Republic of Indonesia Air Traffic Management Master Plan

Objectives, Priorities and Governance

TECHNICAL REPORT

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REPUBLIC OF INDONESIA AIR TRAFFIC MANAGEMENT MASTER PLAN

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Date: December 2011

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INDONESIA INFRASTRUCTURE INITIATIVE

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Peter Atkins

Jakarta, 12 December 2011

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ACRONYMS AND ABBREVIATIONS

ACC	Area Control Centre
ADS-B	Automatic Dependent Surveillance-Broadcast
ADC	Aerodrome Control(er)
AFTN	Aeronautical Fixed Telecommunications Network
AIDC	Air Traffic Services Inter-Facility Data Communications
AIP	Aeronautical Information Publication
AIM	Aeronautical Information Management
AIS	Aeronautical Information System
AIXM	Aeronautical Information Exchange Model
AMC	Airspace Management Centre
ANSP	Air Navigation Service Provider
AoR	Area of Responsibility
AP 1	Angkasa Pura 1
AP 2	Angkasa Pura 2
APP	Approach
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Services
ATSU	Air Traffic Service Unit
CDM	Collaborative Decision Making
CNS	Communication, Navigation, Surveillance
CPDLC	Controller Pilot Datalink Communication

DGCA	Directorate General of Civil Aviation
EOBT	Estimated off Block Time
eTOD	Electronic Terrain and Obstacle Data
ETD	Estimated Time of Departure
FDO	Flight Data Officer
FIR	Flight Information Region
FL	Flight Level
FMP	Flow Management Position
FMU	Flow Management Unit
FPL	Flight Plan
GIS	Geographic Information Systems
GNSS	Global Navigation Satellite System
ICAO	International Civil Aviation Organisation
IndII	Indonesia Infrastructure Initiative
ISO	International Standards Organisation
JAATS	Jakarta Area Air Traffic Control Service
MAATS	Makassar Area Air Traffic Control Service
MTCD	Medium Term Conflict Detection
MWO	Meteorological Weather Office
NDB	Non Directional Beacon
NOF	NOTAM Office
NOTAM	Notice to Airmen
OCD	Operational Concept Document
PMBOK	Project Management Body of Knowledge
PBN	Performance-Based Navigation
PTF	Permanent Task Force

QMS	Quality Management System
RNAV	Area Navigation
RNP	Required Navigation Performance
RPL	Repetitive Flight Plan
RVSM	Reduced Vertical Separation Minima
SARP	Standards and Recommended Practices
SID	Standard Instrument Departure (procedure)
SMS	Safety Management System
SOP	Standard Operating Procedure
SSG	Strategic Steering Group
STAR	Standard Arrival Route (procedure)
STPI	Sekolah Tinggi Penerbangan Indonesia
SWIM	System Wide Information Management
TMA	Terminal Management Area
UP	Makassar (Ujung Pandang)
VHF	Very High Frequency
WGS-84	World Geodetic Standard (1984)

CHAPTER 1: EXECUTIVE SUMMARY AND RECOMMENDATION

1.1 INTRODUCTION

There is a great deal of change required of the aviation industry in the Republic of Indonesia as a result of growth and other key business drivers.

The AusAID funded Indonesia Infrastructure Initiative (IndII) has funded the provision of an Air Traffic Management (ATM) Master Plan to plan required Communication, Navigation, Surveillance (CNS)/ATM projects and initiatives to accommodate the changes required by the key business drivers. This Plan covers both the Regulator (Directorate General of Civil Aviation [DGCA]) and Air Navigation Service Providers.

This is an important step; however more granularity is required to enable those recommendations to be turned into deliverable work.

As a first step in the implementation process, a series of workshops were held against Master Planning Objectives, the implementation of the International Civil Aviation Organisation (ICAO) flight plan, and data management seminars.

1.2 OVERVIEW

This work was undertaken by PSG Consulting Pty Ltd in November 2011. This report is an output from the workshops, and an analysis of the ATM Master Plan and the workshops.

The ATM Master Plan vision is that of a strategic road map for Indonesia in its development of future ATM. It was prepared in alignment with ICAO Global Plan Initiatives and spans from the present to 2020.

1.3 AIR TRAFFIC MANAGEMENT PLAN

The ATM Master Plan was a first step in the change process. It is both a descriptive and prescriptive document; it documents what is planned and or underway, and what needs to be done.

The ATM Master Plan is constrained in that it does not contain a complete description of all system changes that are underway or that should be done. It does not have sufficient granularity to be able to turn the recommendations into deliverables or work, and it does not have the governance required for change management.

Drivers for change are complex but can be categorised as:

- The need for capacity to meet demand
- Meeting domestic and international regulatory requirements
- Ensuring the highest level of safety
- Modernising technology
- Optimising the delivery of services for the customer

A strategy needs to be in place to deliver the work required, or to manage the change. The strategy is:

- Place the work inside logical groups of deliverables (for example "navigation")
- Establish a governance framework for defining and managing the work
- Proceed with a manageable number of projects as a proof of concept against the agreed governance

In deciding which projects should go ahead, the following guiding principles have been applied:

- Do no harm
- Make opportunity cost choices
- Use accepted methods of change and project management
- Sow the seeds of change for sustainability
- Focus on the achievable in the near term whilst maintaining the strategic guidelines

In order to proceed to the next step (R1) it is **recommended** that the following logical work programs be accepted as the basis for developing and managing work packages against all recommendations inside and outside the Master Plan.

- ATM
    - Flexible use of Airspace
    - Redesign of Airspace
    - Flow Management
- CNS
    - Modern communications backbone
    - Move to satellite-based navigation
    - Integrated ATM solutions including surveillance technologies
- Aerodrome Capacity
    - Review aerodrome layout to improve flow and capacity
    - Review aerodrome procedures including flow

- Data Management
  - Stabilise data and data management
  - Implement Aeronautical Information System (AIS) to Aeronautical Information Management (AIM) plan from the 2010 report funded by CAAT
- Organisational Development
  - Improve HR management
  - Develop business continuity plans
  - Improve organisational performance

It is (R2) **recommended** that the following projects be initiated as meeting the guiding principles.

- **Development of an Operational Concept Document (OCD)**
- **Data and data management**
- **Airspace redesign**

The development of an OCD will establish:

- The current CNS/ATM baseline status
- The future state of CNS/ATM
- The required linkages between recommendations

The development of data management and the beginning of the journey to implement AIM and System Wide Information Management (SWIM) will support the move to modernise the Jakarta Area Air Traffic Control Service (JAATS) and other systems.

Airspace redesign is a response to all the current and anticipated drivers and will support all moves to modernise the JAATS and related CNS/ATM systems.

The implementation of the current and anticipated ATM initiatives is all about change management. Best practice for management, and project management principles call for a different type of governance to manage change. The ICAO Safety Management System documentation[1] requires a specific change management process to manage change to any or all parts of the CNS ATM system.

The current DGCA, Angkasa Pura 1 (AP 1), and Angkasa Pura 2 (AP 2) management structures are not designed to manage the level of change that will be required of them in the future; therefore a different governance paradigm must be adopted in

[1] ICAO Document 9859 Refers.

future for the management of change, and this governance should be put in place on a permanent basis.

It is (R3) **recommended** that the governance consist of multi-disciplined, multi-organisational structures including

- Strategic Steering group consisting of senior executives who manage strategy and direction
- Permanent Task Forces (PTF) that manage the logical groupings of deliverables of work and consist of middle managers
- Project Managers who are responsible to the task forces for the delivery of individual items against the task force plans

1.4 ICAO FLIGHT PLAN IMPLEMENTATION

ICAO decided that the implementation of Amendment 1 of the 15th Edition of PANS-ATM Doc 4444 would be in November 2012. Member States including Indonesia adopted this decision. Considering that implementation time is very critical, Indonesia should be able to show to the surrounding Flight Information Region (FIR) their readiness to meet this obligation.

From the information gathered across DGCA, AP 1 and AP 2 there is the indication that the Task Force is unable to work effectively to achieve the objectives set by the DGCA Steering Committee. In conjunction with the Indonesia Master Plan workshop in Jakarta, IndII added another subject, ICAO Flight Plan Implementation, which confirmed this belief.

It is (R4) recommended that DGCA notify ICAO that it will be unable to comply with the implementation timeframe and, in addition, will provide the ICAO with a realistic timeframe within a reasonable time.

The governance and stakeholder management issues need to be addressed. It is (R5) recommended that the (proposed) Permanent Task Force (PTF) for data should take control over the implementation process and review and develop staging steps to enable compliance with the adopted schedule.

1.5 DATA MANAGEMENT AND QUALITY

Capturing and maintaining the data used in aeronautical applications can be very costly. It is also easy to waste effort and money if the data characteristics (resolution, accuracy, confidence level and integrity) are inappropriate for the particular applications for which the data is required. The primary objective of AIM is improved assurance of safety. The other main objective is ensuring that appropriate data is used (to ensure the level of safety) at minimum cost for the target applications. Achieving

this objective is more difficult in a Performance-Based Navigation (PBN) environment because the applications are variable – simply because, by definition, performance characteristics vary.

The data workshop covered some of the aspects of managing and using aeronautical data. It covered the ICAO requirements, including the reasons for these requirements, for aeronautical data as outlined in the various ICAO Standards and Recommended Practices (SARPs). This was done at a level of detail appropriate for a two-day workshop. The workshops had variable and transitory attendance but the discussion was generally robust and sufficient to discern shortcomings and potential problem areas. These are not in any way unique to DGCA and the other Indonesian aviation agencies – the aviation agencies from many countries suffer similar shortcomings and problems viewed from the perspective of the objectives of AIM. The first step to overcoming these shortcomings and problems is recognising that they exist.

The recommendations that can be made from the fairly brief overview of data management within the Indonesian context are as follows:

The (R6) recommendation is to establish an inter-agency working group to oversee the adoption of data and quality standards across all agencies. Responsibilities of the working group should include:

- Establishing the agency responsible for the custodianship of particular data items
- Adoption of ICAO quality and aeronautical data standards by all agencies
- Oversight of the implementation of common data transfer protocols between custodians and users
- Monitoring of implementation of the above and reporting on progress to the DGCA

CHAPTER 2: INTRODUCTION

2.1 FORWARD

2.1.1 Background

The Indonesian Air Traffic Management (ATM) system and infrastructure is in the process of upgrading its capability within the roles of the Directorate General of Civil Aviation (DGCA). This includes Australian Government assistance by AusAID, delivered by the Indonesia Infrastructure Initiative (IndII).

One of the approved objectives from IndII Phase 1 was the delivery of an ATM Master Plan for the Indonesian DGCA, to allow it to develop capability in response to the emerging requirements of the aviation sector in Indonesia and Asia. In response to this requirement, the ATM Master Plan was a deliverable, assigned to the Swedish consultancy LFV. It contained a large number of recommendations for safety related activities and development of improved infrastructure for the aviation sector. These recommendations were made at a strategic level and contained no detail of the implementation process required to bring the strategic intent to effect.

The recommendations involve action across all Directorates of DGCA and, as such, a strategy for determining priorities and a process for implementation and monitoring progress is now required as the link between the strategy and implementation.

The Master Plan timescales were necessarily broad; these need to be refined and more detail provided by implementation agencies to enable Directorates to plan resourcing and scheduling.

The implementation of the recommendations contained in the ATM Master Plan is an important step in improving the safety of aviation activity in Indonesia by effective and timely development of infrastructure for the aviation sector; however, it is complicated by the fact that in many cases the individual recommendations require implementation activity by two or more Directorates. This will require agreement on responsibilities and resourcing to achieve an efficient and timely implementation of the recommendations.

Other considerations are that the broad nature of the recommendations needs to be distilled into individual components as deliverables. The overall management strategy will also need to be agreed.

2.1.2 Strategy for implementation

In order to begin the implementation of the ATM Master Plan, it was essential to conduct a series of workshops and follow-up meetings where all key stakeholders were informed of the issues and were able to agree on priorities for identified key

components of the infrastructure developments recommended in the Master Plan. Information gathered in the workshops was collated for presentation to DGCA. This information will also assist the DGCA in the issuance of the Ministerial Directive concerning the Master Plan.

2.2 TERMS OF REFERENCE

2.2.1 Workshop To Be Delivered

Against the strategy for delivery, a series of workshops were organised and delivered against the following topics:

1. Master Planning Objectives and Priorities workshop
2. International Civil Aviation Organisation (ICAO) Flight Plan Implementation workshop
3. Data Management workshop and seminar

2.2.2 Master Planning Objectives and Priorities Workshop Deliverables

1. Summarise the Master Plan recommendations and prepare a brief on the main issues and responsibilities for each of the DGCA Directorates.
2. Identify the interdependencies across and between the recommendations and the Directorates.
3. Prepare and lead a two day workshop to:
    - Inform senior DGCA management of the implementation issues
        - Achieve consensus within the DGCA Directorates as to priorities for implementation of the Master Plan recommendations
        - Agree an implementation process, including milestones and reports
        - Identify stakeholders and assign responsibilities for implementation and reporting
        - Identify the resources required for implementation.
        - Identify constraints, assumptions, and exclusions.
        - Determine follow up activities
        - Set an implementation roadmap
4. Document workshop proceedings and key points which were discussed in the workshop, including a stakeholder management plan and project management strategy.

5. Provide inputs, such as what should be included in the Ministerial Decree, the structure, the agencies responsible, and so forth, based on the workshop results, to assist in the development of a Ministerial Decree for Master Plan implementation.

2.2.3 ICAO Flight Plan Implementation Workshop Deliverables

1. Prepare and lead a two-day workshop to develop implementation strategies and system requirements for the new format ICAO flight plan in Indonesia including:
    - Impact on current and future Communication, Navigation, Surveillance (CNS) ATM systems
    - Impact on domestic and international users and customers
    - Aeronautical Information System (AIS) and other documentation requirements
    - Training and education requirements, internal and external
    - Identify (if any) changes required to practices and procedures
    - Identify resources required for implementation
    - Stakeholder engagement
    - Regional coordination
    - Safety management requirements
2. Document workshop proceedings and key points which resulted from the workshop
3. Set an implementation roadmap by documenting workshop proceedings and outcomes within a stakeholder management and communications plan, and project management strategy

2.2.4 Data Management Workshops deliverables

1. Prepare and lead two x two-day workshops of similar content to two small groups of DGCA management and staff to:
    - Set an implementation roadmap by documenting workshop proceedings and outcomes within a stakeholder management and communications plan, and project management strategy
    - Inform representatives of all DGCA Directorates of:
        - International activities and standards for management of aeronautical data.
        - The needs for common processes and standards for collection, use, storage and dissemination of aeronautical data in the DGCA environment

  - Issues for DGCA in the implementation of Electronic Topographical Data (eTOD)
  - The need to adopt quality systems for the management of aeronautical data including ICAO, International Standards Organisation (ISO), and "best practice" processes
  - Safety management system needs
- Determine follow up activities for DGCA Directorates
- Provide DGCA management and staff an understanding of the changing nature of aeronautical data management and the relationship with modern ATM systems
- Provide top level explanations of aeronautical data requirements

2. Document workshop proceedings and key points resulting from this workshop.

2.3 UNDERSTANDING THIS DOCUMENT

2.3.1 Understanding This Document

This document is set out in sections which all address the Terms of Reference.

