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GCAA
ADVISORY CIRCULAR

AERODROME & GROUND AID
AC NO: GCAA AC/AGA/003

SUBJECT: AERONAUTICAL STUDIES AND RISK ASSESSMENT

DATE INITIATED: JULY 15, 2016
INITIATED BY: DIRECTOR AVIATION SAFETY REGULATION

1. PURPOSE

The purpose of this Advisory Circular (AC) is to provide guidance to aerodromes operator on the procedures acceptable to the Authority for the conduct of Aeronautical Study and Risk Assessment.

2. GENERAL INFORMATION/CANCELLATION

a. This Advisory Circular GCAA AC/AGA/003 is an initial issue and the effective date is January 1, 2017.

b. Aerodrome operators who are unable to meet the requirements of this AC are required to identify an alternative means of compliance acceptable to the Authority. The alternative means shall include procedures for achieving an equivalent level of safety. Although this AC relates to aerodrome operators, the principles contained in it may be applied more widely in circumstances where requirements cannot be met and an alternative means of compliance is proposed.

c. This AC applies to all aerodrome operators in Guyana.

3. RELATED REFERENCES

a. Manual on Certification of Aerodromes – ICAO Doc 9774

b. Safety Management Manual - ICAO Doc 9859

4. CONTACT INFORMATION

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5. RESPONSIBILITY OF AERODROME OPERATOR TO CONDUCT AERONAUTICAL STUDY

It is the responsibility of the aerodrome operators to carry out aeronautical studies when necessary. Operators who are unable to meet the established requirements of the Authority may propose an alternative means of compliance or a deviation from the requirement. The alternative means of compliance or a deviation shall be acceptable to the Authority.

6. PARTICIPANTS OF AN AERONAUTICAL STUDY

Aeronautical study requires both aerodrome and flight operational expertise. In some cases, Air Traffic Services (ATS) and/or Procedures for Air Navigation Services – Aircraft Operations (PANS – OPS) expertise may be included. Finally, depending on the complexity of the issue, specialists on risk analysis may be used to assess the degree of risk resulting from the aeronautical study and proposed deviances.

7. MATTERS THAT CAN BE CONSIDERED FOR AERONAUTICAL STUDY

a. An aeronautical study shall be carried out to determine the effect of the intended/proposed alternative means of compliance or deviation from the GCAA's requirements regarding the safe and efficient use of airspace by aircraft, and on the safety of persons and property on the ground.

b. The aeronautical study shall consist of, but not limited to, the following:

   i) the impact on existing or anticipated traffic circuits of neighbouring aerodromes or heliports;

   ii) the impact on existing and projected airspace use;

   iii) the impact on safety of persons and property within the affected area;

   iv) impact of existing or proposed man-made objects;

   v) natural objects and features within the affected area;

   vi) the adjustment of other aviation requirements that may be needed to accommodate the proposal;

   vii) wildlife hazard management and the impact associated with wildlife;

   viii) bird attractants; and

   ix) possible revisions of the proposal that may be necessary to eliminate a hazardous or inefficient use of airspace.

8. MATTERS THAT CANNOT BE CONSIDERED FOR AERONAUTICAL STUDY

a. It is not the role of the Guyana Civil Aviation Authority to deal with matters relating to noise or other environmental issues, the effect on lifestyle or property values, or the effect on other services in the area such as roads, railways etc.

b. The aerodrome operator may consider any factor that will have an adverse effect on safety and management of risk. However, it is necessary that an aeronautical study be focused solely on matters that affect the safety and efficiency of airspace use and the safety of persons and property on the ground.

9. ITEMS TO BE CONSIDERED IN AERONAUTICAL STUDIES FOR NEW OBJECTS AT EXISTING AERODROMES

9.1 Consideration of Non-Normal Operations

The PANS-OPS obstacle clearance surfaces (OCS) cater for normal operations. The margin between these and the Annex 14 obstacle limitation surfaces (OLS) is the only airspace available to contain manoeuvres associated with non-normal operations. These include such events as uncontained engine failures after takeoff, manoeuvring in marginal visibility, operator's contingency procedures, emergencies, flight management system faults, and human errors. While rare or extremely rare, such events do occur, and their probability has to be balanced against the consequences when they relate to a dispensation granted by an aeronautical study.

