Cooperative Development of Operational Safety and Continuing Airworthiness Programme
COSCAP-SOUTH ASIA
International Civil Aviation Organization

21st STEERING COMMITTEE MEETING
12-14 DECEMBER 2011, DHAKA, BANGLADESH

LANDING GEAR PROBLEMS- GUIDELINES FOR CONTROLLERS

EXECUTIVE SUMMARY

This article provides guidance for tower/approach controllers on what to expect from an aircraft experiencing the effects of landing gear problems and some of the considerations which will enable the controller, not only to provide as much support as possible to the aircraft concerned, but also maintain the safety of other aircraft at or in the vicinity of an aerodrome and of the ATC service

Background:

The hard, non-retractable landing gear was common in the early days of aviation. Today the latter is only used for light aircraft - commercial airliners use complex retractable undercarriages with multi-step automated extraction procedures. As the importance of the landing gear is obvious, various systems are applied to provide redundancy and control.

One such system provides easily recognizable light indication about the status of the landing gear. The principle is simple - green light when the landing gear is down and locked and red light when there is a discrepancy between the gear lever and landing gear positions. The unsafe indication might be the first sign for a problem, related to the proper preparation of the landing gear for landing. Depending on the aircraft type retraction system the exact nature of the problem may vary significantly.

Due to big variety of modern aircraft gear design, it could be quite hard for non-professional to distinguish between normal and abnormal gear operation. In case of a partial extension the visual inspection should be done only by qualified professional.

Dealing with the Problem:

There is no set of ready out-of-the-box rules to be followed universally. As with any unusual or emergency situation, controllers should exercise their best judgment and expertise when dealing with the apparent consequences of brake related problems and the possible outcomes. A generic checklist for handling unusual situations is readily available from EUROCONTROL but it is not intended to be exhaustive and is best used in conjunction with local ATC procedures.

What to anticipate:

Landing with main/nose gear that might not be locked/fully extended could result in:

- Gear-up landing;
- Landing with partially extended undercarriage;
- Gear malfunction with subsequent airframe damage.

All of the above could be followed by runway excursion and post-landing fire inflicting different extent of damage.

In case of a gear problem, the crew bears significant stress. It might need time to fully assess the nature of the problem. Further steps could include crew visual inspection (if viewers are set by aircraft design), manual emergency extension or special maneuvers for forced drop. All of these steps require significant preparation opposed to the time shortage in any unusual situation.

Several low pass approaches might be necessary to be performed in order to inspect visually the landing gear status and position by qualified technical personnel. The landing with confirmed unlocked gear could result in emergency evacuation of the aircraft. Depending on the situation the crew might have to brief cabin attendants with any important details to ensure adequate response when on ground.

Procedures:

Best practice embedded in the ASSIST principle could be followed:

A- Acknowledge;
S- Separate,
S- Silence;
I- Inform,
S- Support,
T- Time

A- acknowledge the gear problem, ask for the crews' intentions when the situation permits, and establish whether the crew is able to extend the gear into locked position;

S - separate the aircraft from other traffic, prioritize it for landing (allow long final if requested), keep the active runway clear of departures, arrivals and vehicles;

S- silence the non-urgent calls (as required) and use separate frequency where possible;

I - inform the airport emergency services and all concerned parties according to local procedures;

S - support the flight experiencing gear problems with any information requested and deemed necessary (e.g. type of approach, runway length and aerodrome details, etc.);

T - provide time for the crew to assess the situation, don't press with non urgent matters.

If a crew has declared gear problems, the controller may anticipate:

- Need of time to resolve the exact nature of the problem;
- Holding pattern request for preparation and execution of manual extension;
- The necessity of time and place to perform specific maneuvers with the purpose of full extension;
- One or multiple low passes for visual inspection;
- Low speed approach;
- Late engagement of ground emergency units;
- Runway blockage after landing.

Apart from the above mentioned, a controller should:

- Transfer affected aircraft to another frequency, if applicable;
- Maintain close coordination with ground emergency units - an early call could facilitate the effective deployment of manpower;
- Have direct contact with aircraft operator's technical representative (if possible) - any result of a visual inspection should be passed to the crew without delay.
- Provide a wider range of information to the crew - in case of a maneuver for gravitational drop, the crew will surely need minimum safety altitude.
- NOT certify the down and locked position of the landing gear - the visual inspection during low pass should be done by qualified personnel. If not possible, the tower controller should provide information about landing gear not extended or only partly extended to the aircraft concerned without delay.

Use the proper phraseology as recommended by ICAO for such events, i.e. "The landing gear appears down" and "Landing gear appears up".

If the low pass is made for the purpose of observing the undercarriage, one of the following replies could be used to describe its condition but these examples are not exhaustive:

a) landing gear appears down;
b) right (or left, or nose) wheel appears up (or down);
c) wheels appear up;
d) right (or left, or nose) wheel does not appear up (or down).

Provide timely response to crew;
Allow time and space for the affected aircraft;
Provide sufficient personnel in order to transfer affected aircraft to own frequency.