Republic of the Philipines
Department of Transportation and Communication
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES
Office of the Director General

Advisory Circular

AC AN/RSP-01

ESTABLISHMENT OF LOCAL RUNWAY SAFETY TEAM AND LOCAL RUNWAY SAFETY PROGRAMME FOR AERODROME OPERATORS

September 2012

Advisory Circulars (AC) are intended to provide recommendations and guidance, illustrate a means-but not necessarily the only means of complying with regulatory requirements, or to explain certain regulatory requirements by providing interpretative and explanatory materials.

CAAP will generally accept that when the provisions of an Advisory Circular have been met, compliance with the relevant regulatory obligations has been satisfied.

Where an AC is referred to in a "Note" within regulatory documentation, the AC remains as guidance material.

ACs should always be read in conjunction with the referenced regulations.

1. REFERENCES

1.1 This document may refer to portions of the following:

- CAR-ANS Part 11
- CAR-Aerodromes (AO 139)
- Manual of Standards (MOS) for Aerodrome
- ICAO Annex 11
- ICAO Annex 14
- PANS-ATM (Chapter 7)
- Doc 9870, Manual on the Prevention of Runway Incursion
- Doc 9859, Safety Management Manual

2. PURPOSE

2.1 The Philippines, as signatory to the International Convention on Civil Aviation, adheres, to the extent practicable, to the ICAO Standards and Recommended Practices. The modern requirements for enhancing safety in civil aviation has brought into the fore the need for contracting States to develop, establish, and implement State Safety Programmes, Safety Management Systems for service providers and operators, and State Runway Safety Programmes of which the core components are the Local Runway Safety Programmes in tandem with the Local Runway Safety Teams of each aerodrome operator in collaboration with air traffic service providers and air operators/aircraft owners.

Local Runway Safety Programmes, together with Local Runway Safety Teams, provide for a runway safety enhancement system that basically identifies hazards, ensures the implementation of remedial actions necessary to maintain or enhance safety performance, provides for continuous monitoring, reporting, data gathering and analysis, and regular assessment of the safety performance of stakeholders, and aims at a continuous improvement of the risk mitigation measures of the Runway Safety Programme. This AC recommends the guidance material in the Manual on the Prevention of Runway Incursion, Doc9870 in meeting these objectives.

3. STATUS OF THIS AC

3.1 ACs are numbered to reflect the regulatory basis, the serial number of the circular issued for that regulation and the revision status for that AC. In this case, the regulatory bases are CAR-Aerodromes (AO 139), MOS for Aerodromes, CAR-ANS Part 10 B, CAR-ANS Part 11, and PCARS Part 6. This is the first to be issued combining these regulatory requirements in reference to runway safety.

4. BACKGROUND

4.1. This AC provides guidelines in the establishment of an aerodrome operator's Local Runway Safety Program and Local Runway Safety Team in conjunction with air traffic service providers and air operators, in accordance with relevant provisions of Annex 11 — Air Traffic Services, Annex 14 — Aerodromes, Volume I, Annex 6, SMS Manual, and the Manual on the Prevention of Runway Incursion.

4.2 Aviation safety programmes have a common goal — to reduce hazards and mitigate and manage residual risk in air transportation. Runway operations are an integral part of aviation; the hazards and risks associated with runway operations need to be managed in order to prevent runway incursions that may lead to accidents. Runway incursion prevention was closely examined by the Eleventh Air Navigation

Conference (AN-Conf/11) (Montréal, September–October 2003). The Conference recommended that States take actions to improve runway safety worldwide through the implementation of runway safety programmes. It was also recommended that when capacity-enhancing procedures at aerodromes are considered, appropriate safety studies should be conducted which would take due consideration of the effect on runway safety. The Conference also urged ICAO to develop a common definition of runway incursion to be used worldwide.

