



International Civil Aviation Organization

**Fourth Meeting of the Asia/Pacific Regional Search and Rescue Task Force
(APSAR/TF/4)**

Bangkok, Thailand, 06 – 10 July 2015

Agenda Item 2: Review Outcomes of Related Meetings

RELATED MEETING OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents information on search and rescue from relevant meetings.

1. INTRODUCTION

1.1 The Second Meeting of the APANPIRG Air Traffic Management Sub-Group (ATM/SG/2) was held in Hong Kong, China from 04 to 08 August 2014.

1.2 The Twenty Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/25) was held in Kuala Lumpur, Malaysia, from 08 to 12 September 2014.

1.3 The Fifty First Conference of Directors General of Civil Aviation, Asia and Pacific Regions (DGCA/51) was held from 24 to 26 November 2014.

2. DISCUSSION

ATM/SG/2

2.1 ATM/SG/2 had the following key discussion points regarding SAR.

Seamless ATM Reporting and Monitoring (WP06)

The meeting also noted that Air Navigation Report Forms (ANRFs) had replaced the Performance Framework Forms (PFF). The ANRF were intended to be a means of setting milestones, targets, and metrics for each of the key planning elements. The ATM/SG/2 had no comment on the draft ANRFs.

2.2 Included with the 18 Aviation System Block Upgrade (ASBU) ANRFs was a draft SAR ANRF (**Attachment A**), which was intended to be submitted to APANPIRG/26 in 2015 (this ANRF was reviewed by the APSAR/TF/3). Note: the following elements from the ANRF were intended to form four new Seamless ATM Plan elements under its Asia/Pacific monitoring and reporting scheme:

- SAR Regulatory and Coordination Mechanisms;
- SAR Facilities and Assets;
- SAR Information; and
- SAR Improvement.

2.3 The following ATM/SG/2 report except discussed the Regional Air Navigation Plan:

Alignment of the RANP with the Global Air Navigation Plan (WP08)

ICAO reported on the work of the eANP Working Group (eANP WG) which was formed in follow-up to the 12th Air Navigation Conference Recommendation 6/1 Regional Performance Framework – Planning Methodologies and Tools regarding the alignment of regional air navigation plans with the Fourth Edition of the GANP, and proposals to develop a new Asia/Pacific Regional Air Navigation Plan (RANP) document.

The eANP WG had agreed that the ANP data related to the air navigation facilities and services could be classified as: stable, dynamic or flexible. In this regard, it was agreed that the new ANP should be composed of three volumes.

- a) **Volume I** should contain stable plan elements the amendment of which require approval by the Council;
- b) **Volume II** should contain dynamic plan elements, the amendment of which does not require approval by the Council; and
- c) **Volume III** should contain dynamic/flexible plan elements [not subject to the reporting of Deficiencies] providing implementation planning guidance for air navigation systems and their modernization taking into consideration emerging programmes such as the ASBUs and associated technology roadmaps described in the GANP.

2.4 The following electronic Air Navigation Plan (eANP) SAR elements in **Table 1** are presented for the AP SAR/TF/4’s review, consideration and discussion as required:

Reference	Detail	Notes
Vol. I, Part VI	SAR Special Regional Requirements, if any	WP02 Attachment B
Vol. I, Part VI	Table SAR I-1 Search and Rescue Regions	WP02 Attachment C
Vol. II, Part VI	SAR Special Regional Facility Requirements, if any	WP02 Attachment B
Vol. II, Part VI	Table SAR II-1 Search and Rescue Facilities	WP02 Attachment D

Table 1: SAR Air Navigation Plan (eANP) Elements

Human Factors

2.5 ATM/SG/2 discussed IP04 (**Attachment E**), regarding the Federal Aviation Administration’s use of Human Factors analysis in the development and operations of air traffic management (ATM) systems. The paper addressed research on human performance, safety analysis, and system optimization through human factors engineering, and identified the importance of incorporating the human component throughout system development life cycle. The following extract from the ATM/SG/2 report refers:

4.90 There was considerable discussion by the ATM/SG/2 on this topic. India, Hong Kong, China and IFATCA all emphasised the importance of human-in-the-loop planning at the earliest stage of project management. The meeting considered that there was a significant need for improvement in human factors knowledge and input into the development of appropriate processes for system engineering, procedure design, procedures and training. The ATM/SG/2 meeting agreed to the following Draft Conclusion:

Draft Conclusion ATM/SG/2-2: Human Performance Initiatives

4.91 *The meeting was reminded that the Seamless ATM Plan was updated on a three-year cycle, and the outcomes of any human factors study in the Asia/Pacific Region could be included in the next update of the Plan in 2016, if agreed by APANPIRG.*

2.6 It is expected that the ATM/SG/3 (3-7 August 2015, Bangkok) will hold a mini-seminar on this subject, supported by the United States. If a proposed SAREX goes ahead (13-16 October 2015, Hong Kong, China), then the first day would be set aside for the conduct of an Asia/Pacific SAR Human Performance Seminar/Workshop, which would incorporate material from the ATM/SG/3 mini-seminar and in addition, other human performance aspects that we need to stress (such as training) in the Asia/Pacific SAR Plan.

2.7 It is hoped that States and International Organizations support such an Asia/Pacific SAR Human Performance Seminar/Workshop. Planning for this event should become clearer after the SAREX planning effort on Monday 6 July 2015.

APANPIRG/26

2.8 APANPIRG/26 agreed to the following Conclusions related to SAR:

Conclusion APANPIRG/25-11: Human Performance Initiatives

That, ICAO be urged to:

- a) conduct an Asia/Pacific human performance seminar/workshop for optimal Air Traffic Control (ATC) and Search and Rescue (SAR) operational safety and efficiency; and*
- b) review the human performance provisions in the Asia/Pacific Seamless ATM Plan.*

Conclusion APANPIRG/25-18: Cospas-Sarsat Alert Responses

That, considering the importance of effective Cospas-Sarsat alerting and monitoring supporting the international Search and Rescue (SAR) system, States be urged to:

- a) consider becoming formally associated with the Cospas-Sarsat system;*
- b) provide up-to-date SAR Point of Contact (SPOC) details to Cospas-Sarsat, and respond promptly to SPOC communications tests;*
- c) promote registration of 406 MHz distress beacons and make use of the free International Beacon Registration Database (IBRD) facility unless the State has its own readily available registration system;*
- d) support a simplified, serialised beacon unique identification coding system for next generation beacons;*
- e) ensure the provision of immediate access by Rescue Coordination Centres (RCCs) to the 406 MHz distress beacon registration data, whether maintained by the State or the Cospas-Sarsat IBRD; and*
- f) provide post-alert advisories to Cospas-Sarsat on all alert outcomes as soon as practicable as a performance and system improvement measure.*

Conclusion APANPIRG/25-19: Personal Locator Beacon

That, considering the development of miniaturised Personal Locator Beacons (PLBs) being increasingly carried on persons, marine vessels and aircraft, the possible overload of alerting systems and RCCs, and the obligation of States to respond to safety alerts, ICAO in cooperation with the IMO, be urged to consider means of effectively managing PLB alerts.