1. Part A – Executive Summary: This contains a management overview of the total document.
2. Part B Introduction: This contains the purpose of the document, background information, and the terms of reference for the work undertaken.
3. Part C Overview: This contains an analysis of the work undertaken within the workshops and outside the workshops, and includes the general constraints, limitations, and drivers for moving forward on ATM Master Planning.
4. Part D ATM Master Plan Objectives and Priorities: This contains the suggested governance for moving forward on ATM Master Planning, and set of activities and projects that should be undertaken as a priority.
5. Part E ICAO Flight Plan Implementation: This contains specific constraints, limitations, and drivers for the requirement to implement the new ICAO flight plan format and the resultant system impact. It contains specific recommendations for governance and the management of work and issues.
6. Part F Data Management and Quality: This contains the outcome of the workshop and the general constraints, limitations, and drivers for the need for improvement to data quality and management.
7. Part G Attachments: These are the supplementary and/or informative documentation to support the remainder of the report.
8. Part H Annexes: These are supplementary and/or informative but are not required to support the remainder of the report.

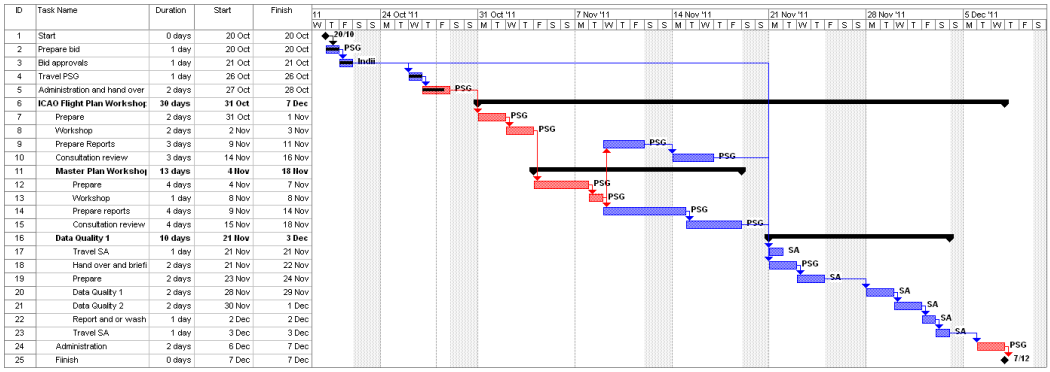
CHAPTER 3: OVERVIEW

3.1 WORK UNDERTAKEN

3.1.1 Work Plan

PSG Consulting was contracted by the Indonesia Infrastructure Initiative (IndII) to undertake the scope of work outlined in Part B of this document. Accordingly, the principal consultant, Peter Atkins, was mobilised from Brisbane Australia to Jakarta on 26 October 2011and provided a work schedule against which all work would be planned and managed (See Figure 1 below).

Figure 1 Original Work Plan



ID	Task Name	Duration	Start	Finish
1	Start	0 days	20 Oct	20 Oct
2	Prepare bid	1 day	20 Oct	20 Oct
3	Bid approvals	1 day	21 Oct	21 Oct
4	Travel PSG	1 day	26 Oct	26 Oct
5	Administration and hand over	2 days	27 Oct	28 Oct
6	**ICAO Flight Plan Worksho**	**30 days**	**31 Oct**	**7 Dec**
7	Prepare	2 days	31 Oct	1 Nov
8	Workshop	2 days	2 Nov	3 Nov
9	Prepare Reports	3 days	9 Nov	11 Nov
10	Consultation review	3 days	14 Nov	16 Nov
11	**Master Plan Worksho**	**13 days**	**4 Nov**	**18 Nov**
12	Prepare	4 days	4 Nov	7 Nov
13	Workshop	1 day	8 Nov	8 Nov
14	Prepare reports	4 days	9 Nov	14 Nov
15	Consultation review	4 days	15 Nov	18 Nov
16	**Data Quality 1**	**10 days**	**21 Nov**	**3 Dec**
17	Travel SA	1 day	21 Nov	21 Nov
18	Hand over and briefi	2 days	21 Nov	22 Nov
19	Prepare	2 days	23 Nov	24 Nov
20	Data Quality 1	2 days	28 Nov	29 Nov
21	Data Quality 2	2 days	30 Nov	1 Dec
22	Report and or wash	1 day	2 Dec	2 Dec
23	Travel SA	1 day	3 Dec	3 Dec
24	Administration	2 days	6 Dec	7 Dec
25	Finish	0 days	7 Dec	7 Dec

3.1.2 Constrains and Limitations

Whilst the work was planned for the optimum effectiveness, it was not expected that IndII and the Directorate General of Civil Aviation (DGCA) would have a problem in the formal approval process for conducting the workshops.

Due to the large number of workshops that were planned outside the scope or knowledge of this project, together with end of year commitments from DGCA, the approval and planning for workshops proved to be problematic and substantially delayed the planned schedule.

3.1.3 Methodology

The work was undertaken under the project management of the principal consultant on site in Jakarta, and located at the IndII offices. Coordination for dates and formal invitation letters for the workshops were undertaken by the AusAID office with the assistance of the IndII office. Formal and informal briefings were undertaken with

DGCA managers to understand the constraints, limitations, and drivers for these workshops.

3.1.4 Resources Used for the Workshop and Reporting

The principal consultant, who was accountable for the overall delivery of the program, was responsible for the planning and delivery of the Air Traffic Management (ATM) Master Plan workshop, as well as the subsequent reporting requirements. Two additional resources were required as follows:

1. Novaro Martodihardjo undertook the primary responsibility for the planning and delivery of the International Civil Aviation Organisation (ICAO) Flight Plan workshop and the subsequent reporting requirements. He is a co-author of this report.
2. John McCarthy undertook the primary responsibility for the planning and delivery of the Data Management workshop and the subsequent reporting requirements. He is a co-author of this report.

3.1.5 Workshops Successfully Undertaken

Notwithstanding the difficulties in conducting workshops at a time when the appropriate audience could be engaged, three successful workshops were undertaken against the contracted scope of work as follows:

Workshop	Purpose	Date Held
1. ATM Master Plan; Objectives and Priorities	Review ATM Master Plan in accordance with contract requirements. This was the primary activity.	11 November, 2011
2. ICAO Flight Planning Implementation Planning	Review the total requirements needed for the implementation of the new ICAO flight plan and report in accordance with contract requirements.	21 November, 2011
3. Data Management Workshop	Provide an interactive workshop and seminar on the need for, and techniques and standards for, modern data management. Report in accordance with contract requirements.	22 – 23 November, 2011

Note that only one data management workshop was undertaken. This was with the approval of IndII, after considering the time constraints of both the contractors and the DGCA and Angkasa Pura 1 (AP 1)/AP 2 staff.

3.2 OVERVIEW OF THE ATM MASTER PLAN

3.2.1 Background

The ATM Master Plan was an initiative of IndII after a request from DGCA for assistance in the future planning of ATM. After a substantial competitive tendering process, LFV Aviation Consulting (AB) was chosen as the successful bid.

The need for a new ATM Master was identified by LFV as follows;

> *(This) Master Plan document is expected to constitute a strategic road map for Indonesia in its development of future ATM.*
>
> *The need for a new ATM MP is driven by a number of factors, not least the fact that the current one is from 1994 and lacks recurrent updates. ICAO Global Plan Initiatives (GPI), other strategic policy documents, growing air traffic, technological progress and gradual liberalisation of civil aviation combine to further increase the need. There are also severe limitations in the present ATM system, getting gradually more pronounced as traffic grows.*

The planning project began in late 2010 and completed in early 2011, with the final report being presented to stakeholders in 2011.

3.2.2 ATM Master Plan Vision

The introduction to the ATM Master Plan contains the following vision:

> *(This) Master Plan document is expected to constitute a vehicle and a strategic road map for Indonesia in its development of future ATM. It is one in a sequence of related foundation documents and will replace the previous ATM Master Plan from 1994 Many activities from the predecessor are not yet implemented and if still valid, they have been retained in this updated plan. The document has a special focus on how operational procedures and technologies comply with current ICAO Global Plan Initiatives (GPI) and other strategic ICAO documents. Current achievements are reflected in order to form a starting point for the evolutionary implementation of the ATM concept components towards the more visionary ICAO-2025-and-beyond concept. Some domains need however urgent actions and are described in the Short Term Recommendations of each chapter.*

CHAPTER 4: ATM MASTER PLAN

4.1 INTRODUCTION

4.1.1 The Vision and a Need to Move Forward

The Republic of Indonesia is undergoing rapid changes in the dynamics surrounding the aviation industry. These drivers for change need to be understood, and then both a top down and bottom up approach to the management of change will need to occur to successfully integrate all the requirements of the stakeholders for the industry. Those drivers are analysed in some detail below.

In addition, there are many reports, plans and audit findings that have occurred over the previous five years, many of which have not seen fruition, due to many circumstances. The most striking of these is the lack of clarity of a single vision that integrates all of these recommendations and changes into one single document.

The Air Traffic Management (ATM) Master Plan was a necessary first step in the process of bringing about a planning framework to harmonise and integrate all modernisation and change management that is required as a result of both drivers for change and in meeting acceptable performance standards.

The vision needs to have added granularity in order to move from planning to implementation. This section of the report is that step in that it provides the tools and structures required to enable change to occur.

4.1.2 Characteristics of the ATM Master Plan

An analysis of the ATM Master Plan shows it has the following characteristics.

- It is both a descriptive document and a prescriptive document. Some actions and recommendations are already planned, whilst the consultants prescribe recommendations that are not already planned by the Directorate General of Civil Aviation (DGCA).
- Notwithstanding the coverage of the ATM Master Plan, there are other operational and organisational factors that require a parallel consideration as a part of the need to modernise the Communication, Navigation, Surveillance (CNS)/ATM system, as well as meet the future requirements.
- It does not have the granularity required to identify the work that needs to be undertaken to implement the recommendations or the mechanisms and governance required for effective change management.
- It contains no mechanism to review and renew itself over time in line with quality principles.

The above characteristics should not been perceived in a pejorative way, as it is simply the nature of an initial strategic document.

4.1.3 Drivers for Change Identified Within the Plan

The ATM Master Plan contains sufficient justification for its own recommendations, notwithstanding that they cannot be considered complete or fully inclusive.

The ATM Master Plan identifies the following drivers for change:

- Airspace management is hampered by rigid sectorisation and route structure
- Air Traffic Flow Management (ATFM) is performed in a haphazard manner as no national or regional ATFM unit is established
- Air Traffic Control (ATC) capacity is fully utilised at some airports, Area Control Centres (ACC) and approach sectors
- Capabilities of modern aircraft are not fully utilised by the ATM system

4.1.4 Business and System Level Drivers for Change Within CNS/ATM.

Notwithstanding the stated operational imperative for the recommendations within the ATM Master Plan, there are universal drivers and factors at a business and/or system level for current and future requirements. These can be summarised as follows;

- Sufficient capacity to meet current and future demand
- Meeting domestic and international regulatory obligations
- Assisting in meeting organisational and national emission targets
- Ensuring the highest level of safety possible
- Modernising technology to meet the customer's requirements and to improve overall CNS/ATM infrastructure
- Optimise delivery of service with all stakeholders

4.2 STRATEGY FOR IMPLEMENTATION

4.2.1 Taking Recommendations Into Logical Work Programs

As indicated earlier in this document, the recommendations provided within the ATM Master Plan are not in a suitable format to enable the transition from the strategic response into a format that is suitable to scope a work program. This is a necessary first step in the link between specifying a strategic response to the business and system

environment and delivering a program of work to enable or enact those recommendations.

The recommendations contained in the ATM Master Plan have been summarised below against a summary objective. That is, the outcome has now been specified before the recommended action. This allows a grouping of recommendations with internal dependencies into a scope of work against that summary objective. It is an attempt to "project-ise" the work. Further definition of these logical objectives is contained within both the recommended priority initiatives later this document, and within the overall governance framework for initiation and management of work.

4.2.2 Governance of the Work Programs

The need for effective change management is established within International Civil Aviation Organisation (ICAO) SMS requirements. The guidelines for establishing a SMS are contained within ICAO Document 9859. These requirements specify that organisations must establish a process for change management. Given the changes that are required for achieving the objectives within the ATM Master Plan, it is essential that the tools and structures for change be made available to DGCA and Angkasa Pura 1 (AP 1)/Angkasa Pura 2 (AP 2) to ensure change can be achieved in a safe and efficient manner. In this case, the following tools are provided in this document:

- Guiding principles by which the program will be run
- Strategy for aligning recommendations into work programs
- Governance structures for managing across divisional or organisational boundaries
- Methodology and procedures for work

4.2.3 Guiding Principles for Implementation

The following guiding principles are provided as a framework for the strategy and governance arrangements for the implementation of the ATM Master Plan.

- Do no harm. Some logical objectives and or individual recommendations are secondary in nature as they rely on decisions and outcomes not yet achieved. Accordingly, only those things that can be undertaken immediately and not cause resultant problems in other areas should, as far as practicable, be undertaken immediately.
- Make opportunity costing choices. Strategies and projects should be chosen on the basis that they enable the remainder of the work to be undertaken and thereby provide the best opportunity cost choice.

- Utilise the principles of change and project management. Programs and initiatives should choose strategies for implementation that provide exit strategies by establishing self-sustaining systems.
- Sow the seeds of change. Programs and initiatives should choose implementation strategies that create future leaders and champions for change management.
- Whilst it is essential to maintain a strategic view of the future, it is also essential to focus on what is achievable in the near term as a basis for project selection and planning.

