



International Civil Aviation Organization

Performance-based Compliance

Fadiga na Aviação
Seminário Internacional
Rio de Janeiro, Brasil
April 28-29

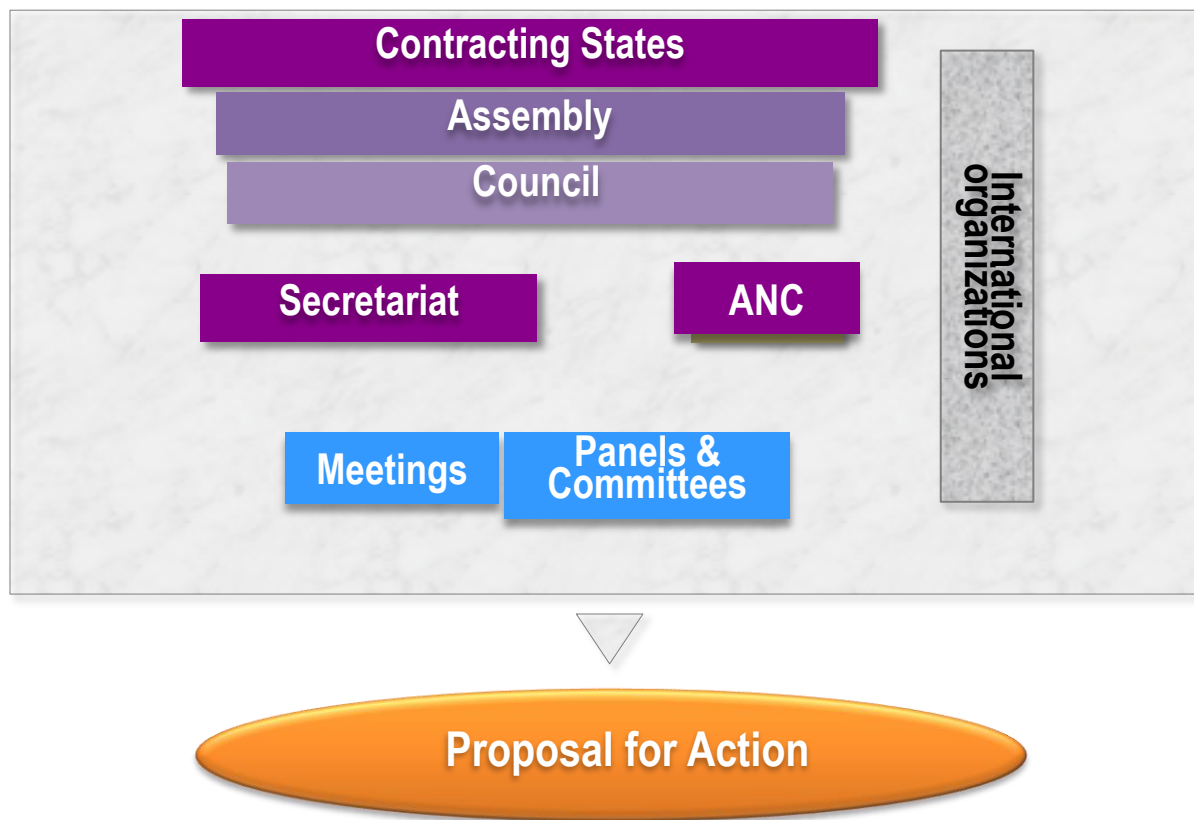
Capt Miguel Marin
T/O Flight OPS
ICAO

Overview

- **The ICAO provision development process**
- **Why is ICAO introducing Performance - based Provisions**
- **Are States ready?**
- **Regulatory environments**
 - **Prescriptive-based and Performance-based**
- **Setting the Scene**



