

## Helicopter Flight Limitations for Polarstern Operations

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### Disclaimer

The following applies to all helicopter operations from and to the expedition vessel Polarstern. Please note that the decision whether a flight can be conducted or not lies solely and entirely with the pilot of the aircraft. The following is a summarised guidance, which is correct in its simplified context. Prior to each flight an assessment is conducted taking into consideration the various influencing factors at the time.

Parameters defined herein are based on experiences made with helicopter operations on many Polarstern expeditions and lessons learned from accidents. Parameters stated below must be obeyed at any time and must not be softened up.

### 1- Weather

The operations conducted from and to Polarstern both in Arctic and Antarctic, are VFR (Visual Flight Rules) only.

According to the SOP (Standard Operating Procedure) Manual:

	<u>Clouds base</u>	<u>Visibility</u>
Day:	600 ft	3 km

Meaning a minimum of 600 ft cloud height from ground is needed and a minimum of 3 km visibility is needed to conduct a flight. There will be no flights under night conditions.

Most important is the contrast between the ground and the sky, a visible horizon is mandatory for flying. **Whiteout <sup>1)</sup> flight condition is prohibited.**

1) Whiteout is a weather condition that causes disorientation and low visibility by snow, overcast cloud and fog. Basically, the whiteout in aviation occurs when the pilots cannot see the visible horizon because of the terrain covered with snow in the white sky. Also, blowing snow may lead to the whiteout due to reduced visibility.

The PIC (Pilot in Command) shall be the one who decides if the flight can be conduct or not.

Flights below -30°C are limited.

The battery has to be warmed up to at least -20°C even when the external power is used for starting the engines. Due to this the helicopter has to be towed into the hangar if the expected time to the next start up is supposed to be too long. Since there is no shelter available and the warm up of the battery isn't possible when the helicopter is away from Polarstern, the time on ground without engines running has to be limited according to the outside local conditions.

The FaB will explain to the scientists what can be done, concerning the daily conditions.

Flights below **-45°C are prohibited**

## 2- Range of Action

In general, there are two BK117s with 2 pilots and 2 engineers scheduled for each PS tour. In principle, the distance limit for the **first helicopter is 80NM from the ship.**

The second helicopter is the SAR (Search and Rescue) helicopter, in case there is an emergency with the first helicopter, or with another team. That means that the second helicopter must be ready for launch or can only fly in the vicinity of the ship. If the second helicopter is airborne, i.e. flying, then the range limit for this **second helicopter is 1NM from the ship** with the ship in sight. Flying with two helicopters at the same time is only acceptable if the overall weather conditions are very stable and appropriate. Strict standards will apply to make the flight of the second helicopter possible.

**If only one helicopter is operational (Technical or crew),** the other one may operate within 15 NM of the Polarstern. Thus, in case of emergency rescue measures can be undertaken from the ship in due time.

In emergency cases the 80 NM and 1 NM can be exceeded to **150 NM** (if refueling and flight weather forecast is available at the destination), after a full risk assessment and an agreement between the FaB (Flugbetriebsleiter on Board / Flight Operations Manager), Captain of the PS and *Fahrtleiter* PS including weather forecaster. The distance will be decided by the FaB according to the refueling and weather forecast available at destination.

If for any reason the limit of 150 NM for a rescue mission has to be further exceeded, this must be first discussed with and agreed by also AWI Schiffskoordination (to be contacted via the emergency number for Polarstern expeditions) and Northern Helicopter (NHC) Polarstern Management/NPFO NHC.

If both helicopter are supposed to be flown, the second helicopter to be taken off must not be towed onto the helideck within 20 minutes after departure of the first one. It has to be assured that the helicopter that is supposed to land as number two has at least a fuel reserve of 45 minutes of flight time at the planned arrival time of the helicopter to be landed first.

## 3- Number of Passengers / Teams

**Available total seats are 8 = 6 in the back+1 front+1 pilot**

The number of passengers to be taken on a flight is **limited to 5 passengers.**

**This number of passengers must allow a rescue mission at any time with the other Helicopter.**

5 Scientists + 1 pilot = 6 persons on board + 1 Rescue Pilot = **7 total** in the Rescue Helicopter

The remaining seat is reserved for a doctor or another medical person in case medical assistance is needed.

The number of passengers can be further reduced if the PIC (Pilot in command) decides so. The pilot makes his considerations on various factors such as: distance, weight of the helicopter, weather, rescue considerations, alternative landings sites, and others.

Only one team is allowed to be out by helicopter in a distance 1-80 NM and shuttling teams (bringing one team out and taking another one in with one flight) is not allowed.

Rescue of all persons away from the vessel must always be possible with one single flight!

#### 4- HESLO operations

The **Helicopter Sling Load Operations** are conducted from Polarstern and / or the ice float as per NHC regulations/risk assessment.

From open water, the Helideck movement must be in the limitation and the weather conditions acceptable for the staff carrying loads on the deck safely.

Because of the particularity of the EM-Bird and Helipod sensors (take-off and landing from a rack), the helideck movement must be acceptable by the PIC.

If other personal than the trained flight crew is involved in HESLO operation this personal has to undergo a proper training/briefing on board before conducting HESLO operation. A record of this briefing has to be signed and stored by the FaB.

#### 5- Emergency

If a rescue flight is triggered, all the **limitations above must be respected**.

Of course, the reactivity is priority number one, but the **safety** part of the rescue flight is on the PIC responsibility.

**The PIC decides if he can fly the rescue flight** and under which conditions.