THE PHILIPPINES' STATE RUNWAY SAFETY PROGRAMME

CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

A Component of the
STATE SAFETY PROGRAMME FOR PHILIPPINE CIVIL AVIATION

Edition 1.0

April 2014

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AMENDMENT RECORD SHEET

Amendment No.	Date	Entered by	Date entered

FOREWORD

It takes a network of people, procedures and technologies to keep the civil aviation system safe. Pilots, controllers, technicians, engineers, inspectors, and supervisors oversee this network to make sure millions of passengers move safely through it every day. Within the aerodrome safety area, one of the highest priorities is runway safety. As such, the ICAO and the global aviation community give focus on all areas to improve runway safety, including training and education, airport signage, lighting and markings, operational procedures, equipment, and technology, among others.

The CAAP aims to reduce the risk of runway incursion by addressing errors committed by pilots, air traffic controllers, airport-authorized vehicles, and pedestrians through outreach and the implementation of improved infrastructure, technology, training, procedures, and regulations. Externally, airport sponsors, operators, tenants, local communities, local governments, and industry groups all contribute time and resources to making airfields safer.

Because the possibility of human error exists, the ICAO is evolving the management of safety that, to the extent possible, accommodates human error without compromising safety, looks at data and addresses root causes, and continues to involve all who play a part in runway safety. A number of components have an impact on runway safety including but not limited to confusing runway and taxiway patterns, airport layouts, pilot awareness and attention, controllers losing situational awareness or forgetting previous instruction, ambiguous pilot-controller communication, and vehicle operators and pedestrians

As a result, many stakeholders have a role in the development of improvements and solutions. It is within this context that worldwide civil aviation institutions adopted the Safety Management System (SMS) which uses a systems approach to manage risk and helps the authority to better track efforts for safety improvement, and their effectiveness once implemented. Every reported runway incursion is taken seriously, investigated thoroughly, and analyzed to determine the causal factors.

The CAAP, through the Philippines' State Runway Safety Programme which forms part of the State Safety Programme (SSP) for Philippine Aviation, will continue to seek ways to improve awareness, training, and technologies, and continue to collaborate with airlines, airports, unions, and aerospace manufacturers to minimize the severity, number, and rate of runway incursions.

LT GEN WILLIAM K HOTCHKISS III AFP (Ret)
Director General

April 2014

The Philippines' Runway Safety Programme

Part 1   Introduction

1.0   General. Safety officials in the aviation world have identified the risk associated with runway incursions as one of the most urgent issues facing the aviation community today. Studies have shown that despite years of professional training, pilots, airport vehicle operators, air traffic controllers and flight service specialists continue to find themselves unwittingly involved in runway incursion incidents.

The worst aircraft accident in history killed 583 passengers and crew when two B747s collided in fog on a runway in Tenerife, Canary Islands, in 1977. In 1978, 38 passengers and crew were killed in Cranbrook, B.C., when a B737 crashed and burst into flames trying to avoid a snowplow on the runway. At a 1998 workshop on runway incursions in Washington, the Executive Director of the Aircraft Owners and Pilots Association (AOPA) Safety Foundation commented on the general aviation (GA) involvement by noting that while the *incursions* tended to involve GA aircraft in conditions of good visibility, the *accidents* involved commercial aircraft at night or in conditions of poor visibility. The four fatal crashes in the U.S. in the 1990s, and the Cranbrook and Tenerife crashes all fit this profile.

1.1   ICAO Runway Incursion Definition

The CAAP supports the efforts of ICAO to establish standard definitions for runway incursion and severity of runway incursions. The ICAO definition of a runway incursion is:

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 takeoff of aircraft.

With the introduction of a common definition as given by ICAO, aviation bodies of ICAO-member States have also adopted identical terms to classify runway incursions. The following terms are used for the classification of incursions by type:

- ➢ **OE** (Operational Errors)**:** Incursions that occur as the result of actions taken by a controller or flight service specialist. Safety may have been jeopardized or less than the appropriate separation minima may have existed in these cases.
- ➢ **PD**: Pilot deviation.
- ➢ **VPD**: Vehicle/pedestrian deviation.

1.2 Runway Incursion Severity Classifications

For the purpose of global harmonization and effective data sharing CAAP has adopted the Severity Classification Scheme in the ICAO Doc 9870 – *Prevention of Runway Incursion Manual*:

ACCIDENT	Refer to ICAO Annex 13 definition of an accident *
A	A serious incident in which a collision was narrowly avoided
B	An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision
C	An incident characterized by ample time and/or distance to avoid a collision
D	An incident that meets the definition of runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and takeoff of aircraft but with no immediate safety consequences
E	Insufficient information, inconclusive or conflicting evidence precludes severity assessment

ACCIDENT – AN OCCURRENCE ASSOCIATED WITH AIRCRAFT OPERATION WHICH TAKES PLACE BETWEEN THE TIME ANY PERSON BOARDS AN AIRCRAFT WITH THE INTENTION OF FLIGHT UNTIL SUCH TIME AS ALL SUCH PERSONS HAVE DISEMBARKED IN WHICH:
- *A PERSON IS FATALLY OR SERIOUSLY INJURED AS A RESULT OF BEING IN OR UPON THE AIRCRAFT OR ANYTHING ATTACHED THERETO.*
- *THE AIRCRAFT INCURS DAMAGE/STRUCTURAL DAMAGE/FAILURE WHICH ADVERSELY AFFECTS STRUCTURAL INTEGRITY/FLIGHT PERFORMANCE AND WHICH WOULD NORMALLY REQUIRE MAJOR REPAIR OR REPLACEMENT OF AFFECTED COMPONENT/S. (Annex 13)*

The objective of runway incursion severity classification is to record an assessment of each runway incursion. The assessment and documentation of runway incursions is a critical component of risk measurement, where risk is a function of the severity of the outcome and the probability of recurrence.

Landing and take-off are critical phases of flight and the runway is an area where landing and departing aircraft may have the opportunities to interact with other taxiing aircraft, ground vehicles, personnel, animals and foreign objects. Given the speed of aircraft and its limited ability in exercising avoiding action on the runway especially during take-off and landing roll, the potential hazard, as may be created by runway incursions or presence of foreign objects, have become a deep concern to aviation safety in many countries.

International Civil Aviation Organization (ICAO) has specified standards and recommended practices relating to airport system operation and development of operational procedures for the purpose of achieving runway safety. However, with the predicted growth of air traffic and increasing complexity in airport operation, the commitment to runway safety should also be addressed by a more systematic approach to ensure consistent and harmonized application of ICAO provisions with clear goals and common understanding shared by all stakeholders. This perspective is in line with the requirement of Annexes 6, 8, 11, 13, 14 and 19. With the aforesaid objective in mind, the CAAP Runway Safety Programme serves to provide **management guidelines and recommendations** to stakeholders for enhancing runway safety. The Programme is distributed to aircraft and airport operators as well as air navigation service providers who are requested to observe the guidelines through continuous system improvement and adoption of industry best practice.

All runway incursions should be adequately investigated to determine the causal and contributory factors and to ensure that risk mitigation measures are implemented to prevent any recurrence. Such investigation is separate and distinct from that of the activities of the Aircraft Accident and Incident Investigation and Inquiry Board (AAIIB).

Runway incursion incidents or accidents should be assessed as soon as possible after the incident notification with due regard for the factors that influence the severity (*section 6.2 of Doc 9870*). At the end of the investigation process, a reassessment of the final outcome may be applied.

1.3 Factors Considered in Severity Categorization

- Speed and performance of the aircraft

- Distance between parties (horizontal and/or vertical)

- Location of aircraft, vehicle, or object on the actual runway or on a taxiway inside the runway holding position markings

- Type and extent of evasive action

- Was the party on the ground stopped or moving?