Origins of New ICAO Provisions

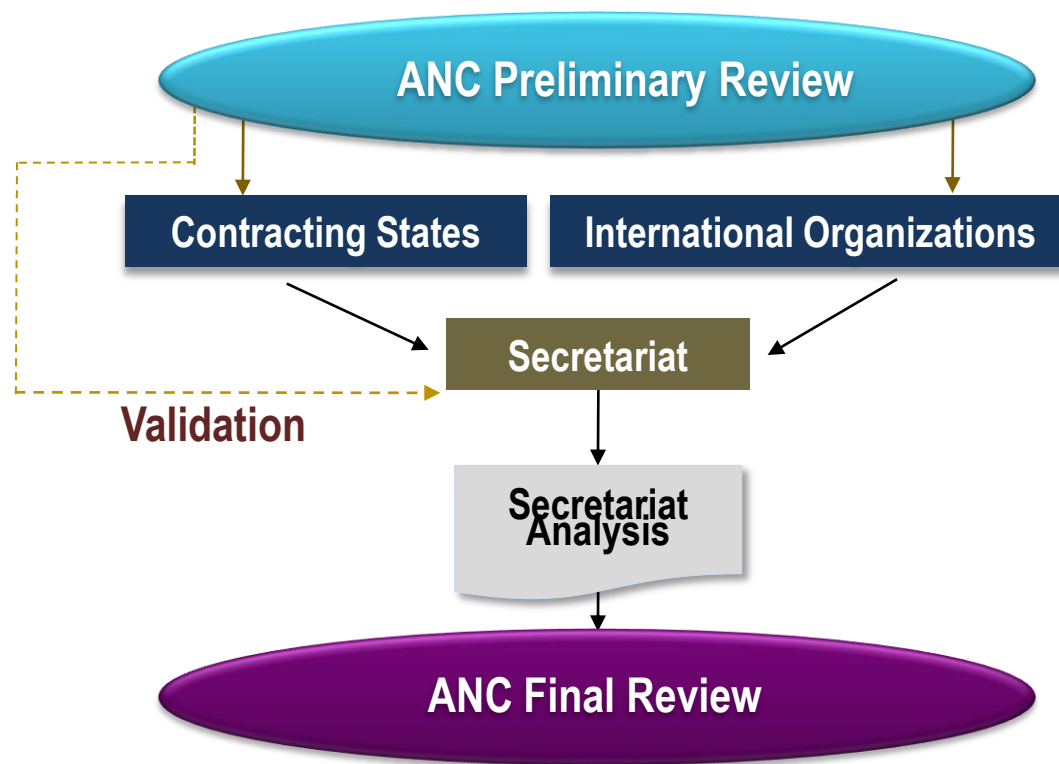


ANC- Air Navigation Commission

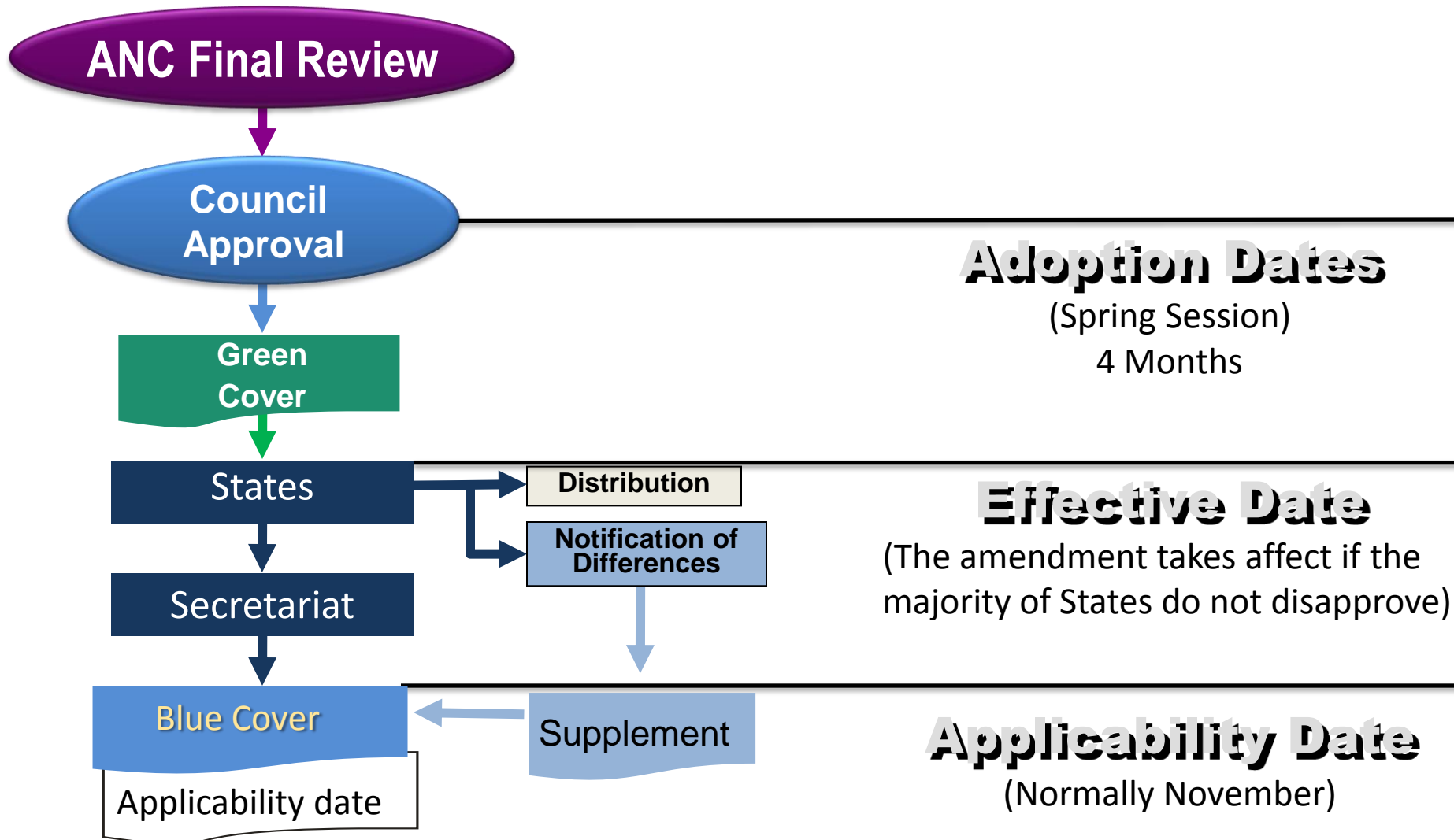
Development of proposal