4.2.4 Implementation Strategies

It is clear that moving into implementation of all of the recommendations is not realistic. It is complicated by the knowledge that the ATM Master Plan is not inclusive of all CNS/ATM and organisational plans and requirements; therefore, it is important to bring further granularity and control over the ATM Master Plan and other requirements and, at the same time, engage in a strategy of selective works delivery in a way that meets the guiding principles set out above. Accordingly, the following strategy is (R3) **recommended**.

1. Establish logical work packages that contain work with internal dependencies and similar external interdependencies. For example, communication systems. These work programs can then be managed in a way that delivers individual projects against the overall scope of work.
2. Establish a governance framework for the management of change. This framework should consist of the following:
    - The senior executives at DGCA, AP 1, and AP 2 should convene as a Strategic Steering Group (SSG) to develop and manage the overall baseline against a concept of operations
    - A number of permanent cross divisional and organisational task forces should be established at a middle management level to manage the logical work packages
    - Individual accountabilities for the delivery of individual projects within the program of work
    - Terms of reference and Standard Operating Procedures (SOP) that capture the principles of change management and project management
    - A capital works program that integrates all of the development work in DGCA, AP1 and AP2, but does not detract from the individual independence of those organisations
3. Choose a manageable number of projects to proceed under the new governance arrangements. These projects should be chosen against the criteria provided in “guiding principles” above.

4. Develop a top level project to develop the baseline and concept for the future, train and embed the principles of change management with participating staff, and act as a "prototype" for all other work against the governance.

The detail of the governance and the program arrangements are contained in subsequent sections and attachments.

4.3 MASTER PLAN RECOMMENDATIONS

4.3.1 Introduction

As discussed earlier in this document, there are constraints that limit both the scope of the ATM Master Plan and the need for greater granularity in placing the recommendations into management work programs. Accordingly, and in accordance with the implementation strategy recommended above, the individual recommendations have been placed in the logical work programs, against which the governance can be applied. The logical work programs have been chosen as they represent a view on the way the CNS/ATM system can be deconstructed. Other views are just as valid. What is important is that recommendations are articulated into work. The logical programs are as follows.

- ATM
- Communication, Navigation and Surveillance
- Aerodrome Capacity
- Data
- Organisation

It is (R1) **recommended** that the following logical work programs be adopted to assist the management of ATM Master Plan initiatives.

4.3.2 Air Traffic Management

The following recommendations relating to ATM have been summarised against the following logical objectives and are both a summary of and an interpretation of the ATM Master Plan content.

Summary Program	Recommendations	Drivers	Interdependencies
Flexible use of Airspace	1. Implement a High Level body of DGCA and Military Counterparts 2. Implement a first step of the Flexible Use of Airspace concept 3. Introduce an Airspace Management Centre (AMC) function for Indonesia for pre-tactical airspace 4. Direct speech between ACC and Military counterparts 8. Update Aeronautical Information Publication (AIP) to include Reduced Vertical Separation Minima (RVSM) status 9. Presentation of RVSM status in ATC system	Capacity Customer Emissions	▪ This is enabling activity for a post-Jakarta Area Air Traffic Control Service (JAATS) airspace and may not be essential in the short term
Redesign of air routes and airspace	11. Review airspace classes with regard to forecast traffic growth 12. Review the requirement for airspace class B categorisation 13. Review the division of Flight Level (FL) 245 between class A and G airspace 14. Review and adapt number of Flight Service Sectors 15. Review and adapt ACC/Approach (APP) sector design 16. Review the airspace classification based on user needs 17. Establish a Change Manual for airspace process 18. Establish a process to review the requirement of future routes 19. Review current airspace design and develop an airspace plan 20. Establish prioritised Performance-Based Navigation (PBN) routes according to user requirements	Capacity Technology Safety Emissions	▪ Required to improve capacity and reduce emissions ▪ Needs to be complete to enable new CNS – e.g. JAATS replacement

Summary Program	Recommendations	Drivers	Interdependencies
	21.Implement one-way route structure 22. Select ATS Route Designators according to ICAO 27. Regulation of aircraft capabilities to be PBN and Automatic Dependent Surveillance-Broadcast (ADS-B) approved 28. Improve Collaborative Decision Making (CDM)concerning airspace 31. Review Standard Instrument Departure (SID)/Standard Arrival Route (STAR) requirements for major airports		
Develop and implement improved flow management solution	35.Determination of sector capacity values 36. Development of a Flow Management Position (FMP) Handbook 37. Implement FMP, interim solution 38. Plan for a permanent solution of FMP/AMC positions 39. Sector demand presentations of ACC and main APP sectors 40. Survey and development activities of future ACC sectorisations 41. Sector and capacity definition criteria 42. Sector load prediction	Emissions Technology Capacity	▪ Planning required for future CNS solution, unknown requirement without more information

4.3.3 Communication, Navigation and Surveillance

The following recommendations have been summarised against the following logical objectives, and are both a summary of and an interpretation of the ATM Master Plan content.

Summary Program	Recommendations	Drivers	Interdependencies
Plan and deploy and maintain a modern communications system	45.Communication operational concept 46.Communication maintenance plan 47.Improved VHF coverage in eastern Indonesia 48. Use of DOC 4444 messages 49. ATN network 1 50. Communication monitoring 51. AMHS implementation 52. Use of Controller Pilot Datalink Communication (CPDLC) 57. Implement Air Traffic Services Inter-Facility Data Communications (AIDC) 58. Use of AIDC for ACC	Technology Safety	• Primary requirement for improved navigation and surveillance. • Improvements required in Eastern RI for safety and service in the short term.
Move to satellite based navigation where possible or practicable.	60.Conventional navigation structure 61. Implement augmentation 62. Implement standardized in-and outbound procedures 63. Develop regulation for the use of augmented Global Navigation Satellite System (GNSS) 64.Implement augmented GNSS step 1 66.Review use of conventional ground navigation aids 67. Navigation operational concept 68. Navigation maintenance plan 69. Calibration procedures plan 70. World Geodetic Standard (1984) (WGS-84) validation, publication and amendments 71. Start of Non Directional Beacon (NDB) phase out	Capacity Emissions Technology	• This is an enabler for airspace changes. • Will contribute to reductions in emissions • Meets customers requirements of their technology

Summary Program	Recommendations	Drivers	Interdependencies
Implement a single Air Traffic Management solution including a JAATS replacement and other advanced surveillance solutions	74.Surveillance operational concept 75. Operational Manual 76. Surveillance maintenance plan 77.Sharing of surveillance information 78.Objective for surveillance coverage 79. Declare operational separation criteria 80. Radar fall-back 81. Replacement of JAATS 82. Wide Area Multilateration for en route and Terminal Management Area (TMA) 83. Sharing of ATM data 84. Airport Multilateration to support surveillance function 86. Develop integrated SID/STAR trajectories 89. Safety net Jakarta ACC 90. Safety nets Ujung Pandang (UP) ACC 91. Planning tool Medium Term Conflict Detection MTCD 92. Sequencing tool	Technology Capacity Stakeholder Regulation	• Single ATM solution reduced cost for stakeholders • JAATS upgraded required – note previous linkages. • This set of recommendations relies on most of other recommendations; they are enablers for this • Facilitates single Air Navigation Service Provider (ANSP)
Manage aerodrome layout to improve traffic flow	95. Review aerodrome design for Indonesian airports 96. Establish forum with airport, ATM and airspace users 97. Establish a road map for capacity enhancement 98. Implement capacity enhancing activities 101. Runway throughput modelling 102. Runway/taxiway architecture 103. Aerodrome Control (ADC) procedures	Capacity Emissions	• Essential for aerodromes approaching capacity. • Contributes to the efficiencies of a new CNS ATM system. • Latent contribution to emission savings.

Summary Program	Recommendations	Drivers	Interdependencies
	105. Dedicated Air Traffic Control Ground positions 106. Proper safety training 107. Sufficient Security 108. Increase surveillance capability 109. Analyse need for a Departure Manager function		

4.3.4 Management of Data

The following recommendations have been summarised against the following logical objectives, and are both a summary of and an interpretation of the ATM Master Plan content.

Summary Program	Recommendations	Drivers	Interdependencies
Stabilise data and introduce system wide data information management	113. Transition from Aeronautical Information System (AIS) to Aeronautical Information Management (AIM) 114. Improved submission and distribution of Flight Plans 115. Flight Plan (FPL) prior submission time 10. Reduce the use of Repetitive Flight Plans (RPL) 116 FPL Training process 117. ICAO New Flight Plan Implementation 2012 118. AIS/ATC communication with associated Meteorological Weather Office (MWO) 119. Web-based AIP, Notice to Airmen (NOTAM), AIC and AIP Supplement 122. Jakarta & UP ACC communication with associated MWO	Technology Emissions Regulation Customer Safety Capacity	• Essential for CNS/ATM initiatives including flow, airspace, and new CNS/ATM • Future Flow concepts require reorganisation of data management. • Data management improvements required for AIP • Changed dynamic data usage.

Summary Program	Recommendations	Drivers	Interdependencies
AIS to AIM plan	There is an existing AIS to AIM roadmap – requires a project to initiate.	Technology Emissions Regulation Customer Safety Capacity	• Integral part of the overall data management requirement

4.3.5 Organisation and Staffing

The following recommendations have been summarised against the following logical objectives, and are both a summary of and an interpretation of the ATM Master Plan content.

Summary Program	Recommendations	Drivers	Interdependencies
Human Resource Management	143. Working conditions 144. Training of ATM staff 145. Air Traffic Control Officer (ATCO), AIS, Flight Data Officer (FDO) and engineers staffing plans 146. Continued training	Safety Stakeholder Regulation Capacity	• Improved Quality Management System (QMS) and SMS for organisation. • New skills are required for new systems and new procedures.
Business Continuity	147. Contingency plan for Jakarta and UP ACC/APP/ADC 148. Contingency plans for major APP/ADC 149. Plan contingency facilities in Jakarta and UP Area of Responsibility (AoR) 150. Define sector capacity in contingency situations 151. Interim life extension for JAATS	Safety Technology Regulation	• Required for integrated CNS ATM solution. • SMS – risk reduction.

Summary Program	Recommendations	Drivers	Interdependencies
Improved Organisational Performance	153. Implement customer orientation 154. Implement a structured working method in the organisation 155. System for deviation reports and improvements suggestions 156. Implement a structured way for follow ups and audits 157. Certify QMS 158. Enhance the QMS 159. Establish a Flight Safety Policy for single ANSP	Safety Regulation Capacity Customer	• Improved QMS and SMS for the organisation. • Improvements in compliance. • This is an outcome that would be expected from a single ANSP.

4.3.6 Analysis

It should be noted that the recommendations above are not complete. Whilst it is necessary to have a long-term vision, this cannot have a reliable level of granularity as the technology and other drivers cannot be predicted. Given that, the focus is on what to proceed with within a normal business cycle of one to three years, and long-term recommendations have not been included.

In addition and as previously indicated, the recommendations are not complete, as they do not contain all of the planned or required initiatives to move from current state and into a future state. The Plan accomplishes its mission successfully as a vehicle for initiation of change as it contains those initiatives and requirements that are planned, those that are underway, and those that have been identified by the consultants.

Therefore there are now three requirements to bring further granularity to the ATM Master Plan and to move from a state of "recommending" to "doing" and enabling change.

1. Establish current baseline status of the complete airways "system"
2. Establish the future system state by way of scenario development at five yearly increments, based on understood drivers for change
3. Prioritise, fund and enable those recommendations that move from current state to future state; that is, manage the change

In order to do this, the governance and tools that are outlined above need to be put in place. The alternative is a continuation of uncoordinated implementation of systems with the resultant expense and delays that are associated with remediating deficiencies after the event.

4.4 GOVERNANCE FOR CHANGE MANAGEMENT

4.4.1 Overview

In addition to the normal line management responsibilities for managers is the accountability to participate in the management of change and change initiatives. This requires the establishment of organisational structures that cross divisional boundaries and enable coordination of different elements of change. For example, the floor space required for a new JAATS is a function of the number of sectors, which in turn is a function of the airspace and traffic.

The governance required in establishing the implementation strategies outlined in previous chapters is provided within this section and associated attachments.

A formal management system needs to be in place to manage the changes required in DGCA, AP 1 and AP 2. There are a number of reasons for this requirement.

1. Effectiveness and efficiency. If change is managed in advance, the results may not always be as predicted but it has been demonstrated that this is better than not planning and not managing the change. The cost of remediating system deficiencies and failures due to poor planning is always a quantum greater than investing or "front loading" prior to implementation.
2. Safety. In summary, change management governance is required to be compliant with ICAO Document 9859 (Safety Management System Manual) which states that;

   > *Change can introduce new hazards, impact the appropriateness of existing safety risk mitigation strategies and/or impact the effectiveness of existing safety risk mitigation strategies. Changes may be external to the organization, or internal. Examples of external changes include changes in regulatory requirements, changes in security requirements, and reorganization of air traffic control. Examples of internal changes include management changes, new equipment and new procedures*[2].

3. Stakeholder management. Unless all stakeholders are involved or consulted, there are usually unintended organisational responses and manoeuvring that may place the change at some risk.

It is (R3) **recommended** that the following governance be implemented.

[2] Refer ICAO Document 9859 Chapter 9.8.2

4.4.2 Establishment of the Strategic Steering Group

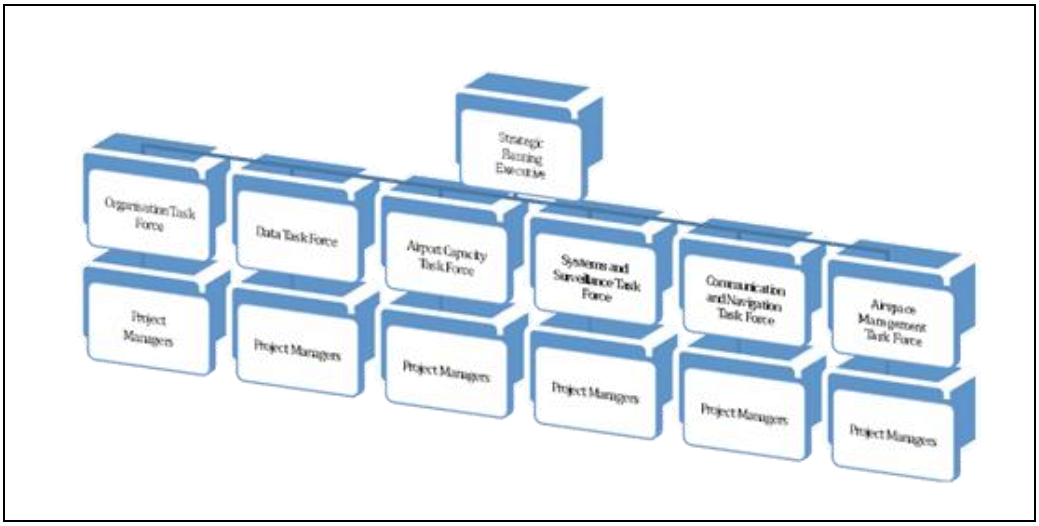
At the top level of the change management governance is the need for the Directors at DGCA, together with the senior executives of AP1, AP2, and Sekolah Tinggi Penerbanagan Indonesia (STPI) Curug to establish a permanent SSG.