5. APPLICABILITY

5.1 The responsibility for the implementation of a Local Runway Safety Programme rests with the aerodrome operator, air traffic service providers, and air operators/aircraft owners. However, taking into account the responsibility of the aerodrome operator in providing and maintaining facilities and equipment in the aerodrome operations area, CAAP recognizes its inherent administrative position and functions as most appropriate in spearheading the establishment of the Local Runway Safety Programme and Local Runway Safety Team.

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TABLE OF CONTENTS

1. 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. Aviation safety programmes have a common goal — to reduce hazards and mitigate and manage residual risk in air transportation. Runway operations are an integral part of aviation; the hazards and risks associated with runway operations need to be managed in order to prevent runway incursions that may lead to accidents.

Several States and international organizations have embarked on extensive programmes to reduce the risk of runway incursions. According to a Transport Canada report (September 2000), a number of factors are likely to be responsible for the continuing increase in runway incursions, including traffic volume, capacity-enhancing procedures and aerodrome design. The report concluded that:

a) as traffic volume increases, the likelihood of a runway incursion increases more rapidly when capacity-enhancing procedures are in effect than when they are not;

b) if traffic remains the same, the potential for a runway incursion increases when capacity-enhancing procedures are put into operation;

c) many aerodrome improvement projects have resulted in a more complex aerodrome layout which, together with inadequate aerodrome design standards, signage, markings and lighting, and the lack of standard taxi routes and availability of improved aerodrome diagrams, has worsened the situation; and

d) increasing environmental pressure can compromise safe air traffic control (ATC) practices by requiring too many configuration changes.

The above factors, combined with inadequate training, poor infrastructure and system design and inadequate ATC facilities, can lead to an increased risk of runway incursions.

In the ICAO accident and incident data reporting (ADREP) system, the use of a common taxonomy and severity classification to assess runway incursion error types and contributory factors and to identify the most serious incidents is fundamental to global risk reduction. A common definition, taxonomy and severity classification will allow for runway incursion data to be compared globally.

ICAO is also verifying via the ICAO Universal Safety Oversight Audit Programme (USOAP) the degree of implementation of runway safety programmes by States, such as the CAAP, through the audit of the oversight capability and the service providers' safety compliance.

Consequentially, the oversight bodies of the State have the mandate to regulate and ensure the safety compliance of the service providers in meeting the agreed acceptable levels of safety, which includes safety performance in mitigating or eradicating runway incursions or other runway safety issues.

2. OBJECTIVE

Survey data have shown that pilots, drivers and controllers consider runway incursions and the potential for collisions to be the most significant risk in aerodrome operations. Bearing in mind that successful prevention of runway incursions requires the collaboration of air traffic controllers, pilots, vehicle drivers

and aerodrome management, this advisory circular is intended for aerodrome operators, in conjunction with aircraft operators, air navigation service providers, and regulators, in providing guidance in establishing:

a) the airport's Local Runway Safety Programme;

b) the Local Runway Safety Team;

c) reporting systems that are globally harmonized; and

d) harmonization of the airport's Runway Safety Programme with ICAO safety management system (SMS) provisions.

This advisory circular aims primarily to provide guidance essential for the implementation of local runway safety programmes, including actions of local runway safety teams. Such initiatives aim to remove or mitigate hazards and minimize the residual risk of runway incursions and to reduce active failures and the severity of their consequences. In all aspects of runway incursion prevention, the principles of safety management systems (SMS) should be used to mitigate or eliminate the hazardous factors.

The AC explores the causal factors that can result in runway incursions. Initiatives are also identified that aircraft and aerodrome operators and air navigation service providers can adopt to remove hazards, mitigate residual risks and create a cooperative, effective and safe operational environment.

Much can be learned by analysing previous incidents and accidents. A standardized runway incursion initial report form and a runway incursion causal factors identification form are included which will facilitate a national and global approach to data collection. Comprehensive analyses of data are essential to distinguish trends and causal factors and develop cost-effective risk reduction strategies.