Preparing the Amendment Proposal

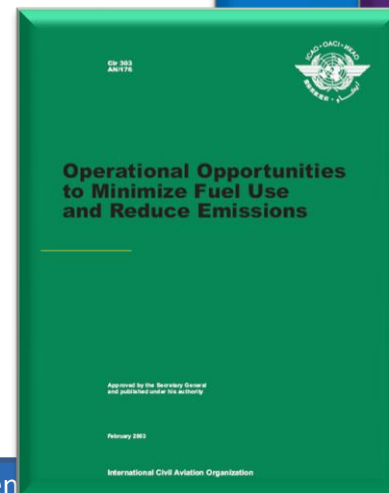
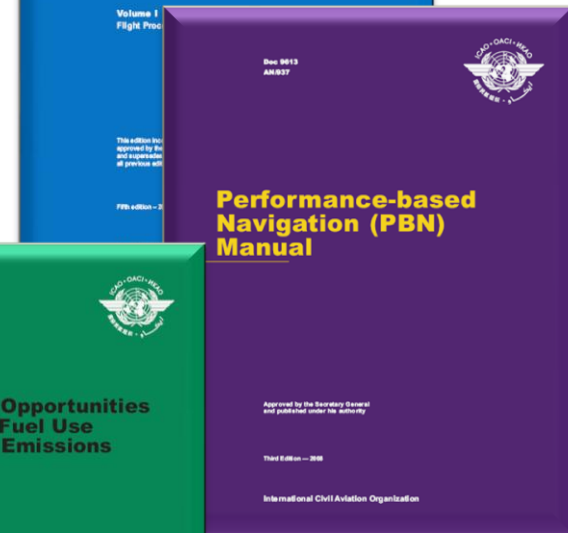
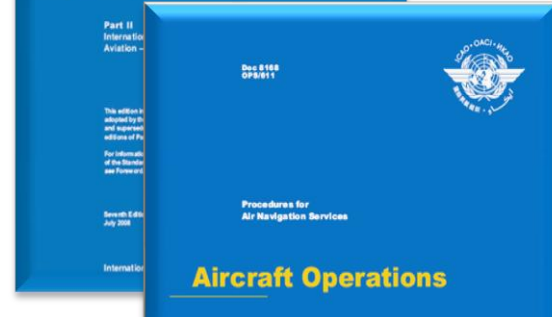


