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Aerodrome Advisory Circular

[AC/AD – 001]

**Procedure for evaluating the impact on the safety of
the existing operation for changes to aerodrome
physical characteristics, facilities or equipment**

First Edition

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FOREWORD

Bhutan Civil Aviation Authority is responsible to conduct certification/surveillance and continuous safety oversight of aerodromes under its jurisdiction to monitor the compliance in accordance with the Bhutan Air Navigation Regulations and Bhutan Aerodrome Standards.

The section 14.2.5.7.3 of Bhutan Air Navigation Regulations (BANRs) requires Aerodrome Operator to notify any changes in aerodrome facilities, equipment, and level of service planned in advance. An aerodrome operator shall notify AIS and the Regulatory Authority in writing at least 60 days before any change to an aerodrome facility or equipment or the level of service at the aerodrome that has been planned in advance and that is likely to affect the accuracy of the information contained in any AIS publication referred to in BANRs 14.2.5.7.2

This Guidance Material is to be used to evaluate the impact on safety of the existing operations whenever there is a proposal for change in physical characteristics, facilities or equipment at aerodrome.

The purpose of this document is to give guidance on the procedures to be used to notify the Regulatory Authority of changes at an aerodrome, covering both infrastructure and management system changes. Additionally, it includes guidance to help ensure that changes comply with licensing and certification criteria and are managed safely

Director General
Bhutan Civil Aviation Authority



Bhutan Civil Aviation Authority

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Abbreviations

AGL - Aeronautical Ground Lighting

BCAA – Bhutan Civil Aviation Authority

IDM - Initial Development Meeting

LVP - Low Visibility Procedures

RESA - Runway End Safety Area

SMS - Safety Management System

WIP - Work in Progress

ATC - Air Traffic Control

FOD - Foreign Object Debris

NOTAM - Notice to Airmen


MOWP - Method of Work Plan

LDA - Landing Distance Available

ASDA - Accelerate-Stop Distance Available

TODA - Take-Off Distance Available

TORA - Take-Off Run Available

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Chapter 1. General

1.0 Purpose

1.1 The purpose of this document is to provide guidance to aerodrome operator for evaluating the impact on the safety of the existing operation due to development activities at the aerodrome.

1.2 References

- 1.2.1 Bhutan Aerodrome Standards
- 1.2.2 ICAO DOC 9157...part...
- 1.2.3 ICAO Annex 14 – Volume 1 (Aerodrome Design & Operations)

1.3 Project Categories

Projects that involve changes to the aerodrome physical characteristics fall into 3 categories:

1.3.1 Development


Where new or upgraded infrastructure is to be provided: Examples include new or extensions to buildings, aerodrome infrastructure (such as taxiways and aprons), visual aids and navigation aids.

1.3.2 Changes

Where the existing aerodrome infrastructure or physical characteristics are being changed: for example reconfiguration of apron stands terminal building, changes to the runway or declared distances. Changes include projects that involve removing or amending existing aerodrome certificate/license variations.

1.3.3 Maintenance

Where existing aerodrome infrastructure is being repaired, refurbished or replaced: i.e. to ensure continuance but without changing the characteristics of the piece of infrastructure.

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Chapter 2. Aerodrome Certification/Licensing

2.1 Grant of an Aerodrome Certificate/Licence

2.1.1 The grant of an aerodrome certificate/licence is governed by the Aerodrome regulations. It is granted on the basis that it meets aerodrome certification/licensing criteria.

2.1.2 An aerodrome certificate/licence conditions requires that changes in the physical characteristics of the aerodrome, including the erection of new buildings and alterations to existing buildings, obstacles, hazards, obstructions, change in level of service, significant change in aerodrome facility, works on runway, stripes that could affect aviation safety at the aerodrome shall be notified to the unit responsible for aeronautical information services and BCAA and warrants precautions as required.