Conclusion APANPIRG/25-20: Global SAR Coordination

That, considering the need for global and inter-regional Search and Rescue (SAR) coordination, ICAO be urged to:

- a) consider securing the necessary technical resources for managing global SAR policy development and inter-regional coordination; and
- b) include SAR as part of the Aviation System Block Upgrades (ASBU).

Decision APANPIRG/25-21: Search and Rescue (SAR) Library

That, States be urged to utilise the SAR Library located at http://www.uscg.mil/hq/cg5/cg534/SAR_Manuals.asp.

Conclusion APANPIRG/25-22: Provision of MH370 Feedback

In accordance with Annex 12, Recommendation 5.9.2, that:

- a) Asia/Pacific States/Administrations involved in the SAR response to MH370 be urged to develop any lessons learned and suggestions for improvement for submission to the APSAR/TF/3 meeting, scheduled for 25-29 January 2015; and
- b) ICAO and IMO be urged to consider lessons learned and feedback in order to update global SAR standards and guidance material.

DGCA/51

2.9 DGCA/51 agreed to the following Action Items related to SAR:

Discussion Paper	Action Item	Agenda Item 3.3 A: Emerging Issues in Aviation
DP/3.3A/1/4	51/2	Noting the progress made in the development of a high-level Concept of Operations for the Global Aeronautical Distress and Safety System (GADSS), the Conference a) urged States and Administrations to contribute to the concerted efforts to improve aircraft tracking and search and rescue; b) requested ICAO to continue its work on developing solutions to improve aircraft tracking and search and rescue.
DP/3.3A/3	51/3	Recognizing that States have the responsibility to ensure the safety of civil aviation operations in their sovereign and delegated airspace, and airspace users have the ultimate responsibility to decide where they are able to operate safely, the Conference: a) urged States to contribute to the concerted efforts to enhance the sharing of information to mitigate the risks associated with operations over or near conflict zones; b) requested ICAO to continue its work to develop solutions to enhance the sharing of information to mitigate the risks associated with operations over or near conflict zones.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) note that APSAR/TF/4/WP10 contains a Draft Conclusion related to the new SAR Seamless ATM Plan elements;
- c) discuss the draft eANP data, but especially:
 - i) SAR Special Regional Requirements, if any;
 - ii) Table SAR I-1 Search and Rescue Regions;
 - iii) Table SAR II-1 SAR Facilities;
- d) discuss the proposed SAR Human Performance Seminar/Workshop; and
- e) discuss any relevant matters as appropriate.

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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module B0-SAR: Improved Safety and Efficiency through the initial application of Regional SAR Initiatives					
Performance Improvement Area 2: Globally Interoperable Systems and Data					
3. ASBU B0-SAR: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	N	Y	Y	Y
4. ASBU B0-SAR: Planning Targets and Implementation Progress					
5. Elements		6. Targets and implementation progress (Ground and Air)			
SAR Regulatory and Coordination Mechanisms		November 2018: All States should develop statutes and related provisions for a SAR organization and its framework, resources, policies and procedures, including a State SAR Plan, international SAR agreements and SAR exercises (SAREX).			
SAR Facilities and Assets		November 2018: All States should establish Rescue Coordination Centres (RCCs) of sufficient size with facilities, tools, and access to SAR Units (SRU) commensurate with the State's responsibilities, or delegate the function as appropriate (all States should investigate the feasibility of establishing Joint Rescue Coordination Centres (JRCCs) and implement where beneficial).			
SAR Information		November 2018: All States should establish a centralised SAR information source, which includes data supporting the Aeronautical Information Publication (AIP), SAR Library, 24 hour Contacts database of SAR facilities, assets and lists of SRUs.			
SAR Improvement		November 2018: All States should implement Quality Assurance (QA) programmes that include continuous improvement and audit processes, gap and safety/quality indicator analysis, and SAR promotion activities.			
7. ASBU B0-SAR: Implementation Challenges					
Elements	Implementation Area				
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals	
SAR Regulatory and Coordination Mechanisms	NA	NA	Legislative restrictions and legal problems enacting SAR agreements. Lack of political support.	NA	



7. ASBU B0-SAR: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
SAR Facilities and Assets	Lack of resources to establish appropriate facilities and SRUs. Cospas-Sarsat facilities or sharing access with other States.	Lack of appropriate communications and direction-finding equipment.	Lack of local, State and regional agreements between agencies to facilitate sharing of SAR resources, including SRUs.	Lack of Civil/Military SAR cooperation, including use of military facilities and SRUs.
SAR Information	Lack of computers and software	NA	Lack of established information support processes.	NA
SAR Improvement	NA	NA	Lack of regional and local training of RCC staff and SRUs. Lack of QA and improvement plans and procedures.	NA

8. ASBU B0-SAR: Performance Monitoring and Measurement	
8A. ASBU B0-SAR: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
SAR Regulatory and Coordination Mechanisms	Indicators: Percentage of States implementing SAR regulatory and coordination mechanisms Supporting metric: Number of States implementing SAR regulatory and coordination mechanisms
SAR Facilities and Assets	Indicators: Percentage of States establishing SAR facilities and assets Supporting metric: Number of States establishing SAR facilities and assets
SAR Information	Indicators: Percentage of States implementing SAR information systems Supporting metric: Number of States implementing SAR information systems
SAR Improvement	Indicators: Percentage of States implementing SAR improvement programmes Supporting metric: Number of States implementing SAR improvement programmes



ASBU B0-SAR: Performance Monitoring and Measurement	
8 B. ASBU B0-SAR: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative benefits)
Access & Equity	NA
Capacity	NA
Efficiency	Benefit: enhanced sharing of SRUs and information leading to more efficient responses that involve less time searching.
Environment	Benefit: reduced emissions as a result of reduced fuel burn of airborne, maritime and land based SRUs.
Safety	Benefit: quicker response times to safety of life events, with better information providing SAR Mission Coordinators the opportunity to better match the SRU with the emergency requirement. Improved civil/military cooperation.