9.2 Risk Calculations for OLS Penetrations

A number of statistical studies have been made on runway end safety areas and on the risk to individuals in airport planning. However, any calculation of risk to aircraft as a function of degree or number of OLS penetrations is fraught with problems and is probably intractable. Firstly, non-normal operations need not be confined to the orientation of the runway(s). Secondly, there is at present no objective method of determining a maximum or acceptable obstacle penetration and density. Finally, when preparing low-probability risk assessment, it is a mistake to consider the perceived likelihood of occurrence, rather than the severity of the consequences.

9.3 Consequences of an Accident Involving an Aeronautical Study

Accidents involving loss of lives near aerodromes can result in public enquiries or the equivalent legal processes. These enquires are normally conducted by a judge or magistrate, and being a legal process are more far reaching than the normal investigation carried out by the State accident investigation body. Such enquiries can and have resulted in significant financial, legal and operational consequences to the aerodrome operator. Where the accident involves a dispensation from Regulations or best practices, the logic associated with that departure becomes a critical issue. Thus, the remote probability associated with such events has to be balanced against the more serious consequences.

9.4 New Objects at Aerodromes

Regarding the penetration of obstacle limitation surfaces, no new objects or extensions of existing objects are acceptable for established aerodromes. The temporary use of cranes in construction projects and equipment necessary for navigation or operational purposes shall be considered as possible concessions and not as new or existing (permanent) obstacles.

9.5 Establishment of a Precedent

One of the most important objections to allowing dispensation via an aeronautical study is that it establishes a precedent. Once a dispensation has been granted, it becomes very difficult to resist the next request for a similar dispensation. This applies not only at that particular aerodrome, but at other aerodromes and at aerodromes in other States. It also becomes a lever for commercial and political pressures.

9.6 Effect on Navigational Aids and Radar

Sometimes forgotten is the effect of new obstacles on VOR and radar facilities. Annex 10 Part I Attachment C contains guidance for VOR, but radars are equipment specific. If a check of the clearance angle reveal problems, the next step is a proper evaluation by an expert, so this eventuality should be included in the aeronautical study budget.

9.7 Mitigating Circumstances

a. It is for the organisation requesting a dispensation via an aeronautical study to propose any associated mitigating circumstances, rather than for the Guyana Civil Aviation Authority to justify the need for protecting the surfaces. However, the applicant must always be given the opportunity to state any considerations he may have and those considerations must be covered in the report.

b. After identifying the safety aspects of an aeronautical study relating to OLS dispensations, there is need to be aware of the ploys that are used in an attempt to justify such dispensations. Those contractors and organisations seeking dispensations frequently may claim "mitigating circumstances".

10. STEPS OF AN AERONAUTICAL STUDY

An aeronautical study implies a systematic and documented approach to a problem. Thus, it consists of certain steps, notably:

i) a description of problems and objectives;
ii) selection of procedures, methods and data sources;
iii) identification of undesired events;
iv) an analysis of causal factors, severity and likelihood;
v) a description of risk;
vi) identification of possible mitigating measures;
vii) an estimation of the effectiveness of mitigating measures;
viii) choice of mitigating measures; and
ix) presentation of results.

11. A DESCRIPTION OF NON-COMPLIANCE

The first step of any risk analysis is to define the problem and the objective of the exercise. The problem will be to identify the safety implications of not complying (in full) with a certain requirement or requirements. The objective will be to identify suitable mitigating measures, which will mitigate these safety implications. Thus, it is important to understand which hazards and scenarios, the requirement(s) in question are designed to protect against.

12. PROCEDURES, METHODS AND DATA SOURCES

It should be determined whether the study shall follow a quantitative or qualitative approach. The determination will be dependent on the data-sources available. A qualitative approach based on common sense and qualified expert opinion will probably, in many cases, yield results that are far better than nothing, and better than a quantitative approach based on a limited set of unrepresentative or unreliable data. Even if it is possible to carry out a quantitative approach, qualified expert opinion is necessary, particularly in the conduct of hazard identification and risk analysis.