Safety initiatives addressing awareness, training infrastructure and procedures, and technologies such as the ICAO and EUROCONTROL runway safety toolkits are available. Educational material for pilots, controllers, vehicle drivers and aerodrome operators is described. Finally, guidance is offered on how individual Local Runway Safety Teams can implement or improve runway incursion prevention safety programmes. Core to these initiatives is the uniform application of ICAO provisions which will ensure consistency of safe operations on the manoeuvring area.

A runway incursion severity classification (RISC) calculator that will enable a consistent assessment to be made of the severity of runway incursion events has been developed by ICAO. A discussion of its proper use can be found in the Manual on the Prevention of Runway Incursion (Doc 9870). It is incorporated in the ICAO Runway Safety Toolkit which is available through ICAO or through the RSP (Runway Safety Programme) Team of AANSOO.

Information about a computer programme (Aerodrome Runway Incursion Assessment (ARIA)) that can help local runway safety teams to identify factors that contribute to runway incursions at a specific aerodrome is also provided. The computer programme can be accessed through the website of ICAO and EUROCONTROL. It is also available through the RSP Team of AANSOO.

3. CONTRIBUTORY FACTORS

Pilots, controllers and drivers can all be involved in runway incursions. A survey of operational staff showed that approximately thirty per cent of drivers, twenty per cent of air traffic controllers and fifty per cent of pilots have reported being involved in runway incursions (reference: EUROCONTROL survey, 2001). Mitigation strategies that address all three parties should be included in systemic solutions.

Runway incursions can be divided into several recurring scenarios. Common scenarios include:

a) an aircraft or vehicle crossing in front of a landing aircraft;
b) an aircraft or vehicle crossing in front of an aircraft taking off;
c) an aircraft or vehicle crossing the runway-holding position marking;
d) an aircraft or vehicle unsure of its position and inadvertently entering an active runway;
e) a breakdown in communications leading to failure to follow an air traffic control instruction; and
f) an aircraft passing behind an aircraft or vehicle that has not vacated the runway.

Statistics show that most runway incursions occur in visual meteorological conditions during daylight hours; however, most accidents occur in low visibility or at night. All runway incursions should be reported and analysed, whether or not another aircraft or vehicle is present at the time of the occurrence.

3.1 BREAKDOWN IN COMMUNICATIONS

A breakdown in communications between controllers and pilots or airside vehicle drivers is a common factor in runway incursions and often involves:

a) use of non-standardized phraseology;
b) failure of the pilot or the vehicle driver to provide a correct readback of an instruction;
c) failure of the controller to ensure that the readback by the pilot or the vehicle driver conforms with the clearance issued;
d) the pilot and/or vehicle driver misunderstanding the controller's instructions;
e) the pilot and/or vehicle driver accepting a clearance intended for another aircraft or vehicle;
f) blocked and partially blocked transmissions; and
g) overlong or complex transmissions.

3.2 AIRSIDE VEHICLE DRIVER FACTORS

The most common driver-related factors identified in several studies are:

a) failure to obtain clearance to enter the runway;
b) failure to comply with ATC instructions;
c) inaccurate reporting of position to ATC;
d) communication errors;
e) inadequate training of airside vehicle drivers;
f) absence of radiotelephony equipment;
g) absence of radiotelephony training;
h) lack of familiarization with the aerodrome;
i) lack of knowledge of aerodrome signs and markings; and
j) lack of aerodrome maps for reference in vehicles.

3.3 AERODROME DESIGN FACTORS

Complex or inadequate aerodrome design significantly increases the probability of a runway incursion. The frequency of runway incursions has been shown in many studies to be related to the number of runway crossings and the characteristics of the aerodrome layout.

Common factors include:

a) the complexity of the airport layout including roads and taxiways adjacent to the runway;
b) insufficient spacing between parallel runways;
c) departure taxiways that fail to intersect active runways at right angles; and
d) no end-loop perimeter taxiways to avoid runway crossings.

