Draft SDR Trial Implementation Guidance and Working Template

Introduction

This document is working document and is provided as **guidance material only**. The information contained within is not to be considered a STANDARD and ANSPs may modify or create their own methodology as required by their operations and regulations. These guidelines may be modified over time based on feedback and operational requirements.

The CANSO/IATA/ICAO Free Route Airspace (CIIFRA) Team, as part of the ICAO NACC Airspace Optimization Task Force, developed the guidance material in conjunction with SENEAM.

SDR Definition

Strategic Direct Routing (SDR): SDR allows users to plan a route using any named waypoints within a specified volume of airspace as long as the route complies with parameters set by the State. The parameters may include restrictions such as hours in which SDR rules apply, at or above altitude requirements and maximum distance between waypoints. Users must file flights via authorized (i.e., published) routes to the entry and exit point at the boundaries of the SDR airspace volume; that is, the SDR system only applies inside the defined volume of airspace. SDR is considered to be a transition to the implementation of the Free Route Airspace (FRA) concept.

Steps involved

Figure 1 below displays the process flow developed by SENEAM to plan, design, validate and implement their SDR trials. It is provided as guidance material for ANSPs to consider in developing their own process.

Table 1 below provides basic guidance on the steps required to plan, develop and initiate SDR Trials. The specific tasks are provided to assist ANSPs on developing their SDR trial planning and are not to be considered as the STANDARD. ANSPs may modify or develop their own methodology as required by their operations and regulations.

Some of the tasks in the trial process are iterative. Feedback loops will be required based on analysis of data and as a resultant, procedures/design parameters/training and publication may need to be refined.

It is important to manage the scope of the trial from the start. It is easier to add new project elements over time than to scale down after the project has already started. The main lesson learned from those already engaged in SDR trials is to “START SLOWLY”.

