TAILWIND OPERATIONS

Definition

Tailwind Operations in fixed wing aircraft are considered to be takeoffs or landings with a performance diminishing wind component – that is, a tailwind.

Effects

Tailwind Operations have a detrimental effect on aircraft performance.

- **Take Off** - The take off run will be longer and the maximum allowable take off weight for a specific runway and temperature may have to be reduced. The climb gradient will be reduced due to the higher groundspeed and could result in a CFIT accident due to inability to out clear an obstacle.

- **Approach** - On approach the increased groundspeed will necessitate an increased rate of descent. Failure to compensate for these factors could easily result in an unstable approach. An unstable approach should result in a go-around.

- **Landing** - The ground speed at touchdown will be greater than usual and any float tendency will result in a long landing. The stopping distance will be significantly increased due to the higher groundspeed and, in combination with a long landing, could easily result in a runway excursion.

Defences

- **Operate in accordance with Manufacturer's Limitations**: Aircraft manufacturers publish a tailwind component limit for both takeoff and landing in the OM or AFM. In most cases, it is in the order of 10 knots but may be as high as 15 knots.

- **Accurate performance calculations** must be completed for all tailwind operations. For headwind operations, the use of the wind factor is optional and regulations dictate that a maximum of 50% of the headwind component can be used. However, for tailwind operations, regulations state that the tailwind component MUST be considered in the performance calculaations and that 150% of the actual tailwind component must be used.

- **Maximize Runway Performance**: Use of the full length of the runway for takeoff is highly recommended. Manufacturers may prohibit reduced power takeoffs under tailwind conditions.

- **Evaluate the Risks**: Obstacle clearance and climb gradients must be carefully examined. Although once airborne the rate of climb in feet/minute will not change, during tailwind operations the lift-off point will be further along the runway (thus closer to the obstacle) and, due to the higher groundspeed caused by the tailwind, the climb gradient in feet/mile will be reduced.

- **Configure Early**: For approach under tailwind conditions, the groundspeed will be higher and, as a consequence, greater descent rates will be required. This will result in the requirement to configure the aircraft sooner than is normal to reduce the potential of a go-around due to an unstable approach.

- **Maintain Accurate Speed Control**: Fly the appropriate speed for the aircraft configuration and weight. Increasing the IAS will also increase the energy that must be dissipated after touchdown and could compromise the ability to stop in the available distance.

- **Land in the Touchdown Zone**: The performance calculations are generally predicated on landing distance on from 50' (which assumes a threshold crossing height of 50', a 3 degree descent to the runway and touchdown with minimal float). If the aircraft is landed "long" due to a shallow final descent or a protracted float, the landing distance will be compromised and a runway excursion could result.

- **Optimise the Use of Stopping Devices to the Landing Distance Available**: Appropriate use of all available stopping devices will help ensure that the aircraft can be safely stopped.

Contributing Factors

Air Traffic Services will often determine preferential runways based on noise abatement or traffic flow criteria and will not change the active runway until the tailwind component exceeds a predetermined value – normally in the order of 5 knots. It is up to the aircraft commander to ensure that the aircraft can be safely operated with this tailwind component. If not, the aircraft commande must request a different runway and be prepared to accept the delay that the accommodation might incur.

Operators may request or, in the case of uncontrolled aerodromes, choose to operate from an out-of-wind runway for convenience or to save time. Again, it is an aircraft ommander's responsibility to ensure that the takeoff or landing can be safely conducted with the existing wind conditions. It should be noted that a tailwind has a much greater effect on a light aircraft than it does on a large commercial jet as the percentage increase in groundspeed due to the tailwind is significantly higher for the smaller aircraft.

When a circling approach in use, there may be a significant tailwind in the descent and intermediate approach even if the landing runway is into wind.

In rapidly changing surface wind conditions associated with phenomena such as microburst or sand storms, tailwinds may be encountered on final approach or landing and possibly without the aerodrome controllers being aware of the fact.

Solutions

Understanding the performance characteristics of the aircraft you fly is critical for safe operations under tailwind conditions. If the performance data is not available or the tailwind component exceeds the allowable limit, another runway must be used.