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Safety Performance Monitoring Measures employed by the NSA for Ireland

1. PURPOSE

- 1.1 This notice provides information on the process utilised by the Irish National Supervisory Authority (NSA) to monitor safety performance. The process involves using historical trend data to identify an Acceptable Level of Safety Performance based on the approach recommended in ICAO Doc 9859.
- 1.2 A “total aviation system” approach has been adopted. It is therefore recognised that a number of actors {not solely the air navigation service provider (ANSP)} contribute towards the safety performance of the overall system.
- 1.3 For a number of safety indicators (defined in Appendix A) a set of associated safety targets/alert criteria have been established in NSA policy ASD.233. It is important to state that these targets are intended to be used to provide a reference level for tracking safety performance. The targets are not considered as pass/fail criteria and comparisons are not made between individual ATS units. They are employed as a tool supporting the NSA in its on-going efforts to monitor safety performance levels in accordance with its regulatory obligations.
- 1.4 It is intended that this notice will be amended as necessary in line with relevant emerging developments. This notice will remain in force until cancelled by a further notice.

2. SCOPE

This notice provides an overview of the safety performance monitoring process utilised by the Irish National Supervisory Authority (NSA).

3. REFERENCES

IAA Policy SRD.004 State Safety Programme
IAA Policy ASD.233 Safety Targets and Safety Indicators established by the NSA for Ireland
ICAO Doc 9859 Safety Management Manual, Fourth Edition, 2018
ICAO Annex 19 Safety Management, Second Edition, July 2016

4. BACKGROUND

ICAO Annex 19 sets out the requirement for States to establish a State Safety Programme¹ (SSP) in order to achieve an acceptable level of safety performance (ALoSP) in a number of activities including the provision of air traffic services. ICAO Doc 9859 (Safety Management Manual) provides guidance on how to define an ALoSP. The Irish NSA's policy ASD.233 aligns with the guidance in ICAO Doc 9859 with respect to the principles for setting safety performance targets and identifying associated alert criteria.

This notice has been reviewed and updated in conjunction with the Irish NSA's safety targets policy (ASD.233) to include the following changes in 2017:

- Notice revised to outline the NSA's safety monitoring process. Numerical targets and alert criteria have been relocated to internal NSA policy ASD.233 following consultation with the IAA ANSP. In addition, the NSA has taken into consideration the conclusions from a recently completed EASA working group report² on safety targets for RP3. This recommended that targets for lagging indicators should not be set due to "possible negative effects and consequences that such an action will have on levels of reporting".

5. CONCEPTS AND DEFINITIONS

As outlined in Doc 9859 (section 2.16) there is an increasing appreciation that the effective implementation of a State Safety Programme (SSP) and Safety Management System requires that "the existing prescriptive approach to safety be complemented with a performance-based approach".

ICAO Doc 9859 (section 4.3.5.1) provides further elaboration;

"The acceptable level of safety performance (ALoSP) concept complements the traditional approach to safety oversight that is primarily focused on prescriptive regulatory compliance with a performance-based approach that defines actual safety performance levels within a prescribed SSP framework.....**ALoSP is the acceptable level of safety performance of a State as defined by its SSP safety indicators and their associated target and alert levels...**"

It is essential to recognize that regulatory compliance still remains at the foundation of safety management. The implementation of an ALoSP "does not replace or supersede the need for States to implement all applicable SARPs" nor does it relieve Ireland from its obligations regarding the Convention on International Civil Aviation and its related provisions (Ref: Doc 9859 section 4.3.5.5).

The applicable ICAO standards and guidance provide the following definitions;

Safety performance indicator: "A data-based parameter used for monitoring and assessing safety performance" (Ref: ICAO Annex 19 Chapter 1).

¹ SRD.004 State Safety Programme for Ireland refers

² Report of the EASA SKPI RP3 S(K)PI Working Group "Indicator Proposals for RP3"

Safety performance target: “The planned or intended objective for safety performance indicator(s) over a given period” (Ref: ICAO Annex 19 Chapter 1).

Safety performance: “A State or a service provider’s safety achievement as defined by its safety performance targets and safety performance indicators” (Ref: ICAO Annex 19 Chapter 1).

