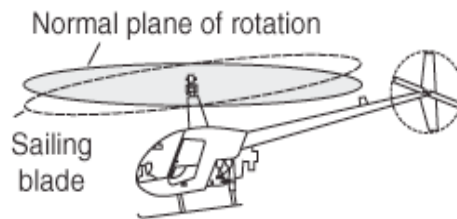


Wellington Hospital BK-117 Operations

Blade Sailing

The undesired flapping of helicopter rotors at low-rotor RPM, especially during start-up and shutdown and in high-wind conditions is called blade sailing. High winds and gusts will cause the main rotor blades of helicopters to flap up and down and be both a danger to people near them and the helicopter itself as the blade stops could be damaged, or a particularly flexible blade could hit the tail boom.



Therefore great care should be taken during start-up and shutdown when the environment and conditions are conducive to variable and unpredictable wind gusts and direction. Mechanical turbulence caused by wind funnelling between natural and physical phenomena is often a cause of this unpredictable danger. Particular care should be taken at all times during a low RPM condition; for example - in the lee of hill, hangar or situated on top of a building.

Prevention

At certain critical speeds (50–100 RPM), blades will pass in and out of the stall. Holding the cyclic in the direction of the wind will keep the pitch of the advancing blade to a minimum and stop it lifting in the first place. Other ways of minimizing the effect include using the rotor brake or increasing the RPM rapidly on start-up, switching off the helicopter when it is facing into the wind, especially in high-wind conditions, parking the helicopter away from the downwind side of obstructions or the downwash or slipstream of other machines, keeping the collective down, or accelerating and decelerating the blades as quickly as possible. In addition, pointing the nose out of wind ensures that the lowest deflection is away from the tail boom.

Wellington Hospital Helipad Operation (NZWH)

NZWH is situated on top of the ninth floor at Wellington Hospital and is particularly exposed to high unpredictable wind conditions; and therefore the possibility of blade sail. The intention of this SOP is to highlight and mitigate some of risks involved in operating to and from NZWH.

Recommendations

Due to the BK-117's susceptibility to blade sail and the vulnerable location of NZWH the following recommendations are to be considered when operating to and from the NZWH.

- The Helicopter should terminate in the middle of the helipad and conduct the offload of patients from this position thus lessening the possibility of unpredictable wind gusts.
- When the surface wind at Wellington Airport (NZWN) is reported in excess of 15kts, it is recommended that the patient be off loaded or loaded rotors running.
- Once the patient is safely inside the hospital with the flight team and possible Helicopter Crewman (HCM), the Pilot repositions the Helicopter to the Western Apron at NZWN for refueling and shutdown.
- Blade tie-downs are to be carried on all flights and should be applied in gusty conditions.
- On completion of the patient handover the Helicopter recovers the flight team from NZWH and returns to NZJH.

Risk

The off loading and loading of patients with the rotors turning adds a significant risk to the operation. Therefore a high level of supervision is required from all members of the crew when working with even the most frequent of flyers.

The following recommendations should be considered prior to a rotors running emplane/deplane of a patient on the Stryker stretcher.

- The Aircraft Captain is ultimately responsible for the safety of all occupants in the helicopter – therefore they are to ensure that only the minimum amount of people are present around the helicopter while the rotors are turning and the transfer is being conducted.
- All flight team personnel are to be briefed by a member of the crew of their responsibilities during the transfer of the patient prior to arriving at NZWH.
- It is recommended that if the crew can unload/load the patient without the assistance of the Flight Team then they should remain in the Helicopter until cleared to vacate.

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- Anytime a non member of the crew is required to assist aft of the rear seats, for example; hold the 'Clam shell' doors open while the stretcher is removed - then they will be escorted to and from their allocated position by a member of the crew.
- Ear protection will be required for all occupants working around the helicopter.
- At night particular attention is to be applied to all people working around the helicopter.

Conclusion

This SOP has highlighted some of risks involved when operating to and from NZWH. It does not remove all the risk of re-counting blade sail / strike happening at NZWN however it does mitigate the possibility of this event happening on top of the hospital building in such an inaccessible place.

As always it relies on crewmembers to apply good airmanship to different situations. If you do encounter NZWH on a fine calm day/night Captains can still preform a shutdown and conduct the transfer with the helicopter shut down ensuring they can relocate to NZWN if another operator arrives requiring the helipad.