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DRAFT

eANP SAR Extracts

ASIA AND PACIFIC REGIONS ANP, VOLUME I

PART VI - SEARCH AND RESCUE (SAR)

1. INTRODUCTION

1.1 This part of the **Asia and Pacific Regions** ANP constitutes the agreed regional requirements considered to be the minimum necessary for effective planning and implementation of search and rescue (SAR) facilities and services in the **Asia and Pacific Regions** and complements the provisions of ICAO SARP's and PANS related to SAR. It contains stable plan elements related to the assignment of responsibilities to States for the provision of SAR facilities and services within the ICAO **Asia and Pacific Regions** in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300) and mandatory requirements related to the SAR facilities and services to be implemented by States in accordance with regional air navigation agreements.

1.2 The dynamic plan elements related to the assignment of States' responsibilities for the provision of SAR facilities and services and the mandatory requirements based on regional air navigation agreements related to SAR are contained in the **Asia and Pacific Regions** Volume II, Part VI – SAR.

Standards, Recommended Practices and Procedures

1.3 The Standards, Recommended Practices and Procedures (SARPs) and related guidance material applicable to the provision of SAR are contained in:

- a) Annex 12 – *Search and Rescue*;
- b) Annex 6 — *Operation of Aircraft*;
- c) *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM) (Doc 4444);
- d) *Regional Supplementary Procedures* (Doc 7030); and
- e) *International Aeronautical and Maritime Search and Rescue Manual* (Doc 9731-AN/958).

2. GENERAL REGIONAL REQUIREMENTS

2.1 Each Contracting State should ensure that the provision of search and rescue services covers its own territory and those areas over the high seas for which it is responsible for the provision of those services. The description of the current Search and Rescue Regions (SRRs), as approved by the ICAO Council, are contained in **Table SAR I-1** and depicted in the **Chart SAR I-1**. The list of Rescue Coordination Centres (RCCs) and Rescue Sub-centres (RSCs) in the Region(s) are detailed in Volume II.

2.2 The three volumes of the *IAMSAR Manual* (Doc 9731) provide guidance for a common aviation and maritime approach to organizing and providing SAR services. States are invited to use the *IAMSAR Manual* to ensure the availability of effective aeronautical SAR services and to cooperate with neighbouring States.

2.3 States which rely on military authorities and/or other sources for the provision of SAR facilities should ensure that adequate arrangements are in place for coordination of SAR activities between all entities involved.

2.4 Arrangements should be made to permit a call on any national services likely to be able to render assistance on an ad-hoc basis, in those cases when the scope of SAR operations requires such assistance.

3. SPECIFIC REGIONAL REQUIREMENTS

3.1 **TBD (if necessary).**

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE (NAME) REGION(S)

EXPLANATION OF THE TABLE

Column:

- 1 Name of the SRR
- 2 Description of SRR lateral limits;
- 3 Remarks — additional information, if necessary.

ASIA AND PACIFIC ANP, VOLUME II

PART VI - SEARCH AND RESCUE (SAR)

1. INTRODUCTION

1.1 This part of the **Asia and Pacific ANP**, Volume II, complements the provisions in ICAO SARP's and PANS related to search and rescue (SAR). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of SAR facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to the SAR facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

2. GENERAL REGIONAL REQUIREMENTS

2.1 The Rescue Coordination Centres (RCCs) and Rescue Sub-centres (RSCs) for the Asia and Pacific Region are listed in **Table SAR II-1** and depicted in **Chart SAR I-1**.

2.2 In cases where the minimum SAR facilities are temporarily unavailable, alternative suitable means should be made available.

2.3 In cases where a SAR alert is proximate to a search and rescue region (SRR) boundary (e.g. 50 NM or less), or it is unclear if the alert corresponds to a position entirely contained within an SRR, the adjacent RCC or RSC should be notified of the alert immediately.

3. SPECIFIC REGIONAL REQUIREMENTS

3.1 The details of the facilities and/or services to be provided to fulfill the basic requirements of the plan could be found in this part. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

TABLE SAR II-1 - SEARCH AND RESCUE FACILITIES IN THE (NAME) REGION(S)

EXPLANATION OF THE TABLE

Column

- | | |
|---|--|
| 1 | State |
| 2 | Name of the Rescue Coordination Centre (RCC) and Rescue Sub-centre (RSC). |
| 3 | SAR points of contact (SPOC). Name of the SPOC. |
| 4 | Remarks. Supplementary information such as the type of RCC (e.g. maritime or aviation or joint). |

ASIA AND PACIFIC REGION ANP, VOLUME III

PART I - GENERAL PLANNING ASPECTS (GEN)

1. PLANNING METHODOLOGY

1.1 Guided by the GANP, the regional planning process starts by identifying the homogeneous ATM areas, major traffic flows and international aerodromes. An analysis of this data leads to the identification of opportunities for performance improvement. Modules from the Aviation System Block Upgrades (ASBUs) are evaluated to identify which of those modules best provide the needed operational improvements. Depending on the complexity of the module, additional planning steps may need to be undertaken including financing and training needs. Finally, regional plans would be developed for the deployment of modules by drawing on supporting technology requirements. This is an iterative planning process which may require repeating several steps until a final plan with specific regional targets is in place. This planning methodology requires full involvement of States, service providers, airspace users and other stakeholders, thus ensuring commitment by all for implementation.

1.2 Block 0 features Modules characterized by technologies and capabilities which have already been developed and implemented in many parts of the world today. It therefore features a near-term availability milestone, or Initial Operating Capability (IOC), of 2013 for high density based on regional, sub-regional and State operational need. Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2018, 2023 and 2028 respectively.

2. REVIEW AND EVALUATION OF AIR NAVIGATION PLANNING

2.1 The progress and effectiveness against the priorities set out in the regional air navigation plans should be annually reported, using a consistent reporting format, to ICAO.

2.2 Performance monitoring requires a measurement strategy. Data collection, processing, storage and reporting activities supporting the identified global/regional performance metrics are fundamental to the success of performance-based approaches.

2.3 The air navigation planning and implementation performance framework prescribes reporting, monitoring, analysis and review activities being conducted on a cyclical, annual basis. An Air Navigation Reporting Form (ANRF) reflecting selected key performance areas as defined in the Manual on Global Performance of the Air Navigation System (ICAO Doc 9883) has been developed for each ASBU Module. The ANRF is a customized tool which is recommended for the application of setting planning targets, monitoring implementation, and identifying challenges, measuring implementation/performance and reporting. If necessary, other reporting formats that provide more details may be used but should contain as a minimum the elements described in the ANRF template. A sample of the ANRF is provided in **Appendix A**. A sample Template of a planning table which may be used to show the elements planned in an ICAO region is provided in **Appendix B**.

