The air traffic control perspective on runway incursion hazards

Session 2

Presentation 3

DEFINITION OF A RUNWAY INCURSION

"Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft."

INTRODUCTION TO RUNWAY INCURSION PREVENTION

Runway incursions have sometimes led to serious accidents with significant loss of life. Although they are not a new problem, with increasing air traffic, runway incursions have been on the rise.

Communication Hazards

Instructions are unclear or misunderstood

- Lack of standard phraseology
- Call sign confusion
- Read back errors
- Language barriers
  - including: more than one language on frequency, speed of delivery, low level of aviation language proficiency

Increased complexity and the potential for loss of situational awareness and errors due to:

Communication Hazards

- Frequency congestion
- Multiple tower/ground frequencies in use
- Conditional clearances, complex/non-standard taxi instructions
- Assumption that flight crews and airport personnel have certain familiarity with airport
- Simultaneous communication required for coordination between local, ground and radar controllers

Construction Hazards

Hazards appear when part of the airport becomes non-operational

- Potential capacity constraints that increase controller workload
- Potential need to manage and coordinate increased number of runway crossings
  - The more crossing possibilities, the higher the incursion risk
- Added vehicular traffic on runway and taxiway surfaces
- Possible increased use of intersection takeoffs
- Potential impact on RFF procedures

Airport Design Hazards

Complex aerodrome layout

•Inadequate signage, markings and lighting

•Lack of standard taxi routes

•Lack of improved aerodrome diagrams

•Blind spots

•Hot spots (areas identified as having an increased risk of conflict)

•Complex layout + capacity enhancing procedures increases complexity, potential for loss of situational awareness and errors

Closely spaced parallel runways

- Monitoring adherence to hold short clearances, particularly for high-speed turnoffs after landing
- Potential for separation issues related to runway confusion

Intersecting runways

- Simultaneous operations to intersecting runways
- Increased coordination required when multiple tower / ground frequencies are in use

Visibility Hazards

Low visibility

- Due to fog, smoke, haze, precipitation, window condensation, sun location, night operations and glare from reflection off snow/sand/water

Blind spots

- Movement areas not visible from the control tower
- Lack of surveillance equipment for maneuvering area

Additional Operational Hazards

- Traffic volume, capacity enhancing procedures, controller workload
- Complex airport operations, configuration changes, increasing environmental pressure including restrictions on runway utilization
- Controllers assigned additional duties while staffing operational position
- Shift work and fatigue-related performance effects
- Intersecting runways
- capacity-enhancing procedures
- Tower Environment
  - Cab design, equipment layout, incorrect position display, noise, distractions, false/nuisance alerts, equipment failure, sight lines
- Managing contingencies related to:
  - Runway / taxiway closures
  - Inoperative approach aids
  - Technical issues experienced by flight crews
  - Weather phenomena

Mitigation Process

- A runway incursion prevention programme should start with the establishment of runway safety teams at individual aerodromes. The primary role of a local runway safety team, which may be coordinated by a central authority, should be to develop an action plan for runway safety, advise management as appropriate on potential runway incursion issues and recommend strategies for hazard removal and mitigation of the residual risk. These strategies may be developed based on local occurrences or combined with information collected elsewhere
- The team should comprise representatives from aerodrome operations, air traffic service providers, airlines or aircraft operators, pilot and air traffic controller associations and any other groups with a direct involvement in runway operations. The team should meet on a regular basis. Frequency of meetings should be determined by the individual groups. At some aerodromes, other groups may already exist that could carry out the functions of a runway safety team.

- Once the overall number, type and severity of runway incursions have been determined, the team should establish goals that will improve the safety of runway operations. Examples of possible goals are:
- a) to improve runway safety data collection, analysis and dissemination;
- b) to check that signage and markings are ICAO-compliant and visible to pilots and drivers;
- c) to develop initiatives for improving the standard of communications;
- d) to identify potential new technologies that may reduce the possibility of a runway incursion;
- e) to ensure that procedures are compliant with ICAO Standards and Recommended Practices (SARPs); and
- f) to initiate local awareness by developing and distributing runway safety education and training material to controllers, pilots and personnel driving vehicles on the aerodrome.

THANK YOU