In summary, the SSG would be responsible for the establishment, maintenance and enablement of the Strategic Plan for ATM (ATM Master Plan and Concept Document). It would do this by:

1. Developing an operational concept for ATM
2. Establishing a coordinated capital work program
3. Maintaining the ATM Master Plan and Operational Concept Document (OCD)
4. Devolving accountability for specific initiatives and projects to the Permanent Task Forces (PTF) to manage
5. Meeting regularly to address issues and risks

A diagram of the relationships is provided below in Figure 2

Figure 2 Change Management Structure



4.4.3 Permanent Task Forces

The DGCA currently uses the functions of temporary task forces to enable change management across divisions. An example of this is the current ICAO Flight Plan implementation task force.

The terms of reference for these task forces change and they exist only whilst the particular change or project is underway. What is needed is the further development of

this idea to address the permanent nature of change. PTFs should address the logical work groupings that have been identified earlier in this report and take accountability from the SSG for their delivery. PTFs should be appointed to take accountability for:

- Data Management
- Airspace Design and Management
- Aerodrome Capacity
- Communications
- Surveillance and Navigation, and
- Organisation

As an example, an "Airspace Design and Management" task force would take accountability for initiatives such as revising airspace across the whole spectrum of Indonesian airspace.

These permanent task forces would be made up of Sub Directors from DGCA, and middle level executives from AP1, AP2, and STPI Curug and would be accountable for:

1. Delivery of specific programs and projects endorsed by the SSG
2. Maintenance of project and program plans across divisions and organisations
3. Devolving single points of accountability to project managers for delivery of specific items or projects in accordance with the plans
4. Meeting regularly to update progress against current plans and to resolve issues and risks

Draft Terms of Reference for the PTFs are provided in Attachment 2.

4.4.4 Project Management

Whilst duty statements do contain individual accountabilities for functions within DGCA and AP1/2, this is not sufficient singularity or granularity to ensure the delivery of change management initiatives. For this to occur, individuals should be made accountable to the PTFs for the delivery of scopes of work against the overall program or project. These individuals would be accountable for:

1. Identification, coordination and reporting against all activities in any division or organisation that forms a part of the change management initiative or project
2. Use of project and change management methods and tools
3. Identification and resolution of issues and risks

There are well established project management methodologies and processes and an outline of the skills required can be found in the Project Management Body of Knowledge (PMBOK).

4.5 ESTABLISH WORK PROGRAMS

4.5.1 Introduction

Given that a strategic direction has been agreed to and documented within the ATM Master Plan and Operational Concept Documentation, there remains a requirement to have a centralised view of work programs planned and underway. Each organisation, quite properly, has a need to plan and implement capital work independently of other organisations; however, without visibility and coordination, current issues of implementation control over a strategic intent will continue. The solution to this is the establishment and maintenance of a central capital works program within the framework of the ATM Master Plan and the Operational Concept.

4.5.2 Capital Work Program

A central capital works program is the next level down in the documentation hierarchy to the ATM Master Plan and the OCD. A capital works plan would show the status of each project or initiative, and provide information relating to funding, priority and the resources assigned to the task. The SSG would be responsible for this program and would endorse projects going ahead based on their need in terms of the ATM Master Plan and the Operational Concept. This would ensure that projects and programs do not overuse valuable resources and that their dependencies on one another are recognised. For example, there needs to be a review of airspace prior to re-sectorisation, and this needs to be a coordinated activity across AP 1/2 and DGCA.

4.6 RECOMMENDED ACTIVITIES AND PRIORITIES

4.6.1 Introduction

There is a need to proceed with the implementation of ATM Master Plan initiatives. Previous sections outline the guiding principles that should be followed in proceeding. In summary:

- Do no harm
- Use opportunity cost initiatives
- Utilise change management tools
- Sow the seeds of change in the organisation
- Focus on what is achievable

Accordingly, this section applies the guiding principles to the ATM Master Plan and offers the following activities as suitable projects for initiation in the near term.

4.6.2 Recommended Projects for Immediate Initiation

The ATM Master plan offers a roadmap but it offers no prioritisation, nor any governance on how the activities should be undertaken, that is it contains no change management methodology. This document has offered the analysis and methodology for change. In order to begin the process of putting some of these initiatives into action, the following key enabling projects are (R2) **recommended** for immediate initiation:

1. Develop an Operational Concept Document
2. Implement the AIS to AIM Roadmap project
3. Restructure Airspace and Air Routes

4.6.3 Develop an Operational Concept Document

This report has recommended further granularity to support a holistic approach to change management and that the focus of this should be the development of an OCD. The purpose of the OCD is to describe the scope of CNS and ATM services required to meet the current and forecasted requirements of all airspace users in a cost-effective, low-emission, and flexible manner. The OCD should contain an “as is” or current state analysis, target CNS/ATM state for the first five years, and selected strategies and initiatives in order to meet those targets. The OCD should be sponsored and owned by the SSG and subject to yearly review and update in much the same manner that commercial organisations reset business plans. A provisional project brief is provided below.

4.6.4 Operational Concept Project Brief

The OCD project will provide DGCA, AP 1, AP 2, and STPI Curug with an OCD. It will do this by:

- Utilising a select team of local staff
    - Physically located apart from their current jobs and in a neutral environment to foster new ways of thinking about change and systems
    - Selected as future ambassadors for change when they finalise the project and return to their organisations. This provides sustainability and an exit strategy if required
- Utilising the change management governance outlined in this document
- Utilising mentoring by senior consultants versed in change management and the development of strategic documents including OCD
- Reviewing current state by:

- Undertaking a review of ATM Master Plan traffic and airspace user assumptions to endorse validity
- Reviewing all drivers for change to ascertain their impact on future CNS/ATM systems
- Interviewing key stakeholders in and outside the sponsor organisations to ascertain their expectations and requirements
- Auditing and documenting all CNS/ATM facilities and assets and their status

- Developing a five and 10 year target concept "scenario"
  - Describing the traffic, airspace management and volumes, and air routes
  - Specifying CNS performance outcomes to service those needs
  - Providing business continuity and disaster recovery strategies
- Developing a draft Capital Work Program based on the OCD as developed within this scope of work:
  - Selecting project and programs from inside and outside the ATM Master Plan to enable the change from current state to future state
  - Prioritising the projects and programs to change from current to future state
  - Identifying risk and issues in moving from current to future state

4.6.5 AIS to AIM Roadmap

This document has recommended improved data and data management systems based on the current and future needs of CNS systems as well as other drivers including safety. The overall view of this is a System Wide Information Management (SWIM) approach where all aeronautical data including surveillance and flight data is integrated. One of the major aspects of this data management approach is the move from AIS to AIM. The ICAO documents describe the objective of the future ATM network as follows:

> *"For all phases of flight, to enable the safe, economic, expeditious and orderly flow of traffic through the provision of ATM services which are adaptable and scalable to the requirements of all users".* [3]

This service needs to be met in a cost-effective way, be globally inter-operable, operate to uniform principles, be environmentally sustainable and satisfy national security requirements.

[3] ICAO AIS to AIM Global Roadmap

One key enabler of the ATM system is interoperability. It is essential that the new definition of aeronautical data be provided in a common, system and platform independent format (or a set of harmonised formats) within a virtual information management system. The objective is to ensure consistency, authenticity and appropriate coverage of the data, and to provide accessibility to the data by all users of the ATM network, both on the ground and in the air. The enlarged scope of Aeronautical Information Management (AIM) includes all categories of information required to support the new ATM system.

4.6.6 AIS to AIM Project Brief

The AIS to AIM project will provide DGCA with the "phase one" of the ICAO roadmap for transitioning from AIS to AIM. This will provide a platform for future system integration as well as data integration and will support the integration of the current diverse number of systems supporting AIS. It will do this by:

- Improving the quality, integrity and reliability of data:
  - Establish training and awareness of data owner and data custodian accountabilities
  - Review and map data and cleanse data
  - Transfer the data over time into an enhanced centralised database suitable for including all dynamic and static aeronautical data including Aeronautical Information Exchange Model (AIXM) databases
  - Aggregate, validate, and ensure a publication of all outstanding AC, AIC and or AIP supplements into the permanent AIP by the use of improved technology and improved processes
- Re-engineering AIS and other data centric processes:
  - Review and finalise the CASR 175 and participate as required in other regulatory reviews
  - Review and implement the AIS Quality Manual provided within the CAAT report (2010)
  - Review and adopt the European SOPs for AIP production and the NOTAM Office (NOF), train staff, and adjust and publish any ancillary staff instructions
  - Select an appropriate works management format and tool, train and implement including processes and stakeholder management and training regarding data accountabilities
- Developing appropriate organisational structures, and training and performance management, and ensuring current staff are appropriately licensed and trained:
  - AIS staff are positioned within an organisational structure that uses product focused teams
  - Provide a career path for staff

- A Quality Manager is established to implement and run the QMS for AIS including the function of audit and regulation
- The NOF is transferred to the service provider

4.6.7 Restructure Airspace and Air Routes

The ATM Master Plan has many initiatives and recommendations that either directly or indirectly indicate that a review of the management of all airspace volumes is required. Key drivers for this include the following:

- The growth and change in traffic within the Republic of Indonesia is dramatic. Current routes and structures are still based on terrestrial navigation systems and will not cope with future growth.
- Technology now allows aircraft to adopt Performance-Based Navigation techniques and the resultant specialised procedures require a review of airspace volumes.
- There are targets for emission reductions that must be adopted. These can only be achieved by reducing flight times and by track "smoothing". Whilst flow control plays a major part in this, air routes, SIDs and STARs also contribute in a major way to reducing emissions.
- New ATM facilities at Jakarta will mean that better use can be made of the airspace that is available. To take advantage of this, air routes and airspace volumes need to be revised. This revision will also assist in specifying the size and capability for any new system.
- There is a need and a commitment to harmonise the air route structure with Indonesia's neighbouring states.
- Aerodromes and air routes have specific and different drivers and constraints; however they are interdependent and must work in harmony, and so any review or change to one must mean a change in the other.

4.6.8 Project Brief – Restructure Airspace and Air Routes

The Airspace and Air Route project will provide DGCA, AP1 and AP2 with an integrated airspace volume that can accommodate the growth in traffic, move towards satellite-based navigation systems and support for legacy terrestrial navigation systems. It will be accountable for delivery of the airspace and airspace management recommendations within the ATM Master Plan, and in accordance with the (future) OCD. It will do this by;

- Revising the air route structure within the Indonesian Flight Information Regions (FIRs)
  - Utilising the current and future state analysis for traffic flows and numbers that are evident in the OCD

  - Coordinating with adjacent states and with ICAO to either participate in a joint effort or to establish boundary constraints
  - Reviewing airspace management arrangements with other agencies including the military
  - Coordinating closely with SIDS/STARS (sub project below) for seamless flows into and out of terminal areas
  - Providing harmonised air routes that accommodate the current navigation technologies and future technologies. This means PBN for the more sophisticated customers, in addition to air routes to accommodate traffic without sophisticated navigation equipment
- Reviewing and or developing terminal area procedures
  - Revised SIDs and STARs in concert with new air route structures
  - GNSS – Required Navigation Performance (RNP) non precision approaches
  - PBN Precision approaches
- Reviewing levels of service
  - Reviewing current and future traffic levels for safety and service
  - Ensuring changes to airspace classifications are serviced by appropriate CNS/ATM facilities
  - Developing sector load criteria
  - Re-sectorising airspace volumes based on new air route structures and or levels of service
- Stakeholder Management
  - Training and educating staff and stakeholders
  - Maintaining continuous communications with core airspace users
  - Maintaining continuous communications with ICAO and airspace users and representative organisations and the military

CHAPTER 5: ICAO FLIGHT PLAN IMPLEMENTATION

5.1 INTRODUCTION

5.1.1 Background

The International Civil Aviation Organisation (ICAO) decided that the implementation of Amendment 1 of the 15th Edition of PANS-ATM Doc 4444 will be on 15 November, 2012. This decision has been adopted by Member States including Indonesia.

Adoption of the amendment involves a major role for ATM provisions in the modification of flight plan format and Air Traffic Services (ATS) messages.

To avoid a major catastrophic situation, it is necessary to phase implementation from the present to new flight plan format as follows:

- Phase 1. 1 January to 31 March, 2012, Air Navigation Service Providers (ANSP) software delivery and internal testing
- Phase 2. 1 April to 30 June, 2012, ANSP's external testing and implementation
- Phase3. 1 July to 15 November, 2012 airspace users testing and implementation

Considering that implementation time is very critical, Indonesia should be able to show to the surrounding Flight Information Region (FIR) their readiness to meet this international obligation.

5.1.2 Flight Plan Workshop

To anticipate amendment implementation, several activities had taken place, including the establishment of Indonesia flight plan format task force, which consists of the Directorate General of Civil Aviation (DGCA), AP I, AP II under DGCA Steering Committee.

From the information gathered across DGCA, AP I and AP II, there are indications that the task force is unable to work effectively to achieve the objectives set by DGCA Steering Committee.

In conjunction with the Indonesia Master Plan workshop in Jakarta, the Indonesia Infrastructure Initiative (IndII) added a workshop on ICAO Flight Plan Implementation.

The workshop objectives were to review existing flight plan processing and identify issues that should be resolved before the implementation date for the new format. The workshop objectives also included assisting the Task Force to improve their planning

and implementation initiatives for the flight plan implementation and other related issues.

The workshop was conducted on 21 November, 2011. The participants were selected from Flight Plan Task Force members, and are listed in the following table.

5.1.3 Flight Plan Workshop Attendees

The following staff attended the ICAO Flight Plan workshop.