3. REPORTING AND MONITORING RESULTS

3.1 Reporting and monitoring results will be analyzed by the PIRGs, States and ICAO Secretariat to steer the air navigation improvements, take corrective actions and review the allocated objectives, priorities and targets if needed. The results will also be used by ICAO and aviation partner stakeholders to develop the annual Global Air Navigation Report. The report results will provide an opportunity for the international civil aviation community to compare progress across different ICAO regions in the establishment of air navigation infrastructure and performance-based procedures.

3.2 The reports will also provide the ICAO Council with detailed annual results on the basis of which tactical adjustments will be made to the performance framework work programme, as well as triennial policy adjustments to the GANP and the Block Upgrade Modules.

3.3 Table GEN III-1 contains a minimum set of High-Level Implementation Indicator(s) for each of the eighteen ASBU Block 0 Modules necessary for the monitoring of these Modules (if identified as a priority for implementation at regional or sub-regional level). These high-level indicators are intended to enable comparison between ICAO Regions with respect to ASBU Block 0 Modules and will apply only to commonly selected ASBU Modules. All regions/PIRGs reserve the right to select the ASBU Modules relevant to their needs and to endorse additional indicators, as deemed necessary. No reporting is required for ASBU Block 0 Modules that have not been selected.

Note: The priority for implementation as well as the applicability area of each selected ASBU Block 0 Module is to be defined by the APANPIRG. This should be reflected in Part II - Air Navigation System Implementation.

TABLE GEN III-1 - IMPLEMENTATION INDICATOR(S) FOR EACH ASBU BLOCK 0 MODULE

Explanation of the Table

- 1 Block 0 Module Code
- 2 Block 0 Module Title
- 3 High level Implementation Indicator
- 4 Remarks

Additional information as deemed necessary.

Module Code	Module Title	High level Implementation Indicator	Remarks
1	2	3	4
B0-APTA	Optimization of Approach Procedures including vertical guidance	% of international aerodromes having at least one runway end provided with APV Baro-VNAV or LPV procedures	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	% of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation	1. Not to be considered for the first reporting cycles due to lack of maturity. 2. List of ADs to be established through regional air navigation agreement.
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	% of applicable international aerodromes having implemented AMAN / DMAN	1. Not to be considered for the first reporting cycles due to lack of maturity. 2. List of ADs to be established through regional air navigation agreement.
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	% of applicable international aerodromes having implemented A-SMGCS Level 2	List of ADs to be established through regional air navigation agreement.

Module Code	Module Title	High level Implementation Indicator	Remarks
1	2	3	4
B0-ACDM	Improved Airport Operations through Airport-CDM	% of applicable international aerodromes having implemented improved airport operations through airport-CDM	List of ADs to be established through regional air navigation agreement.
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	- % of States having implemented an AIXM based AIS database - % of States having implemented QMS	
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	- % of States having implemented SADIS / WIFS - % of States having implemented QMS	
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	% of FIRs in which FUA is implemented	
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	% of FIRs within which all ACCs utilize ATFM systems	
B0-ASUR	Initial capability for ground surveillance	% of FIRs where ADS-B OUT and/or MLAT are implemented for the provision of surveillance services in identified areas.	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-ASEP	Air Traffic Situational Awareness (ATSA)	% of States having implemented air traffic situational awareness	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	% of FIRs having implemented in-trail procedures	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-ACAS	ACAS Improvements	% of States requiring carriage of ACAS (with TCAS 7.1 evolution)	
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	% of States having implemented ground-based safety-nets (STCA, APW, MSAW, etc.)	
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	- % of international aerodromes / TMAs with PBN STAR implemented - % of international aerodromes/TMA where CDO is implemented	
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	% of FIRs utilising data link en-route in applicable airspace	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	- % of international aerodromes / TMAs with PBN SID implemented - % of international aerodromes/TMA where CCO is implemented	

Appendix A

SAMPLE TEMPLATE

1. AIR NAVIGATION REPORT FORM (ANRF)

(This template demonstrates how ANRF to be used. The data inserted here refers to ASBU B0-05/CDO as an example only)

Regional and National planning for ASBU Modules
Appendix B - Main Planning Table Template (SAMPLE)

	Objectives					Priorities and targets			Referen ce
Block	ASBU module s and elemen ts Enable rs	Performan ce Improvem ent Area	Applica ble or not in [Region] (Yes/No)	Region al plannin g elemen ts	Enable rs	Priorit y allocat ed in [Region]	Target (s) in [Region]	Indicator (s) / Metric(s)	Supporti ng Planning Docume nt (ANRF, other)

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

SRR	Lateral limits coordinates	Remarks
1	2	3
Australia SRR (Brisbane FIR)	120000S — 1143000E 120000S — 1232000E 092000S — 1265000E 070000S — 1350000E 095000S — 1394000E 095000S — 1410000E 093700S — 1410000E thence along COAST 091600S — 1420300E 091900S — 1424800E 090800S — 1435200E 092400S — 1441400E 095700S — 1440500E thence along BARRIER REEF, to 113000S — 1440200E 114300S — 1440400E 120000S — 1440000E 120000S — 1550000E 140000S — 1550000E 140000S — 1611500E 175000S — 1630000E 300000S — 1630000E 450000S — 1630000E 443400S — 1500000E 435100S — 1504000E 430000S — 1510000E 381100S — 1501900E 365700S — 1504500E thence along the minor arc of a circle of 120.0NM radius centred on 351900S — 1525600E 342100S — 1514000E 335900S — 1520100E 333500S — 1515400E 332800S — 1514800E 331500S — 1512600E 331200S — 1511400E 332000S — 1504200E 332700S — 1503300E 320600S — 1485000E 290000S — 1463200E 290000S — 1433000E 261400S — 1382300E 221800S — 1363800E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	212800S — 1360900E 211100S — 1313400E 215100S — 1305800E 231300S — 1282800E 232200S — 1262900E 232700S — 1241500E 215300S — 1222500E thence along the minor arc of a circle of 15.0 NM radius centred on 213300S — 1220100E 202600S — 1204500E 182300S — 1182500E 175300S — 1182200E 140800S — 1150900E	
Australia SRR (Melbourne FIR)	90 00 00S — 163 00 00E 900000S — 0750000E 450000S — 0750000E 060000S — 0750000E 020000S — 0780000E 020000S — 0920000E 120000S — 1070000E 120000S — 1100000E 120000S — 1143000E 140800S — 1150900E 175300S — 1182200E 182300S — 1182500E 202600S — 1204500E 213300S — 1220100E 215300S — 1222500E 232700S — 1241500E 232200S — 1262900E 231300S — 1282800E 215100S — 1305800E 211100S — 1313400E 212800S — 1360900E 221800S — 1363800E 261400S — 1382300E 290000S — 1433000E 290000S — 1463200E 320600S — 1485000E 332700S — 1503300E 332000S — 1504200E 331200S — 1511400E 331500S — 1512600E 332800S — 1514800E 333500S — 1515400E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	<p>335900S — 1520100E 342100S — 1514000E 351900S — 1525600E 365700S — 1504500E 381100S — 1501900E 430000S — 1510000E 435100S — 1504000E 443400S — 1500000E 450000S — 1630000E</p>	
Australia	<p>0600S 07500E - 0200S 07800E 0200S 07800E – 0200S 09200E 0200S 09200E - 1200S 10700E 1200S 10700E – 1200S 12320E 1200S 12320E – 0920S 12650E 0920S 12650E – 0700S 13500E 0700S 13500E – 0950S 13940E 0950S 13940E - 0950S 14100E 0950S 14100E - 0937S 14101E 0937S 14101E – 0916S 14203E Then along the Australian EEA boundary 0919S 14248E – 0908S 14353E 0908S 14353E – 0924S 14414E 0924S 14414E – 0957S 14405E 0957S 14405E – 1005S 14359E 1005S 14359E - 1009S 14357E 1009S 14357E – 1018S 14355E 1018S 14355E – 1023S 14355E 1023S 14355E – 1027S 14354E 1027S 14354E – 1031S 14355E 1031S 14355E – 1035S 14356E 1035S 14356E - 1047S 14400E 1047S 14400E – 1102S 14403E 1102S 14403E – 1107S 14404E 1107S 14404E – 1111S 14404E 1111S 14404E – 1114S 14404E 1114S 14404E – 1115S 14403E 1115S 14403E – 1130S 14402E 1130S 14402E - 1143S 14404E 1143S 14404E – 1200S 14400E 1200S 14400E – 1200S 15500E 1200S 15500E – 1400S 15500E 1400S 15500E – 1400S 16115E 1400S 16115E – 1740S 16300E 1740S 16300E – 9000S 16300E 9000S 16300E - 9000S 07500E 9000S 07500E – 0600S 07500E</p>	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