- Knowledge of the other party's location

- Visibility conditions

- Night vs. Day

- Runway conditions (e.g., wet, snow covered

- Status of radio communications

- Other relevant factors

1.4   The Aerodrome and Air Navigation Safety Oversight Office (AANSOO) of Civil Aviation Authority of the Philippines (CAAP) is responsible for periodic review of the Programme taking into consideration the current international requirements, the airport development, the growth in air traffic and technological advancement that in turn may help to better equip the airport in achieving a high level of runway safety.

1.5   The Runway Safety Programme forms part of the State Safety Programme for Civil Aviation as approved and promulgated by the Director General.

1.6   Enquiry on this Runway Safety Programme may be addressed to the Chairman of the SSP for Philippine Aviation. As the SSP Office (administrative) is still in the process of being established, any enquiry in the interregnum may be coursed through (care of) the Chief, AANSOO, Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Tel/Fax No (632) 8799118, Zip code 1300, email aanso.caap@gmail.com.

Part 2   CAAP RUNWAY SAFETY PROGRAMME STRUCTURE

2.1   Runway Safety Office (Office of Runway Safety)

o   An office shall be established by the CAAP at the national level tasked with the implementation of the State Runway Safety Programme, including education and awareness, guidance and assistance to Local Runway Safety Teams, among others. The Runway Safety Office shall be ultimately responsible for the runway safety initiatives throughout the civil aviation community. The office shall be headed by the Runway Safety Programme Manager (RSPM) who will be appointed by the Director General.

o   The RSPM shall be assisted by Runway Safety Programme Officers (RSPOs) from each of the following offices: (1) AANSOO, (2) FSIS *(preferably an experienced pilot),* (3) ATS *(preferably ATC with experience in Aerodrome Control)*, and (4) ADMS *(preferably with experience in airport management)*. All officers should have training in Safety Management System (SMS), State Safety Programme (SSP), and Prevention of Runway Incursions. This office shall work closely with many groups on the runway safety initiatives, including CAAP offices with responsibility for runway safety, aircraft operations, airport management, and the aviation academic community.

The Runway Safety Programme Office shall be responsible for developing and implementing safety guidance for all controlled and uncontrolled (aerodrome advisory service) airports in the country. The primary goals of the Runway Safety Programme Office shall be to:

a) Develop, emphasize and promote a runway safety education and awareness program for pilots, controllers and vehicle operators.

b) Develop strategies to significantly reduce the number and severity of runway incursions.

2.2   Runway Safety Programme Office Staff

1. Runway Safety Programme Manager (Regulatory Office)
   - Provides program oversight and direction for the State's runway safety activities and initiatives.
   - Develops and promotes a runway safety education and awareness program for pilots, controllers and vehicle operators.

- Formulates, directs, coordinates and evaluates runway safety strategic plans, programs, policies and standards.

2. Runway Safety Programme Officer -Airports Division
- The regulatory aerodromes subject matter expert who provides safety oversight and compliance of commercial service airports.
- Investigates, reports and tracks vehicle/pedestrian deviations (V/PD).
- Coordinates runway incursion and surface incident reports, status and outcomes.

3. Runway Safety Programme Officer - Flight Standards
- The flight standards subject matter expert on the Runway Safety integrated team.
- Investigates, reports and tracks all runway incursion reports relating to pilot deviations (PD).
- Conducts educational seminars at pilot safety meetings.
- Provides liaison between Flight Standards and the Runway Safety Programme for incursions involving pilot deviations (PD).
- Provides guidance and support to the Runway Safety Programme Manager through the promotion of pilot safety and technical proficiency training.

4.   Runway Safety Programme Officer — Air Traffic Services
- The regulatory air traffic control service subject matter expert on the Runway Safety integrated team
- Investigates, reports and tracks operational errors/deviations (OE/OD).
- Conducts educational seminars and workshops.
- Provides procedural compliance oversight of the air traffic control facilities
- Investigates, reports and tracks operational errors/deviations (OE/OD).
- Provides liaison with the Tech Ops.
- Evaluates the impact that CAAP-owned and maintained facilities for communication and navigation may contribute to the runway incursion.
- Facilitates the coordination of modifications to facilities when these are determined to have impact on airport safety.

5.   Runway Safety Programme Secretariat
- Manages day-to-day correspondence, administrative functions and budget of the State Runway Safety Program Office.
- Coordinates the Runway Safety Office RSPO's travel itineraries and travel authorizations, runway safety meetings and correspondence.
- Customer service provider for all safety information and materials.

2.3 **Local Runway Safety Teams (LRSTs)**

A Local Runway Safety Team (LRST) shall be established in each airport, to be participated in locally by aerodrome ATC (or ATS for airports with no ATC), airport management (including maintenance, security, crash fire and rescue, medical, navigation and communications maintenance, airport field lighting and power), pilots and ground crew of air carriers and general aviation operators. Each LRST shall be headed by a chairman/team leader, normally the Airport Manager or the local ATC/ATS Manager. Local Runway Safety Teams shall develop and implement a Local Runway Safety Programme and shall have, among others, the following tasks:

o Review the current implementation of the relevant ICAO provisions applicable in the local airport surface movement area
o Improve runway safety occurrence reporting and analysis
o Establish a risk-based approach to Change Management
o Ensure that the existing aerodrome Safety Management System and those of the local ATS, airline, flying school, aircraft operator (GenAv), etc., explicitly incorporate runway safety
o Share information about common problems and exchange common solutions
o Develop a Runway Safety Handbook for the respective LRST.

2.4 **Local Runway Safety Programmes**

The RSPM, RSPOs and LRST members shall interface directly with aviation customers, both internal and external to airport operations and the CAAP. Regular LRST meetings shall be conducted at airports that experience frequent or severe runway incursion incidents. The purpose of these meetings is to identify and address existing and potential runway safety problems and to identify corrective actions to further improve safety in surface operations. Additionally, best practices and lessons learned shall be shared. After developing a plan, the RSPM and the RSPOs shall assist LRSTs in implementing solutions. Annually, the RSPM will plan meetings at airports for the coming year, as well as other education and training activities such as:

▪ Meetings between RSPOs and LRSTs
▪ Safety Meetings
▪ Incident Investigations
▪ Other meetings

2.5 Significant Activities of the Runway Safety Office

❖ Develop "*Pilot & Flight Crew Procedures During Taxi Operations*" posters for national distribution.

❖ Develop "*Airfield Procedure for Vehicles and Pedestrians*" posters for national distribution.

❖ Adopt the DVD presentation entitled *Runway Safety and the Air Traffic Controller*, on human factors of an ATC error. It is to be used as a recurrent briefing item that covers results of analysis of operational errors and pilot deviations and the human factors that permeate such events.

❖ Participate at the International Air Transport Association (IATA) annual conference and in other similar conferences.

❖ Provide a briefing on runway safety and the procedures recommended and put in place.

❖ Host presentations on runway safety topics at Aviation/Airports Conferences/Seminars/Symposiums.

❖ Develop *Airport Sign & Marking Quick Reference Guide* which includes a reference to enhanced taxiway centrelines. These documents should be widely disseminated nationally.

❖ Disseminate Runway Incursion Prevention materials which explore the human factors issues in re-creations of actual incursions, such as the DVD entitled *ATC: Face to Face, Eye to Eye.*

2.6 Other Initiatives

2.6.1 **Runway Safety Educational Materials.** The Runway Safety Office shall produce other educational materials for pilots, controllers and airport vehicle drivers. Some of these materials should be developed at the headquarters level in response to trends and prominent issues, but some should be developed at the local level in response to needs seen by the local teams, then shared nationally.

2.6.2 **Runway Safety Reviews**

• Runway safety reviews to be conducted at significant airports (selected international airports initially) that should result in short

term, mid- and long-term initiatives that can lead to many surface safety improvements at these airports.

- Runway Safety Programme Managers (RSPM), Officers (RSPOs) and staff to conduct or participate in Local Runway Safety Team Meetings, Safety Meetings, Aircraft Incident Investigations, and other meetings which should allow them to present or provide runway safety information to airmen, airport operators, vehicle drivers inside airports, aircraft maintenance, safety managers and officers.