Name	Institution	Telephone
Suhartato	ATM System Manager - AP II	021-5506149
Nurhasan	ATS Standard Manager - AP II	021-5506152
Made Adi Sanjaya	Assistant Manager - FDM AP I	081252627197
Novalina Maranathana	Assistant Manager - RTK - MATSC	-
Damayanti M. Sudarto	Directorate of Airport	085656256876
Alex Rudi	Directorate of Airport	-
Sri Lestari Yuni	Directorate of Navigation	021-3516961/3507603
Bimantoro	Aeronautical Information System (AIS) - Air Navigation	021-3505006 ext.4149
Anggi	Aviation Communication - Air Navigation	021-3505006 ext 5152
Marlan P	AMSS M Jr. Manager	081513003635
Teguh Harmono	Assitan Man ATS Operation Manager PT AP II	081281700310
Zainal Arifin Harahap	Air Traffic Management	08128111551
Eddy Prasetyo	Operation Directorate- AP I	08123750669
Wahyu Tirtadi	AP I	08155787957
Budiono Richwan	AIS & Comm Manager AP II	081513417039

Name	Institution	Telephone
Dinni Noerdiani	Aeronautica Information Directorate	0818766982
Novaro M	National Consultant	-
Maria Renny	IndII	021-72780538
Peter Atkins	PSG Consulting	61-42299321

5.2 CURRENT STATE

5.2.1 Flight Plan and ATS Messages Exchanges Between FIR

Besides distributing a flight plan through the Aeronautical Fixed Telecommunications Network (AFTN) from the aerodrome of departure, is it rare that the related ATS messages are sent either from the aerodrome of departure or from the Air Traffic Service Unit (ATSU). In the current system:

- Coordination with adjacent ATSU/FIR is achieved using voice communication;
- Flight plan data from Repetitive Flight Plan (RPL) list does not exchange information between ATSU/FIR in the form of a FPL.

No automatic flight plan data and ATS messages are exchanged between JAATS (Jakarta FIR) and Makassar Advanced Air Traffic Services (MAATS) (Ujung Pandang FIR) even though support functions are available on both systems.

5.2.2 Filing Time and Validity

Flight plan filing time varies amongst ATSU/aerodromes. An ATSU that is supported by an automated system requires FPL data at least one hour before Estimated Time of Departure (ETD) while in other facilities there is no standard.

5.2.3 Flight Plan and RPL Operation Procedure

In the case of a delay of more than 30 minutes, the delay message will be distributed by the aerodrome of departure.

There is no routine check on RPL validity, which, in turn, means violation of RPL practice tends to increase.

There is no Standard Operating Procedure and guidance on FPL and RPL practice available, even though in 2009 DGCA published CASR Part 170 – Air Traffic Service. Note that knowledge and reference to CASR Part-170 Air Traffic Service is not common within ANSP such as AP 1, AP 2 or within DGCA.

5.2.4 Amendment 1 of 15th Edition of PANS-ATM Doc 4444

To anticipate amendment implementation, DGCA established a Task Force Team consisting of representation from DGCA, AP I and AP II. Among other objectives defined by the Steering Committee, the Task Force is to prepare the readiness for implementation of the amendment.

It is noted (at least until the date of workshop) that there were three Task Force meetings.

Until the 5th ICAO Task Force meeting in Manila in November 2011, Indonesia had indicated that it will be able to comply with the amendment implementation schedule.

It is identified that to comply with the amendment in accordance with the ICAO implementation date, a number of activities are required. These include:

- Training for all flight plan staff
- Transition procedures
- Support facilities readiness

These are currently not well organised.

5.3 ISSUES IN ACHIEVING IMPLEMENTATION

5.3.1 Staff Training

AP II has just completed training for all staff within the organisation, however there are several ATSUs within Jakarta FIR that have not been involved.

AP I and DGCA have given no firm indication how and when the training is to start.

5.3.2 Procedures

The ICAO flight plan changes in accordance with the PANS-ATM Amendment 1 are complex. Those ATSU that are supported by the Air Traffic Control (ATC) system require software modification. Before modification can be carried out there are policy and operational procedures which must be in place.

Field 10 (equipment and capabilities) and field 18 (other information) of the revised format flight plan will impact, not only for flight plan, but include the use of avionics on board an aircraft as well as training for pilots.

Advisory Circular Part 170-02 needs to be reviewed and updated before Indonesia can implement the flight plan changes.

5.3.3 Support Facilities

To implement the changes it is necessary for DGCA, AP I and AP II to adopt new equipment and procedures.

AP II reported that Soekarno-Hatta will be ready to enable technical conversion Flight Plan messages from the current format into the new format by way of software changes to their systems. There is no information concerning how other ATSUs within Jakarta will be ready to accept and distribute the new format.

AP I advise that some of their facilities will ready to convert the present format to the new format by June/July 2012.

There is no indication from DGCA how they will comply with the new ICAO format.

5.4 WORKSHOP OUTCOMES

5.4.1 Identification of Issues

The workshop was organised for all participants to share their information on the current situation and how they anticipate implementing the new flight plan format.

Under the current flight plan practice:

- There is no standard procedure to submit flight plan FPL prior to EOBT;
- The aerodrome of departure is responsible for receiving and distributing FPL and RPL;
- RPL listing is distributed through fax/mail;
- Some ATSU have difficulties with RPL practice;
- No automatic flight plan data and ATS message exchange takes place between Jakarta Area Air Traffic Control Service (JAATS) and MAATS;
- There is no national policy and standard procedures for FPL and RPL practice, unless generally prescribed in AC 170-02.

With respect to the implementation of the new format:

- Policy and guidance on transition procedures are required from DGCA;
- Step-by-step guidance is needed for ATSU to implement the amendment;
- JAATS and MAATS will not be ready to adopt the amendment as scheduled by ICAO;
- Jakarta ATSU (at Soekarno-Hatta) has installed a converter to implement the amendment; however, there is no indication it has been tested and approved by DGCA;
- No contingency plan is in place;
- Training has only been conducted for AP II staff with no scheduled time frame for the staff of other organisations;

No information concerning when aeronautical information circular/supplement to be issued has been provided.

5.5 RECOMMENDATIONS

5.5.1 Status Overview

The time remaining to implement the flight plan changes is less than 12 months. The opinion of the workshop was that Indonesia will not be ready to implement the changes in concert with other States in the region. A transition phase will be required. It is (R4) **recommended** that DGCA notify ICAO that it will be unable to comply with the implementation timeframe and, in addition, will provide the ICAO with a realistic timeframe within a reasonable time.

The governance and stakeholder management issues need to be addressed. It is (R5) **recommended** that the (proposed) Permanent Task Force (PTF) for data should take over control of the implementation process and review and develop staging steps to enable complying with adopted scheduled.

5.5.2 Action Items

Action that needs to be taken immediately (possibly with the assistance of more prepared States in the region) to assist the Indonesia Flight Plan Task Force Team includes:

- Developing national policy and practical guidance for flight plan practices for ATSU in Indonesia;

- Preparing a contingency procedure as a fall back procedure, to ensure international flights transiting Indonesian FIRs are not adversely affected if the implementation is delayed or interrupted;
- Developing a training program including the training syllabi;
- Reviewing all letters of operational agreement related to flight plan practice.

CHAPTER 6: DATA MANAGEMENT

6.1 INTRODUCTION

6.1.1 Overview

The aeronautical data management workshops provided an overview of some aspects of Aeronautical Information Management (AIM). They briefly touched on the need for AIM in a Performance-Based Navigation (PBN) environment and then outlined the requirements for using metadata to describe to data users the characteristics of the data. The importance of the use of data characteristics stems from ensuring that data used for various aeronautical applications is appropriate for those applications. This is particularly important in a PBN environment because applications have performance characteristics that vary between types of operation and aircraft/air crew/navigation system combinations. As well, the cost of capturing and maintaining data is significant, so an understanding of data characteristics for particular applications can ensure that cost is minimised and that money and effort are not wasted.

The workshop, because of the limited time, only covered many aspects of aeronautical data in a very brief manner; however, most of the International Civil Aviation Organisation (ICAO) requirements were introduced at some level so the coverage of requirements was fairly comprehensive. This was deemed to be an appropriate level of detail to elicit comments from attendees about the data requirements of their own sections/agencies and about the exchange of data between sections/agencies. This was sufficient to allow conclusions to be drawn about data requirements and for recommendations to be made concerning future initiatives.

This report provides an overview of the workshop including its objectives and the approach taken in attempting to achieve those objectives. It summarises the findings gleaned from the comments made and discussion of aspects of aeronautical data management. From these, a set of fairly high level recommendations are made.

6.1.2 Work

Two data management workshops were planned under the Terms of Reference stated in full in Part B of this document. Due to staffing constraints, and after consultation and approval from the Indonesia Infrastructure Initiative (IndII), one workshop was delivered from 22–23 November 2011. In summary the workshop objectives were to:

1. Document workshop proceedings and key points resulting from the workshop
2. Determine follow-up activities for Directorate General of Civil Aviation (DGCA) Directorates

3. Provide DGCA management and staff with an understanding of the changing nature of aeronautical data management and the relationship with modern Air Traffic Management (ATM) systems
4. Provide top level explanations of aeronautical data requirements

6.1.3 Workshop Objectives

In order to meet the Terms of Reference, the specific objectives of the workshop were to:

- Establish the need for aeronautical data that has appropriate characteristics for its intended area of application.
- Outline the characteristics of aeronautical data to ensure it is fit for particular aeronautical applications. This included:
    - The general concept of metadata (data about the data) and its usage
    - Broad concepts of application requirements for data such as routine, essential and critical
    - Concepts of resolution, accuracy, confidence and integrity for geographic data
    - General concepts of a data chain – source, custodian, use, where used, when updated and how
    - Brief discussion of the standards for exchange of aeronautical data
    - An overview of the requirements to meet minimum standards for particular applications
- Discuss the situation within DACCA, Angkasa Pura 1 (AP 1) and Angkasa Pura 2 (AP 2) and the airports with respect to understanding generally about aeronautical data management and applications.
- Determine from this discussion any shortfalls in aeronautical data management and, consequently, to make recommendations of some of the means of improving perceived shortcomings.

6.2 DATA WORKSHOP AND OUTCOMES

6.2.1 Approach

The general approach was to frame the workshops as an overview only because detailed discussion of many of the concepts would require considerably more time than that available.

To establish the growing importance of aeronautical data management the difference in the requirements for data for conventional (ground-based) navigation and for PBN

were discussed. It was established that for PBN there is a much greater need to understand the characteristics of the data to know if it is appropriate in terms of resolution, accuracy, confidence level, and integrity for the type of navigation used.

After this introduction, the general approach taken was to discuss in slightly more detail data characteristics for aeronautical data described in ICAO Annexes 4, 14 and 15 and ICAO Doc 9906 – The Quality Manual for Instrument Flight Procedures.

In particular, considerable focus was given to describing the ICAO requirements for 'Electronic Terrain and Obstacle Data' (eTOD) – as described in Annexe 15 and ICAO Doc 9881. This was done because eTOD is the one area, in the ICAO standards and recommended practices (SARPs), which describe in detail the characteristics of data to be used for aeronautical applications. The concepts developed for eTOD are generally applicable to other types of aeronautical data. (In part Annexe 15 describes aeronautical data characteristics by reference to the International Standards Organisation (ISO) 19000 series of standards for Geographic Information Systems (GIS). These standards are particularly difficult to understand as they are written for computer professionals with a detailed knowledge of GIS.)

In discussing the notion of a data chain, the concepts used in aeronautical data exchange standards were briefly outlined. This included a very quick overview of AIXM, DAFIF, etc including their purposes and application areas.

Issues pertinent to the Indonesian aviation agencies were discussed throughout the workshop and a general attempt made to determine the need for the implementation of aeronautical data management throughout these agencies. The objective was to obtain a general impression of the shortcomings and potential solutions to these shortcomings.

6.2.2 Attendance

Different people attended the workshop on day 1 and day 2 and some only attended for part of each day. The general reason for the changing attendance was the pressure of work; however, often when one person left the workshop they were replaced by someone from the same area. Generally, most attendees became involved in the discussion, asking questions or making suggestions.

The second day involved repeating a fair bit of the material from day one.

6.2.3 Conclusions and Observations

As mentioned above, the attendance of the workshop was fragmented and transitory. Despite this the discussion was generally robust and some general impressions can be gleaned from the comments made during the exchanges; however, because the

audience was fragmented, any impressions provided from the discussions cannot be taken as comprehensive or complete. As well, some of the statements made below might be true of one agency or section of an agency but not true of others, and no attempt has been made to ascribe particular statements to particular agencies.

The general level of computer literacy within the agencies is not high by international standards. Many people do not have a computer on their desks and for those that do the level of professional training (for particular applications) may not be high. This presents a basic problem in discussing aeronautical data – the audience will have a vastly different appreciation of statements about data depending upon their level of experience and training.

The functions that create, maintain and use aeronautical data are scattered across the various agencies. Mostly this data is used within the agencies capturing and maintaining the data. Some of this data is passed between agencies but apparently without any metadata describing things like its currency, accuracy, confidence level or integrity. Without the information that can be derived from such metadata, data may be misused with potentially catastrophic results. Data is created in multiple agencies because, to some extent, functions are duplicated. As well, some data capture may be duplicated but using different standards for data quality. Apart from being wasteful of resources, this can also cause confusion.

For example, PANS-OPS procedure design functions appear to be proliferating in a number of agencies or sections of agencies. This function uses a substantial amount of data and is responsible for the creation of safety critical aeronautical data. This may not be a problem if the data use and data creation functions adhere to the same standards across agencies; however, it is not clear that this is the case. There might be some debate about where such functions should exist but this is not relevant to the question of aeronautical data.

As well, the data is seen as being owned by the agency that created the data – not by the State. While data can be captured and maintained by a custodian it should be seen as being for the general benefit of the agencies, and its capture and storage should be designed to suit multiple purposes.

6.2.4 Recommendations

Following an assessment of the data management workshop discussions, and a review of the ATM Master Plan, the following recommendations are made.

It is (R6) **recommended** that;

DGCA establish an inter-agency working group to oversee the adoption of data and quality standards across all agencies. The inter-agency working group would work directly with the Permanent Task Force (PTF) for Data. Responsibilities of the working group should include:

- Establishing the agency responsible for the custodianship of particular data items;
- Adoption of ICAO quality and aeronautical data standards by all agencies;
- The inter-agency working group should be responsible for:
    - Overseeing the implementation of common data transfer protocols between custodians and users
    - Monitoring implementation of the above and report on progress to the DGCA

CHAPTER 7: ATTACHMENT

Attachment 1 - Master Planning Workshop Minutes

7.1 INTRODUCTION

7.1.1 Background

One of the approved objectives from Indonesia Infrastructure Initiative (IndII) 1 was the delivery of an Air Traffic Management (ATM) Master Plan for the Indonesian Directorate General of Civil Aviation (DGCA), to allow it to develop capability in response to the emerging requirements of the aviation sector in Indonesia and Asia. In response to this requirement, the ATM Master Plan was a deliverable, assigned to the Swedish consultancy LFV. It contained a large number of recommendations for safety related activities and development of improved infrastructure for the aviation sector.