13. IDENTIFICATION OF HAZARDS

a. Hazards are any situation or condition that has the potential to cause damage or harm. The basic question one must ask is: ***What can go wrong and where?***

b. Examples of "***what***" include, but are not limited to:

   i) Aircraft colliding with terrain, aircraft, vehicles or objects.

   ii) Aircraft landing in front of the threshold, running off the far end of the runway or veering off the side of the runway.

   iii) Aircraft colliding with, or ingesting wildlife or foreign objects

c. Examples of "***where***" include, but are not limited to:

   i) During flight (approach, landing, balked landing, take-off, climb-out).

   ii) On the ground (Runway, taxiway, apron, strips, RESAs, or outside these areas).

d. The key is to identify hazards that the requirement in question is designed to protect against.

14. SAFETY RISK MANAGEMENT

a. Safety risk management is a generic term that encompasses the assessment and mitigation of the safety risks of the consequences of hazards that threaten the capabilities of an organisation, to a level as low as reasonably practicable (ALARP). The objective of safety risk management is to provide the foundation for a balanced allocation of resources to ensure that all identified risks that are associated with specified hazards are consistently managed to ensure that the safety of all operations is not compromised.

b. Figure 1 below depicts a broadly adopted generic visual representation of the safety risk management process. The triangle is presented in an inverted position, suggesting that aviation (just like any other socio-technical production system**)** is "top heavy" from a safety risk perspective: most safety risks of the consequences of hazards will be assessed as initially falling in the intolerable region. A lesser number of safety risks of the consequences of hazards will be assessed in such a way that the assessment falls straight in the tolerable region, and an even lower number will be assessed in such a way that the assessment falls straight in the acceptable region.

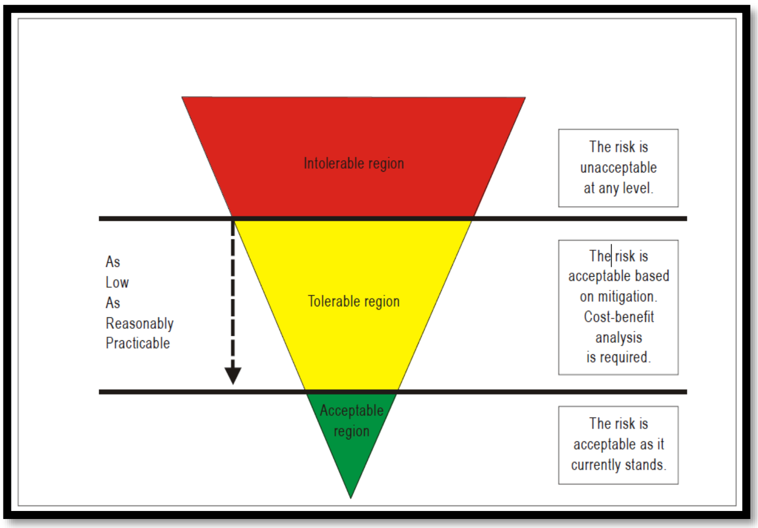

FIGURE: 1 SAFETY RISK MANAGEMENT

15. CAUSAL FACTORS, PROBABILITY, SEVERITY AND TOLERABILITY

15.1 Analysis of Causal Factors

a. When analysing casual factors regarding safety risk management, he basic questions to be asked are:

   i. Why can it go wrong?

   ii. What is the consequence if it does go wrong?

   iii. How likely is it that it will go wrong?

b. Examples of "***Why can it go wrong?***" include, but are not limited to:

   i) Lack of guidance (non-visual aids, lights, markings, signs, charts).

   ii) Confusing guidance (non-visual aids, lights, markings, signs, and charts).

   iii) Inaccurate obstacle surveys and obstacle publications.

   iv) Inaccurate aeronautical data.

   v) Insufficient protected areas (strips and RESAs).

   vi) Insufficient separation distances.

   vii) Insufficient surface widths.

   viii) Insufficient maintenance programmes.

   ix) In some cases, these factors can contribute to an accident. In other cases, they can increase the consequences of an incident so that it becomes an accident.

c. "***What are the (potential) consequences if it goes wrong?***". The severity of the occurrence is better described by using the table in figure 3.

d. "***How likely is it that it goes wrong?"*** This is a probability issue. How often is it likely to go wrong within a certain number of movements?