2.6.3 Airport Infrastructure and Information

- Upgrading airport taxiway markings gives pilots another indication that they are approaching a runway hold short line. Medium and large airports with more than 1 million annual enplanements should add the enhanced taxiway centreline markings. Extending the requirement for enhanced markings to smaller airports will increase awareness of pilots at those airports.

- Implementing a Runway Safety Area (RSA) improvement program will enhance safety in the event of an aircraft undershoot, overrun, or excursion from the side of the runway.

- Improving signage within the aerodrome especially within the runway safety area.

- Making runway, taxiway, and airport configuration charts readily available to all airmen especially those intending to taxi and take-off.

2.7 Human Factors and Training Initiatives

- Requiring all airlines, general aviation operators, and aviation flying schools to provide their pilots with simulator or other training that incorporates realistic scenarios from pushback through taxi operations stresses the importance of this phase of flight.

- Conducting Crew Resource Management (CRM) training at significant airports and terminal facilities helps controllers detect and correct controller and pilot mistakes before they result in operational errors or accidents.

- Using Runway Incursion Safety Clips (re-creations) as mandatory briefing items provides an opportunity for controllers to review incidents and discuss ways of preventing similar incidents.

- Key organizations such as the Federation of Domestic Aviation Operators (FEDAVOR), Air Line Pilots Association of the Philippines (ALPA) and airline operators/owners' associations will be very helpful for outreach to their members.

- Tower Refresher Training to ensure air traffic controllers maintain a high level of runway incursion prevention awareness. The CAAP should mandate that runway incursion prevention be included in the annual refresher training at every control tower. These training courses revisit the fundamentals of tower procedures. It is a supplement to the work at each individual airport wherein scenarios of incidents are reviewed.

2.8 Improving the Safety Culture

- Conducting a **Safety Management System (SMS)** programme at significant airports allows for data collection and analysis in preparation for the development of an SMS regulation for certificated airports.

- Certificate holders and repair stations shall be enjoined to participate in **Aviation Safety Action Programmes (ASAPs)** which will lead to the identification and correction of safety events where incidents are voluntarily reported by pilots, dispatchers, mechanics, and flight attendants.

- Similarly, establishing an **Air Traffic Safety Action Program (ATSAP)** for air traffic controllers will provide a mechanism for reporting flight safety concerns in a non-punitive environment.

- Offering a **Runway Incursion Information Evaluation Program** enables the collection and analysis of information about runway incursions to implement safety education programs, produce guidance and augment technologies.

2.9 Changes in Procedures

- Reviewing cockpit procedures to identify distractions in the cockpit during taxi operations which can lead to developing plans to minimize these distractions. All active air carriers and general aviation operators should complete this review.

- Conducting Operational Error Reduction Workshops with representatives of similar facilities provides the opportunity to

discuss procedures and standardization of techniques for risk mitigation.

- Convening Safety Risk Management Panels on five air traffic control operations (1. Detailed Taxi Instructions for multiple runways, 2. Takeoff Clearances, 3. Taxi To, 4. Landing Clearances, and 5. Line Up and Wait) identified hazards and assessed risks associated with recommended procedure changes that are thought to decrease the risk of runway incursions.

2.10 New Technology

Technological solutions to prevention of runway incursions have been developed, while some are still being developed. The following strides in technology are worth considering:

- Installing and operating Airport Movement Area Safety System (AMASS) at airports gives visual and aural prompts to tower controllers to respond to situations on the airfield that potentially compromise safety.

- Moving Map Displays are under development, and will show the pilot their own position on the airport surface, and have the potential to greatly improve runway safety at night and in poor visibility. At least one such system is already certificated by the FAA for use in aircraft.

- Low cost surveillance systems are currently being tested, and could reduce the risk of incursions at small and medium-sized airports.

- Runway Status Lights and Final Approach Occupancy Signal (FAROS). Runway Status Lights provide illuminated red in-pavement lights to indicate to pilots that a runway is unsafe for entry or is unsafe for takeoff due to traffic on the runway. Final Approach Runway Occupancy Signal (FAROS) system alerts pilots on approach, via flashing Precision Approach Path Indicator (PAPI) lights, if the runway is occupied.

Part 3   LOCAL RUNWAY SAFETY TEAMS

3.1 **Background**

Section 3.1.1 of Doc 9870 states:

"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 State, through the Civil Aviation Authority of the Philippines (CAAP), aims to establish a Local Runway Safety Team in each airport utilized for civil aviation. Through seminars and workshops that form part of the education and awareness campaign, the CAAP has established in some airports and shall be establishing in more airports, local runway safety teams composed of 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 shall meet on a regular basis. Frequency of meetings should be determined by the individual groups, but should be no less than on a semi-annual basis.

3.2 **GOALS OF THE LOCAL RUNWAY SAFETY TEAM**

Once established, the Local Runway Safety Team (LRST) shall team shall establish, at a minimum, the following goals that will improve the safety of runway operations in their respective aerodromes.

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.

3.3 **TERMS OF REFERENCE**

Terms of reference (ToR) for local runway safety team should be developed to assist in enhancing runway safety by:

1. Implementing a safety team composed of Pilots, ATC (Aerodrome Control), Airport Authorities, Airlines, and Handlers representatives.

2. Determining the number, type and, if available, the severity of runway incursions;

3. Considering the outcome of the investigation reports to identify local hotspots or problem areas at the aerodrome.

4. Working as a combined team to better understand the operating difficulties of those working in other areas, and suggest items for improvement.

5. Co-ordinating with the organizations or teams they represent the implementation of the recommendations that have been assigned to the LRST in the Runway Safety Document.

6. Identifying any local problem issues and making suggestions for improvements that are considered necessary.

7. Running a local Runway Safety Campaign, that focuses on local issues, by producing and distributing local hotspot maps or other guidance material as considered necessary.

8. Confirming that communications between the ANS providers and Aircrew/Drivers are satisfactory, or if any improvements could be suggested. Although standard ICAO phraseology may be utilized, some messages from ATC may be overlong or complex, which may have the potential to confuse the drivers or aircrew.

9. Driving on the airfield on a regular basis to ensure that all markings and signage are compliant with standards, are understandable for all parties, and that no possible ambiguity exists.

10. Analyzing and commenting on any proposal of modification/s and, when deemed necessary, initiate new procedures, works, airport layout, working methods, and new equipment when required. Modifications should be ICAO-compliant.

11. Monitoring the development of the drivers' license based on a specific training and assessment.

12. Monitoring of communication procedures for vehicle drivers.

3.4 HOT SPOTS

Although some airports may have similar layouts, each airport has its unique hot spot/s. 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.

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). The LRST in each airport shall take the lead in this regard.

Once hot spots have been identified by the LRST, 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) mitigation of blind spots in the aerodrome control tower.

3.5 ACTION ITEMS

A plan containing action items for mitigating runway safety deficiencies should be developed by each LRST. 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.

3.6 RESPONSIBILITY FOR TASKS ASSOCIATED WITH ACTION ITEMS

Each action item should have a designated person or group 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 group 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.

3.7 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.

3.8 EDUCATION AND AWARENESS

Education and awareness materials such as newsletters, posters, stickers and other educational information are invaluable tools for reducing the risk of runway incursions. The ICAO runway safety toolkit provides a wealth of information for educational and awareness programmes and shall be a major resource in propagating runway safety. To be functional and

valuable as a component of the local runway safety team, each member should enhance his education and awareness through CAAP- or ICAO-sponsored/recognized Runway Safety seminars, workshops, or training. The Civil Aviation Training Center (CATC), in collaboration with the AANSOO RSP Training Team, offers a seminar-workshop on runway safety focusing on the prevention of runway incursion which can be availed of by CAAP employees as well as non-CAAP (private) individuals or groups.

