



| ICAO PARIS UNITING AVIATION

NAT Vision

Proposed Goal Progression Strategy

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Oceanic Strategic Planning | Proposed NAT Vision Goal Progression Strategy

The following slides provide a suggested work program process, a programmatic approach that could be applied to progressing the NAT Vision goals to support prioritization, decision making and user/industry support.

Examples used to develop the FAA's draft Oceanic Strategic Plan (OSP) (in-progress) are included in the following slides.

In summary, the process suggests that specific achievements included in the NAT vision could be combined to describe how the achievements will be used, SMART goals, and the expected potential benefits.

Oceanic Strategic Planning | Proposed NAT Vision Goal Progression Strategy



01

Overarching, “umbrella”, principles or precepts that guide an organization throughout strategic planning to implementation, irrespective of changes in its goals, and establishes a framework for decision-making.

Guiding principles are applied to all goals.



02

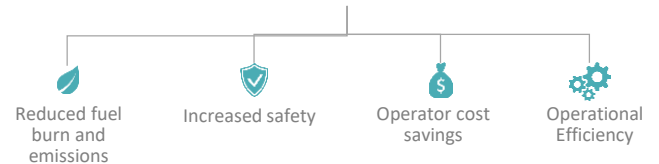
To support achievements that are carefully planned, trackable and successful, high-level SMART goals are developed.

SMART goals are designed to be specific, measurable, achievable, realistic and timely.



03

To justify investments and measure success; metrics are developed and monitored.



Oceanic Strategic Planning | Proposed NAT Vision Goal Progression Strategy

For example, using NAT Vision Goal 4: The NAT operations takes account of both the prevailing and forecast operational and stakeholders' capabilities and implements proportionate performance- based outcomes.

1. Space-based ADS-B surveillance
2. Use of aircraft downlink parameters (e.g., pilot selected level)
3. Implement SWIM and FF-ICE
4. Address the regulatory oversight of CSPs and SSPs



Identify specific goals, such as Global TBO or enhanced procedures, that use or are enabled by the technologies included under goal 4.



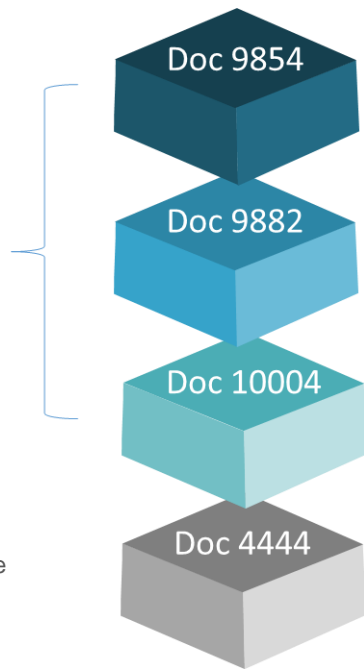
Then identify potential benefits.

Metrics Legend



1	Reduced emissions				
2	Reduced fuel burn				
3	Reduced delays				
4	Reduced operational errors				
5	Reduced controller workload				
6	Increased number of cleared FL change requests				
7	Increased number of cleared route requests				
8	Increased efficiency transitioning to and from domestic to oceanic				

ICAO ATM Modernization Guidance | Resources Used for Specifications and Requirements (Guiding Principles)



The Global Air Traffic Management Operational Concept (OCD) guides the planning and implementation of global ATM by providing a description of how the emerging and future ATM system should operate and is the foundation by which the GANP and ASBUs were developed.

Manual on Air Traffic Management System Requirements. To assist States in complying with the requirements specified in ICAO Doc 4444 and ensure that future planning will be in alignment with the OCD, ICAO developed Doc 9882 which “provides a comprehensive understanding of the intent of, and delivery mechanisms for, the ATM system envisioned in the Global Air Traffic Management Operation Concept.”

The **Global Aviation Safety Plan** supports the implementation of the GANP by promoting the effective implementation of safety oversight and a safety management approach to oversight.

The Procedures for Air Navigation Services – Air Traffic Management (PANS – ATM) provides detailed processes and methodology which States employ to satisfy Annex requirements included in Annex 11 – Air Traffic Services.