Bali SRR	No coordination provided in record	
Bangkok SRR	095600N 0983300E	
Bangkok SRR	11 37.00N 102 55.00E 10 00.00N 102 15.00E 09 30.00N 103 45.00E 07 00.00N 103 00.00E 06 15.00N 102 15.00E 10 00.00N 096 30.00E 07 15.00N 098 00.00E 06 30.00N 099 30.00E	
Beijing SRR	452500N 1151900E 431500N 1173100E 395400N 1192100E 393000N 1195200E 381500N 1200000E 372900N 1173000E 363200N 1151800E 362100N 1145500E 360600N 1142100E 345400N 1124700E 340000N 1102900E 343200N 1101500E 353200N 1101800E 372800N 1104400E 382200N 1103600E 384400N 1094100E 402000N 1070100E 404300N 1055500E 414400N 1051300E	
Biak SRR	No coordination provided in record	
Bombay SRR (Mumbai FIR)	060000S 0600000E 104200N 0600000E 120000N 0600000E 194800N 0600000E 233000N 0643000E 250000N 0705500E 250000N 0820000E 171500N 0820000E 180000N 0810000E 180000N 0760000E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	150000N 0760000E 150000N 0720000E 073000N 0720000E 073000N 0700000E 030500N 0700000E 060000S 0680000E	
Calcutta SRR (Kolkata FIR)	253800N 0895200E 262200N 0880200E 213800N 0891000E 200000N 0920000E 140000N 0920000E 163000N 0830000E 171500N 0820000E 250000N 0820000E 250000N 0830000E 271000N 0830000E 272700N 0834000E 271700N 0834000E	
Colombo FIR	064400N 0775700E 070000N 0783000E 100000N 0800000E 100000N 0820000E 060000N 0920000E 020000S 0920000E 020000S 0780000E 060000N 0780000E 060000N 0763000E	
Colombo SRR	1000N 08000E - 1000N 08200E 0600N 09200E - 0200S 09200E 0200S 07800E - 0600N 07800E 0600N 07630E - 0700N 07830E 1000N 08000E	
Delhi SRR	250000N 0830000E 250000N 0820000E 250000N 0705500E Along political boundary to (Pakistan/India) 300000N 0733500E	
Dhaka SRR	210000N 0920000E 200000N 0920000E 213800N 0891000E 262200N 0880200E 253800N 0895200E 215700N 0923200E	
Dhaka SRR	2100N 09200E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	<p>2138N 08910E Thence along the national boundary until it meets the Yangon FIR boundary at 2209N 09237E 2100N 09200E The boundary of Dhaka Search and Rescue Region is coincident with the boundary of Dhaka Flight Information Region (Dhaka FIR) covering the whole territory of Bangladesh and adjacent waters. Area Control Center serves as the point of contact for collecting information relating to the state of emergency of an aircraft operating within the Search and Rescue Region.</p>	
Guangzhou SRR	<p>212500N 1113000E 203000N 1113000E 203000N 1080300E Along political boundary 231100N 1053200E 243900N 1054800E 252500N 1075300E 264100N 1091200E 275300N 1091900E 293100N 1092400E 292300N 1130600E 290200N 1143400E 264200N 1135700E 260300N 1140700E 250700N 1141800E 244600N 1150100E 242200N 1164200E 234200N 1171100E 234100N 1171300E Along political boundary 203000N 1080300E 203000N 1113000E 193000N 1113000E 164000N 1140000E 143000N 1140000E 143000N 1120000E 172500N 1084300E 182000N 1074100E 191600N 1071100E 195700N 1075600E</p>	
Hanoi SRR	<p>203000N 1080300E</p>	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	195700N 1075600E 191600N 1071100E 182000N 1074100E 172500N 1084300E 171300N 1080000E 170000N 1063400E Along political boundary to Lao PDR/Viet Nam 231100N 1053200E Along political boundary to Sanya SRR/Viet Nam	
Ho Chi Minh SRR	090000N 1024000E 101400N 1033800E Along political boundary to Phnom Penh and Vientiane 170000N 1063400E 171300N 1080000E 172500N 1084300E 143000N 1120000E 143000N 1140000E 103000N 1140000E 070000N 1080000E 070000N 1030000E	
Hong Kong SRR	230000N 1173000E 210000N 1173000E 193000N 1113000E 212500N 1113000E Along political boundary with China 234100N 1171300E 233000N 1173000E 231000N 1173000E	
Hong Kong SRR	23 40 00N 117 30 00 E 21 00 00N 117 30 00 E 16 40 00N 114 00 00E 19 30 00N 111 30 00E 21 25 00N 111 30 00 E then along the limit of the territorial waters of the PR. China, i.e. 3 NM off-shore and thenorthern boundary of Macao and the Hong Kong Special Administrative Region, to 23 40 00 N 117 30 00E	
Honiara SRR	103000S 1664500E 114800S 1665200E 140000S 1630000E 140000S 1611500E 140000S 1550000E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	120000S	1550000E	
	071900S	1550000E	
	065600S	1553600E	
	065600S	1554200E	
	065100S	1555500E	
	064000S	1560200E	
	063300E	1560200E	
	103000S	1664500E	
Jakarta SRR	013800N	1022000E	
	005000S	1060000E	
	010000N	1085800E	
	011600N	1133700E	
	030000S	1102300E	
	082000S	1102300E	
	120000S	1143000E	
	120000S	1100000E	
	120000S	1070000E	
	020000S	0920000E	
	060000N	0920000E	
	060000N	0942500E	
	060000N	0973000E	
Kabul SRR	300000N	0661900E	
	Along political boundary		
Karachi SRR	233000N	0612000E	
	244000N	0612000E	
	251000N	0612000E	
	300000N	0661900E	
	300000N	0733500E	
	250000N	0705500E	
	233000N	0643000E	
Kathmandu SRR	302600N	0813700E	
	271700N	0834000E	
Kota Kinabalu SRR	073000N	1173000E	
	040000N	1200000E	
	Along political boundary to		
	011600N	1133700E	
	Along political boundary to		
	010000N	1085800E	
	010000N	1083000E	
	020000N	1083000E	
	021500N	1083000E	
	060000N	1131500E	
	082500N	1163000E	
Kota Kinabalu SRR	0825N 11630E, 0730N 11730E, 0400N 12000E, 0400N 11800E thence along the INTL BDRY of		