Adopting a SARP



ICAO Documentation

- Annex Provisions
 - Standards (shall)
 - Recommended Practices (should)
 - Appendices (Standard = shall)
 - Attachments (guidance)
- PANS - Procedures for Air Navigation Services
- Guidance Material
 - Manuals
 - Circulars



ICAO – The State – The Operator

- ICAO provides provisions (SARPs and guidance material) to the States;
- The States establish Laws and regulations in accordance with the (SARPs);
- Operators develop policies to comply with their State's regulations.

Why Performance – based Provisions?

- A31-2: “Increasing the effectiveness of ICAO” (1995)
 - Establish procedures for setting objectives,
 - Expected results,
 - Priorities and targets, and
 - Application of performance indicators;
- The ICAO Council Decision (2005)
 - Per recommendation A35-14
 - SARPs development should take into account “Performance Objectives”

*Official beginning of “Performance-based”
approach concept in ICAO*

Performance-based Regulations Challenges



- Prescriptive
 - Monitoring compliance with requirements
- Performance-based
 - Identification of acceptable performance outcomes
 - Validation of the system by which the outcomes are achieved
- Requires a change in the knowledge base and skill sets
 - Individuals involved in developing the regulations and providing the oversight
 - implications for the way in which the regulator and the operator interact.
- Regulator's resources.

Performance-base Regulations Foundations



- Consistent Implementation of International Standards
- Consistent Regulatory Oversight
- Effective Incident and Accident Investigation
- Sufficient Number of Qualified Personnel
- Effective Errors and Incidents Reporting
- Continuous Improvement
- State Safety Program implementation

Lack of Effective Implementation (LEI) ICAO's Analysis



- Like Golf, the lower the score the better
- ICAO's Universal Safety Oversight Audit Program (USOAP)
 - Focus on the State's capability for providing safety oversight
 - Assessing whether the critical elements of a safety oversight system have been implemented effectively
 - LEI measurement is based on protocol questions not satisfactorily addressed by a State for each critical element



Lack of Effective Implementation (LEI) Global Results



- States audited by USOAP
 - **32%** have more than 50 % LEIs
 - **31%** have more than 30 % and less than 50% LEIs
 - **37%** have less than 30 % LEIs
- States with scores above 30% may not be ready
 - Safety oversight systems need to be mature
 - May have difficulty in adequately regulating and overseeing performance-based regulations.

Defining the Regulatory Architecture

Prescriptive



- Prescriptive regulatory architecture
 - Assumes that compliance will ensure that the system is performing safely
 - Within limits = safe
 - Outside limits = unsafe
 - Establish “what” is to be achieved and “how” it must be achieved
- Often the “one fits all” does not work

No matter its past successes, Prescription must be complemented by supplemental strategies

