GHANA
CIVIL AVIATION AUTHORITY

ADVISORY CIRCULAR
AC-24-002

REQUIREMENT FOR DEVELOPMENT OF ATS SAFETY CASES

SECTION 1 - GENERAL

1. PURPOSE

This Advisory Circular (AC) is issued to for Compliance by the ATS Provider for the development of safety cases.

2. STATUS OF THE ADVISORY CIRCULAR

This AC is an original issuance.

3. BACKGROUND

A. ICAO Annex 11 requires that any significant safety-related change to an air traffic service system, including the implementation of a new procedure shall only be effected after a safety risk assessment has demonstrated that an acceptable level of safety will be met. The reason behind this requirement is that such a significant safety-related change has the potential to introduce new safety risk to ATC operations.

B. International best practice to fulfill this requirement is through the conduct of a safety case. The successful completion of a safety case by the Air Traffic Services (ATS) Provider would provide the safety assurance to both the ATS Provider and Regulator and any other interested parties (in the event of an accident or incident) that an acceptable level of safety would be met

C. In relation with the above requirement, Section 24.2.9(7) of the Part 24 of GCADs requires the ATS Provider to develop a safety case whenever a new safety critical system is being introduced or commissioned.

D. In line with best practices, the requirement to develop a safety case is extended to other significant safety-related change to the air traffic services. A list of examples of these significant safety-related changes which is not exhaustive is given below.

i. Re-sectorisation of airspace

ii. Significant changes to ATC procedures, for example

1. Continuous Descent Operation (CDO)
2. Changes to civil/military operations
3. Multiple runway operations
4. Operations of Remotely Piloted Aircraft (RPA)

iii. Introduction of major ATC facilities, for example

1. New or major upgrade of ATC Area or Approach Centres
2. New or major upgrade of Control Tower

iv. Introduction of major ATC functions and capabilities such as ADS-B

4. APPLICABILITY

This AC is applicable to the Air Traffic Services (ATS) Provider of Ghana Civil Aviation Authority, and is intended for dissemination to relevant staff involved in development of safety cases.

5. RELATED DIRECTIVIES

This AC is related to the Part 24 – Air Traffic Services (ATS) of the Ghana Civil Aviation (Air Navigation Services) Directives.

6. RELATED READING MATERIAL

A. ICAO DOC 4444 – PANS ATM

B. ICAO DOC 9859 - Safety Management Manual (SMM)

7. ACRONYMS

AC - Advisory Circular

ANS - Air Navigation Service

ATS	-	Air Traffic Services
ANSP	-	Air Navigation Service Provider
GCAA	-	Ghana Civil Aviation Authority
GCAD	-	Ghana Civil Aviation Directives
DG	-	Director General
SRD	-	Safety Regulation Department
CDO	-	Continuous Descent Operation
RPA	-	Remotely Piloted Aircraft
ATC	-	Air Traffic Control
ADS-B	–	Automatic Dependent Surveillance – Broadcast

SECTION B - GUIDANCE AND PROCEDURES

8. SAFETY PLAN

A. NEED FOR A SAFETY PLAN

A significant safety-related change such as a project to acquire an ATC system normally involves a number of phases from the system definition phase, system design, etc, through to system commissioning. Safety needs to be planned for and addressed separately in all of these phases of the project as the hazards and associated risks may differ in type and degree in each of these phases. A Safety Plan shall be developed to provide the basis for the development of the safety case and different parts of the safety case at various phases. The Safety Plan shall include the following details:

i. An overview of the scope of the significant safety-related change such as the system functions, equipment and procedures;
ii. the safety activities and processes to be carried out during the various phases;
iii. the authorization structure and processes to approve the various safety document; and
iv. the roles and responsibilities of the staff to be involved in the various safety activities and processes.

B. PHASE APPROACH TO DEVELOP A SAFETY CASE

A four-phase approach to develop a safety case is suggested in this Advisory Circular, but as each significant safety-related change is different in size and scope, the ATS Provider is free to adapt and adopt different number of phases to suit a particular change. The four phases are:

i. **Phase 1: System definition and operational requirements phase** – this is when the broad functionality and operational requirements of the new system are defined. This phase should identify the safety objectives of the system. A hazard and risk assessment has to be conducted to identify the hazards and establish safety requirements;

ii. **Phase 2: System design and equipment development phase –** this is when the system configuration and operation are defined, in support of the safety requirements defined in the earlier phase. The human factors aspects of the design and the safety implications of the design should be considered. The hazard and risk assessment conducted at the earlier phase will need to be updated;

iii. **Phase 3: Installation, testing and pre-commissioning phase –** this is when the system is being installed and subjected to various tests prior to commissioning. The safety requirements are also tested during this phase and specific control procedures are developed to obviate or mitigate the identified risks. Important pre-commissioning and transition activities with safety implications such as the development of contingency plans and the competency level of trained operational and technical staff need to be assessed; and

iv. **Phase 4: Commissioning, operation and maintenance phase –** this is when the system is put into actual operation. This last phase should provide all the complete evidences that the system is safe for operational service. During this phase, the safety of the system is also continuously being monitored and improved as new hazards are identified and the risks mitigated.

C. HAZARD AND RISK MANAGEMENT

i. Hazard and risk management is the identification, analysis and elimination or mitigation of risks to an acceptable level of safety to the ATS Provider. It usually encompasses:

1. hazard identification

2. risk assessment
3. risk control

ii. There are different methodologies to conduct a hazard and risk analysis and it is up to the ATS Provider to determine the appropriate methodology for each safety case, depending on the size and complexity of the significant safety-related change and the severity of the safety implications from the introduction of the system, facilities or procedures into operation.

9. **APPROVAL OF SAFETY CASE**

The ATS Provider shall put in place an authorization structure and process to approve the safety case. The officer responsible for the overall development of the safety case and the accountable officer who approves the safety case shall be clearly identified.

10. SUBMISSION OF SAFETY CASE

A. All documents produced from the development of the safety case such as the Safety Plan and the safety case reports at the end of each phase shall be submitted to ANS Division of Safety Regulation for comments and acceptance. The final report shall be submitted at least one (1) month before the commencement of the significant safety-related change.

B. Following ANS Division's comments, the ATS Provider may need to revise the safety case to the satisfaction of ANS Division before it is accepted.

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