There are other materials that may be helpful to local runway safety teams. Some of these sources are listed below:

- 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
  http://www.tc.gc.ca/civilaviation/systemsafety/posters/tools.htm

- United Kingdom Safety Regulation Group
  http://www.caa.co.uk

3.9 Memorandum Circular: ESTABLISHMENT OF LOCAL RUNWAY SAFETY PROGRAMMES and LOCAL RUNWAY SAFETY TEAMS

The regulatory bases for this memorandum circular are CAR-Aerodromes (AO 139), MOS for Aerodromes, CAR-ANS Part 10 B, CAR-ANS Part 11, PCAR Part 6 and Annex 19. This is the first to be issued combining these regulatory requirements in reference to runway safety.

This MC provides guidelines in the establishment of an aerodrome operator's Local Runway Safety Programme and Local Runway Safety Team in conjunction with air traffic service providers, air operators and other relevant stakeholders, in accordance with pertinent provisions of Annex 11 — Air Traffic Services, Annex 14 — Aerodromes, Volume I, Annex 6, Annex 19, Doc 9859 - Safety Management Manual, and the Doc 9870 - Manual on the Prevention of Runway Incursion.

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.

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 the aerodrome operator's inherent administrative position and functions as most appropriate in spearheading the establishment of the Local Runway Safety Programme and Local Runway Safety Team.

Part 4 *Airport Operations* – Guidance for Local Runway Safety Teams and Local Runway Safety Programmes

4.1 Favourable operating environment and prevention of runway incursions are important factors that contribute to runway safety. With these basic principles, an aerodrome operator should establish procedures to monitor the conditions of runways and ground aids which must be supported by effective maintenance programme to ensure system integrity. Logical layout, simplicity and avoidance of runway crossings should be included as elements in the design and introduction of new aerodrome infrastructure. Human factors shall be considered in setting up aerodrome procedures with the objectives of minimizing human errors and respecting user-friendliness when used by pilots, vehicle drivers and air traffic controllers. The following are guides for managers in airport operations. Other actions, procedures and infrastructure for the enhancement of runway safety not included here but deemed necessary should be implemented.

4.2 Annex 14 Provisions

An aerodrome operator is required to fully implement at high priority the ICAO provisions relevant to runway safety. Their compliance forms the basis for consideration of certifying aerodromes. Appropriate additional safeguards should be taken into account to avoid runway incursion.

4.3 Runway and Runway Strip Maintenance Programme

4.3.1 A maintenance programme, including preventive maintenance, where appropriate, shall be established for the aerodrome to maintain the runway and runway strip in a condition that does not impair the safety of aircraft operations. A robust maintenance programme should be implemented to prevent failure or degradation of runway facilities.

4.3.2 The design and application of the maintenance programme should observe Human Factors principles. Guidance material on Human Factors principles can be found in the ICAO Human Factors Training Manual (Doc 9683).

4.4 Pavement Maintenance

4.4.1 The surface of pavements (runways and adjacent areas) shall be kept clear of loose stones or other objects that might cause damage to aircraft structures or engines, or impair the operations of aircraft systems. In this connection, a comprehensive runway inspection and sweeping programme

should be incorporated into the standard operation procedures of aerodrome operators.

4.4.2 The surface of runways shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance. Standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed as rapidly and completely as possible to minimize accumulation. On every landing, the runway touch-down zone is heavily loaded and rubber from aircraft tyres would be inevitably deposited on runway surface. The adverse effect as a result of rubber deposit should be continuously monitored and addressed.

4.4.3 An aerodrome operator shall establish a programme to measure the friction characteristics of its runway/s. Different levels of friction corresponding to the level of maintenance required, including rubber removal, should be defined. Pertinent information should be made available to air traffic control (ATC) for onward transmission to pilots if necessary.

4.5 **Visual Aids**

4.5.1 A system of preventive maintenance of visual aids shall be adopted to ensure the availability and reliability of the runway lighting and marking systems. Guidance on preventive maintenance of visual aids is given in the ICAO Airport Services Manual, Part 9 (Doc 9137 Part 9).

4.5.2 The system of preventive maintenance employed for a precision approach runway should include at least the following checks:
  - visual inspection and in-field measurement of the intensity, beam spread and orientation of lights included in the approach and runway lighting systems;
  - control and measurement of the electrical characteristics of each circuitry included in the approach and runway lighting systems; and
  - control of the correct functioning of light intensity settings used by the air traffic control unit.

4.5.3 The frequency of measurement of lights for a precision approach runway should be based on traffic density, the local pollution level and the reliability of the installed lighting equipment. The results of the in-field measurements should be continuously assessed and subject to audit by the Aerodrome and Air Navigation Safety Oversight Office (AANSOO) of the Civil Aviation Authority of the Philippines.

4.6 Runway Works and Methods of Working Plans (MOWP)

4.6.1 An aerodrome operator shall plan and implement works to be carried out at an aerodrome so as not to create any hazard to aircraft operations or confusion to pilots. A method of working plan should be developed whereby the work items are thoroughly co-ordinated among aerodrome users, air traffic control and other service providers after suitable consultations.

4.6.2 An aerodrome operator shall make arrangement to inspect the works areas, as circumstances require, to ensure aviation safety during and immediately after any period of construction or repair of runway facility or equipment that is critical to the safety of aircraft operations, and at any other time when there are conditions on the runway that could affect aircraft operations.

4.6.3 An aerodrome operator shall not close the runway to aircraft operations due to pre-planned aerodrome works unless an Aeronautical Information Manual (AIP) Supplement or a Notice to Airmen (NOTAM) giving notice of the closure has been issued in advance before the closure takes place.

4.6.4 An aerodrome operator shall appoint a person responsible for the safe and proper execution of each item of runway works. This person is responsible to ensure that the works information is widely promulgated to airport users by way of Airport Circular, AIP Supplement or NOTAM.

4.6.5 Runway or taxiway sections that are closed as a result of the aerodrome works being carried out shall be suitably delineated with marker boards and lit in accordance with the appropriate aerodrome standards.

4.6.6 All obstacles including vehicles and plants created as a result of the aerodrome works being carried out shall be marked and lit in accordance with the appropriate aerodrome standards.

4.567 Vehicles used by works parties carrying out aerodrome works on the movement area should be equipped with a radio for two-way communications with air traffic control and the unit responsible for airfield control. The drivers of these works vehicles should be properly trained and briefed about the works details prior to each works session.

4.7 Safety Management System (SMS)

4.7.1 An aerodrome operator shall implement an SMS in accordance with the provisions in CAR-Aerodromes, Annex 14 and Annex 19. Facilities, equipment and procedures used to support runway operations shall be

designed and operated in a way that the combination of the probability of occurrence and the seriousness of the consequences of the hazard occurring must not result in a level of risk that is unacceptable. Risk assessment matrices facilitate the determination of acceptable levels of risks taking into account the probability of occurrence and seriousness of consequences.

4.8   SMS Implementation

4.8.1 The implementation of the SMS should include the introduction of:

- **Quantitative safety levels** – an acceptable level of safety in respect of runway operations should be specified.
- **System safety assessment** – safety assessment exercises should be performed whenever changes, additions or replacements of runway facilities are introduced. All records should be documented.
- **Safety committee** – forum with members from pilot community, air traffic controllers, aerodrome operator, airline representatives and relevant franchisees with operations associated with runway operations should be formed to discuss issues on runway safety;
- **Safety competency scheme** – a scheme should be developed to assess the safety competency on staff involved in runway operations.
- **Safety audit** – periodic safety audits are to be performed to confirm the compliance with the safety requirements and the principles of the safety management system;
- **Safety monitoring and reporting system** – suitable monitoring and reporting mechanism should be developed for identifying undesirable trends in runway safety performance for further remedial action;
- **Safety information dissemination** – a system of information dissemination should be developed to keep aerodrome staff notified whenever a potential safety threat is discovered for enhancing their awareness; and
- **Continuous safety promotion** – efforts should be made to nurture a safety culture amongst the airport community.