- The GANP, and corresponding Aviation System Block Upgrades (ASBUs), are planning tools intended “to drive the evolution of the global air navigation system and ensure that the vision of an integrated, harmonized, globally interoperable and seamless system becomes a reality”
- The GANP is in line with the Global Air Traffic Management Operational Concept (Doc 9854) and the Manual on Air Traffic Management System Requirements (Doc 9882).



Oceanic Strategic Planning | Relevant Oceanic ATM Modernization Planning Guiding Principles Extracted from Doc 9882 and Doc 4444

	ID	Requirement Description
ATM System (general)	R1	Enable maximum use of enhanced capabilities provided by technical advances and meets the expectations of all users
	R2	Provide for flexible use of airspace to improve the efficiency of operations and increase capacity
	R3	Evolve their ATM systems to meet the balanced expectations of users.
Safety and Resiliency	R4	Ensure that ATM system safety is maintained during any transition
	R5	Provide an enhanced capability to disseminate information regarding emergency situations to appropriate ATM community members
	R6	Establish contingency plans at all levels of operation to deal with anomalies/disruptions and to ensure safety and an appropriate level of operations
	R7	Ensure that the target level of safety is the minimum level of safety to be achieved
	R8	Be designed so that the human is never in doubt as to the ongoing status of the ATM system or the flight environment as appropriate to the human task undertaken
Access and Equity	R9	Ensure that, in the design of the ATM system, the principles of access and equity are considered
	R10	Be designed to accommodate all types of airspace user missions and all types of vehicles and associated characteristics
	R11	Be designed to minimize restriction of access to airspace
Capacity	R12	Ensure that the ATM community works collaboratively to plan and implement the capacity needed to cost-effectively meet the forecast demand
	R13	Ensure that all available capacity is fully and efficiently used
	R14	Minimize the impact of adverse weather on the total ATM system so as to ensure that maximum throughput is generated in all meteorological conditions



Oceanic Strategic Planning | Relevant Oceanic ATM Modernization Planning Guiding Principles Extracted from Doc 9882 and Doc 4444

	ID	Requirement Description
Environment	R15	Ensure that environmental issues are considered in the design, development, and operation of all aspects of the ATM system
	R16	Establish and monitor agreed environmental performance targets to ensure that the expectations of society for the aviation industry contribute to the reduction of impacts on the environment
	R17	Facilitate collaborative decision making between the appropriate community members and appropriate environmental authorities to ensure that an appropriate balance exists between the need to mitigate the effects of the ATM system on the environment, and the economic benefit to States derived from operation of the ATM system
Predictability	R18	Ensure that ATM community members provide past, current, and predicted information as required by the system for predictability of services
	R19	Provide the ATM community with data essential to the planning of its operations
Community Participation	R20	Be designed in such a way as to ensure that all pertinent ATM community members are included in relevant collaborative decision making and have easy access to the associated necessary information
Flexibility	R21	Implement and operate in such a way that the varying and diverse user requirements will be met as closely as technically possible within the defined equity and access
	R22	Enable all airspace users to adjust departure and arrival times and modify flight trajectories dynamically and, where necessary, renegotiating trajectory agreements, thereby permitting them to exploit operational opportunities as they occur
Efficiency	R23	Address the operational and economic cost-effectiveness of gate-to-gate flight operations from a single flight perspective
	R24	Modify the airspace user's preferred trajectory when required to achieve overall ATM system performance requirements
	R25	Modify the airspace user's preferred trajectory collaboratively with the airspace user, in a manner that recognizes the airspace user's need for single-flight efficiencies
Global Interoperability (seamless boundaries)	R26	Be based on global standards and uniform principles, ensure the technical and operational interoperability of ATM systems and facilitate homogeneous and non-discriminatory global and regional traffic flows
	R27	Establish common operational procedures within similar operational environments



Oceanic Strategic Planning | Goal Progression Strategy (Example process applied by the U.S.)

Guiding “umbrella” Principles (GPs)

- ATM System (general)
- Safety and Resiliency
- Access and Equity
- Capacity
- Environment
- Predictability
- Community Participation (all stakeholders)
- Flexibility
- Efficiency
- Global Interoperability (seamless boundaries)

Shortfall/Needs Assessment

Taking into account the guiding principles, existing and forecasted oceanic ATM safety improvements, system operational and technical inefficiencies and deficiencies, and user needs were identified.