15.2 Safety Risk Probability

a. The process of bringing the safety risks consequences of hazards under organisational control starts by assessing the probability that the consequences of hazards materialize during operations aimed at delivery of services. This is known as assessing the safety risk probability.

b. Safety risk probability is defined as the likelihood that an unsafe event or condition might occur. The definition of the likelihood of a probability can be aided by questions such as:

c. Is there a history of similar occurrences to the one under consideration, or is this an isolated occurrence?

d. What other equipment or components of the same type might have similar defects?

e. How many personnel are following, or are subject to, the procedures in question?

f. What percentage of the time is the suspect equipment or the questionable procedure in use?

g. To what extent are there organisational, management or regulatory implications that might reflect larger threats to public safety?

h. Any or all of the factors underlying these example questions may be valid, underlining the importance of considering multi-causality. In assessing the likelihood of the probability that an unsafe event or condition might occur, all potentially valid perspectives must be evaluated.

i. In assessing the likelihood of the probability that an unsafe event or condition might occur, reference to historical data contained in previous investigation findings, etc., is paramount in order to make informed decisions. In the absence of these, the investigator can only make probability assessments based, at best, on industry trends and, at worst, on opinion.

j. Based on the considerations emerging from the replies to questions such as those listed above, the probability that an unsafe event or condition might occur can be established and its significance assessed using a safety risk probability table.

k. Figure 2 below presents a typical safety risk probability table, in this case, a five-point table. The table includes five categories to denote the probability of occurrence of an unsafe event or condition, the meaning of each category, and an assignment of a value to each category. It must be stressed that this example is not binding.

LEVEL OF PROBABILITY	MEANING	VALUE
FREQUENT	Likely to occur many times (has occurred frequently)	5
OCCASIONAL	Likely to occur sometimes (has occurred infrequently)	4
REMOTE	Unlikely to occur, but possible (has occurred rarely)	3
IMPROBABLE	Very unlikely to occur many times (not known to have occurred)	2
EXTREMELE IMPROBABLE	Almost inconceivable that the event will occur	1

FIGURE: 2 SAFETY RISK PROBABILITY

15.3 Safety Risk Severity

a. Risks are the potential adverse consequences of a hazard, and are assessed in terms of their severity and probability.

b. Once the safety risk of an unsafe event or condition has been assessed in terms of probability, the second step in the process of bringing the safety risks of the consequences of hazards under organisational control, is the assessment of the severity of the consequences of the hazard if its damaging potential materialises during operations aimed at delivery of services. This is known as assessing the safety risk severity.

c. Safety risk severity is defined as the possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation. The assessment of the severity of the consequences of the hazard if its damaging potential materialises during operations aimed at delivery of services can be assisted by questions such as:

   i. How many lives may be lost (employees, passengers, bystanders and the general public)?

   ii. What is the likely extent of property or financial damage (direct property loss to the operator, damage to aviation infrastructure, third-party collateral damage, financial and economic impact for the State)?

iii. What is the likelihood of environmental impact (spillage of fuel or other hazardous product, and physical disruption of the natural habitat)?

iv. What are the likely political implications and/or media interest?

d. Based on the considerations emerging from the replies to questions such as those listed above, the severity of the possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation, can be assessed using a safety risk severity table.

e. Figure 3 below presents a typical safety risk severity table (risk assessment matrix) which is also a five-point table. It includes five categories to denote the level of severity of the occurrence of an unsafe event or condition, the meaning of each category, and the assignment of a value to each category. As with the safety risk probability table, this table is not binding.