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	Sabah / Sarawak and Indonesia to a point 0100N 10854E, 0100N 10830E, 0215N 10830E to 0825N 11630E.	
Kuala Lumpur SRR	100000N — 0942500E 100000N — 0960000E 100000N — 0963000E 071500N — 0980000E 062700N — 0993600E Along political boundary to 064500N — 1024000E 060000N — 1030500E 045000N — 1034400E 034000N — 1034000E 023600N — 1044500E 012000N — 1042000E Along political boundary to 011300N — 1033000E 013800N — 1022000E 060000N — 0973000E 060000N — 0942500E	
Kuala Lumpur SRR	0645N 10240E - 0450N 10344E 0340N 10340E- 0236N 10445E 0120N 10420E - along 0120N to the Peninsular Malaysia/Singapore INTL BDRY- then along the Peninsular Malaysia/Singapore INTL BDRY to 0117N 10336E 0113N 10330E -0139N 10210E 0600N 09730E - 0600N 09425E 1000N 09425E - 1000N 09630E 0715N 09800E - 0630N 09930E then along the border of Peninsular Malaysia/Thailand INTL BDRY 0615N 10215E - 0645N 10240E.	
Kunming SRR	315400N 1093100E 301700N 1092900E 293100N 1092400E 275300N 1091900E 264100N 1091200E 252500N 1075300E 243900N 1054800E 231100N 1053200E	
Lahore SRR	300000N 0661900E Along political boundary to 300000N 0733500E	
Lazhou SRR	414400N 1051300E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	404300N	1055500E	
	402000N	1070100E	
	384400N	1094100E	
	382200N	1103600E	
	372800N	1104400E	
	353200N	1101800E	
	343200N	1101500E	
	340000N	1102900E	
	333200N	1105200E	
	315400N	1093100E	
	321400N	1072400E	
	322700N	1054900E	
	325500N	1014200E	
	314900N	0983500E	
	320000N	0970000E	
	325200N	0915500E	
	360200N	0890100E	
	362500N	0872300E	
	382100N	0901300E	
	414800N	0950800E	
	425500N	0962000E	
	323200N	1035300E	
Madras SRR (Chennai FIR)	171500N	0820000E	
	163000N	0830000E	
	140000N	0920000E	
	133000N	0942500E	
	110000N	0942500E	
	100000N	0960000E	
	100000N	0942500E	
	060000N	0942500E	
	060000N	0920000E	
	100000N	0820000E	
	100000N	0800000E	
	070000N	0783000E	
	064400N	0775700E	
	060000N	0763000E	
	060000N	0760000E	
	060000N	0740000E	
	073000N	0740000E	
	073000N	0720000E	
	150000N	0720000E	
	150000N	0760000E	
	180000N	0760000E	
	180000N	0810000E	
Male SRR	060000N	0763000E	
	060000N	0780000E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	020000S	0780000E	
	060000S	0750000E	
	060000S	0680000E	
	030500N	0700000E	
	073000N	0700000E	
	073000N	0720000E	
	073000N	0740000E	
	060000N	0740000E	
	060000N	0760000E	
	060000N	0763000E	
Manila SRR	210000N	1173000E	
	210000N	1213000E	
	210000N	1300000E	
	070000N	1300000E	
	033000N	1330000E	
	033000N	1320000E	
	040000N	1320000E	
	040000N	1200000E	
	073000N	1173000E	
	082500N	1163000E	
	103000N	1140000E	
	143000N	1140000E	
	164000N	1140000E	
Nadi SRR	033000N	1800000E	
	250000S	1800000E	
	250000S	1712500E	
	280000S	1680000E	
	300000S	1630000E	
	175000S	1630000E	
	140000S	1611500E	
	140000S	1630000E	
	114800S	1665200E	
	100000S	1700000E	
	033000N	1700000E	
	033000N	1800000E	
	050000S	1800000W	
	050000S	1720000W	
	250000S	1800000W	
Nauru SRR	033000N	1600000E	
	033000N	1700000E	
	000000N	1700000E	
	100000S	1700000E	
	114800S	1665200E	
	103000S	1664500E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	045000S	160000E	
	000000N	160000E	
New Zealand SRR	900000S	163000E	
	450000S	163000E	
	300000S	163000E	
	280000S	168000E	
	250000S	171250E	
	250000S	180000E	
	050000S	180000E	
	250000S	180000W	
	050000S	160000W	
	050000S	157000W	
	300000S	157000W	
	300000S	131000W	
	900000S	131000W	
	900000S	180000W	
Phnom Penh SRR	No data		
Port Moresby SRR	045000S	160000E	
	045000S	159000E	
	063300S	156200E	
	064000S	156200E	
	065100S	155500E	
	065600S	1554200E	
	065600S	1553600E	
	071900S	155000E	
	120000S	155000E	
	120000S	144000E	
	114300S	1440400E	
	113000S	1440200E	
	095700S	1440500E	
	092400S	1441400E	
	090800S	1435200E	
	091900S	1424800E	
	091600S	1420300E	
	093700S	141000E	
	000000N	141000E	
	000000N	160000E	
Pyongyang SRR	422500N	1303600E	
	420900N	1305300E	
	414000N	1313100E	
	403000N	1355600E	
	383800N	1333900E	
	383800N	1282500E	
	Along political boundary to		
	380000N	124000E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	395100N 1241000E	
	Along political boundary	
Shanghai SRR	363200N 1151800E	
	372900N 1173000E	
	381500N 1200000E	
	380000N 1240000E	
	300000N 1240000E	
	290000N 1240000E	
	250000N 1200000E	
	230000N 1173000E	
	231000N 1173000E	
	233000N 1173000E	
	234100N 1171300E	
	234200N 1171100E	
	242200N 1164200E	
	244600N 1150100E	
	250700N 1141800E	
	260300N 1140700E	
	264200N 1135700E	
	290200N 1143400E	
	300500N 1155600E	
	325400N 1154700E	
	351500N 1152700E	
	354200N 1150100E	
	362100N 1145500E	
Shenyang SRR	No coordination provided	
Singapore SRR	023600N 1044500E	
	034000N 1034000E	
	045000N 1034400E	
	060000N 1030500E	
	064500N 1024000E	
	070000N 1030000E	
	070000N 1080000E	
	103000N 1140000E	
	082500N 1163000E	
	060000N 1131500E	
	021500N 1083000E	
	020000N 1083000E	
	010000N 1083000E	
	010000N 1085800E	
	000000N 1091000E	
	000000N 1080000E	
	005000S 1060000E	
	000000N 1051000E	
	000000S 1045700E	
	013800N 1022000E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	011300N 1033000E 012000N 1042000E	
	070000N 1030000E 070000N 1080000E 103000N 1140000E 082500N 1163000E 021500N 1083000E 010000N 1083000E 010000N 1085400E, thence south along the coastline of Borneo to 001500N 1090000E to Equator 1090000E Equator 1080000E 005000S 1060000E Equator 1051000E Equator 1044600E, thence around the arc of a circle radius 100NM centred on Singapore Island to 013900N 1021000E 011300N 1033000E 011700N 1033600E, thence east along the international boundary of Singapore/Peninsular Malaysia, thence along 012000N to 012000N 1042000E 023600N 1044500E 034000N 1034000E 045000N 1034400E 064500N 1024000E 070000N 1030000E	
Taegu SRR (Incheon FIR)	383800N 1333900E 380000N 1330000E 373000N 1330000E 344000N 1291000E 323000N 1273000E 323000N 1265000E 300000N 1252500E 300000N 1240000E 380000N 1240000E 383800N 1282500E	
Tahiti SRR	033000N 1450000W 033000N 1200000W 300000S 1200000W 300000S 1305400W 300000S 1570000W 050000S 1570000W 050000S 1550000W	
Taibei SRR	250000N 1200000E 290000N 1240000E 233000N 1240000E 210000N 1213000E 210000N 1173000E 230000N 1173000E	
Tokyo SRR	450000N 1500000E 500500N 1590000E	