Part 5   *Aircraft Operations* – Guidance for Local Runway Safety Teams and Local Runway Safety Programmes

5.1   Pilots play an important role in contributing to runway safety. Aircraft operators are therefore requested to review the suggestions put forward in this document and adopt these guidelines where necessary in order to refine their ground operation procedures. The following are guides for pilots, airline managers and aircraft owners/operators in aircraft operations and runway safety. Other actions, procedures and infrastructure for the enhancement of runway safety not included here but deemed necessary should be implemented.

5.2   **Pilots' Training**

Pilots should be given training on visual aids, for example, aerodrome signage, lightings and markings, to assist in determining positions. Emphasis should be given to maintaining a high level of awareness in observing and complying with signs and markings. A sound knowledge of all the symbols, signs and colour of lightings that can be anticipated at aerodromes is vital.

5.3   **Cockpit management during ground operation**

5.3.1   The taxi phase should be treated as a 'critical phase of flight', which requires careful planning.

5.3.2   Pilots should be familiar with the airport that they operate in. Airfield charts and NOTAMs should be reviewed prior to commencement of taxi and before top of descent. Special attention should be paid to the location of HOT SPOTS if known, i.e. complex intersections and runway crossings where runway incursions have taken place in the past.

5.3.3   Pilots should monitor the aircraft's position against the aerodrome chart so as to ensure that instructions received from ATC are being followed correctly. Any uncertainty must be resolved through clarification and assistance from ATC.

5.3.4   Cockpit instruments, such as compass heading display or Instrument Landing System (ILS) localizer, should be used as supplement to visual observation, for confirming correct taxiway or runway alignment especially at complex intersections.

5.3.5 Pilots should exercise extra caution when being instructed to taxi into position and hold, particularly at night or in poor visibility. Remaining in position and holding on the departure runway for an extended period without direct communication with ATC should be avoided.

5.3.6 When crossing or entering runways, all flight crew members should assign full concentration on the runway condition. In addition to visual checking, other available means, such as monitoring of ATC frequency and aircraft radar may be used to obtain a better picture on the traffic situation.

5.3.7 Prior to entering a runway, each flight crew member must cross check and positively confirm with the other the runway identification signage and that the aircraft heading aligns with the designated runway.

5.3.8 After landing and exiting the runway, non-essential communications and non-essential flight crew actions should not be initiated until clear of all runways, in accordance with sterile cockpit procedures.

5.4   **Communication with Air Traffic Control**

5.4.1 It is vital that pilots follow the clearance or instructions that are actually received, and not the one that they expected to receive.

5.4.2 Standard phraseology should be used as far as practicable.

5.4.3 Clearance should be read back in its full content with the aircraft callsign included. The runway designator should be included in case of hold short, runway crossing, take-off, or landing.
.
5.4.4 The receipt of a clearance to taxi to a point beyond a runway does not automatically include the authorization to cross that runway. Each taxi clearance beyond a runway should contain an explicit clearance to cross the runway or an instruction to hold short of that runway.

5.4.5 An ATC instruction to follow other traffic does not automatically imply that permission to enter or cross a runway is given. Each aircraft requires a specific clearance to enter or cross any runway. Flight crew should seek clarification from ATC if in doubt.

5.4.6 Flight crew members should pay extra attention to ATC messages when another aircraft with a similar callsign is on the frequency.

5.4.7 All pilots are required to attain at least ICAO Level 4 in the language proficiency test.

5.5 Crew resource management

5.5.1 Flight crew members should support each other in managing the cockpit. All flight crew members should monitor the frequency and agree upon the acceptance of a clearance to taxi, cross a runway, and take-off or land on a nominated runway. Any misunderstanding or disagreement among flight crew on flight deck duties should be resolved immediately by contacting ATC for clarification.

5.5.2 All the visual information that is available should correlate with the actual position. The gathering of visual information, allowing a critical review and cross-checking of position, is the task of the entire flight crew. Any crew member who is uncertain or in doubt about the current aircraft position must speak up and resolve that uncertainty.

Part 6 *Vehicle Operations in Airside* – Guidance for Local Runway Safety Teams and Local Runway Safety Programmes

6.1 Runway incursion by vehicles has caused considerable concern in daily operation at airfields. An aerodrome operator therefore should establish comprehensive procedures to regulate the quality and discipline of airside drivers. Suitable measures should be introduced to promote a safety culture in general and arouse the situation awareness of drivers and aircrew. The following are guides for vehicle drivers and managers in airport operations. Other actions, procedures and infrastructure for the enhancement of runway safety not included here but deemed necessary should be implemented.

6.2 Control of Airside Driving and Airside Driving Certification

6.2.1 In order to ascertain drivers' competency for operating vehicles at airside, an aerodrome operator shall administer an Airside Driving Permit (ADP) System for the aerodrome.

6.2.2 The numbers of drivers permitted to drive on the manoeuvring area should be kept to the minimum necessary. The driving operations should be related to the functions of their duties.

6.2.3 All drivers should be trained and assessed initially and be provided with refresher training at agreed intervals for re-examination to ascertain their competency.

6.2.4 Where responsibility for the training of vehicle drivers is delegated to a third party provider, the aerodrome operator should institute a programme of audits/examinations, as part of its SMS, to ensure that agreed standards are being maintained.

6.3 Airside Driving Training

6.3.1 An aerodrome operator should introduce a formal driver training and assessment programme. Training guidelines should be provided, and a set of agreed standards on driver competency should be developed in administering the programme.

6.3.2 Training material should cover general aerodrome layout, including:

- Runway/s, taxiway/s, apron, roads, crossings, runway holding points, etc.

- all aerodrome signs, markings and lights for both vehicles and aircraft
- specific reference to signs, markings and lights used to guard runways and critical areas, and
- specific reference to low visibility operation.

6.4 Airside Driving Discipline

6.4.1 Airside drivers must be given a clear message that ATC instructions must be followed at all time. Without ATC's authorization, drivers must not enter the runway. If there is any doubt in the mind of a vehicle driver when receiving a clearance or instruction, clarification should be immediately requested from ATC before the clearance or instruction is enacted. Vehicle drivers should immediately contact the unit responsible for airfield control or ATC when uncertain of their exact position on an aerodrome.

6.4.2 Vehicle drivers experiencing radio problems while on manoeuvring area must immediately vacate the manoeuvring area. Driver with vehicle breakdown on runways and taxiways must report to airfield control or ATC immediately

6.5 Language Proficiency in respect of Radiotelephony (RTF) Communication

6.5.1 Standard phraseology should be used for communication among drivers, controllers and airfield control personnel. Vehicle driver or his team members who communicates with air traffic controller should read back all instructions pertaining to entering, leaving or crossing runways.

6.6 Situational Awareness

6.6.1 On the part of airside drivers, situational awareness is about knowing where they are and where they want to go, as well as knowing the traffic in the surrounding. Drivers should be encouraged to exercise extra vigilance when operating in the vicinity of runways. Close references should be made with any visual cues, lightings and signage especially at times of darkness and poor visibility.

Part 7 *Air Traffic Control Operations* – Guidance for Local Runway Safety Teams and Local Runway Safety Programmes

7.1   One of the primary objectives of air traffic control is to prevent collision on the ground between aircraft and between aircraft and vehicles. The skills and procedures for achieving this objective have long been included in the basic training and proficiency assessment of air traffic control personnel. However, air navigation service providers (ANSP/ATS) are advised to make continuous effort to promote runway safety through service quality assurance, excellence in operational management, improvement of air traffic control facilities through utilization of state-of-the-art technology, and institutionalizing a safety management system. The following are guides for ATCs and managers in air traffic control operations. Other actions, procedures and infrastructure for the enhancement of runway safety not included here but deemed necessary should also be implemented.

7.2   Safety Management System

7.2.1 The top management of air navigation service providers (ANSP/ATS) and local ATS managers should make full commitment in promoting runway safety. Safety Management for Air Traffic Management is generally specified in Annex 11 and Annex 19. ANSPs shall implement the necessary Safety Management provisions and practices stated therein and make effort to arouse the safety awareness of its staff and motivate a safety culture within the organization.