3.4 PILOT FACTORS

Pilot factors that may result in a runway incursion include inadvertent non-compliance with ATC clearances. Often these cases result from a breakdown in communications or a loss of situational awareness in which pilots think that they are at one location on the aerodrome (such as a specific taxiway or intersection) when they are actually elsewhere, or they believe that the clearance issued was to enter the runway, when in fact it was not.

Other common factors include:

a) inadequate signage and markings (particularly the inability to see the runway-holding position lines);

b) controllers issuing instructions as the aircraft is rolling out after landing (when pilot workload and cockpit noise are both very high);

d) pilots performing mandatory head-down tasks, which reduces situational awareness;

d) pilots being pressed by complicated and/or capacity enhancement procedures, leading to rushed behaviour;

e) a complicated airport design where runways have to be crossed;

f) incomplete, non-standard or obsolete information about the taxi routing to expect; and

g) last-minute changes by ATC in taxi or departure routings.

3.5 AIR TRAFFIC CONTROL FACTORS

The most common controller-related actions identified in several studies are:

a) momentarily forgetting about:
    1) an aircraft;
    2) the closure of a runway;

3) a vehicle on the runway; or
4) a clearance that had been issued;

b) failure to anticipate the required separation, or miscalculation of the impending separation;

c) inadequate coordination between controllers;

e) a crossing clearance issued by a ground controller instead of an air/tower controller;

f) misidentification of an aircraft or its location;

g) failure of the controller to provide a correct readback of another controller's instruction;

g) failure of the controller to ensure that the readback by the pilot or the vehicle driver conforms with the clearance issued;

h) communication errors;

i) overlong or complex instructions;

j) use of non-standard phraseologies; and

k) reduced reaction time due to on-the-job training.

Other common factors include:

a) distraction;

b) workload;

c) experience level;

d) inadequate training;

e) lack of a clear line of sight from the control tower;

f) human-machine interface; and

g) incorrect or inadequate handover between controllers.

4. ESTABLISHING A RUNWAY INCURSION PREVENTION PROGRAMME

4.1 LOCAL RUNWAY SAFETY TEAMS

A runway incursion prevention programme should start with the establishment of runway safety teams at individual aerodromes (Local Runway Safety Team or LRST).

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, pilots or pilot associations, aerodrome air traffic controller groups/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.

4.2 OBJECTIVE OF LRST

The team should establish goals that will improve the safety of runway operations. Goals include but are not limited to the following:

a) To improve runway safety data collection, analysis and dissemination;
b) To determine the overall number, type and severity of runway incursions through data collected and analyzed;
c) To check that signage and markings are ICAO-compliant and visible to pilots and drivers;
d) To develop initiatives for improving the standard of communications;
e) To identify potential new technologies that may reduce the possibility of a runway incursion;
f) To ensure that procedures are compliant with ICAO Standards and Recommended Practices (SARPs); and
g) To initiate local awareness by developing and distributing runway safety education and training material to controllers, pilots and personnel driving vehicles on the aerodrome.

Runway safety programmes should promote the use of a standardized approach for reporting and analysing information on runway incursions information on runway incursions. This approach will support the analysis of runway incursions using the severity classification scheme. Global use of such an approach will enable not just the State but also the other neighbouring States to collect and share data to continually improve the safety of runway operations. Doc 9870 discusses the ways in which the information gained from the analysis of runway incursions can be used to enhance runway safety.

To identify the causes and contributory factors of runway incursions, specific information must be collected on each occurrence. This information is best collected in a “just culture” environment where reporting is promoted. This makes it possible to learn from runway incursion data collectively. The development of effective countermeasures to factors that result in runway incursions depends upon fact-based, systematic reporting and analysis of the causal factors. A nationwide exchange of information has the potential to effectively contribute to national aviation safety in two ways. First, each airport can contribute to gaining a full understanding of how individual errors evolve into runway incursions and potential collisions, leading to the development and implementation of effective mitigating measures. Second, each airport can learn from the experiences of other airports so that the same mistakes do not perpetuate.