Acceptable level of safety performance (ALoSP): “The minimum level of safety performance of civil aviation in a State, as defined in its State safety programme, or of a service provider, as defined in its safety management system, expressed in terms of safety performance targets and safety performance indicators” (Ref: ICAO Doc 9859).

The selection of appropriate safety indicators is key to the development of ALoSP. ICAO Doc 9859 Section 4.3.5 states “ALoSP is the overarching concept while safety indicators with their corresponding alert and target levels (performance boundary settings) are the actual metrics of the ALoSP”.

6. STRATEGY FOR DEFINING SAFETY INDICATORS

The NSA has supported European-wide initiatives on safety data reporting including Eurocontrol’s AST (Annual Summary Template) process for a number of years. A number of quantitative safety indicators with historical data are therefore available. The safety indicators selected are included in Appendix A. The indicators are expressed in terms of rates instead of absolute incident numbers as recommended in ICAO Doc 9859 (section 4.3.)

7. STRATEGY FOR DEFINING SAFETY TARGETS

For the defined safety indicators, it is necessary to develop associated safety targets in order to provide quantifiable measures for the maintenance and/or improvement of the level of safety for the air navigation services domain in Ireland. In defining the safety targets identified in ASD.233, consideration has been given to:

- the level of safety risk that applies
- the safety risk tolerance
- the cost/benefits of improvements to the aviation system
- public expectations that the Irish civil aviation system will continue to provide safe air traffic services to the high standards expected in a western European state.

8. ALERT CRITERIA

For each safety performance indicator a corresponding alert level is specified as recommended in ICAO Doc 9859. The objective of such alerts is to quantify the “unacceptable performance threshold” during the monitoring period providing a trigger for remedial action. ICAO Doc 9859 recommends that the standard deviation of the historical data may be used as a “basic objective method of setting alert criteria” (this takes into consideration the volatility of the data when deriving appropriate alert levels – more volatile data will result in more generous alert level values). The alert criteria employed by the Irish NSA are defined in Appendix A. Each safety target has an associated numerical alert threshold as detailed in NSA policy ASD.233.

9. APPENDICES

Appendix A: Irish NSA Safety Indicators

10. FURTHER INFORMATION

Requests for further information on the contents of this notice should be addressed to:
ansdinfo@iaa.ie

**Chief Executive
Irish Aviation Authority**

APPENDIX A: Irish NSA Safety Indicators

SI-1

Separation Minima Infringements (as defined in Implementing Regulation (EU) 2015/1018 Annex III): *[Number]* of occurrences per 100,000 flight hours.

SI-2

Runway Incursions (as defined in ICAO Doc 4444 - PANS-ATM): *[Number]* of occurrences per 100,000 Aircraft Movements (AM).

SI-3

Deviation from ATC Clearance (as defined by EUROCONTROL – HEIDI): *[Number]* of occurrences per 100,000 flight hours.

SI-4

Level Busts (as defined by EUROCONTROL – HEIDI) *[Number]* of occurrences per 100,000 flight hours.

SI-5

Unauthorised Penetration of Airspace (as defined by EUROCONTROL – HEIDI): *[Number]* of occurrences per 100,000 flight hours.

For indicators SI-1, SI-2 and SI-5 the targets will be derived for both national and unit level (where appropriate).

Alert Criteria for SI-1 to SI-5

The alert level³ for the new monitoring period (current year) is based on the preceding period's performance. The safety target +1.5 standard deviation⁴ (SD), safety target +2SD are employed.

Alert level trigger:

An alert (abnormal/unacceptable trend) is indicated if any of the conditions are met:

- the actual performance exceeds the target + 2*SD level
- the actual performance for 2 consecutive 6 month periods exceeds the target + 1.5*SD level

When an alert is triggered appropriate follow-up action is expected, such as further analysis to determine the source and root cause of the abnormal incident rate and any necessary action to address the unacceptable trend.

European Safety Key Performance Indicators

Refer to Aeronautical Notice S.21.

End.

³ ICAO Doc 9859 provides an example of how targets and alert criteria may be employed and tracked using the *mean* and standard deviation. ANSD reviews safety performance trends on a 6-monthly basis therefore the ICAO methodology has been adapted accordingly.

⁴ Population Standard Deviation as recommended by ICAO Doc 9859.