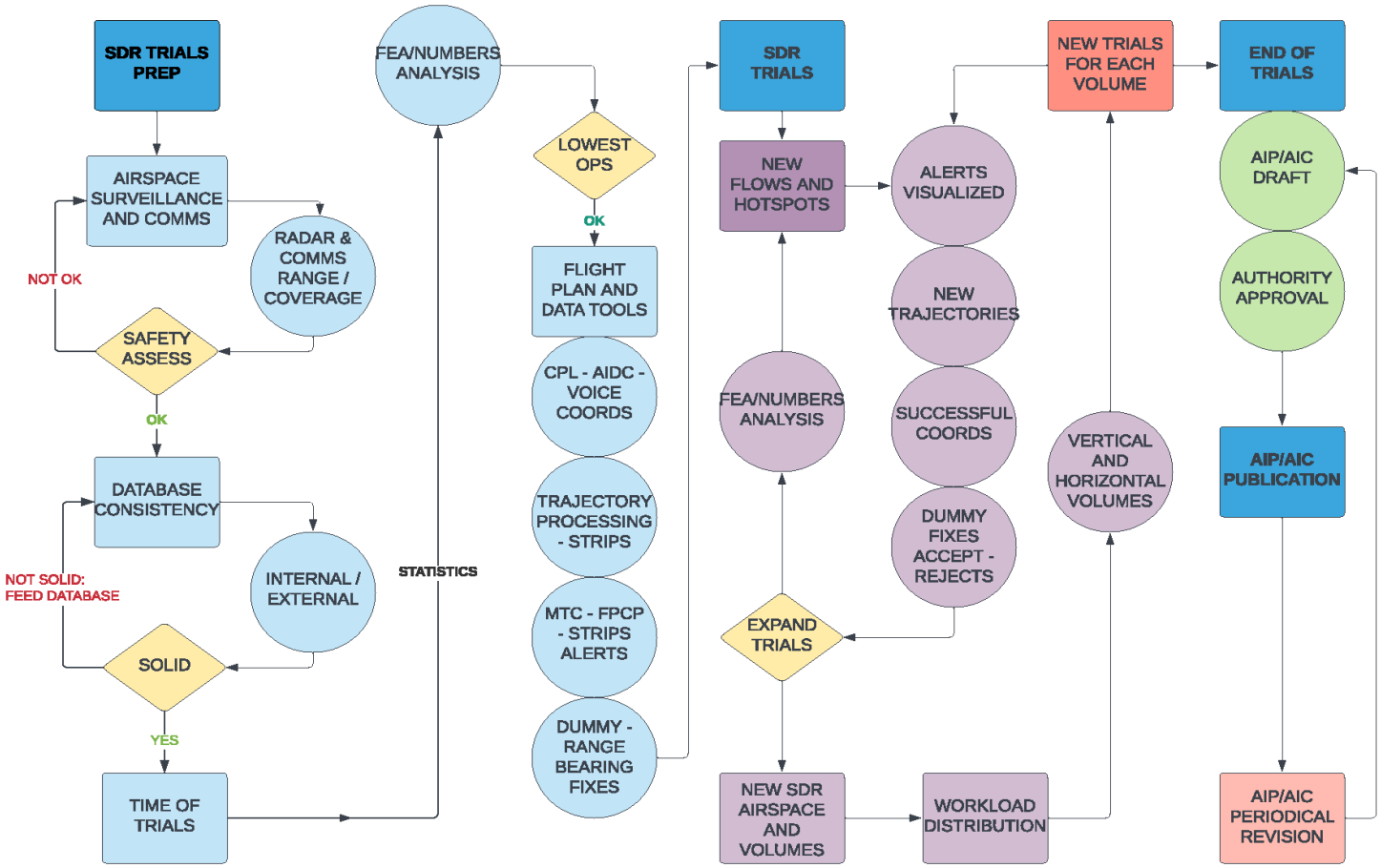

Figure 1 SDR TRIAL PROCESS - SOURCE SENEAM

Table 1 - SDR Implementation Guidelines

STEP	TASK	DESCRIPTION
PLAN	Agree on the operational requirement	Consider the desired outcome: • SAFETY • CAPACITY • EFFICIENCY • ENVIRONMENT
	Create Team	Ensure all stakeholders are involved
	Agree on the scope	• Define the project objectives (Be realistic) • Consider Timeframe • Consider Resources required e.g. (Human/Finance/Tools/Equipment/DATA availability etc.)
	Analyze the current Situation	• Consider Airspace complexity, density etc. • Analyze the CNS infrastructure • Analyze the ATM system capabilities • Analyze the ATS Procedures • Consider portion(s) of airspace that the trials be conducted in • Consider times when trials will be conducted • Collect Data • Perform Analysis • Produce report
	Safety Case	• Define safety criteria • Define the methodology for conducting the Safety Case • Hazard identification/Risk mitigation • Collect data • Conduct Analysis • Produce Report
	Training	• Develop training for ATCOs • Provide training prior to simulation exercises or live trials
	Draft AIC	• Start drafting AIC for trials
DESIGN	Engage with stakeholders	• Discussions with Regulator • Acquire proposed trajectories from Users • Consult with ATS Operations

STEP	TASK	DESCRIPTION
		• CDM with adjacent ATSUs • CDM with TMAs/Aerodromes • Engage with CNS/ATM system providers
	Draft new trajectories	• Plot new requests and analyze the effects based on existing routes
	Decision on trial parameters	• Finalize number of airline operations per day for the test • Finalize airspace sector/Flight level/UTC time period • Determine waypoints in adjacent ATSUs that may need to be in your system database • CDM with selected airline operators on waypoints that must be filed
	Publication of Trials	• Publish AIC with relevant information
VALIDATE	Test ATM System	• Ensure the ATM System database contains the necessary waypoints • Determine if FDP can accept flight plans on random tracks • Engage with CNS/ATM system providers • Test MTCD capabilities
	Validation Methodology	If using simulator: • Design exercises based on proposed trajectories • Conduct exercises • Collect/Analyze data • CDM with ATS Operations • CDM with Users • Amend proposed live trial procedures if required
		Table top exercise: • Internal exercise with Supervisors/ ATCOs on procedures • Hazard identification and risk mitigation • Make necessary changes to procedures as required
	Regulatory Approval	• Provide validation/safety case to regulators • Obtain necessary approvals
Implement	Conducting live trials	• Ensure ATCOs are trained and briefed for the operations • Ensure appropriate publications were made • Ensure Airline operators are aware of all procedures • Supervise the implementation • Collect/analyze data

STEP	TASK	DESCRIPTION
		• Monitor Progress • Make necessary changes to procedures as required
	Adjusting trial parameters	• Based on the results of the initial trials, decide on the trial parameters that can be amended (Number of operations, time of day, flight level etc. • Repeat necessary planning/design/validation steps as required • Implement new parameters • Collect Data/Analyze • Monitor Progress • Make necessary changes to procedures as required

ANSP SDR Trial Assessment Template

The template in this section provides a sample template to assist ANSPs in identifying their capabilities to conduct SDR trials.