2.1.3 Project proposals should comply with the criteria contained in aerodromes regulations. Additionally, some proposals provide an opportunity to review existing variations to certification/licensing criteria, with the intention of removal, where possible. Where a variation cannot be removed, a supporting hazard analysis should be carried out, taking into account current and foreseeable operations, and the outcome of the analysis acted upon accordingly. However, there may be circumstances where the proposal does not comply with certification/licensing criteria, but would enhance safety. In such cases additional safety risk assessment need to be carried out and ensure that safety is compromised.

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Chapter 3. Coordination with BCAA, airlines, AIS, ATC, other relevant agencies

3.1 Coordination

3.1.1 Whenever possible, aerodrome operator should inform and conduct coordination meetings of the forthcoming projects. This will enable the aerodrome operator to identify the level of specialist resources required to meet their objectives, to plan and to manage the work involved. Typically, developments involving navigation aids, flight procedure changes, ATC facilities and other major developments within the aerodrome might require a lead-time of 6 months.

3.1.2 Projects that involve changes to the aerodrome’s infrastructure will require prior approval and consultations with regulatory authority.

3.1.3 Projects that involve the construction of new facilities, extensions or enhancements are classed as development, and will also require prior consultation regulatory authority.


3.1.4 The aerodrome operator should assess project proposal, identify whether the project is minor or major, using the criteria shown in Chapter 4 and consultation of regulatory authority should be sought. When necessary, the aerodrome operator should seek involvement of Aviation expertise.

3.1.5 For maintenance projects, see Chapter 7.

3.2 Meetings

3.2.1 An Initial Development Meeting (IDM) be conducted to brief all relevant agencies. Where possible, all aspects of the development should be covered at the IDM. IDM in the form of presentations often proves the most successful way to brief all participating agencies. Notes of the meeting should be produced as agreed by all parties.

3.2.2 Ideally, outline plans and drawings should be made available during the IDM to ensure that the IDM achieves the maximum benefit. Further development meetings can also be conducted during project progress period.

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Chapter 4. Aerodrome Development Project Requirement

- 4.1 Aerodrome developments as defined on paragraph 1.3 are classified major or minor should fulfill all the requirements of regulatory authority.
- 4.2 Aerodrome section of Aerodrome operator should evaluate each development proposal in detail and classify it as major or minor depending on the nature of project. The section should ensure that all development proposals are evaluated consistently with reasons for the decision reached. The operator will inform regulatory authority in writing of the outcome of the evaluation process and the rationale for the decision.
- 4.3 The criteria used to determine whether a development is deemed to be major or minor may include the following to determine, although this list is not exhaustive:
- The complexity of the development;
 - The number of site visits required;
 - The impact on aerodrome operations
 - Changes required to aerodrome operations resulting from the new facility;
 - Changes required to the Aerodrome Manual;
 - Whether the development would create a new certificate/licence variation that would require detailed evaluation;
- 4.4 Typically, the projects listed in Table 1 below are those that may qualify as a major development.



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Table - 1

<p align="center">Developments that might be classed as ‘major’</p>	
<p>This list is indicative only and projects may be excluded or included, depends upon the complexity of the proposal and regulatory oversight required</p>	
<p align="center">Project</p>	<p align="center">Description</p>
<p>New Runway/resurface</p>	<p><i>A development resulting in the construction of a ‘new’ runway or re-surfacing</i></p>
<p>Runway Extension</p>	<p><i>A runway extension resulting in an amendment to the distances or the provision of extra RESA.</i></p>
<p>Threshold Relocation</p>	<p><i>A development involving relocation of the of a non-instrument runway threshold</i></p>
<p>New Building/Structure</p>	<p><i>A proposal involving a new terminal or terminal extension, hangers, or any other structure that may affect aircraft operations.</i></p>
<p>Installation of Aids to Navigation</p>	<p><i>An installation of ILS or MLS, glide path or associated equipment, other navigation equipment.</i></p>
<p>Taxiway Development</p>	<p><i>A new taxiway or significant change to the existing taxiway system.</i></p>
<p>Apron Development</p>	<p><i>A new apron or apron development resulting in a substantial increase in area.</i></p>
<p>New or Replacement Visual Control Tower</p>	<p><i>Introduction of a new or replacement of Visual Control Tower</i></p>
<p>Any other development which materially affects the basis upon which the aerodrome certificate/license has been granted</p>	

