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Statement

09POS01

IFALPA Runway Safety Position

Executive summary

IFALPA believes that runway safety issues are among the most serious threats to aviation safety. A significant percentage of accidents are as a result of runway safety deficiencies. Therefore, the Federation argues that the implementation of solutions to counter this threat is of vital importance to the industry. Set out in this document IFALPA defines the solutions that it believes will dramatically improve runway safety for the travelling public.

Introduction

Runway incursions and excursions are among the most serious threats to safety in air transport operations. The seriousness of these threats is difficult to over state. The fact remains that over the last 20 years runway excursions happen at an average rate of around four per month. It also remains true that the worst accident in aviation history was as a result of a runway incursion. In this document, IFALPA sets out its strategies and principles for reducing and mitigating threats to runway safety.

Part one: Runway incursions

ICAO has adopted a runway incursion action plan based on the Eurocontrol and FAA initiatives. This plan focuses on short and medium term solutions. These might be the best achievable at the present, but in reality the solution lies in designing out the problem. This will require a more systematic approach.

Clearly, new build airports should be designed in such a way that the runway incursion risk is minimised. Furthermore, at existing airports, the effect on runway incursions should be taken into account when runway and taxiways systems are altered.

However, these programmes are by their nature medium term, there is also a need to seek more immediate solutions. An excellent means of seeking and finding means to reduce and or mitigate runway incursion risks is the Local Runway Safety Teams (LRST) initiative. LRSTs consist of operational users of the airport, pilots, vehicle drivers, air traffic control as well as the airport management. IFALPA strongly believes in the effectiveness of LRSTs and encourages Member Associations to take an active role in that process. As mentioned earlier, a number of simple and cost effective local solutions can provide either incursion risk reduction or mitigation. Good examples of this are surface painted mandatory markings and interrupted taxiway centre lines. Equally LRSTs are an effective means of defining incursion hotspots. Hotspots are generally found near runway or taxiway intersections. The Federation believes that once hotspots are identified they should be removed or a means of long term mitigation adopted in accordance with established other means of compliance.

The world's worst air disaster, a collision between two B747s in Tenerife in 1977, was the result of a runway incursion.

Communications issues

Communication remains one of the major causal factors in runway incursions and therefore it is essential that the standard use of aviation English to at least ICAO level 4 together with standard ICAO phraseology should be accepted and used worldwide. At the same time, future advances in technology should be aimed at reducing the chance of mis-communication.

IFALPA believes that aerodrome designs, that reduce the number of runway crossings for example perimeter taxiway systems or mid-field terminal layouts, are a vital component in reducing runway incursion frequency. Where this is not possible then hazard mitigation can be greatly enhanced by the use of stopbars as well as procedures like only crossing runways at either end via perpendicular taxiways.

Aerodrome Design

IFALPA has a number of policies concerning aerodrome design but the guiding principle is based on the principle that the design should be instinctive and logical to the pilot. These policies include a number of runway incursion prevention strategies:

- Taxiway crossings of runways should be avoided whenever possible. This may be achievable by the construction of "end-around" or "perimeter" taxiways. When a crossing is unavoidable, it should be done at a low energy point on the runway, at either runway end.

- Vehicle entry or crossing of runways for non-operational purposes is unacceptable and therefore, vehicles shall make use of perimeter roads.

- Runway entrance taxiways shall be at the thresholds of the runways only and shall be perpendicular to the runway centreline.

- Rapid exit taxiways shall be used for runway exiting only and shall have "no entry" signage and illuminated stop-bars installed to prevent inadvertent entry.

In addition to these policies IFALPA has thorough guidance policy on the use of aircraft external lights for the purpose of mitigating the risk of runway incursion **(*See 09AGEBL01*)**.
IFALPA has existing policy and positions that deal with stop bars and taxiway designations which again will help alleviate incursion risk for example, IFALPA policy on stop-bars states:

- Stop bars shall be selectively switch-able by the appropriate air traffic controller.

- Stop bars shall be installed at all aerodromes where a runway crossing is possible, and provided at every runway-holding position serving a runway, including non active runways.

- Aircraft shall not cross red stop bars unless contingency measures are in force. Contingency measures should cover all cases where the stop bars or controls are unserviceable.

Part two: Runway excursions

Approach

There is an old saying in aviation "a good landing follows a good approach" and while certainly not the only cause for excursion it is true that excursion risk can be reduced by a stable approach. IFALPA believes that four parameters are essential for a safe approach: flight track, flight path angle, airspeed and thrust. If one of these parameters cannot be met a go-around shall be carried out. These elements shall be defined by the operator's standard operating procedures (SOPs) and these should include minimum power setting, crossing altitude deviation tolerances, configuration, maximum sink rate, completion of check lists, and crew briefings.

In addition the SOPs should include as a minimum 'gates' at 1000ft, in IMC and 500ft in VMC. The approach shall remain stabilised from these gates until the pre touchdown flare.

ATC has a role to play as an aid to avoid rushed approaches. Providing information to pilots is a way of achieving this. The information should include the runway in use and surface condition, wind direction and QNH. Runway changes after top of descent, especially last minute changes, can cause a lack of situational awareness and rushed approaches. These are contributing factors to unstabilised approaches. Therefore these changes should be regarded as threats to the operation.

Approach angle. The approach angle should be standardized to three degrees. Unless special consideration is needed for specific aircraft.

Runway allocation. It is necessary to emphasise that, in selecting the runway, priority should be given to achieve a safe stabilised approach before noise abatement procedures are considered. A thorough risk assessment must be made for any noise abatement procedure (this includes the use of idle reverse thrust).

IFALPA supports the Flight Safety Foundation stabilised approach guidelines.