4.3 LRST GENERIC TERMS OF REFERENCE

Suggested generic terms of reference for a local runway safety team to assist in enhancing runway safety are by:

a) determining the number, type and, if available, the severity of runway incursions;
b) considering the outcome of investigation reports in order to establish local hot spots or problem areas at the aerodrome;
c) working as a cohesive team to better understand the operating difficulties of personnel working in other areas and recommending areas for improvement;
d) ensuring that the recommendations contained in the *Manual on the Prevention of Runway Incursions* (Doc 9870) are implemented;
e) identifying any local problem areas and suggesting improvements;
f) conducting a runway safety awareness campaign that focuses on local issues, such as, producing and distributing local HOT SPOT MAPS or other guidance material as considered necessary; and
g) regularly reviewing the airfield to ensure its adequacy and compliance with ICAO SARPs.

4.4 HOT SPOTS

The ICAO definition of a hot spot is:

> ***"A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary."***

Note 1.*— The criteria used to establish and chart a hot spot are contained in the PANS-ATM (Chapter 7) and Annex 4 —* Aeronautical Charts *(Chapters 13, 14 and 15).*

Note 2.*— Hazards associated with hot spots should be mitigated as soon as possible and so far as is reasonably practicable.*

Examples of how hot spots are shown on charts are provided in Figures D-1 and D-2.

Aerodrome charts showing hot spots should be produced locally, checked regularly for accuracy, revised as needed, distributed locally, and published in the Aeronautical Information Publication (AIP).
Once hot spots have been identified, suitable strategies should be implemented to remove the hazard and, when this is not immediately possible, to manage and mitigate the risk. These strategies may include:

a) awareness campaigns;
b) additional visual aids (signs, markings and lighting);
c) use of alternative routings;
d) construction of new taxiways; and
e) the mitigation of blind spots in the aerodrome control tower.

Figure D-1. Example of Hot Spot detail.