SEVERITY OF OCCURRENCE	MEANING	VALUE
Catastrophic	- Equipment destroyed - Multiple deaths	**A**
Hazardous	- A large reduction in safety margin, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely - Serious injury - Major equipment damage	**B**
Major	- A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating condition as a result of increase in workload, or as a result of conditions impairing their efficiency - Serious incident - Injury to persons	**C**
Minor	- Nuisance - Operating limitation - Use of emergency procedures - Minor incident	**D**
Negligible	- Little consequences	**E**

FIGURE: 3 SAFETY RISK SEVERITY

15.4 Safety Risk Tolerability

a. Once the safety risk of the consequences of an unsafe event or condition has been assessed in terms of probability and severity, the third step in the process of bringing the safety risk under organisational control is the assessment of the tolerability of the consequences of the hazard if its damaging potential materialises during operations aimed at delivery of services. This is known as assessing safety risk tolerability. This is a two-step process.

b. First, it is necessary to obtain an overall assessment of the safety risk. This is achieved by combining the safety risk probability and safety risk severity tables into a safety risk assessment matrix, an example of which is presented in Figure 4. For example, a safety risk probability has been assessed as occasional (4). The safety risk severity has been assessed as hazardous (B). The composite of probability and severity (4B) is the safety risk of the consequences of the hazard under consideration. It can be seen, through this example, that a safety risk is just a number or alphanumerical combination and not a visible or tangible component of the natural world. The colour coding in the matrix in Figure 4 reflects the tolerability regions in the inverted triangle in Figure 1.

c. Second, the safety risk index obtained from the safety risk assessment matrix must then be exported to a safety risk tolerability matrix that describes the tolerability criteria. The criterion for a safety risk assessed as 4B is, according to the tolerability table in Figure 5, "Unacceptable under the existing circumstances." In this case, the safety risk falls in the intolerable region of the inverted triangle. If the safety risk of the consequences of the hazard is unacceptable, the inspector may:

   i. orchestrate the allocation of resources to reduce the exposure to the consequences of the hazards;

   ii. allocate resources to reduce the magnitude or the damaging potential of the consequences of the hazards; or

   iii. cancel the operation if mitigation is not possible.

d. For each hazard resulting from the non-compliance, one can now describe the risk by placing the combination of severity and probability in the Risk Assessment Matrix shown below. If the risk comes out as medium or above, risk reduction measures must be identified.

RISK ASSESSMENT MATRIX					
RISK PROBABILITY	RISK SEVERITY				
	CATASTROPHIC A	HAZARDOUS B	MAJOR C	MINOR D	NEGLIGIBLE E
FREQUENT	5A	5B	5C	5D	5E
OCCASIONAL	4A	4B	4C	4D	4E
REMOTE	3A	3B	3C	3D	3E
IMPROBABLE	2A	2B	2C	2D	2E
EXTREMELY IMPROBABLE	1A	1B	1C	1D	1E

FIGURE: 4 SAFETY RISK ASSESSMENT MATRIX

SUGGESTED CRITERIA	ASSESSMENT RISK INDEX	SUGGESTED CRITERIA
INTOLERABLE REGION	5A, 5B, 5C 4A, 4B 3A	UNACCEPTABLE UNDER THE EXISTING CIRCUMSTANCES
TOLERABLE REGION	5D, 5E 4C, 4D, 4E 3B, 3C, 3D 2A, 2B, 2C	ACCEPTABLE BASED ON RISK MITIGATION. IT MAY REQUIRE MANAGEMENT DECISION.
ACCEPTABLE REGION	3E, 2D, 2E 1A, 1B, 1C, 1D, 1E	ACCEPTABLE

FIGURE: 5 SAFETY RISK TOLERABILITY MATRIX

16. SAFETY RISK CONTROL/MITIGATION

a. In the fourth and final step of the process of bringing the safety risks of the consequences of an unsafe event or condition under organizational control, control/mitigation strategies must be deployed. Generally speaking, control and mitigation are terms that can be used interchangeably. Both are meant to designate measures to address the hazard and bring under organizational control the safety risk probability and severity of the consequences of the hazard.

b. Continuing with the previous example, the safety risk of the consequences of the hazard under analysis has been assessed as 4B ("Unacceptable under the existing circumstances."). Resources must then be allocated to slide it down the triangle, into the tolerable region, where safety risks are ALARP. If this cannot be achieved, then the operation aimed at the delivery of services which exposes the organization to the consequences of the hazards in question must be cancelled. Figure 5 presents the process of safety risk management in graphic format.