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Chapter 5. Project Planning and Preparation

5.1 Projects require extensive planning, and the following areas will need to be considered. However, it is stressed that this list is neither mandatory nor exhaustive and it is recognised that these elements may not be available or fully developed at the planning stage:

- Aeronautical Ground Lighting;
- Aerodrome Manual changes;
- Air traffic procedures during and post-development;
- ATC line of sight requirements;
- Bird Hazard implications;
- Building Induced Turbulence;
- Changes to the existing aerodrome operating procedures;
- Changes to Magnetic Field Density as a result of development;
- Emergency Procedures;
- Environmental impact;
- Instrument Approach and Departure Procedures and Minima;
- Project Safety Management Procedures (outline);
- Proposed timescale;
- Revised Low Visibility Procedures
- Removal of certificate/license variations;
- Revised runway incursion prevention measures;
- Signage;
- Site access plan.


5.2 Whenever a project is proposed, it is essential to establish whether it will result in a change to the established operating procedures at the aerodrome. It is therefore imperative that the management of any change is fully integrated into the aerodrome's safety management system and that the aerodrome operator's safety documentation covers this aspect.

5.3 When considering a project it is important that, at an early stage, aerodrome operator undertake a hazard appraisal and risk assessment to identify the potential hazards and associated risks surrounding any proposed changes. The ICAO Safety Management

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Manual (Doc 9859) and other related BCAA requirements provide guidance on hazard and risk assessment.

- 5.4 The level of details required should be commensurate to the size and complexity of the project and the aerodrome, as well as to the safety hazard and change presented.

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Chapter 6. Project Proposals/Submission Process

6.1 Introduction

6.1.1 For development projects and changes, following 3-stage processes will apply to assist aerodromes and ensure that aerodrome operator meet their obligations under the certificate. This Section details the information required for each of the 3 stages and the process to be followed.

6.1.2 This process must be used for development projects and changes, but may also be used for significant maintenance projects should the aerodrome operator deem it necessary. Additionally, the process and/or elements of it can be used whatever the project type or size as determined within the aerodrome SMS. The documentation submitted may be proportionate to the size of the project. For smaller projects it is acceptable to submit Parts 1 and 2 together.

6.2 Submission Process


6.2.1 The three stage process consists of 3 separate parts as follows:

- a. Part 1: Compliance
- b. Part 2: Control
- c. Part 3: Completion

6.2.2 Compliance (Part 1)

i) Each development proposal should be accompanied by documentation that provides clear evidence that the proposal conforms to certification/licensing requirements detailed in aerodrome regulation and other applicable standards. It will enable the aerodrome section of the aerodrome operator to assess the proposal and should include:

- Project Overview.
- Notification Form.
- Compliance Matrix (to demonstrate that the project design meets certification/licensing requirements).
- Scaled Drawings.
- * An Example Notification Form is attached at Appendix 2 and Compliance Matrix at Appendix 3.

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ii) When Part 1 has been completed to the satisfaction of the aerodrome section, confirmation that the project is compliant with certification/licensing requirements will be given. However, if any changes are proposed to the design or build, the modified information shall be notified to the implementing division by the aerodrome section of the operator.

6.2.3 Control (Part 2)

- i) Following completion and acceptance of development proposal, the implementing division must demonstrate to the reviewing aerodrome section of the operator that the project will be managed safely. Accordingly, the aerodrome section will expect implementing division to develop safety assurance documentation that describes how the implementer will manage the construction works, and operating procedures to ensure that aerodrome operations can continue safely during the project. The implementing division should develop and implement a formal system for the strict control, safety management, safeguarding and safety coordination of all airside works. Safety Assurance Documentation can take many forms but should be proportionate to the size of the project.
- ii) The implementing division must ensure that systems for control and safe management extend to contractors working at the aerodrome.
- iii) All members of the project management team should have clearly defined responsibilities and accountabilities in the project programme. During construction on an aerodrome, safety levels and standards of conduct must be maintained. These are essential in promoting safety, preventing accidents and meeting the aerodrome obligations.
- iv) It is important that accurate, up to date information is made available to all stakeholders involved in the project, including the regulatory authority, both as part of the project planning and during the work in progress period. Therefore, the safety assurance and project management documentation may include any or all of the following information:
 - A clear statement of the supervision structure for the safety management and monitoring of works, including contact details of key duty personnel concerned, for both project and aerodrome management. This should include clear responsibilities, including the person with overall accountability for the development;