7.3   Airfield Surveillance

7.3.1 In addition to the basic skills of aerodrome control, controllers should be advised through training or periodic briefing on the importance of visual surveillance with particular emphasis on vigilance in determining aircraft and vehicle positions. Restrictions to the visibility from the control tower that may have a potential impact to the ability of controllers to see the runway should be assessed and clearly made known to aerodrome controllers.

7.3.2 Other airport units may be requested to provide supplementary surveillance from their locations or vehicles on aircraft/vehicle positions if necessitated by circumstances such as at night or in time of poor visibility.

7.3.3 Surveillance equipment (such as advanced surface movement guidance and control system, surface movement radar or close-circuit TV) should be provided as aids to controllers in determining aircraft and vehicle positions. Some models of surface movement radars, by virtue of its design, are prone to signal attenuation by heavy precipitation. The system limitations, if applicable, must be made known to controllers so that caution is exercised during equipment utilization.

7.4 Operational Management

7.4.1 Oversight of daily ATC-related aerodrome operation should be exercised by competent supervisory staff. The workload of individual control positions in the tower should be closely monitored to ensure that it is within the manageable limit.

7.4.2 In the Philippine setting, low weather minima operations do not occur frequently. ANSP management should, however, ensure that aerodrome control staff are familiar with the Low Visibility procedures through refresher training, periodic briefing or discussion during proficiency examinations.

7.4.3 A system or work practice serving the purpose of a memory aid to indicate that the runway is being occupied by towing aircraft, vehicles or maintenance personnel, etc. should be developed and provided for use by aerodrome control tower staff.

7.5 Operational Communication

7.5.1 The radio equipment used for communication with pilots and airport ground vehicles must be thoroughly evaluated to ensure that it is reliable and provides adequate coverage for runway operation.

7.5.2 All aerodrome controllers are required to attain at least ICAO Level 4 in the language proficiency test.

7.5.3 Standard radio-telephone phraseology should be used as far as practicable.

7.5.4 Instructions for aircraft or vehicles to enter/exit the runway shall be issued in a clear and unambiguous manner. Full callsign of aircraft or vehicles and runway designator should be used to avoid confusion.

7.5.5 All clearances for operation on the manoeuvring area should be read-back by the receivers, and the ATC personnel should practice proper hear-back of the instructions read-back by pilots/drivers.

7.5.6 In the interest of enhanced situational awareness, all communications associated with runway operations should be conducted on a common frequency, when practicable.

7.5.7 If the taxi route is expected to be long and complex, the controller should use, where applicable, progressive taxi instructions to reduce pilot workload and the likelihood of confusion.

7.5.8 Where practicable, en-route clearance should be passed before leaving the gate to avoid distraction to pilots during taxiing.

PART 8   INCIDENT REPORTING AND DATA COLLECTION

8.1 Background

8.1.1 ICAO promotes the use of a standardized approach for reporting and analysing 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 States, including the Philippines, to collect and share data to continually improve the safety of runway operations.

8.1.2 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.

8.1.3 An international exchange of information has the potential to effectively contribute to global aviation safety in two ways. First, each State 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 State can learn from the experiences of other States so that the same mistakes do not perpetuate.

8.2   Just Culture

8.2.1 "Just culture" is an atmosphere of trust in which people are encouraged to provide essential safety-related information but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour. Just culture philosophy is designed to counter the strong natural inclination to blame individuals for errors that contribute to runway incursions. A key objective of the just culture perspective is to provide fair treatment for people, applying sanctions only where errors are considered to be intentional, reckless or negligent.

8.2.3 Even the most conscientious and well-trained pilot, airside vehicle driver or air traffic controller is capable of making an error that results in a runway incursion. While a single pilot, driver or controller may be deemed responsible for the incursion, it is rarely the case that the individual is totally responsible for the error and its consequences. Pre-existing conditions, e.g. aerodrome design, and factors such as distraction,

weather, traffic and workload peaks, are only some of the conditions that can induce human error.

8.2.4 The way in which an incident is analysed is as important as the way in which information about the event is collected. *The quality of the investigations has a direct impact on the assessment of the risk of collision, the severity of the outcome, and the identification of causal and contributory factors.*

8.2.5 Due consideration must be given both to the circumstances under which the error occurred (e.g. the tasks the individual was performing at the time and relevant environmental conditions) and to the latent conditions that originate deep within the organization (e.g. complex aerodrome layout, inadequate signs and markings, and high workload).

8.3 Standard Approach to Runway Incursion Incident Reporting and Data Collection

8.3.1 **Annex 13 — *Aircraft Accident and Incident Investigation, 8.1*** requires States to establish a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies.

8.3.2 **Annex 6 — *Operation of Aircraft*, Annex 11 — *Air Traffic Services*, and Annex 14 — *Aerodromes*** require States to establish safety programmes in order to achieve an acceptable level of safety in the provision of services. Use of standard definitions, reporting formats and error taxonomy will facilitate data sharing among States. The larger the data pool, the more robust the analysis of common causal factors will be and, thus, a better understanding of the nature of the problem.

8.3.3 **The *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), 2.4.1.2**, requires ATS authorities to establish a formal incident reporting system for ATS personnel to facilitate the collection of information on actual or potential safety hazards or deficiencies related to the provision of ATS.

8.4 Initial Runway Incursion Notification

8.4.1 ICAO, through Doc 9870, the Manual on Runway Incursion Prevention, recommends the use of a 6-page initial runway incursion notification form which requires inclusion of data to describe the event and to classify its severity, and an 8-page runway incursion causal factors identification form that establishes the how, what and why concerning the event and is to be completed once the detailed investigation into the event has been completed.

8.4.2 For harmonization with global practice, the ICAO Initial Runway Incursion Notification Form and the Runway Incursion Causal Factors Identification Form shall be adopted and incorporated into the CAAP Runway Safety Programme and into the Local Runway Safety Programmes of individual airports.

8.4.3 Runway Incursion Initial Report Form

<div align="right">Report no.: _____</div>

A. Date/time of runway incursion (in UTC) (YYYYMMDDhhmm)   Day ⋯ Night ⋯

B. Person submitting the report   _____

    Name: Job title: _____

    Telephone no.:   _____

    Facility/unit: _____
    Date/time/place of completion   _____
    of form: _____

C. ICAO aerodrome designator   _____

D. Surface conditions
    (Braking)   _____

    _____

    _____

E. Aircraft, vehicle or person involved in the runway incursion (indicate all those involved in the occurrence)

    Aircraft 1:   _____
    Aircraft 2:   _____
    Aircraft 3:   _____
    Vehicle: _____
    Person: _____

F. Weather conditions

    Wind: _____   Visibility/RVR: _____

    Temperature (° Celsius): _____ Ceiling/cloud:

    Additional information:

    _____

    _____

    _____

    _____

    _____

G.   Evasive action — Aircraft 1

No   ···

Yes   ···   Select from the list below as appropriate:

Cancelled take-off clearance	···	
Rejected take-off	···	distance rolled: _____
Rotated early	···	
Delayed rotation	···	
Abrupt stop	···	
Swerved	···	
Missed approach	···	distance to runway threshold: _____
Other	···	

H.   Evasive action — Aircraft 2

No   ···

Yes   ···   Select from the list below as appropriate:

Cancelled take-off clearance	···	
Rejected take-off	···	distance rolled: _____
Rotated early	···	
Delayed rotation	···	
Abrupt stop	···	
Swerved	···	
Missed approach	···	distance to runway threshold: _____
Other	···	

I.   Evasive action — Vehicle

No   ···

Yes   ···   Select from the list below as appropriate:

Abrupt stop	···
Swerved	···
Other	···

J.   Closest proximity

Vertical (ft):   _____   Horizontal (m):   _____

K.   Communication difficulties

No   ···

Yes   ···   Select from the list below as appropriate:

Readback/hearback

···

Blocked communication	···
Confused call signs	···
Aircraft on wrong frequency/no radio	···
Non-standard phraseology	···