c. There are three generic strategies for safety risk control/mitigation:

   i. ***Avoidance.*** The operation or activity is cancelled because safety risks exceed the benefits of continuing the operation or activity. Example of an avoidance strategy is operations into an aerodrome surrounded by complex geography and without the necessary aids are cancelled.

   ii. ***Reduction.*** The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the accepted risks. Example of reduction strategy is operations into an aerodrome surrounded by complex geography and without the necessary aids are limited to daytime, visual conditions.

   iii. ***Segregation of exposure.*** Action is taken to isolate the effects of the consequences of the hazard or build in redundancy to protect against them. Example of strategy based on segregation of exposure is operations into an aerodrome surrounded by complex geography and without the necessary aids are limited to aircraft with specific performance navigation capabilities.

d. In evaluating specific alternatives for safety risk mitigation, it must be kept in mind that not all have the same potential for reducing safety risks. The effectiveness of each specific alternative needs to be evaluated before a decision can be taken. It is important that the full range of possible control measures be considered and that trade-offs between measures be considered to find an optimal solution. Each proposed safety risk mitigation option should be examined from such perspectives as:

   i. ***Effectiveness.*** Will it reduce or eliminate the safety risks of the consequences of the unsafe event or condition? To what extent do alternatives mitigate such safety risks? Effectiveness can be viewed as being somewhere along a continuum, as follows:

      - ***Control mitigations.*** This mitigation accepts the safety risk of the consequences of the unsafe event or condition but adjusts the system to mitigate such safety risk by reducing it to a manageable level, for example, by imposing more restrictive operating conditions. Both engineering and control mitigations are considered to be "hard." mitigations, since they do not rely on flawless human performance.

- ***Personnel mitigations.*** This mitigation accepts that engineering and/or control mitigations are neither efficient nor effective, so personnel must be taught how to cope with the safety risk of the consequences of the hazard, for example, by adding warnings, revised checklists, MANOPs provisions and/or extra training. Personnel mitigations are considered to be "Soft actions." since they rely on flawless human performance.

ii. ***Cost/benefit.*** Do the perceived benefits of the mitigation outweigh the costs? Will the potential gains be proportional to the impact of the change required?

iii. ***Practicality.*** Is the mitigation practical and appropriate in terms of available technology, financial feasibility, administrative feasibility, governing legislation and regulations, political will, etc.?

iv. ***Challenge.*** Can the mitigation withstand critical scrutiny from all stakeholders (employees, managers, stockholders/State administrations, etc.)?

v. ***Acceptability to each stakeholder.*** How much buy-in (or resistance) from stakeholders can be expected? (Discussions with stakeholders during the safety risk assessment phase may indicate their preferred risk mitigation option.)

vi. ***Enforceability.*** If new rules (SOPs, regulations, etc.) are implemented, are they enforceable?

vii. ***Durability.*** Will the mitigation withstand the test of time? Will it be of temporary benefit or will it have long-term utility?

viii. ***Residual safety risks***. After the mitigation has been implemented, what will be the residual safety risks relative to the original hazard? What is the ability to mitigate any residual safety risks?

ix. ***New problems.*** What new problems or new (perhaps worse) safety risks will be introduced by the proposed mitigation?

e. The most effective mitigations are hard mitigations. Because hard mitigations are often expensive, soft mitigations (such as training) are usually the most popular methods used due to their cost effectiveness.

f. To summarise, safety risk control/mitigation strategies are mostly based on the deployment of additional safety defences or the reinforcement of existing ones. Defences in the aviation system can be grouped under three general categories:

i. Technology;

ii. Training; and

iii. Regulations.

g. As part of safety risk control/mitigation, it is important to determine why new defences are necessary or why existing ones must be reinforced. The following questions may pertain to such determination:

i. Do defences to protect against the safety risks of the consequences of the hazards exist?

ii. Do defences function as intended?

iii. Are the defences practical for use under actual working conditions?

iv. Is the operational staff involved aware of the safety risks of the consequences of the hazards, and the defences in place?

v. Are additional safety risk mitigation/control measures required?

