and putting it to use. It is believed that the HOFO regulation should already have been subject to review and update in this area to keep up with the technological development. Most of the fleet of helicopters operated on the Norwegian Continental Shelf CS now and for many years to come, will most likely have an individual C of A issued before 2018, and will therefore not have HTAWS where it not for this additional requirement. It is considered unacceptable to not require a retrofit to ensure the safety benefit of HTAWS extends to passengers and crew happening to be travelling in these not very old aircraft or in smaller helicopters. The benefit of HTAWS is widely recognised and numerous accidents and serious incidents have or could have been avoided if adequate HTAWS had been in use.

	HTAWS is valuable in operations to and from helidecks, especially for approaches and departures in instrument meteorological conditions with reduced visibility, or in night conditions, provided the database is accurate and the HTAWS is tailored to the rig environment (Mode 7). Improvements in the HTAWS logic in this respect has been developed and certified and is being installed in the current fleet. The benefit of such equipment is proven beyond doubt, especially for operations in IMC and in darkness. These conditions are more prevalent on the Norwegian Continental Shelf, and darkness covers all or a major part of the day during the winter months. In addition, several of the heliports used for offshore operations and the airfields available as alternates are surrounded by mountainous terrain. HTAWS adds an additional barrier when performing instrument departures from and arrivals to such heliports/airfields. HTAWS is also useful over areas with other obstacles. The growing deployment of wind turbines emphasizes the importance of being aware of the exact position of any obstacles below in situations requiring an immediate landing/descent to lower heights, which is one not uncommon action in some serious emergencies. Wind turbines are becoming more and more common and covering large sea areas in the offshore environment. Terrain and obstacle data are continuously and rapidly updated, and improved terrain databases can be developed with a high degree of reliability and accuracy. This helps ensure that HTAWS databases can be kept up to date and be useful, also when new installations are built.

3.7 Airborne collision avoidance system (ACAS)

Reg ref	**Text**
BSL D 2-3 § 8	Helicopters used for offshore operations must be equipped with an airborne collision avoidance system class II (ACAS II) version 7.1.
No corresponding requirement in Reg. 965/2012	Reg. 965/2012 does not require ACAS on helicopters, only on aeroplanes over 5600kg or if configured for more than 19 passengers ref. CAT.IDE.A.155
Difference/ gap:	The additional requirement is to specify that ACAS II already required for turbine-powered aeroplanes with an MCTOM of more than 5 700 kg or an MOPSC of more than 19, is required to be installed on all helicopters used on the Norwegian Continental Shelf.
Reason:	Anti-collision system (ACAS/TCAS) which helps prevent collisions between aircraft in flight is considered important safety equipment. Helicopter safety studies earlier rated mid-air collision (MAC) as the highest risk in offshore operations, due to the potentially severe consequences if two offshore helicopters should collide.

	A requirement for ACAS was not part of the original NPA 2013-10 for HOFO. In response to a CAA-N comment that a requirement for ACAS should be included, it was argued by EASA in CRD 2013-10, that ACAS should be an airspace requirement. This appears not to be consistent with the requirements for aeroplanes as they are contained in ops regulations (CAT.IDE.A.155). The initial problems of adapting ACAS II to helicopters have been resolved a long time ago, but nothing appears to have happened in the way of including this requirement in helicopter regulations that as we are aware of. And we have not been able to find any airspace regulation requiring ACAS. Some areas/routes on the Norwegian Continental Shelf can be considered as fairly congested at times. Several offshore helicopter land bases are also co-located with airports (AFIS), without ATC and radar or other surveillance and operate mixed with other traffic (scheduled and unscheduled). For these locations ACAS is considered especially useful safety equipment. In addition, military aircraft, both allied and Russian, are operating in the entire area of the Norwegian Continental Shelf at any altitudes and times of the day and year. Large scale NATO-exercises are also held annually involving land- and carrier-based aircraft. The current lack of serious MAC incidents and accidents is considered to be at least partly due to ACAS and may be an indication that this is working. The initially high risk associated with MAC appears now to have significantly diminished, very likely due to the barriers put in place over the years. Multi layered probability reducing defences are the only option against MAC, as the consequences are most likely disastrous. These barriers include, in addition to ACAS II, the fact that virtually all routes/areas over the Norwegian Continental Shelf with regular traffic are designated as ADS areas, controlled airspace Class D based on ADS-B, the rest is subject to ATS surveillance, partially ground based, partially space based ADS and VHF radio coverage in most of the area. Future development in the environment may influence MAC risk negatively. The energy companies plan to use UAVs for regular cargo flights and have already started test programs, but employing UAVs without certified avionics and where ACAS fitted to the manned helicopters is listed as one important risk reducing measure in granting them approval to operate in the offshore environment. In Norway, it is a general goal that flight safety for offshore helicopter flights is as close as possible to flight safety for commercial passenger flights by plane. In the current version of the national SSP, the goal is actually set at 0 accidents for offshore operations. This means we are compelled to add available barriers, as offered by all realistically installable safety measures. ACAS II is one of them.