L.   ATC

Did ATC forget about:	Yes	No
An aircraft/person/vehicle cleared onto or to cross a runway?	···	···
An aircraft on approach to land?	···	···
A runway closure?	···	···

M.   Description of the incident and relevant circumstances

1.   A description or diagram of the geometry of the incident scenario:

Description:

_____
_____
_____
_____
_____
_____

Diagram:
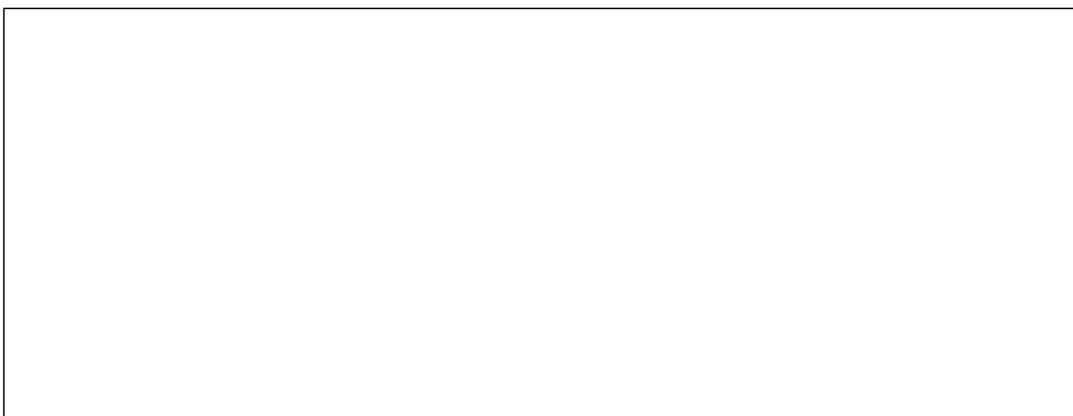
2. A description of any evasive or corrective action taken to avoid a collision:

    _____
    _____
    _____
    _____
    _____
    _____
    _____

3. An assessment of the available reaction time and the effectiveness of the evasive or corrective action:

    _____
    _____
    _____
    _____
    _____
    _____
    _____

4. An indication of whether a review of voice communication has been completed and the results of that review:

    _____
    _____
    _____
    _____
    _____
    _____
    _____

5. Initial assessment of severity:

    _____
    _____
    _____
    _____
    _____
    _____
    _____

N. Aircraft details — Aircraft 1

Registration no.: _____ Call sign: _____ SSR code (if applicable): _____

Flight no.: _____ Owner/operator: _____

Aircraft 1 type: _____

Flight details (select from the list below as appropriate):

Type of flight		Flight rules	
General aviation		IFR	···
		VFR	···
···			
Military	···		
Non-scheduled	···		
Scheduled	···		

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O.   Aircraft details — Aircraft 2

Registration no.: _____ Call sign: _____ SSR code (if applicable): _____

Flight no.: _____ Owner/operator: _____

Aircraft 2 type: _____

Flight details (select from the list below as appropriate):

Type of flight		Flight rules	
General aviation		IFR	···
		VFR	···
···			
Military	···		
Non-scheduled	···		
Scheduled	···		

P.   Vehicle details — Vehicle 1

Registration no.: _____ Call sign: _____

Mobile no.: _____ Owner/operator: _____

Vehicle 1 type: _____

Other details (select from the list below below as appropriate):

Type of vehicle		Other:
Runway inspection	···	
Bird control	···	
Tugging/towing	···	
Fire brigade	···	
Maintenance	···	
Snow clearing	···	
Military	···	

Q.   Vehicle details — Vehicle 2

Registration no.: _____ Call sign: _____

Mobile no.: _____ Owner/operator: _____

Vehicle 2 type: _____

Other details (select from the list below below as appropriate):

Type of vehicle		Other
Runway inspection	•••	
Bird control	•••	
Tugging/towing	•••	
Fire brigade	•••	
Maintenance	•••	
Snow clearing	•••	
Military	•••	

R.   Report received by

_____   _____
(name of person)   (date)

S.   Date when detailed investigation will commence

_____

8.4.4   INSTRUCTIONS FOR COMPLETING THE RUNWAY INCURSION INITIAL REPORT FORM

Item

A   Indicate the date/time (in UTC) and conditions (day or night) of the runway incursion.

B   Provide details about the person submitting the report.

C   Provide the aerodrome designator as indicated in *Location Indicators* (Doc 7910).

D   Supply information regarding the runway condition at the time of the runway incursion, which affected the braking action of the aircraft.

E   Identify the aircraft, vehicles or persons involved in the runway incursion. More details should be provided in N, O, P and Q.

F   Provide information on weather conditions such as wind, visibility, RVR, temperature, ceiling, cloud and additional information as required.

G, H, I   Provide information regarding evasive action taken by the aircraft and/or vehicles.

J   Provide information regarding the closest proximity or distance, horizontally and/or vertically, between both parties during the runway incursion or at the point at which both parties were aware of the situation and the aircraft was under control at taxi speed or less.

K, L   Provide information regarding communication difficulties and ATC memory lapses.

M   Describe the runway incursion, by providing the information requested. Attach additional pages as required.

N, O, P, Q   Supply detailed information regarding the aircraft and vehicles involved in the runway incursion.

R   Provide the name of the person receiving the report and date.

S   Indicate the date when the detailed investigation of the runway incursion will commence.

_____

8.4.5   Runway Incursion Causal Factors Identification Form

Initial runway incursion report no.: _____

A.   Date/time/place of runway incursion (in UTC)
     (YYYYMMDDhhmm)   _____ _____ _____
                                         (date)   (time)   (place)

B.   Aircraft, vehicle or person involved in the runway incursion (indicate all those involved in the occurrence)

     Aircraft 1:   _____

     Aircraft 2:   _____

     Aircraft 3:   _____

     Vehicle: _____

     Person: _____

C.   Severity of the runway incursion (select as appropriate)

Severity	
A	....
B	...
C	...
D	...
E	...

D. Causal and coincident factors (select from the list as appropriate — multiple choices can be made)

1.   AIR TRAFFIC CONTROL

1.1   *Communications*

1.1.1   Transmitted instructions were long, complex, spoken rapidly or not in accordance with ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language)[1]

1.1.2	Did not obtain readbacks for clearances, instructions and coordination as required by ICAO	...
1.1.3	Did not correct an error in a readback	...
1.1.4	Issued a clearance to the wrong aircraft	...
1.1.5	Confused similar call signs	...
1.1.6	Transmission was completely blocked	...
1.1.7	Deviation from established ICAO standard phraseologies	...
1.1.8	Other (please specify). If not an ICAO procedure, please briefly describe the procedure used and where.	...

_____

_____

_____

_____

1.2   *Situational awareness*

1.2.1	Head-down time due to equipment/displays; duties other than traffic processing such as inputting flight data	...

1.2.2   Forgot:

• aircraft on an active runway	...
• aircraft cleared to cross a runway	...
• aircraft in the lined-up position	...
• aircraft on approach to land	...
• to issue a clearance	...
• that a clearance had already been issued	...
• closed runways	...
• a vehicle on an active runway	...
• a vehicle cleared to cross a runway	...

1.2.3   Distractions due to:

• performing other assigned duties, such as conducting operational telephone calls, weather observations and recording, issuing NOTAM and other operational information	...
• engaging in non-operational activities such as a personal telephone call, extraneous conversation, reading material and radios	...

1.2.4	Used a language not in accordance with ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language)	...
1.2.5	Other (please specify).	...