Go-arounds

Standard operating procedures should include the operator's policy with regard to the decision to go around encouraging the crews to do so in case the approach is not stabilized. Operators should promote a non punitive "go-around" policy and remind crews that approaches should be discontinued if any safety criteria are not met, for example, an occupied runway, and incursion or unstable approach.

Technology

Developments such as the Airbus "energy circles", (HEAM system) could be useful for pilots in assessing their approach.

PAPI or VASI lights. A visual approach slope indicator system to be operated during day and night, irrespective of the visibility conditions.

Planning a successful approach is dependant on accurate and up to date information about the prevailing conditions at the airport. This includes, but is not limited to, the latest weather data and runway surface conditions.

Aircraft operating procedures and performance data

The day to day operation should adequately be covered by certification. This short general policy statement implies that the operational use of aircraft should always be in accordance with certified procedures. For example, thrust reverser system must be fully operational and brake and tyre condition within certified tolerances. Certification standards, conditions and assumption must be totally comparable with day to day line operations.

Training shall be representative to the intended operation

Aircraft operators should set up a training program to develop theoretical knowledge

of runway excursions. This should at least include adequate safety awareness among crew, the importance of effective Cockpit Resource Management (CRM) and a solid understanding of the excursion risk. Specific training regarding situational awareness in case of critical runway length or critical geographical location (mountainous terrain, local weather conditions) should be included. Understanding of performance criteria, to include the effects of excess threshold crossing height, excess threshold crossing speed, assumed touchdown point, and use of declared distances.

Experience , knowledge & fatigue issues

Operators should specify minimum experience and training criteria on aircraft type for short or special runway operation, operation in adverse weather conditions and crosswind restriction in relation to experience. Operators should respect the normal Flight Time Limitations (FTL) and avoid too tight a schedule, so that a safe flight in different conditions (diversions to alternate, adverse weather, non normal conditions) can be made.
For proper planning and decision making the flight crew should have the following knowledge, training and tools:

- Thorough knowledge of the assumptions used in the (performance) data
- Tools to apply corrections for situations known beforehand which deviate from these assumptions (e.g. speed additives, threshold crossing height, use of reverse thrust, etc.)
- A margin for unforeseen deviations from the assumptions on which the performance data is based.
- Clear trigger points when exceedences will no longer be covered by the applied margins.
- Conservative values for operationally relevant parameters such as crosswind and braking action, i.e. taking the inaccuracies of measurement and reporting into account.

Proper understanding of the effects of and mitigation that are applied to counter the following causal factors in take-off and landing performance:

- Aircraft energy deviations from the reference value (e.g. as a result of unstable approach, or as a result of an unaccounted tailwind).
- Measured/reported braking coefficient and/or runway state and assumed aircraft braking action versus actual braking action.
- Insufficient controllability due to adverse wind characteristics (e.g. crosswind, gusts) in combination with or without an adverse runway state.
- Improper application or inability to apply full braking during crosswind conditions.
- Incorrect aircraft configuration reverse/spoilers (e.g. due to late wheel spin up as a result of runway flooding or slippery runway conditions).

Computing by crew during flight

Calculations such as landing distance and other performance critical items should be in line with the phase of flight. Crew workload should be reduced as much as possible especially during critical phases of flight. Procedures should be as simple and unambiguous as possible

Aerodrome information

Naturally, the ability to plan a successful approach is dependant on accurate and up to date information about the prevailing conditions at the airport. This information should be presented in a standardised format. This includes, but is not limited to, the latest weather data and runway surface conditions. Margins of accuracy must be applied to compensate for deviations in data. Accurate data is required to reduce margins.

Wind direction/strength

Observing and reporting of surface wind shall be in accordance with ICAO Annex 3 Appendix 3. The desirable accuracy in reporting of the surface wind is:

Direction: +/- 10 degrees

Velocity: +/- 1 kt up to 10 kts and +/- 10% above 10 kts

Mean surface wind: +/- 2 kts

Runway state

Condition reporting shall be done in an easily understandable, reliable and harmonised way, so that crews can take appropriate action. Several different types of runway friction measurement equipment are in use worldwide. This equipment may produce different results for the same runway surface conditions and therefore may not be representative for actual aircraft behaviour.

IFALPA believes that the goal must be a worldwide common evaluation and correlation between surface conditions and braking action.

IFALPA believes that the effect of all contaminants on aircraft performance should be assessed, whenever it is not possible to fully clear the runway, taxiway or apron of these contaminants.

IFALPA believes a serious effort should be undertaken to evaluate the feasibility of an onboard system which would provide real time measured friction data from the aircraft to other aircraft and the aerodrome.

Improving post accident survivability

The runway environment should be constructed for optimum survivability following a runway excursion or other accident. In addition to the runway strip as defined by ICAO, this should include a runway end safety area (RESA).

IFALPA policy is that the minimum acceptable RESA is 240m beyond the 60m runway strip and twice the width of the corresponding runway. This area should be laid out to optimise survivability, in other words, flat, firm, ground capable of supporting the heaviest RFF equipment at the airport and free of non-frangible objects.

An alternative means of compliance is the installation of an arrestor bed which will provide the same level of protection as a 240m RESA. Other factors, for example safety minded construction zoning in the airport vicinity will further mitigate risk. **(*For details of IFALPA's RESA policy see 08POS01*)**

Any hazard in the vicinity of an airport requires a thorough risk assessment to determine if it is acceptable.

Emergency exercises must form a part of every airport's Emergency Plan. Such an exercise must be carried out, in full, on a regular basis and involve all personnel and agencies that would be expected to attend an actual airport emergency. Table top exercises are of some value, but they should never replace regular full scale exercises.
Operators should develop a system to provide adequate support for crew involved by an incident or accident. As a principle, crew should be regarded as not fit for flight, directly after being involved in an incident or accident.