Defining the Regulatory Architecture

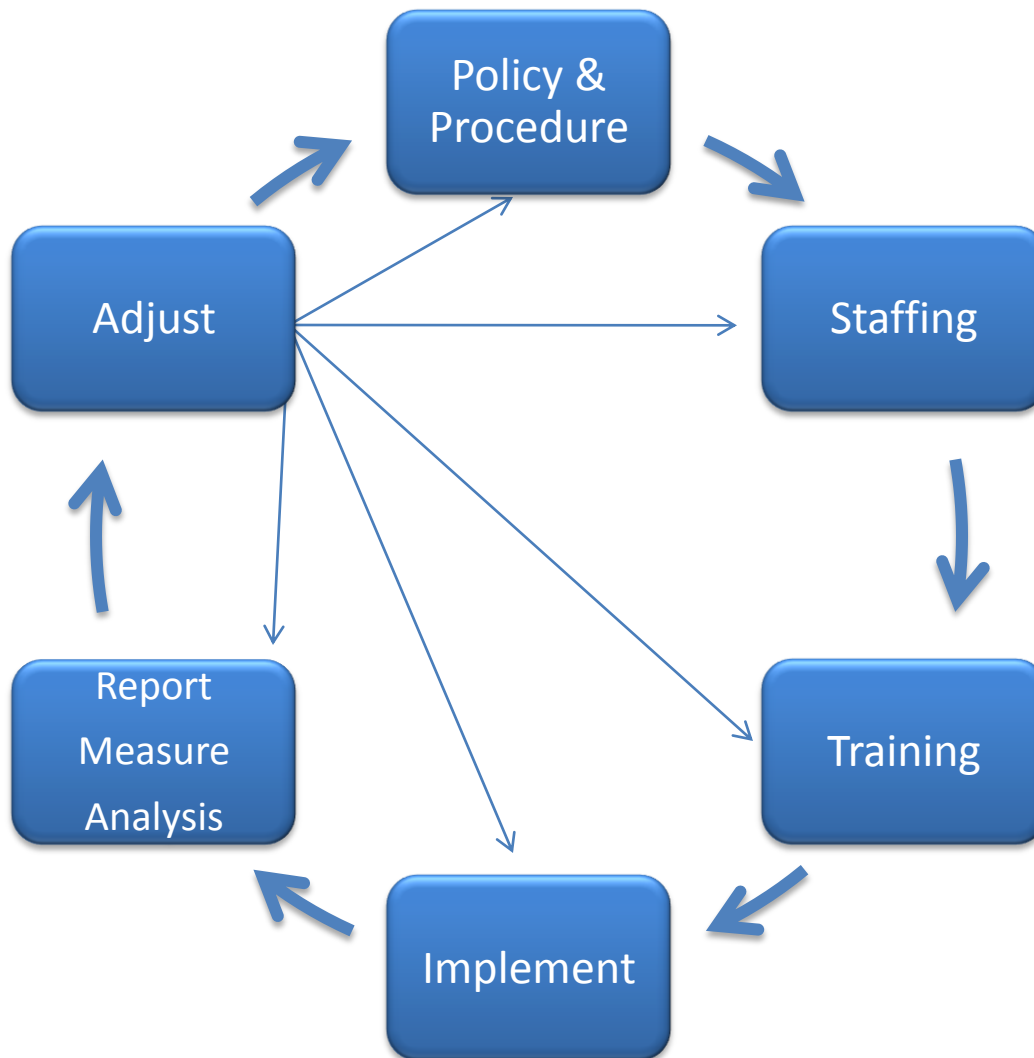
Performance-based



- Performance-based architecture
 - Establish “what” is to be achieved, but provide flexibility on “how” it must be achieved
 - For the regulatory authority
 - Measurable objectives
 - For service providers
 - Measurable performance objectives

Constant cycle to ensure that the safety management processes are operating in accordance with design expectations.