3.8 Tail camera

Reg ref	Text
BSL D 2-3 § 9	Helicopters used for offshore operations which have a certificate of airworthiness issued after the regulations came into force (1 July 2018), must be equipped with a forward-facing tail camera with image presentation in the cockpit.
No corresponding requirement in Reg. 965/2012	However, EASA NPA 2022-11 proposes to introduce such requirement on certain helicopters: "(d) Situational awareness at the offshore location Helicopters used in CAT operations with an MOPSC of more than 9 and first issued with an individual CofA after 1 January 2024 shall be equipped with a device that increases the situational awareness of the crew on both sides of the helicopter at the offshore location." ... 'In Norway,... Modern helicopters (e.g. H225, H175) have forward-looking tail-boom cameras that provide pilots with a view of each side of the helicopter."
Difference/ gap:	If the proposal in NPA 2022-11 is adopted as a regulatory requirement in Re. 965/2012, the difference will be that the national requirement is applicable to all helicopters new from 2018 onwards used on the Norwegian Continental Shelf, as opposed to only have this requirement for certain newer helicopters.
Reason:	The benefit of a tail camera is recognised in the NPA 2022-11. Use of a tail camera gives the crew better situation awareness in flight and on deck, as well as the opportunity to verify open hatches, warnings, smoke etc. and is thus considered appropriate safety equipment. A tail camera could also contribute to prevent ditching due to false fire warning alarms, and possibly other malfunctions related to engine/gearbox issues. This is especially important to avoid in rough sea conditions, reduced visibility and darkness, and considering the often extremely low water temperatures on the Norwegian Continental Shelf. Hardly any helicopters in use on the NCS are built after 2018, not to mention 2024 which is the cut-off date proposed in NPA 2022-11. Which means the vast majority of the fleet will not be equipped in the foreseeable future without the additional requirement.

3.9 Two-pilot crew

Reg ref	Text
BSL D 2-3 § 10	For passenger flights, the crew must consist of at least two pilots.
ORO.FC.200 (d)	The provision requires a flight crew of two pilots on helicopters configured for more than 19 passengers, or on helicopters configured for more than 9 passengers when used in IFR operations (instrument flights).

Difference/ gap:	The additional requirement is to specify that a flight crew of two pilots, is required to for all helicopters used on the Norwegian Continental Shelf regardless of number of passengers.
Reason:	The common European regulations allow a minimum crew of one pilot for this type of operation if the helicopter is certified for one pilot and 9 or fewer passenger seats are installed (MOPSC). In terms of safety, however, this solution should not be preferred over a multi crew concept (MCC). The safety advantage of using two pilots is evident, as a MCC can be utilised including sharing of duties in Pilot Flying/Pilot Monitoring roles. For instance, if the pilot in control should become incapacitated, there is a second pilot who can take control over the aircraft. The need for a two-pilot crew concept is enhanced in instrument flight conditions (such as during low visibility) and in night conditions, allowing a proper sharing of duties during flight. The additional tasks required from the crew in normal offshore operations, such as keeping track of multiple destinations, M&B calculation, rotors running refuelling etc., point to the need for two flight crew members. So do handling of abnormal or emergency situations where sharing of duties between two competent pilots will increase the probability of a successful outcome, especially in a demanding environment as in offshore operations on the Norwegian Continental Shelf. In contrast, expecting a successful outcome of abnormal or emergency situations when one pilot has to simultaneously handle the helicopter, deal with the emergency, make the emergency radio call to ATS and inform/instruct/reassure the passengers, while possibly in a rapid decent preparing for an emergency ditching in rough seas at night from a relatively low height, is highly unlikely. It is also difficult to imagine that regular operations could be performed by one pilot, as the norm is that the pilot flying during landing is the pilot seated on the side where the helideck is located, relative to the helicopter, which need to be heading into wind unless the winds are calm. Landing from the other seat is considered to pose an unacceptable risk of hitting obstacles around the helideck, and which as always is more likely at night. Such issues are equally relevant for take-off from helidecks. Considering that offshore helicopter operations in Norway are conducted in a demanding environment, often at night and with low visibility, and considering that all passenger flights should have a high level of safety, a requirement for two pilot crew has therefore been mandated on offshore passenger flights regardless of the number of passengers on board.