FOCUS AREAS/Shortfall Solutions

- Examples
- 1 Global Trajectory-based Operations
 - 2 Enhanced Separation Procedures
 - 3 Tactical Operations
 - 4 Emerging Users
 - 5 Improved ATM System
 - 6 Contingency/Resiliency

SMART Goals (examples) “umbrella” programs

- 1 **Implement Global TBO**
- 2 **Implement Enhanced Separation Procedures**
Tactical Operations
- 3 **Integrate Emerging Users & Space Operations**
- 4 **Implement Improved Oceanic ATM System**
Contingency/Resiliency

Justification for Change

32 Shortfalls/user needs based on
27 Oceanic ATM Improvement and Modernization Requirements

Consolidated Solutions/Categories that address most shortfalls

To support SMART goal development, the focus areas were consolidated into four high-level goals.



1 - Implement Dynamic Trajectory-Based Operations

- Achieve Seamless, end-to-end operations between Oceanic/Offshore/Domestic airspaces and across international borders
- Fly closer to desired profiles/Optimized flight plans
- Reduce fuel burn, carbon emissions/time
- Using real-time data, enable ability to modify flight plans and optimize flights
- Enable more predictable flight times
- Less Delays

2 - Implement Enhanced Oceanic Separation Procedures

- Implement:
 - ✓ Horizontal-radial separation procedures
 - ✓ On-demand tactical maneuver capability
 - ✓ Efficient management of pair-wise aircraft performance differences (Pairwise trajectory management)
- Enable more flexibility during conflict/deviation scenarios
- Maximize benefits to all system operators based on equipage
- Increase accommodation and resolution of critical aircraft contingency scenarios
- Improve departure/arrival ATC services into remote oceanic airports

3 - Safely Integrate Emerging Users & Space Operations

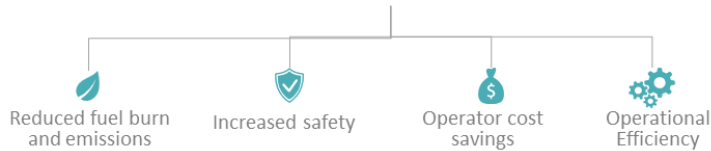
- Implement automated dynamic management of airspace reservations/hazard areas
- Enhance services for non-conventional users
- Increase controller situational awareness
- Increase automation of non-conventional user operational data

4 - Implement Improved Oceanic ATM System

- Implement automation capabilities, such as machine learning, to improve seamless, efficient and safe oceanic operations
- Promote global harmonization and seamless boundaries
- Integrate data and information services such as SWIM and FF-ICE
- More agile development of functionalities for ATC and users
- Implement real-time, low-latency voice comms and enhanced surveillance
- Explore alternate methods to improve communications
 - VHF communications through satellite
 - Banding together HF frequencies
- Enable 4DT & On-Demand Tactical Operations
- Reduce interface complexity and controller workload
- Increase interoperability with other systems
- Increase resiliency, adaptability, and enable portability during emergencies

Metrics Development | Methods by which we can measure success and justify investments (U.S. examples)

Metrics Legend



Goal 1: Global Trajectory-based Operations

1	Reduced emissions				
2	Reduced fuel burn				
3	Reduced delays				
4	Reduced operational errors				
5	Reduced controller workload				
6	Increased number of cleared FL change requests				
7	Increased number of cleared route requests				
8	Increased efficiency transitioning to and from domestic to oceanic				

Goal 2: Enhanced Separation Procedures

1	Reduced number of conflict scenarios				
2	Reduced number of denied deviation requests				
3	Tactical oceanic maneuvers				
4	Reduced controller workload				
5	Reduced island departure and landing delays				
6	Increased flying time at optimal levels				
7	Decreased risk (Target level of safety)				

Goal 3: Integrate Emerging Users

1	Reduced controller workload				
2	Increased situational awareness				
3	Reduced conflict scenarios due to restricted airspace				
4	Increased emerging-user ATM services				
5	Increased operations due to dynamic management of restricted airspace				



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THANK YOU