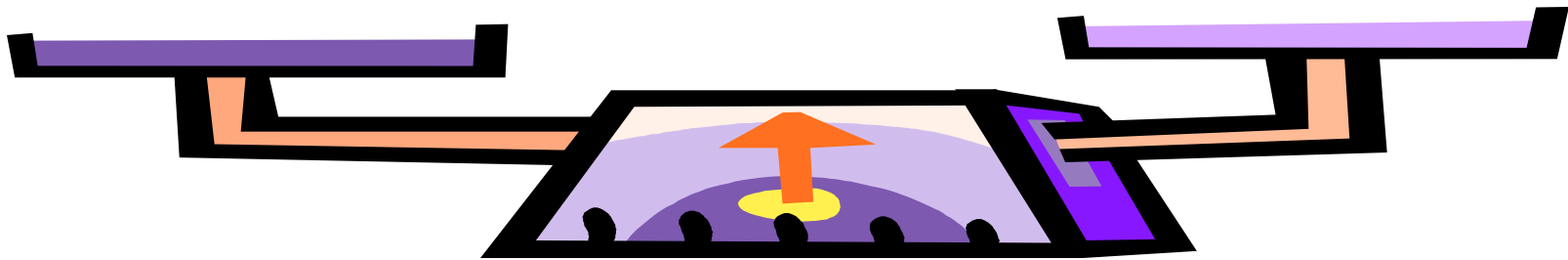
Performance Cycle



Performance-based Benefits



- Balance between Safety, Flexibility and Efficiency
- Custom provisions ensure equivalent or better level of safety
- Addresses the issue “one size does not fit all”



Guidance Material in Development

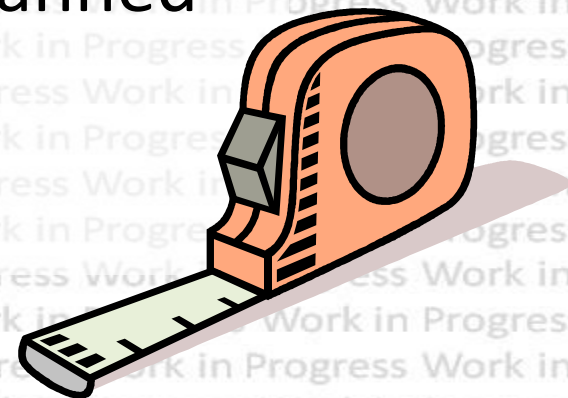
- FRMS
 - July 2011
- SMM third edition
 - Early 2012
- FPFMM
 - Mid 2012



Equivalent level of Safety Brain Storming



- 6 of one is equivalent to half a dozen
 - Gets complicated when SARPs are complex
- Measure the accuracy of the baseline
 - proximity to the limits (how critical)
 - variance of the actual with the planned (how often)
- Ensure that the PB is equivalent



Components of a Performance-based Provision



- Require a Prescriptive base line
- Clearly identify the possible “Variances”
- Ensure an equivalent level of Safety
- Identify specific areas for the Risk Assessment
- Requires supporting guidance material

In essence a performance based provision is in itself prescriptive

Model Performance-based Provision

4.7.2.3.1 Notwithstanding the provisions in 4.7.2.3 a); the State of the Operator may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operations beyond the time limits of the most time-limited system. The specific safety risk assessment shall include at least the:

- a) capabilities of the operator;
- b) overall reliability of the aeroplane;
- c) reliability of each time limited system;
- d) relevant information from the aeroplane manufacturer; and
- e) specific mitigation measures.

Note.— Guidance for the specific safety risk assessment is contained in Attachment D.

Baseline

Variances

Level of Safety

Risk Assessment

Guidance

Summary

- ICAO is placing increased emphasis on performance-based provisions
 - Allow variances to the prescriptive provisions under determined circumstances
- Performance-based is a means of compliance
 - Bound by the prescriptive provisions unless specific specifically indicated
- Implemented correctly it enhances Safety
 - Proactive
 - Continuous monitoring
 - Customizing rather than regulating based on the lowest common denominator

Summary (cont.)

- Performance-based compliance
 - Offers balance between safety and flexibility/efficiency
 - Requires a solid prescriptive foundation
 - Requires skills for proper oversight
- Improperly implemented can have negative effects