The template is provided as guidance material only and is not a STANDARD. ANSPs may modify or develop their own methodology as required by their operations and regulations.

The information filled out in the sample template is provided as an example. ANSPS will be required to fill out their own information based on their assessments.

Blank templates will be provided via the AOTF section of the CAO NACC Website.

SDR Trial Assessment Template

Section 1 – Basic Airspace Definition

NAME OF STATE/ANSP/ORGANIZATION	****
AIRSPACE BOUNDARY DEFINITION	(Coordinates)
NUMBER OF SECTORS	***

Section 2 – Airspace Density

SECTOR	TYPE OF AIRSPACE	UTC PERIOD	DENSITY	COMPLEXITY	COMMENTS
1	OCEANIC	0000 - ****	LOW	LOW	
		**** - ****	HIGH	MEDIUM	
		**** - ****	MEDIUM	HIGH	
2	CONTINENTAL	**** - ****	LOW	LOW	
3	CONTINENTAL	**** - ****	MEDIUM	HIGH	
4	OCEANIC	**** - ****	MEDIUM	HIGH	
***	***	**** - ****	***	***	

Section 3 – CNS Capabilities

SECTOR	COMMUNICATIONS	SURVEILLANCE/ADS-C	AIDC WITH ADJACENT ANSP	COMMENTS
1	CPDLC/HF	ADS-C	NO	• AIDC Planned with 2 Adjacent Units for 2024 • ADS-B SAT planned for 2025
2	VHF	SSR/ADS-B	With 1 Unit	• Full VHF coverage and redundancy • Full Surveillance Redundancy • ADS-B planned for 2025 • AIDC with 1 additional units planned for 2024
3	VHF/CPDLC	SSR/MLAT	NO	• No VHF Redundancy • Partial Surveillance • ADS-B SAT planned for 2025 • AIDC with 2 additional units planned for 2024
4	CPDLC	ADS-C		• ADS-B SAT planned for 2025
***	****	****	****	• ****

Section 4 – ATM System Capabilities

ATM SYSTEM CAPABILITY	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Fully automated/Partially automated (Vendor - ****)	ATM System upgrade planned for 2025; FDP has issues accepting flights that do not file a named entry waypoint
MEDIUM TERM CONFLICT DETECTION (STCA)	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Available and tested	MTCD provides resolutions for flights on random routes
SHORT TERM CONFLICT ALERT (STCA)	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Available and tested	No comment
ATM SYSTEM DATABASE	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Waypoints up to 200 nm in adjacent ATSUs airspace are included	

Section 5 – ATS Procedures

LETTERS OF AGREEMENTS WITH ADJACENT ATSU's	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	All LOAs are up to date	There is an established procedure for periodic reviews and for dealing with critical issues that may develop and require attention
SURVEILLANCE HAND-OFF	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Not implemented	Discussions with adjacent units. Lack of harmonization of ATM systems is a challenge
SEPARATION STANDARDS	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Separation Standards are not harmonized across FIR Boundaries	CDM with adjacent ATSUs on harmonizing lateral separation standards

Section 5 – DATA ANALYSIS/SAFETY CASE

DATA AVAILABLE TO ANALYSE TRAFFIC SCENARIOS	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Some data available	Discussions with AIM/CNS/ATM system vendors to acquire additional information
SIMULATOR AVAILABLE TO TEST PROPOSED SDRs	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Not available	Table top assessment will be utilized
PERSONNEL AVALABLE TO CONDUCT SAFETY CASE	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	ATS Safety Unit trained and capable of conducting safety case	

End

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