7.1.2 Objectives of the Workshop

The ATM Master Plan has been complete for some time and has been socialised with the stakeholders allowing for feedback. Now this period is complete, and before any meaningful implementation can take place, the large numbers of recommendations need to be put into a logical order and prioritised against the most immediate requirements of the stakeholders.

The next step in this process was this Objectives and Priorities workshop. This workshop has been sponsored by IndII in order to:

- Inform senior DGCA management of the implementation issues;
- Achieve consensus within the DGCA Directorates as to priorities for implementation of the Master Plan recommendations;
- Agree an implementation process, including milestones and reports;
- Identify stakeholders and assign responsibilities for implementation and reporting;
- Identify the resources required for implementation;
- Identify constraints, assumptions, and exclusions;
- Determine follow-up activities.

7.1.3 Administration

1. The meeting was held in the large conference room at the Ministry of Transport, 5th Floor, on 11 November, 2011.
2. The meeting was facilitated by Peter Atkins with Pak Novaro Martodihardjo acting as moderator.

3. The meeting was opened at 09:30 by Pak Hari and closed at 16:00.
4. Minutes of this meeting are required to be provided by the contractor with the end of mission report on or before 10 December.

7.1.4 Staff Attendance at the Workshop

The following staff attended the workshop.

No	Name	Institution	Telephone	Email
1	M. Hasan B	Directorate of Aviation Navigation	021-505550 ext. 5162	
2	M. Mega H	Sub-directorate of Standardization & Certification	021-505550 ext 16005	M364_666@yahoo.com
3	Bambang Rianto	AP I	08152402211	Brats111@yahoo.co.id
4	Diding S	Aircraft Worthiness & Operations	021-3507615	
5	A.N Avlia	Aviation Navigation Standardization & Certification	021-3506451 ext. 5159	nurdinavlia@dephub.go.id
6	Suhartato	AP II	021-5506178	
7	Bambang P Sigit	ATS PSI - AP II	021-5506120	Bepe_cs@yahoo.com
8	Erfiyanti	Air Navigation	021-3506707	Sunday_data@yahoo.com
9	M. Heru Jatmika	BMKG	081342778679	Heru.jatmika@bmkg.go.id
10	Sri Budjono	KNKT	0811982730	
11	Budiono R	AP I	081513417034	ifaima.apac@gmail.com
12	Novie R	Air Navigation	08129063031	novieyanto@yahoo.com
13	Muh. Khasbi	Air Navigation	085299719351	hsb_ais@yahoo.com
14	Ramsay	ITSAP	0811993320	david.ramsay@infrastructure.gov.au
15	Akhmad Zaenuri	AP I	0888354015	akhmadzaenuri@yahoo.com

No	Name	Institution	Telephone	Email
16	Tugino	Air Navigation	0811812958	
17	Nur Isnin	Airport Directorate	081363379989	nurisinindsae@yahoo.co.id
18	Arfiyanti Sammad	DGCA	021-3505132 ext. 1372	arfiyanti.samad@dephup.go.id
19	Herry Bakti	DGCA	021-35052132 ext. 1382	herry_bakti@yahoo.com
20	Emil A	IndII	0816951112	emil.ardiaman@indii.co.id
21	Sri Dewi Susanty	PAU - IndII	085284773581	dewi.susanty@indii.co.id
22	Yoke Saputra	PAU - IndII		yoke.saputra@indii.co.id
23	Nita	DGCA	021-3505132	
24	Revy Petradradia	IndII	08562190631	revy.petragradia@indii.co.id
25	Annetly Ngabito	IndII	0818779935	annetly.ngabito@indii.co.id
26	Emi Astuti	Air Navigation	085214276305	emi_atc6@yahoo.com
27	Maya Fadini	Air Navigation	021 35052132 ext. 5152	mayafadini@yahoo.com
28	Rusmanto	ATS - BSH	ext 6130	rusmanto.sit@gmail.com
29	Elvira	MLLP	5163	
30	Didi Purwadi	PAP 2	5506193	didip.go@yahoo.com
31	Ichwanul Idrus	DNP		
32	Mursyidin	DKU PPU		
33	Debora Ayu	IndII	085726518107	debora.ayu@indii.or.id
34	Rahma Utami	IATA	29349020	utamir@iata.org
35	Musdahfi	DAV	3506702	

7.2 WORKSHOP

7.2.1 Discussion

The workshop was presented against a set of PowerPoint slides presented by Peter Atkins as the basis for discussion. The themes presented were as follows:

- Background to the Master Plan
- What is in and not in the Master Plan
- Objectives for the workshop
- Suggested governance and strategies for implementation
- The reasons and drivers for the need to change
- Review of the detailed recommendations under the summary activities of
    - ATM
    - Communication, Navigation, and Surveillance (CNS)
    - Aerodrome Capacity
    - Organisation

The workshop focused on the background to the Master Plan, the governance required for implementation and the detailed recommendations, with a view to try to put some form of priority on the individual objectives.

There was much discussion regarding the need to move from a series of recommendations into understanding the current baseline for CNS/ATM in the Republic of Indonesia, and then having the means to undertake future work against an agreed concept.

The slides are provided as Annexe A to these minutes

7.2.2 Conclusions

The workshop was not able to arrive at detailed priorities as it was agreed that a baseline for current state was required. This baseline would be a part of a more detailed Operational Concept Document (OCD) that would be fully inclusive of all current and required concepts and requirements.

The proposal for a new form of governance was accepted as a way forward. The proposed governance consists of permanent task forces across the different disciplines.

The workshop agreed that the concepts put forward in the presentation were a suitable starting point for recommendations on how to move from strategic recommendations to doing the work required.

7.2.3 Action Items

The planned activity of the consultants includes summarising and developing the proposals put forward.

Attachment 2 – Draft Terms of Reference – Permanent Task Force(s)

7.3 ROLES AND RESPONSIBILITIES

7.3.1 The primary Functions of the Permanent Task Force(s)

The primary function of the Permanent Task Force(s) (PTF) is to take responsibility for and address the major business issues associated with the overall program and portfolio management of all projects that deliver CNS/ATM objectives, in accordance with the Air Traffic Management (ATM) Master Plan. It includes the approval of budgetary strategy, scope, definition and realisation of benefits, and the monitoring of risks, quality and timeliness.

7.3.2 The role of Permanent Task Force(s)

The Role of the PTFs is to:

- Take on responsibility for the particular program, (for example ATM), the operational plans and every project and initiative that is conducted under the ATM Master Plan;
- Ensure each project's feasibility, provide an implementation plan and achievement of outcomes;
- Ensure the program and each project's scope aligns with the requirements of the overall ATM Master Plan objectives;
- Provide project managers and those directly involved in the program and each project with guidance on program and/or project business issues;
- Capture, track and resolve issues and risk to the overall program and reconcile differences in opinion and approach, and resolve disputes arising from them;
- Report on program and project’s progress to the Strategic Steering Group.

7.3.3 Change Management for Projects and Programs.

The PTFs are required to discuss and approve (where appropriate) recommendations made for the following issues:

- Changes to program and/or a project’s scope or priorities (including document variation and version control);
- Budget and budget constraints
- Project schedules
- Program and project deliverables (e.g. implementation plans)
- Risk minimisation strategies

Attachment 3 – Preliminary Stakeholder Management for Master Plan

The following stakeholder management plan should be considered preliminary as it has been documented without stakeholder input.

The following table outlines an assessment of some key stakeholders in the delivery of the ATM Master Plan and the strategies employed to manage them, along with the communications between the management groups and the other stakeholders. The Strategic Steering Group (SSG) should develop and implement this plan as a way of categorising and dealing with stakeholders.

Stakeholder	Key Messages	Scope	Strategy	Timing	Delivery *(who delivers the message)*	Level of commitment required
Manager AP1/AP2	*The Manager of Angkasa Pura 1 and 2 (AP 1/2)will be a member of the Strategic Steering Group and will be provided with key progress reports from the Permanent Task Forces (PTFs), as well as be responsible for ensuring users and customers of AP1/2 services are delivered appropriate information*	Provide input into the strategic direction and development of the ATM Master Plan over time. Deliver progress reports and updates in relation to AP1 Deliverables and sub deliverables within the ATM Master Plan. Provide direction and leadership within AP1/2 in relation to participation in ATM Master Plan deliverables and projects	Management Meetings Project Report	Monthly Monthly	Permanent Task Forces.	Leadership and Full commitment to the ATM Master Plan deliverables and objectives

Stakeholder	Key Messages	Scope	Strategy	Timing	Delivery *(who delivers the message)*	Level of commitment required
Director Air *Navigation*	*The Director of Air Navigation will be a member of the Strategic Steering Group and will be provided with key progress reports from the Permanent Task Forces, as well as be responsible for ensuring users and customers of AP1 services are delivered appropriate information*	*Provide input into the strategic direction and development of the ATM Master Plan over time.* *Deliver progress reports and updates in relation to AP1 Deliverables and sub deliverables within the ATM Master Plan.* *Provide direction and leadership within AP1/2 in relation to participation in ATM Master Plan deliverables and projects*	*Management Meetings* *Project Report*	*Monthly* *Monthly*	*Permanent Task Forces*	*Leadership and Full commitment to the ATM Master Plan deliverables and objectives*

Stakeholder	Key Messages	Scope	Strategy	Timing	Delivery *(who delivers the message)*	Level of commitment required
Airline Representative	*The executive level of key airline users need to have a representative on the Strategic Steering Group and.,* *Be provided with the key initiatives and their timing in order to harmonise airline operations with development in CNS/ATM*	*One representative to Provide input into the strategic direction and development of the ATM Master Plan over time.* *Other key executive stakeholders in the airline industry be provided with information through this representative.*	Management Meetings Project Report Airline coordination meetings separate from the SSG and PTF meetings. Website with update Emails where required	*Monthly* *Monthly* *As required* *Updated weekly* *As required*	*Permanent Task Forces (PTFs)* *Separate Airline coordination meetings*	*Leadership and Full commitment to the ATM Master Plan deliverables and objectives*

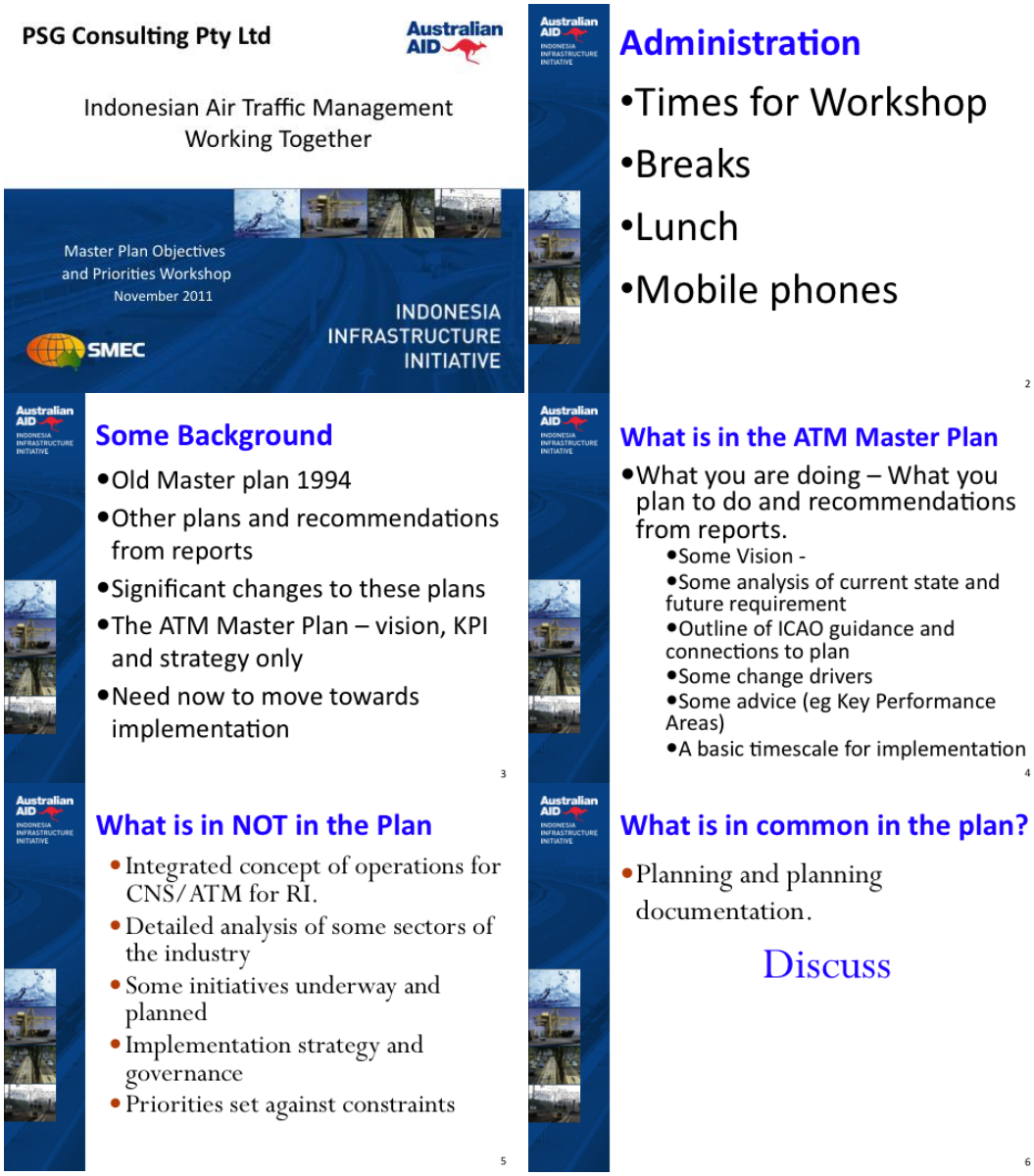
Stakeholder	Key Messages	Scope	Strategy	Timing	Delivery *(who delivers the message)*	Level of commitment required
Military Representative	*The executive level of key airline users need to have a representative on the Strategic Steering Group and.,* *Be provided with the key initiatives and their timing in order to harmonise airline operations with development in CNS/ATM*	*One representative to Provide input into the strategic direction and development of the ATM Master Plan over time.* *Participate in ATM Projects, particularly the airspace and air route design.*	Consultation in relation to Management meetings and the Strategic Steering group meetings Military coordination meetings		*PTFs* *Director, Directorate General of Civil Aviation (DGCA)*	*Participation. Full commitment is useful but not required.*

Attachment 4 - Preliminary Stakeholder Management Plan for Flight Plan Implementation

Stakeholder	Key Messages	Scope	Strategy	Timing	Delivery *(who delivers the message)*	Level of commitment required
DGCA **AP I** **AP II** **Airlines** **Air Force**	*Implementation of Amendment 1 of Edition 15th of PANS-ATM Doc 4444*	▪ *Develop national Policy and ConOps;* ▪ *Implementation of change format and field contents on ICAO New Flight Plan;* ▪ *Implementation AIDC coordination Messages;* ▪ *Publishing Aeronautical Information;*	▪ Empower the existing Task Force Team; ▪ Define Project Management ▪ Regular Meeting between Steering Committee and Task Force; ▪ Develop Training programme	▪ Weekly Meeting; ▪ Immediately ▪ Bi weekly meeting; ▪ Immediately	▪ Director General of Civil Aviation; ▪ Project Manager	▪ Commitment from Director General, Project Manager; ▪ Budget availability to fund the project management;

CHAPTER 8: SLIDES FOR MASTER PLANNING WORKSHOP

8.1 SLIDES FOR MASTER PLANNING WORKSHOP



What we need to achieve

- Terms of reference for this workshop
  - A workshop that includes the following topics: confirming the high priority recommendations, establishing a process for implementation and management oversight of these recommendations, timescales, and issues for implementation.
- Outcomes from the workshop
  - Stakeholder Management plan
  - Project Management Strategy and schedule of priorities Draft ATM Master Plan Implementation Plan based on international best practice. – that is HOW we are going to go forward.