h. Figure 6 presents the full safety risk/mitigation process in graphic format. Hazards are potential safety vulnerabilities inherent to the aviation system. Such vulnerabilities manifest as an array of consequences. In order to manage safety, it is necessary to assess the safety risks of the consequences of hazards, by assigning each safety risk an index. Each hazard can generate one or many consequences, and each consequence can be assessed one or many safety risks. The first step in the safety risk mitigation/control process is, therefore, hazard/consequence identification and safety risk assessment.

i. Once hazards and consequences have been identified and safety risks assessed, the effectiveness and efficiency of existing aviation system defences (technology, training and regulations) relative to the hazards and consequences in question must be evaluated. As a consequence of this evaluation, existing defences will be reinforced, new ones introduced, or both. The second step in the safety risk mitigation/control process is, therefore, evaluation of the effectiveness of the existing defences within the aviation system.

j. Based on the reinforcement of existing defences and/or the introduction of new ones, initial safety risks are reassessed to determine whether they are now ALARP. The third step in the safety risk mitigation/control process is, therefore, control and/or mitigation action.

k. Following reassessment of safety risks, the effectiveness and efficiency of the mitigation/control strategies must be confirmed. The fourth step in the safety risk mitigation/control process is accepting the mitigation of the safety risk. The following questions pertain:

   i. Does the mitigation address the safety risks?

   ii. Is the mitigation effective?

   iii. Is the mitigation appropriate?

   iv. Is additional or different mitigation warranted?

   v. Do the mitigation strategies generate additional risks?

l. Once the mitigation has been accepted, the strategies developed and deployed must, as part of the safety assurance process, be fed back into the organisation's defences, upon which the mitigation strategies are based, to ensure integrity, efficiency and effectiveness of the defences under the new operational conditions.

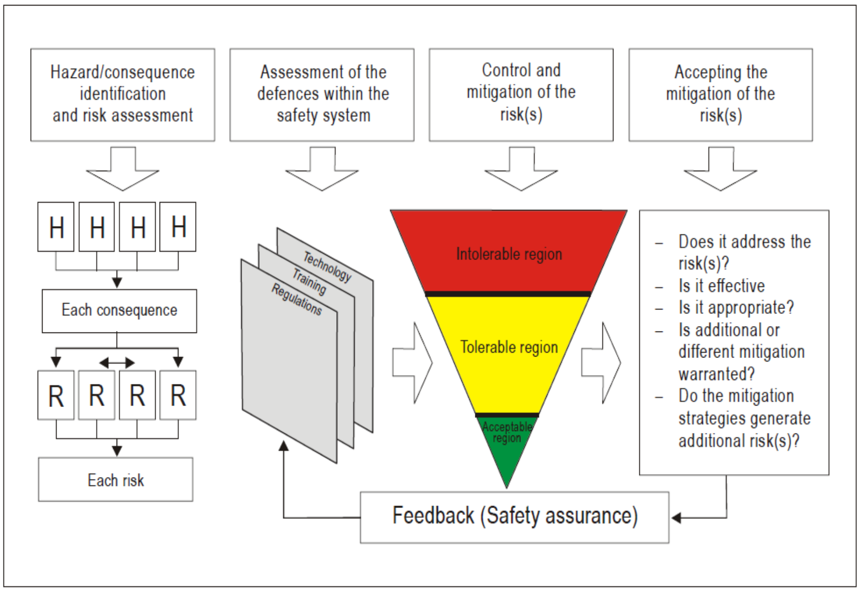

FIGURE 8-6 SAFETY RISK MITIGATION PROCESS

17. IDENTIFICATION OF POSSIBLE MITIGATING MEASURES

a. As can be seen from the risk classification matrix, risk reduction measures can aim towards either reducing the likelihood of an occurrence, or reducing the severity of an occurrence. Some measures could conceivably do both.

b. The first priority should always be to seek measures that will reduce the likelihood of an occurrence (i.e. accident prevention).

c. When contemplating mitigating measures, it is always necessary to look to the intent of the requirement that is not (fully) complied with. Examples of mitigating measures include, but are not limited to:

   i) Publication in the AIP as a minimum. (This is an ICAO Annex 15 Standard and is also necessary in order that the airlines can take their precautions, as they are obliged to do according to ICAO Annex 6).