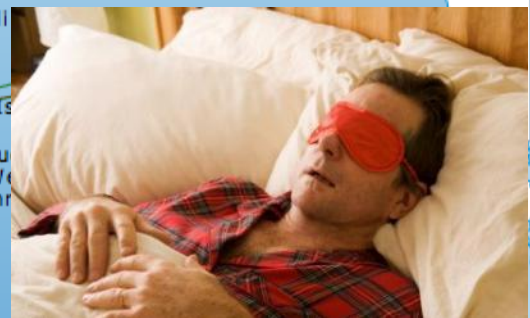
Scene setting

Crew 1



Crew Roster 01 August 2008 - 31 August 2008

Base: MAN Category: LCC Qual: ALL767 BLH: 35:48 Sectors: 4 DutyT: 95:23



Scene setting

Crew 2

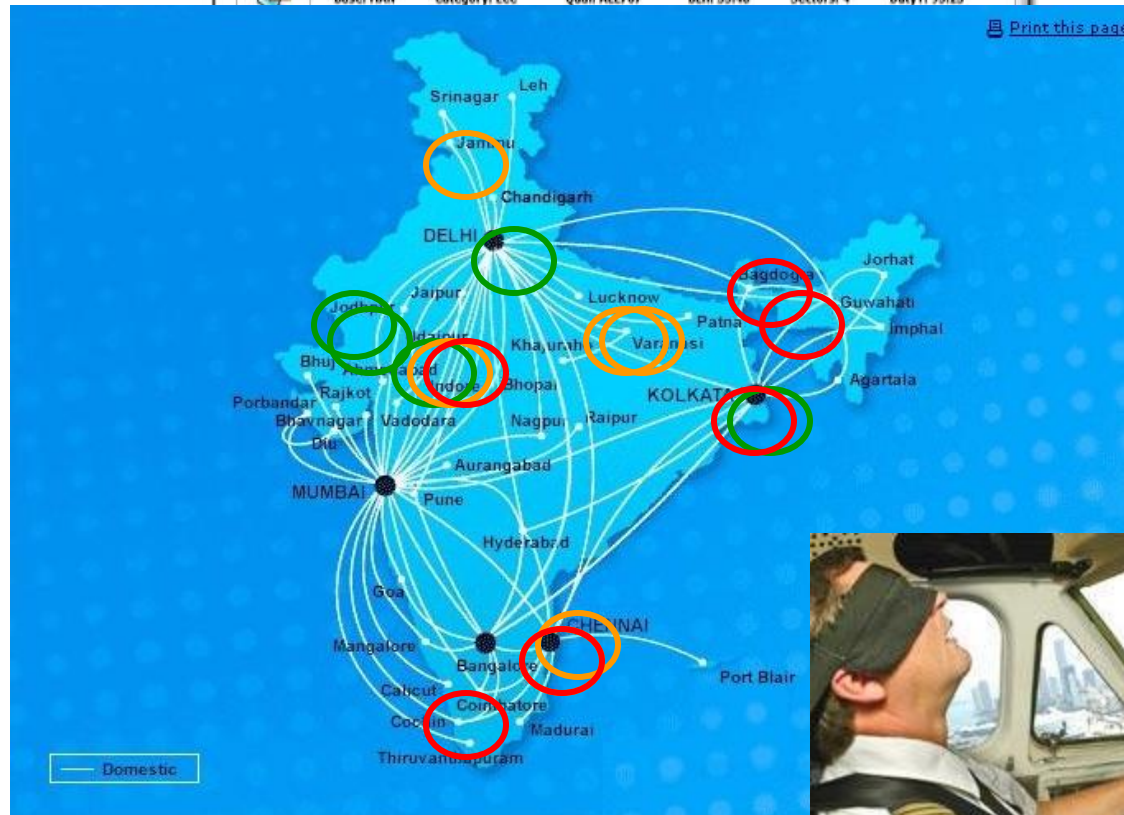


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Crew Roster 01 August 2008 - 31 August 2008

95:23 hrs

Base: MAN Category: LCC Qual: ALL767 BLH: 35:48 Sectors: 4 Duty: 95:23



Day	City	Base	Start	End	Base
Sun 17	CTP	MAN	1500	1600	MAN
	CTA	MAN	0700	0830	MAN
	CTP	MAN	1500	1600	MAN



Scene setting



As we speak, how many flight crews are flying within regulatory limits?

How many of those crews are safely flying within regulatory limits?....