7

What we need to achieve

- What would you would like to achieve?
- What do you think is missing?
- Who are the stakeholders?

Discuss

8

What we need to achieve

- How do we manage implementation?
- Accountabilities
- Update of the plan
- Use of steering committee and task force

Discuss

9

What the plan contains - review

- Airspace and Airspace Management (ATM)
- Communications and Navigation
- Replacement systems and Surveillance
- Data and Data Management
- Organisation

10

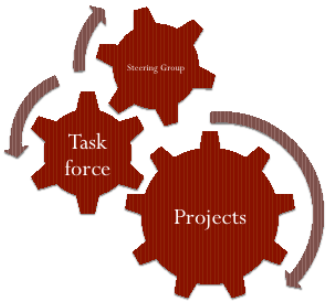
Current State of activities

- Many disconnected activities in a connected world
- Some examples…. Discuss

11

Governance – Suggested Model

Discuss



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Slides for Master Planning Workshop, *continued*

Governance – Suggested Model

13

Strategy for Implementation

- Prototype
  - Pick a single project
  - Use the suggested governance
  - Learn lessons and update
  - Training
  - Implement across all parts of DGCA and AP1 and AP2

14

Review the planning framework

15

Drivers for change

- Capacity and Demand
- Regulation
- Technology
- Emissions
- Safety
- Customer and Stakeholders

16

Technology

- Customer technology – Primary
  - Eg. Aircraft GNSS capable
- Other countries technology
  - Eg. Sharing data
- ATM technology
  - Eg. Replacing/Integrating

17

Capacity and Demand

- Airspace – a finite resource
- Meeting increasing traffic demand
- Changes to technology
- Changes to airspace organisation and management

18

"Regulations"

- Law of Indonesia
- International and domestic standards
- International and domestic guidelines
- International Agreements – eg emissions

19

Constraints - Discussion

- Need to maintain capacity for our customer – Time
- Need to maintain safety for our stakeholders
- Budget
- People and skills
- Governance
- Current organisational changes

20

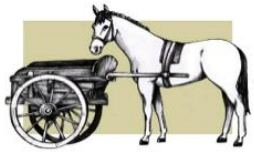
Assumptions - Discussion

- Assessment of future demand
- Budget will be made available- some
- Staff and skills are available – some
- Government policy and law will not change over the short term

21

Lets do things the right way around

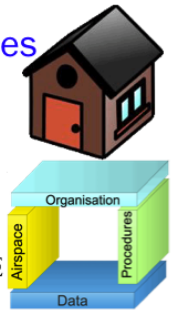
- Where do we go from here?



22

Enabling Activities

- Before we can implement new systems.
- GET THE ENABLING DONE Good foundations make good houses



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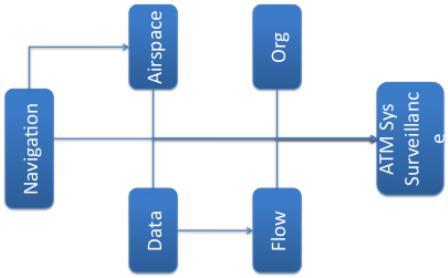
• Planning Framework - Links



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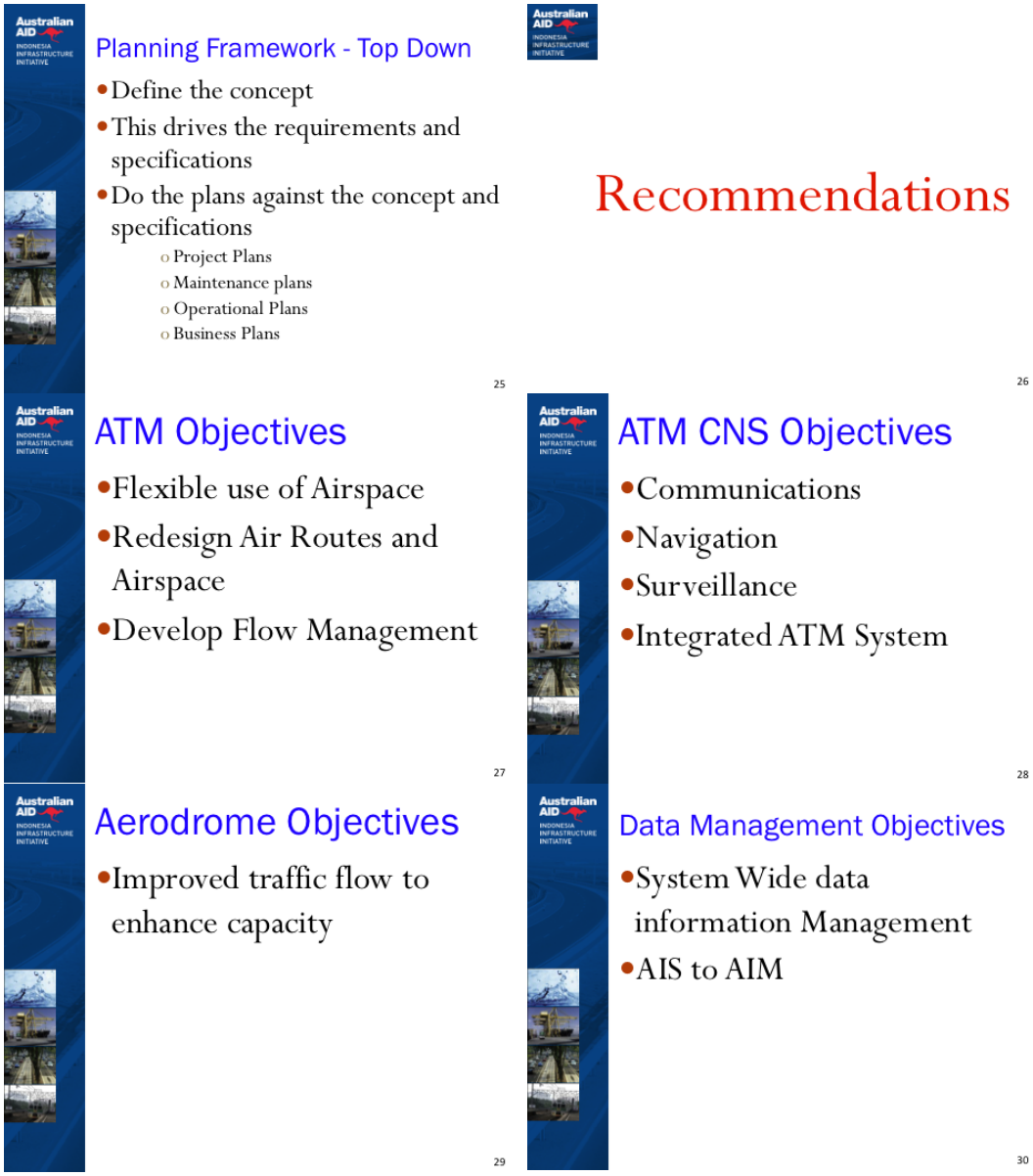
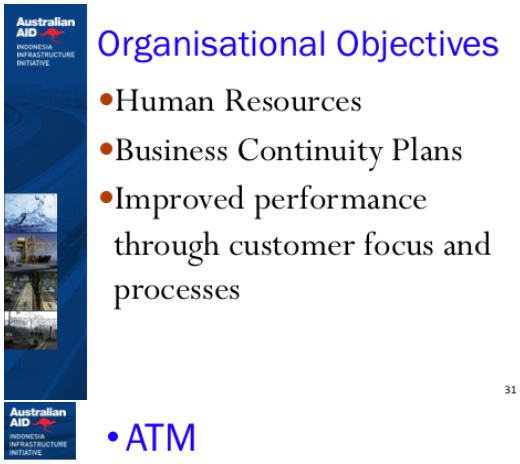
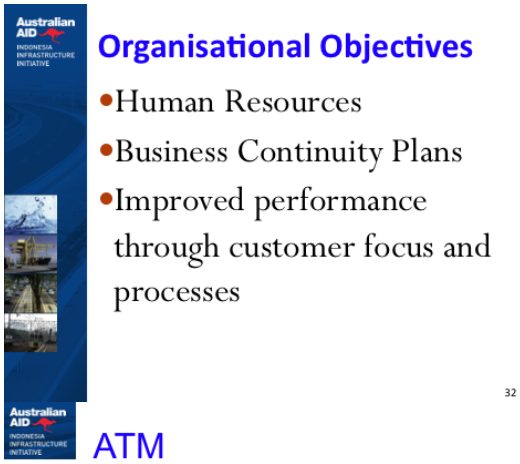
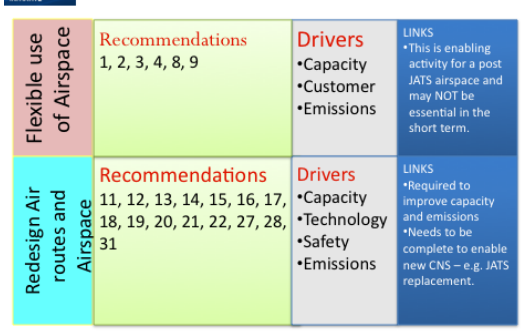
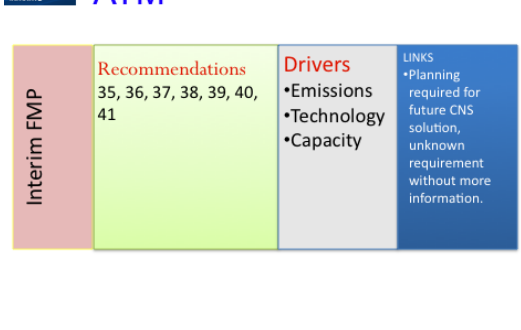
Slides for Master Planning Workshop, *continued*

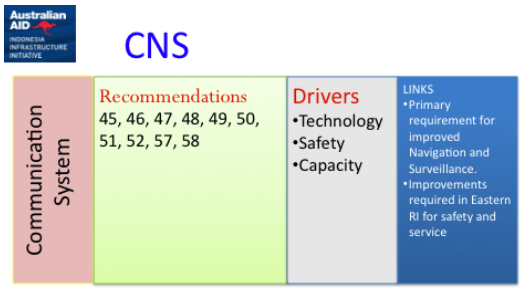


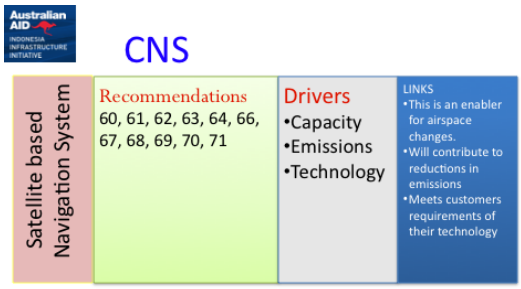

Organisational Objectives
•Human Resources
•Business Continuity Plans
•Improved performance through customer focus and processes
31


Organisational Objectives
•Human Resources
•Business Continuity Plans
•Improved performance through customer focus and processes
32

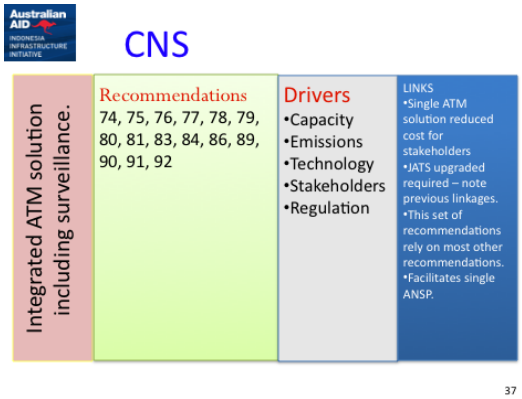

• ATM
Flexible use of Airspace
Recommendations
1, 2, 3, 4, 8, 9
Drivers
•Capacity
•Customer
•Emissions
LINKS
•This is enabling activity for a post JATS airspace and may NOT be essential in the short term.
Redesign Air routes and Airspace
Recommendations
11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 31
Drivers
•Capacity
•Technology
•Safety
•Emissions
LINKS
•Required to improve capacity and emissions
•Needs to be complete to enable new CNS – e.g. JATS replacement.
33