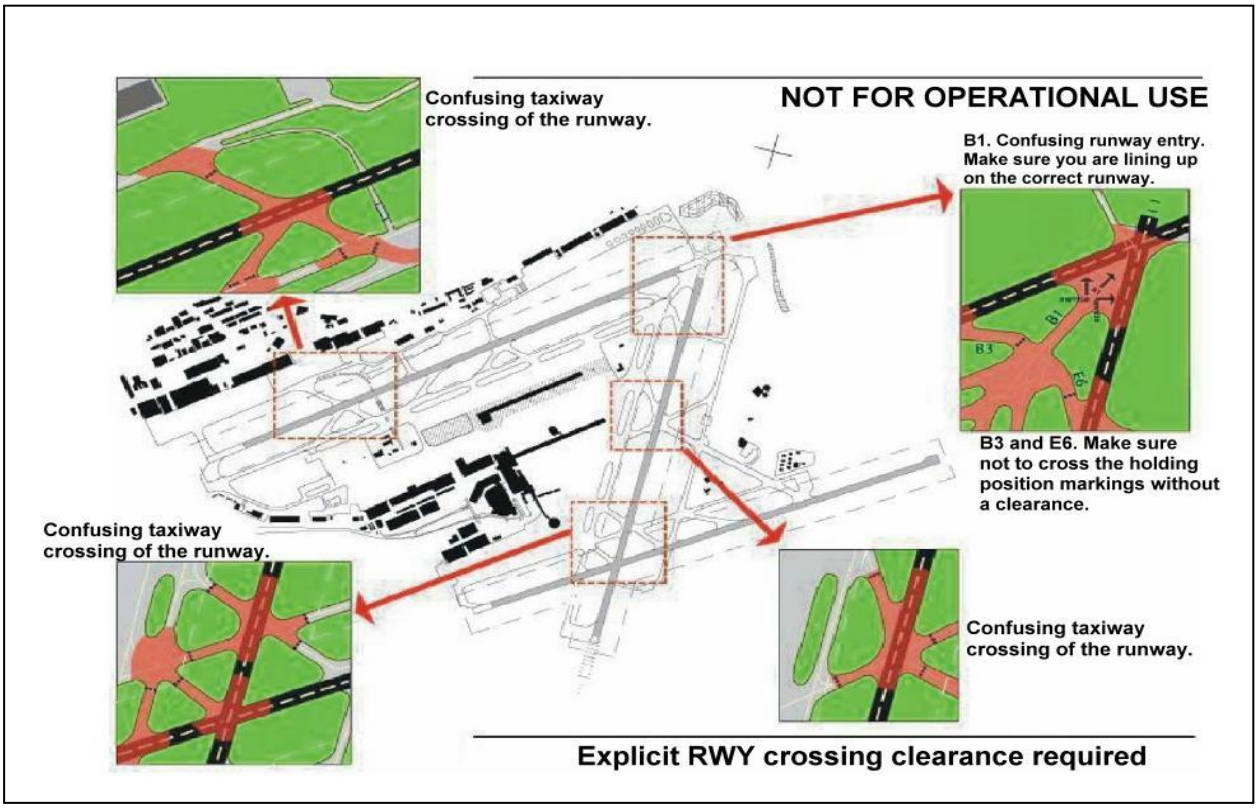
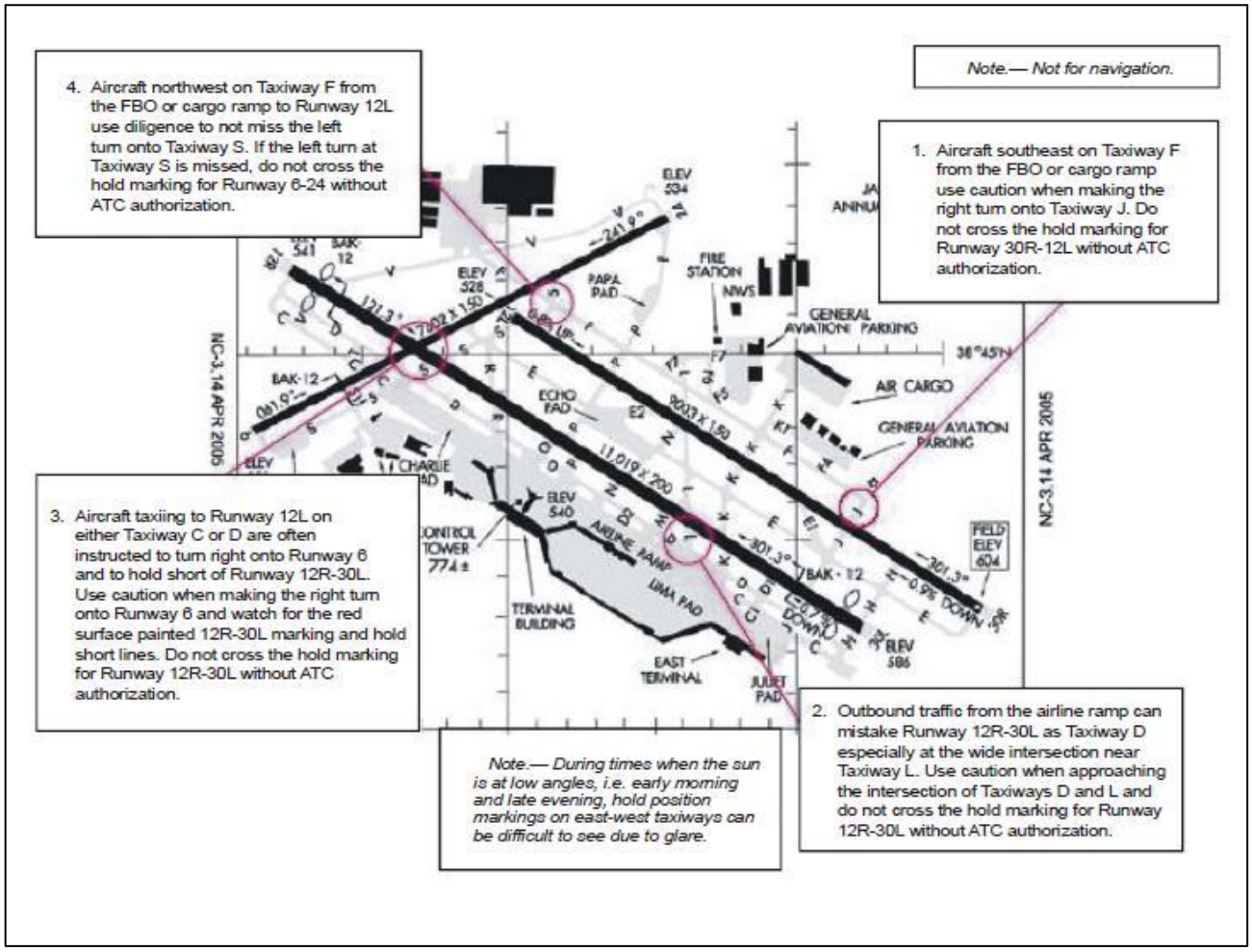