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- Aerodrome operating procedures during the development, including contingencies;
- Arrangements for liaison meetings/briefings between the aerodrome operator and the contractors;
- Appropriate plans and diagrams relating to the construction process;
- Control of contractors;
- Day and night start, control and completion of work procedures;
- Communications procedures between the aerodrome operator (e.g. ATC, Airfield Operations) and construction teams;
- Emergency procedures;
- Method of working;
- Plans of site and diagrams of works;
- Points of contact - aerodrome operator and contractor, including identification of manager with overall responsibility;
- Site access plan;
- Site safeguarding and marking;
- Weather minima that will affect the works;
- The general layout of the aerodrome including airside access points;
- The location and limits of works areas;
- The specific security access points to be used and the location and marking of the access routes to be used to reach airside sites;
- Methods of control and access for works sites within the Apron and Manoeuvring Area including arrangements for crossing taxiways and runways (if applicable);
- The methods and equipment to be used for protecting, marking and lighting the boundaries of works sites and for protecting normal aerodrome operations in the vicinity of the site. Also the requirement to control site lighting to prevent distraction of aircraft crews, drivers and ATC;
- The strict timing for the setting up of work sites, the start of work, daily permitted working hours at the site and procedures to be followed for starting and stopping work;




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- Aerodrome emergency procedures, including response times during periods of WIP, should not be compromised. This extends to ensuring compensatory arrangements are in place to cover depletions of fire main or fire hydrants when the fire main has been deactivated due to work in progress;
 - Vehicle and equipment requirements, operating rules and the requirements for staff discipline;
 - Calculating and communicating amended runway declared distances;
 - Maintaining appropriate pavement friction characteristics;
 - Procedures for the return of a runway to operational status;
 - Information on special safety requirements for aircraft operations in the vicinity of works and the methods of control available on the Manoeuvring Area, including radio telecommunication procedures if appropriate;
 - Arrangements for the special control of ‘hot works’;
 - Requirements for the operation of cranes and other tall structures;
 - Arrangements for the receipt and movement of heavy or bulky loads;
 - Requirements for vehicle and area cleanliness, also the implications of Foreign Object Debris (FOD) and loose material hazards for aircraft operations;
 - Arrangements for the disposal of waste;
 - Information on the safety implications for the site and staff of special aircraft hazards including blast, vibration, fumes and noise;
 - Information on the effects of strong winds at the aerodrome;
 - Site safety, including personnel protection.
- v) Aerodrome operator should ensure that all stakeholders are notified of aerodrome projects in a timely manner. These communications should continue through the project and may include Safety Instructions or NOTAMs.
- vi) Before contractors start work at any aerodrome/airside location, aerodrome operator should provide a comprehensive safety briefing including the results of ongoing hazard analyses, to ensure all information needed to achieve the safe completion of any works or activity is clearly understood and agreed. Additionally, aerodrome operator should hold regular progress meetings to ensure project safety and operational objectives continue to be met. There should be close monitoring of the safety of aerodrome/airside


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operations while the project work is in progress and, when reaching decisions, project priorities should be subordinate to the maintenance of safety standards.

- vii) When the aerodrome section of the aerodrome operator has been assured that the aerodrome can continue to operate safely during the project, approval will be given to commence work.