_____

_____

_____

_____

_____

1.2.6   Misidentified the aircraft or the aircraft's position due to:

      • incorrect position report   ···

      • an incorrect expectation (e.g. expected the aircraft to be clear of the runway) ···

1.2.7   Lack of visual scanning of ground movements   ···

1.2.8   Limitations on the view of the manoeuvring area from the ATC tower   ···

1.2.9   Recent runway configuration change   ···

1.2.10   Unusual runway configuration   ···

1.2.11   Error occurred within 15 minutes of assuming the control position   ···

1.2.12   Controller was conducting on-the-job training   ···

1.2.13   Fatigue   ···

1.2.14   Other (please specify).   ···

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1.3   *Staffing*

1.3.1   ATC positions were combined on the same frequency   ···

1.3.2   Absence of a supervisor in the tower   ···

1.3.3   Supervisor was working a control position.   ···

1.4   *Decision making*

1.4.1   Misjudged separation or anticipated separation   ···

1.4.2   Inadequate ATC to ATC coordination   ···

1.4.3   Other (please specify).   ···

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1.5   *Procedures*

1.5.1   Misapplication of conditional clearances   ···

1.5.2   Use of multiple line-up clearances   ···

1.5.3   Other (please specify). If not an ICAO procedure, please briefly describe the procedure used and where.   ···

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1.6 *Aerodrome works*

1.6.1 ATC not advised of works on the manoeuvring area ...

1.6.2 Other (please specify). ...

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2. FLIGHT CREW

2.1 *Communications*

2.1.1 Transmission was completely blocked ...

2.1.2 Transmission was partially blocked ("stepped-on") ...

2.1.3 Accepted a similar aircraft's clearance:

· with similar call signs ...

· without similar call signs ...

2.1.4 Deviation from established ICAO standard phraseologies ...

2.1.5 Used other than ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language) in a situation not covered by ICAO standard phraseology ...

2.1.6 Used language not in accordance with ICAO language requirements for air-ground radiotelephony

communications (language normally used by the station on the ground or the English language) ...

2.1.7 Speech quality:

· not proficient in ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language) ...

· poorly enunciated or heavily accented ...

· spoken rapidly ...

· spoken with an inconsistent volume ...

2.1.8 Did not use headsets ...

2.1.9 Received clearance or instructions during periods of high cockpit workload ...

2.1.10 Did not advise ATC of a delay on the runway prior to take-off ...

2.1.11 Other (please specify). ...

2.2	*Situational awareness*	
2.2.1	Crew conducting checklists while taxiing	...
2.2.2	Crew member programming flight management system or other flight deck system while taxiing	...
2.2.3	Crew member was on another radio frequency	...
2.2.4	Competing radio communications	...
2.2.5	Unfamiliar with the aerodrome layout	...
2.2.6	Crew mistook their position on the aerodrome (thought they were in a different location)	...
2.2.7	Fatigue	...
2.2.8	Reported incorrect location to ATC	...
2.2.9	Taxied fast	...
2.2.10	Did not refer to the aerodrome diagram	...
2.2.11	Did not listen to the automatic terminal information service (ATIS)	...
2.2.12	Works on the manoeuvring area were not previously advised by NOTAM	...
2.2.13	Used out-of-date or inaccurate publications or charts	...
2.2.14	Failed to apply or correctly observe sterile cockpit procedures	...
2.2.15	Other (please specify).	...

2.3	*Markings, signs and lighting*	
2.3.1	Not ICAO-compliant	...
2.3.2	Not provided	...
2.3.3	Irregularly spaced	...
2.3.4	Ambiguous and difficult to follow	...
2.3.5	Poorly sized	...
2.3.6	Poorly situated	...
2.3.7	Poorly maintained	...
2.3.8	Other (please specify).	...

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2.4	*Clearances and instructions*	
2.4.1	Misunderstood clearance:	
	• conditional	...
	• follow	...
	• other	...
2.4.2	Flight crew did not ask for clarification when they did not understand a clearance or instruction	...
2.4.3	Did not inform ATC when could not comply with a clearance	...
2.4.4	Forgot part of the clearance or instruction	...
2.4.5	Entered the runway after being instructed to "hold short"	...
2.4.6	Lined up on the runway after instruction to taxi to the runway-holding position (point)	...
2.4.7	Took off without a clearance after being instructed to "line up and wait"	...
2.4.8	Took off without a clearance after being instructed to taxi to the runway-holding position (point)	...
2.4.9	Landed or departed on the wrong runway	...
2.4.10	Landed or departed on the taxiway	...
2.4.11	Other (please specify).	...

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3. VEHICLE DRIVERS AND PEDESTRIANS

3.1	*Communications*	
3.1.1	Did not operate on the appropriate:	
	• ground frequency for operations outside the runway strip	...
	• tower frequency for operations within the runway strip	...
3.1.2	Turned the radio volume down or off after initial communication with ATC	...
3.1.3	Other (please specify).	...

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3.2	*Situational awareness*	
3.2.1	Forgot the details/limits of any clearance to operate on the manoeuvring area	...
3.2.2	Distracted by:	
	• current work	...
	• high noise levels	...

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	• monitoring more than one frequency and possibly a mobile telephone	…
	• being disoriented or lost on the aerodrome	…
3.2.3	Failure to report correct location	…
3.2.4	Other (please specify).	…

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3.3   *Markings, signs and lighting*

3.3.1	Not ICAO-compliant	…
3.3.2	Not provided	…
3.3.3	Irregularly spaced	…
3.3.4	Ambiguous and difficult to follow	…
3.3.5	Poorly sized	…
3.3.6	Poorly situated	…
3.3.7	Poorly maintained	…
3.3.8	Other (please specify).	…

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3.4   *Procedures*

3.4.1	Not adequately familiar with the aerodrome and its procedural requirements	…
3.4.2	Did not refer to the current aerodrome NOTAM	…
3.4.3	Did not refer to the current aerodrome diagram	…
3.4.4	Used out-of-date or inaccurate publications or charts	…
3.4.5	Did not advise ATC of work that affected operations	…
3.4.6	Ground vehicles did not stop at required positions	…
3.4.7	Other (please specify).	…

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3.5	*Clearances and instructions*	
3.5.1	Did not comply with ATC clearances and instructions	...
3.5.2	Mistook a clearance intended for another vehicle or aircraft	...
3.5.3	The driver did not advise ATC that he/she did not understand the clearance or instruction	...
3.5.4	Other (please specify).	...

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E.   Person submitting the form

Name   _____

Title   _____

Date   _____

8.4.6   INSTRUCTIONS FOR COMPLETING THE RUNWAY INCURSION CAUSAL FACTORS IDENTIFICATION FORM

Item

A   Indicate the date/time (in UTC) and place of the runway incursion.

B   Identify the aircraft, vehicles and persons involved in the runway incursion.

C   Classify the severity of the runway incursion according to Chapter 6 of the *Manual on the Prevention of Runway Incursions* (Doc 9870).

D   Fill out all causal and coincident factors applicable to the runway

incursion. E   Provide details of the person submitting the form and the date.

Note.— When instructed by ICAO, the information on this form should be sent to ICAO to facilitate global identification of runway incursion casual factors.

PART 9   HANDBOOK FOR THE LOCAL RUNWAY SAFETY TEAM

9.1   The Director General approved, through a directive (memorandum) to all Airport Managers and all ATS Facility Heads, the *Guide for the Development of Local Runway Safety Team Handbook,* as adopted from the ICAO *LRST Handbook*. The *Guide for the Development of Local Runway Safety Team Handbook (ICAO LRST Handbook)* is designed to assist Local Runway Safety Teams in developing their own handbook suited to their condition and situation. The purpose of an LRST Handbook is not only to describe the components of an effective Local Runway Safety Team (LRST) but to serve as a single reference while conducting LRST activities and to establish a network for sharing safety information among LRSTs within the Philippines through the CAAP data gathering and sharing network (to be established through the SSP) and, when appropriate, with RSTs of other Contracting States via the ICAO Runway Safety Team Portal (https://portal.icao.int).

9.2   Scope of the Handbook

A successful Local Runway Safety Programme and LRST require all key stakeholders to cooperate in a collaborative manner. The LRST Handbook, therefore, is intended to serve as a reference for aerodrome operators, air traffic services organizations, commercial air operators, organizations representing the general aviation community, meteorological services and other stakeholders interested in developing their Local Runway Safety Programme and in improving runway safety.