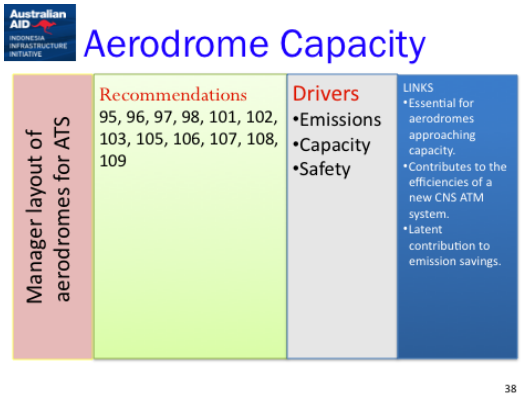

ATM
Interim FMP
Recommendations
35, 36, 37, 38, 39, 40, 41
Drivers
•Emissions
•Technology
•Capacity
LINKS
•Planning required for future CNS solution, unknown requirement without more information.
34

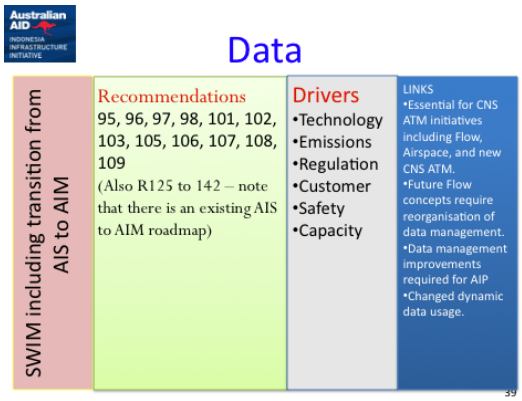

CNS
Communication System
Recommendations
45, 46, 47, 48, 49, 50, 51, 52, 57, 58
Drivers
•Technology
•Safety
•Capacity
LINKS
•Primary requirement for improved Navigation and Surveillance.
•Improvements required in Eastern RI for safety and service
35

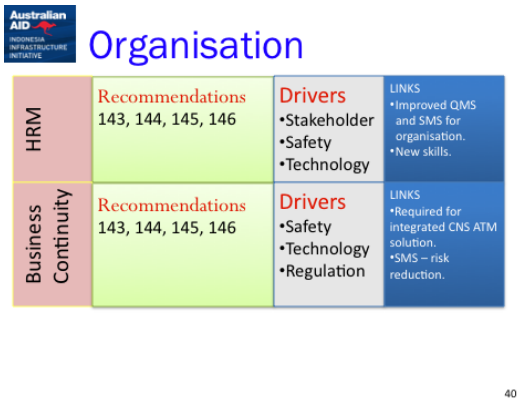

CNS
Satellite based Navigation System
Recommendations
60, 61, 62, 63, 64, 66, 67, 68, 69, 70, 71
Drivers
•Capacity
•Emissions
•Technology
LINKS
•This is an enabler for airspace changes.
•Will contribute to reductions in emissions
•Meets customers requirements of their technology
36

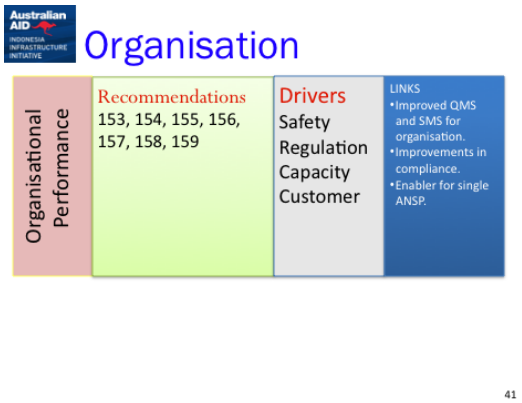
Slides for Master Planning Workshop, *continued*

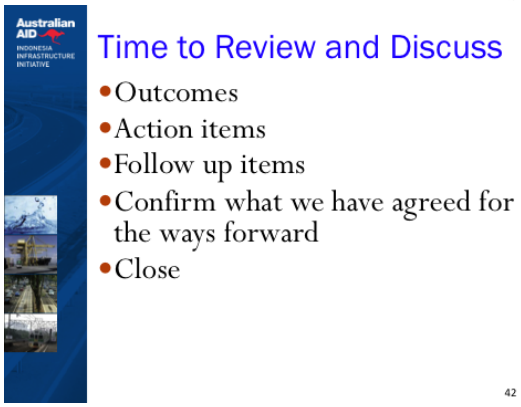




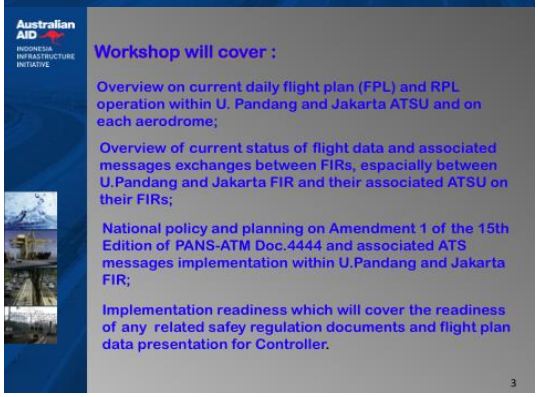


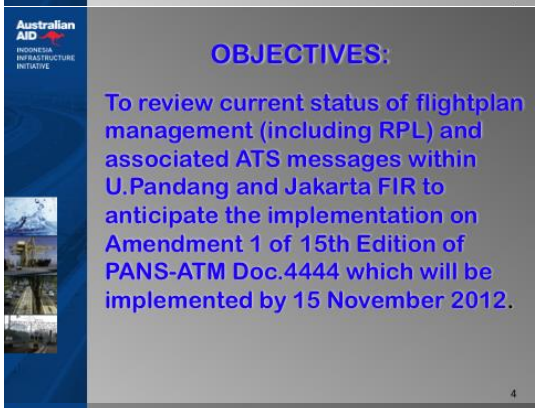


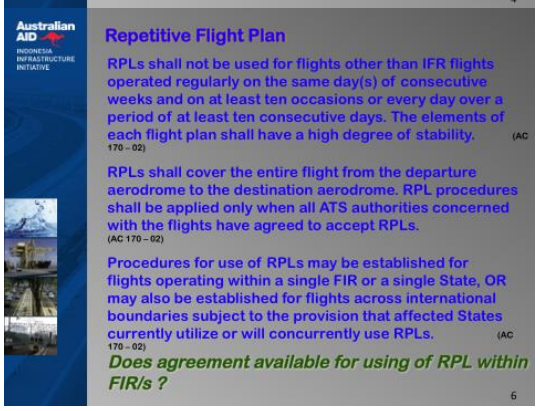




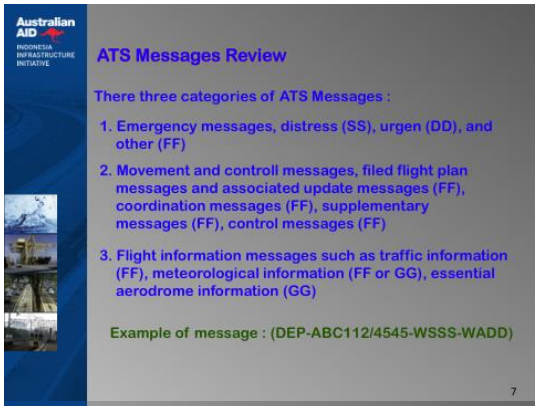
8.2 SLIDES FOR FLIGHT PLAN WORKSHOP

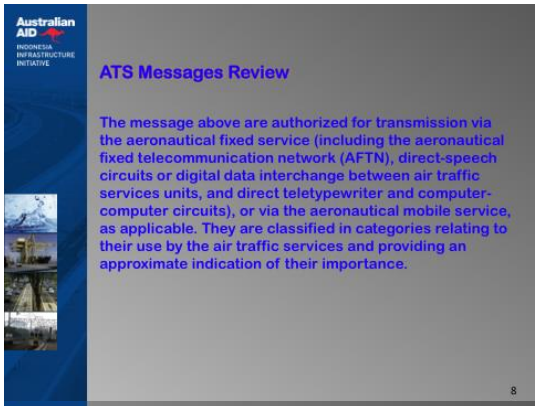


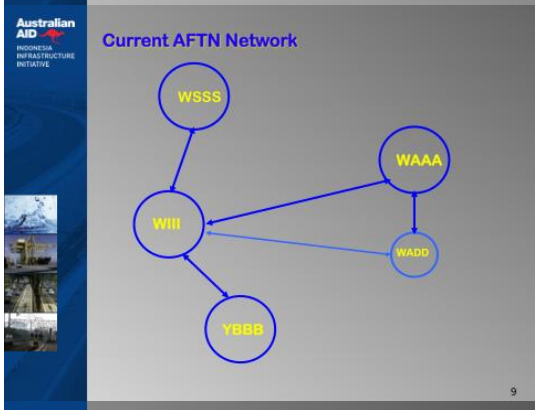


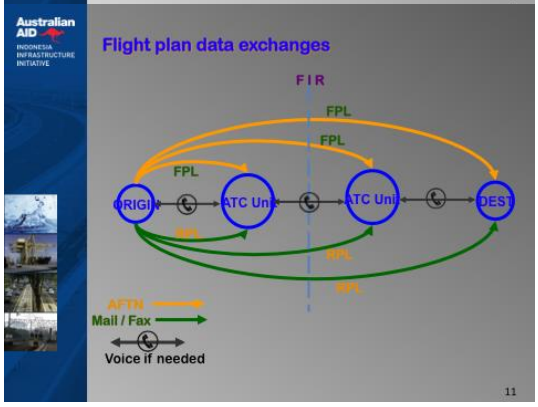


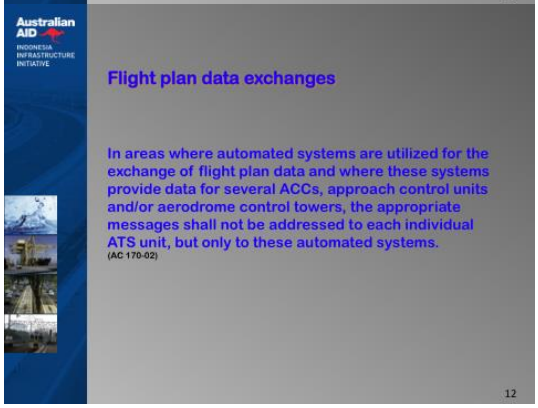
Slides for Flight Plan Workshop, *continued*





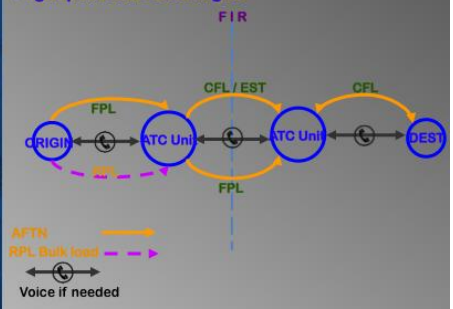






Slides for Flight Plan Workshop, *continued*

Flight plan data exchanges



13

New ICAO Flight Plan Format

ICAO State Letter AN 13/2.1-08/50 Dated 25 June 2008
Subject: Approval of Amendment 1 to the PANS-ATM
Action required: a) Implementation of the amendment on 15 November 2012; b) Publication of any differences as of 15 November 2012

Air Navigation Commission, acting under delegated authority, at the first and second meetings of its 177th Session, on 22 and 24 January 2008, approved Amendment 1 to the *Procedures for Air Navigation Services — Air Traffic Management*, Fifteenth Edition (PANS-ATM, Doc 4444) for applicability on 15 November 2012. The amendment was approved on 27 May 2008 by the President of the Council on behalf of the Council

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New ICAO Flight Plan Format

Amendment 1 stems from the work of the Flight Plan Study Group (FPLSG). The nature and scope of the amendment is to update the ICAO model flight plan form in order to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management (ATM) systems, while taking into account compatibility with existing systems, human factors, training, cost and transition aspects.

Transition

The ICAO Asia Pacific Region has adopted a declared transition period and a phased implementation from 1 January 2012 until 15 November 2012.

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New ICAO Flight Plan Format (cont)

The phased implementation comprises of :

Phase 1 :1 January to 31 March 2012 ANSPs software delivery and internal testing

Phase 2: 1 April to 30 June 2012, and ANSPs external testing and implementation

Phase 3 : 1 July to 15 November 2012 Airspace users testing and implementation

Are you ready ?

16

KEPUTUSAN DIREKTUR JENDERAL PERHUBUNGAN UDARA NOMOR: SKEP/279/V /2011 TENTANG PEMBENTUKAN KELOMPOK KERJA TIM IMPLEMENTASI FLIGHT PLAN FORMAT BARU INDONESIA

To establish Indonesia working group team on flight plan implementation compose of Steering Committee, Executive and Secretariate which consist of Members as mentioned on Attachment.

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Task List

1. to coordinate among the team to correspondance with ICAO State Letters;
2. to review the capacity and limitation toward flight plan processing which are exists in Indonesia;
3. to surey toward flight plan submision on every unit which send flight plan;
4. to review toward the use of Repetitive Flight Plan and its optimalisation for operational purpose in developing flight safety;
5. to prepare New ICAO Flight Plan Format implementation;
6. to conduct safety assesment and its associated effect to the operation of AIDC, ADS-C/CPDLC;
7. to publish aeronautical information publication such as NOTAM, AIC and AIP as necessary;

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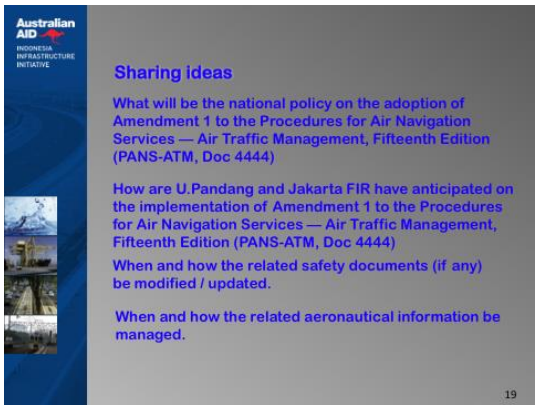
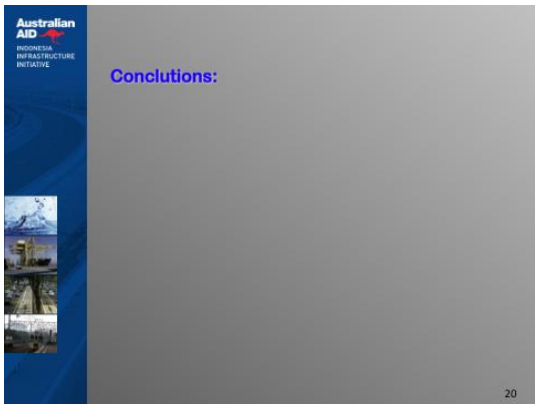
Slides for Flight Plan Workshop, *continued*





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