6.2.4 Completion (Part 3)

- i) Transition into service is a critical phase of the project and can present complex challenges. Careful planning and procedures need to be established to ensure that the change is introduced safely and efficiently. This may be demonstrated by undertaking a process of operational readiness, which may include simulations, testing, audits or sample inspections, involving appropriate key stakeholders.
- ii) On completion of the development, but prior to operational use, the aerodrome operator should confirm to the aerodrome section of the operator and also to the regulatory authority that the project meets the agreed design criteria and is fit for purpose. The regulatory authority along with the aerodrome section of the operator will undertake audits and certification of the facility as may be required before facility is brought into operation.
- iii) Safety performance monitoring should be a key process of an aerodrome's SMS, to ensure that the introduction of the new facility continues to maintain safety standards at the aerodrome.

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Chapter 7. Maintenance Projects

- 7.1 Maintenance projects can vary enormously in size. Much maintenance work involves short-term minor works, such as painting, periodic replacements, refinements to systems/infrastructure and small repairs to aerodrome infrastructure, which can be completed in short time scales and with limited disruption. Smaller planned or routine maintenance works need not be notified to the stakeholders and regulatory authority, although the Aerodrome section would expect to be kept informed of some of these activities.
- 7.2 However, maintenance may also involve large, longer-term projects (weeks/months), which may involve many key stakeholders, and which may have significant impacts on operations and so test the aerodrome's safety management system. Examples of major maintenance would include runway rehabilitation and. Major maintenance projects such as these should be notified directly to the regulatory authority and other relevant stakeholders, who will advise on the approval required and maintain regulatory oversight of the project.

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APPENDIX -1

NOTIFICATION OF CHANGES TO THE PHYSICAL CHARACTERISTICS

This form shall be completed, signed and submitted as instructed.

Dear Implementing division/agency,


An aerodrome operator's certificate/license condition states that any change in the physical characteristics of an aerodrome, including the erection of new buildings and alterations to existing buildings or to visual aids, shall not be made without notifying regulatory authority, aeronautical information service unit and air traffic control unit.

In order to consider your proposal fully, please complete below requirements and return to the undersigned section.

If you have difficulty completing the form, please do not hesitate to contact Aerodrome section.

Yours sincerely

Airport Manager/Aerodrome Inspector
Aerodrome section
Department of Air Transport

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NOTIFICATION OF CHANGES TO THE PHYSICAL CHARACTERISTICS Contd.

1. AERODROME DETAILS

Aerodrome Name:

Aerodrome Address:
.....
.....
.....

Accountable engineer /manager:

Name:.....

Tel:.....

Email:

Project Manager:

Name:.....

Tel:.....

Email:

2. PROJECT DETAILS

Title of Project:

Reason for Change:

Brief Description:
.....
.....
.....
.....

Planned Commencement Date:

Planned Duration of Work:

Estimated Completion Date:

Aerodrome closed during Work in Progress? YES / NO (*Delete as applicable*)

Hours of Work:

3. SUPPORTING DOCUMENTS ATTACHED

List of Enclosed Documents:

.....

.....

.....

4. IMPACT ON OBSTACLE LIMITATION SURFACES (OLS)

Grid Co-ordinates (Northings and Eastings) of Structure:

.....

Ground height at site location:

.....

Maximum height of Structure:

.....

Height of relevant OLS at Site Location:

.....

5. STRIP CLEARANCES

Structure(s) outside Runway & Taxiway Strip: YES / NO (Delete as applicable)

Structure(s) outside Runway Cleared & Graded Area: YES / NO (Delete as applicable)

If 'No', please provide details below:

.....

.....


.....

.....

6. FOR RUNWAY EXTENSIONS, DETAILS OF DECLARED DISTANCES

RW xx; TODA: TORA: LDA: ASDA:


RW xx; TODA: TORA: LDA: ASDA:

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7. RUNWAY STATUS

Existing: Non-Instrument/Instrument* (Delete as applicable)

Proposed: Instrument (Delete as applicable)

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APPENDIX -2

AERODROME COMPLIANCE MATRIX

Aerodrome Name :

Proposed Change :

Proposed Start Date :

Proposed Completion Date :

Description	Reference	Compliance Statement <i>(include reference documents where appropriate)</i>	Project Manager