   ii) Aerodrome operational procedures are in some cases relevant. One example is to restrict traffic on a parallel taxiway if runway/taxiway or taxiway/taxiway separation distance is insufficient.

   iii) Infrastructure and/or additional visual and/or non-visual aids.

   iv) Operational restrictions that might be necessary. These may include restrictions on all-weather operations, increased spacing between aircraft (in the air or on the ground).

   v) Restrictions on aircraft operators that might be necessary, such as: Operations restricted to operators/crew who can demonstrate special competence.

   vi) Requirements that aircraft carry special equipment or certifications.

   vii) Requirements that operators set special wind limits.

d. Mitigating measures usually means reduced usability for an aerodrome. Safety and usability is a balancing act.

18. ESTIMATING THE EFFECT OF MITIGATING MEASURES

The mitigating measures should be fed back into the consideration listed earlier in order to evaluate their relevance and effectiveness in reducing risk.

19. CHOICE OF MITIGATING MEASURES

If one or more measures enable the risk to be sufficiently reduced, one can recommend a choice, bearing in mind that the preferred option should be accident prevention, and prepare the final report. Thus the final description should recommend mitigating actions and list the consequences and their probabilities when these are taken into account

20. PRESENTATION OF RESULTS

a. The work shall be documented in such a way that it is possible to see what has been done. The steps referred to above should be identifiable.

b. Other key issues are as follows:

   i) What essential assumptions, presuppositions and simplifications have been made?

   ii) Any uncertainty about the results due to the choice of and availability of methods, procedures and data sources should be discussed.

   iii) The results of the study should emphasize which undesired event contributes the most to risk, and factors influencing these undesired events.

   iv) Recommendations for measures to mitigate risk, their character and their estimated effect shall be stated.

21. DETERMINATIONS

a. Following completion of the aeronautical study the Director General of Civil Aviation (DGCA) shall make a Determination.

b. Determinations will be one of the following:

   i) ***Unobjectionable*** when the DGCA is satisfied that the proposed action will not adversely affect the safe and efficient use of airspace by aircraft nor the safety of persons or property on the ground. Any determination of a variation from the notification or SARPs, the GCAA shall filea difference with ICAO.

   ii) ***Conditional*** when the study identifies objectionable aspects of a proposed action but specifies conditions which, if complied with, satisfy the DGCA that the proposed action will not adversely affect the safe and efficient use of airspace by aircraft, nor the safety of persons or property on the ground. Any determination of a variation from the notification or SARPs, the GCAA shall filea difference with ICAO.

   iii) ***Objectionable*** when the study identifies objectionable aspects of the proposed action. The Determination will specify the reasons for finding the proposed action objectionable.

c. The Determination will be issued to the proponent, appropriate local authorities, and those who made submissions.

d. Local Government Authorities administer the use of land under the provisions of the Land Act and it is likely that they will take due consideration of any Conditional or Objectionable Determination issued.

22. EFFECTIVE PERIOD OF THE DETERMINATION

Unobjectionable and Conditional Determinations shall contain a void date. The purpose of this is to allow for the orderly planning of aerodromes and to eliminate unnecessary protection of airspace. An extension to the void date may be granted if there are valid reasons for not completing the action by the void date.

23. REVISION OF THE DETERMINATION

a. An Unobjectionable or Conditional Determination can be revised if any new facts that change the basis on which the Determination was made are identified.

b. Interested persons may, at least 14 days in advance of the void date, petition the DGCA to revise a determination.

24. ACCEPTANCE BY THE REGULATOR

The right to accept or reject the results of the aeronautical study rests fully with the Authority.

25. EXEMPTION

The Authority, where satisfied with the results of the aeronautical study, equivalent level of safety and mitigating measures provided, may offer an exemption to the compliance within the provision of the applicable Regulations.

Approved By:

Guyana Civil Aviation Authority
Director General

Chaitrani Heeralall
Director General of Civil Aviation (ag.)
Guyana Civil Aviation Authority