Figure D-2. Example of Hot Spot information.



4.5 ACTION ITEMS

A plan containing action items for mitigating runway safety deficiencies should be developed. Action items should be aerodrome specific and linked to a runway safety concern, issue or problem at that aerodrome.

Action items may include suggested changes to the physical features of, or facilities at, the aerodrome; air traffic control procedures; airfield access requirements; pilot and vehicle operator awareness; and production of hot spot maps.

4.6 RESPONSIBILITY FOR TASKS ASSOCIATED WITH ACTION ITEMS

Each action item should have a designated person or organization which is responsible for completing the relevant tasks. There may be more than one person or organization affected by an action item; however, one person or organization should take the lead and be responsible for the completion of all the tasks

associated with the action item. A realistic time frame to accomplish the work should also be associated with each action item.

4.7 EFFECTIVENESS OF COMPLETED ACTION ITEMS

Periodically the effectiveness of implemented and/or completed action items should be assessed. This can be accomplished by comparing the results of the initial analysis and the current runway incursion status. For example, if an action item was to provide training for controllers, pilots or vehicle drivers, the effectiveness of such training should be evaluated by the team. If the analysis shows little or no improvement in the number, type or severity of runway incursions, the team should re-evaluate the implementation of that action item.

4.8 EDUCATION AND AWARENESS

Education and awareness material such as newsletters, posters, stickers and other educational information are invaluable tools for reducing the risk of runway incursions.

Seminars and workshops on Runway Safety conducted by the AANSOO RSP Team can be availed of at the Civil Aviation Training Center. These can also be coordinated with CATC and AANSOO for specific target audience on a case-to-case basis.

The ICAO runway safety toolkit provides a wealth of information for educational and awareness programmes. Other awareness material that may be helpful to local runway safety teams is available from:

Airports Council International (ACI)
www.airports.org
Air Services Australia
www.airservicesaustralia.com
European Organisation for the Safety of Air Navigation (EUROCONTROL)
www.eurocontrol.int/runwaysafety/public/subsite_homepage/homepage.html
Federal Aviation Administration (FAA)
www.faa.gov/runwaysafety
International Air Transport Association (IATA)
www.iata.org
International Civil Aviation Organization (ICAO)
www.icao.int/fsix/res_ans.cfm
International Federation of Airline Pilots' Associations (IFALPA)
www.ifalpa.org
Transport Canada
www.tc.gc.ca/civilaviation/systemsafety/posters/tools.htm
United Kingdom Safety Regulation Group
www.caa.co.uk