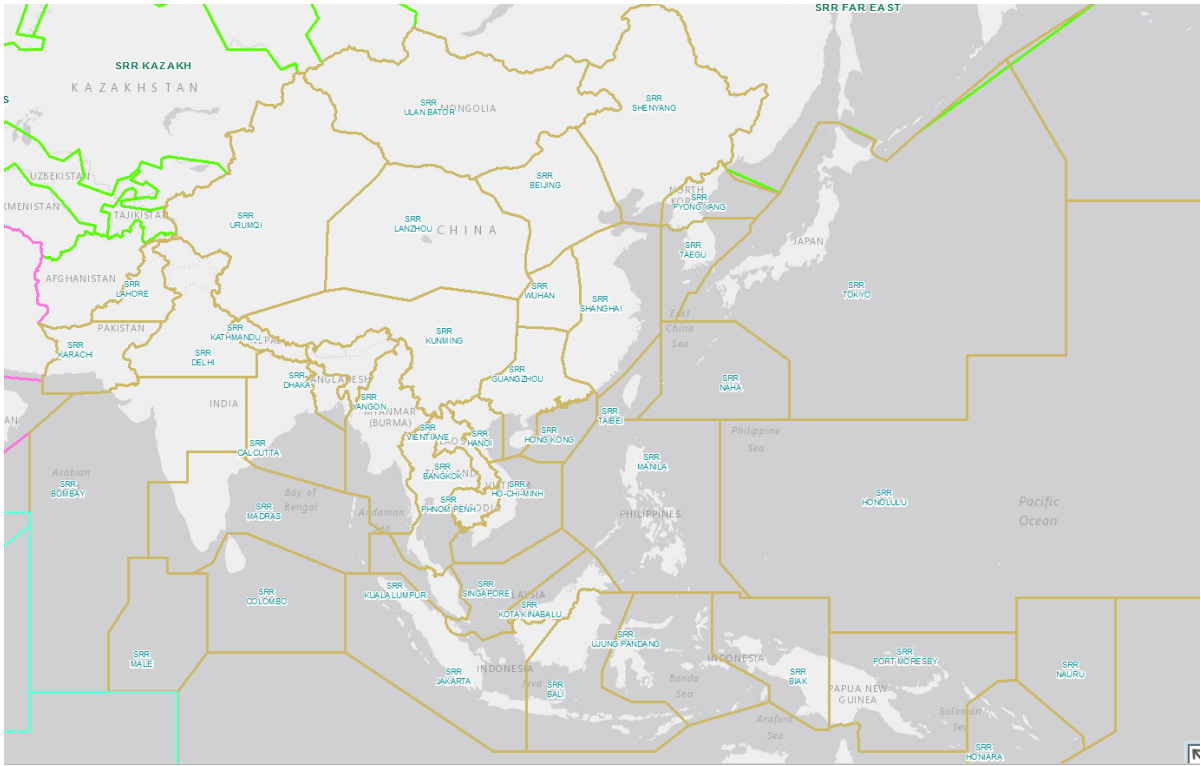
TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	<p>454200N — 1625500E 430000N — 1650000E 270000N — 1650000E 270000N — 1550000E 210000N — 1550000E 210000N — 1300000E 210000N — 1213000E 233000N — 1240000E 290000N — 1240000E 300000N — 1240000E 300000N — 1252500E 323000N — 1265000E 323000N — 1273000E 344000N — 1291000E 373000N — 1330000E 383800N — 1333900E 403000N — 1355600E 454500N — 1400000E 454500N — 1420000E then between Hokkaido and Kunashiri Islands 443000N — 1454000E 442700N — 1454400E 432000N — 1455000E 431200N — 1461300E 430000N — 1465000E 450000N — 1500000E</p>	
<p>TOKYO SRR Naha SRR?</p>	<p>454500N1420000E - 443000N1454000E 432000N1455000E - 430000N1465000E 450000N1500000E - 500500N1590000E 430000N1650000E - 400000N1650000E 270000N1650000E - 270000N1550000E 210000N1550000E - 210000N1213000E 233000N1240000E - 300000N1240000E 300000N1252500E - 323000N1265000E 323000N1273000E - 344000N1291000E 373000N1330000E - 380000N1330000E 383800N1333900E - 403000N1355600E 454500N1400000E - 454500N1420000E Then along the national borders between SRR Juneau, Honolulu, Manila, Taipei, Shanghai, Incheon, Pyong Yang and FAR East.</p>	
<p>Ujung Pandang SRR</p>	<p>033000N 1330000E 033000N 1410000E 095000S 1410000E 095000S 1394000E 070000S 1350000E</p>	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS

	092000S 1265000E 120000S 1232000E 120000S 1143000E 082000S 1102300E 030000S 1102300E 011600N 1133700E then along the national border between Indonesia and Malaysia 040000N 1200000E 040000N 1320000E 033000N 1320000E	
Ulan Bator SRR	495500N 894000E 520600N 990000E 452500N 1151900E 414400N 1051300E	
Urumqi SRR	425500N 0962000E 414800N 0950800E 382100N 0901300E 302600N 0813700E Along political boundary 392900N 0734000E Along political boundary 402000N 0755000E Along political boundary 421100N 0802000E	
Vientiane SRR	170000N 1063400E	
Wuhan SRR	333200N 1105200E 340000N 1102900E 345400N 1124700E 360600N 1142100E 362100N 1145500E 354200N 1150100E 351500N 1152700E 325400N 1154700E 300500N 1155600E 290200N 1143400E 292300N 1130600E 293100N 1092400E 301700N 1092900E 315400N 1093100E	
Yangon SRR	140000N 0920000E 200000N 0920000E 210000N 0920000E 215700N 0923200E	

TABLE SAR I-1 – SEARCH AND RESCUE REGIONS (SRR) OF THE ASIA AND PACIFIC REGIONS



**TABLE SAR II-1 - SEARCH AND RESCUE FACILITIES IN THE ASIA AND PACIFIC
REGIONS**

State	Name of and RCC/RSC	SPOC	Remarks
1	2	3	4 (Abbreviations are clarified at the end of the table)
AFGHANISTAN		Website: N/A Telephone 1: (974) 4503452 Telephone 2: (974) 4364193 Facsimile: (974) 4327382 Mailing Address: N/A	
AUSTRALIA	JRCC Australia (JRCC Australia is a Joint Aeronautical and Maritime RCC located in Canberra)	Website: http://www.amsa.gov.au/search-and-rescue/rcc/index.asp Telephone 1: (61.2) 62306820 Facsimile: (61.2) 62306868 AFTN: YSARYCYX email: rccaus@amsa.gov.au Mailing Address: JRCC Australia, Australian Maritime Safety Authority G.P.O. Box 2181 Canberra, ACT 2601 Australia Phone: +61 2 6230 6899 (Aeronautical) Phone: +61 2 6230 6811 (Maritime)	Thursday Island: HEL-M, RV Cairns: MRG/HEL-M, RV Townsville: VLR/HEL-M, RV Yeppoon: HEL-M, RV Whitsunday Islands: HEL-M, RV Brisbane: ELR/HEL-M, RV Coffs Harbour: RV Newcastle: HEL-M, RV Sydney: ELR/HEL-M, RV Melbourne: MRG/HEL-M, RV Hobart: HEL-M, RV Adelaide: ELR/HEL-M, RV Perth: MRG/HEL-M, RV Port Headland: RV Broome: HEL-H, RB Darwin: ELR/HEL-M, RV
BANGLADESH	Dhaka RCC	Website: http://www.caab.gov.bd Telephone 1: (880.2) 8901462 Telephone 2: (880.2) 8901463 Facsimile: (880.2) 8901924 AFTN: VGHSZQZX email: rcc_dhaka@caab.gov.bd Mailing Address: Dhaka Area Control Centre 3rd Floor Control Tower Building Hazrat Shahjalal International Airport Kurmitola Dhaka-1229, Bangladesh	Dhaka: SRG, RV
BRUNEI DARUSSALAM		Website: N/A Telephone 1: (673) 2332600	

**TABLE SAR II-1 - SEARCH AND RESCUE FACILITIES IN THE ASIA AND PACIFIC
REGIONS**

		<p>Telephone 2: (673) 2344191 Facsimile: (673) 2344191 AFTN: WBSBCYCY email: atc@civil-aviation.gov.bn Mailing Address: Department of Civil Aviation Ministry of Communications Brunei International Airport Bandar Seri Begawan BB2513 Brunei Darussalam</p>	
CAMBODIA	Phnom-Penh RCC	<p>Website: N/A Telephone 1: (855) 12994878 Telephone 2: (855) 888736 919 Facsimile: (855) 23224259 Telex: 064411469 AFTN: VDPPYAYC email: sieng.ssca@ymail.com Mailing Address: #62, Preah Norodom Blvd, Phnom Penh, Cambodia</p>	Phnom-Penh: MRG, RV
CHINA	Beijing RCC Guangzhou RCC Kunming RCC Lanzhou RCC Shanghai RCC Shenyang RCC Taibei RCC Uramqi RCC Wuhan RCC	<p>Website: N/A Telephone 1: (86.10) 65293298 Telephone 2: (86.10) 65292221 Facsimile: (86.10) 65293296 AFTN: ZBBBZSZX email: cnmcc@mail.eastnet.com.cn Mailing Address: CNMCC China Maritime Search and Rescue Centre 11 Jianguomennei Avenue Beijing,100736 China (P.R. of)</p>	<p>Beijing: MRG/SRG, RV Tianjin: RV Guangzhou: MRG/SRG, RV Sanya: RV Shantou: RV Zhanjiang: RV Kunming: SRG, RV Lanzhou: SRG, RV Fuzhou: RV Lianyungang: RV Shanghai: MRG/SRG, RV/ RB Qingdao: RV Yantai: RV Wenzhou: RV Xiamen: RV Dalian: RV Qinhuangdao: RV Chiayi: LRG/HEL-M Chilung: RV Hsinghu: LRG/HEL- M Hualien: RV Uramqi: SRG Wuhan: SRG</p>
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA (DPRK)	Pyongyang RCC	<p>Website: N/A Telephone 1: +872-765058157 Telephone 2: +850-2-18111 ext 8059</p>	Pyongyang: MRG/HEL-M, RV

**TABLE SAR II-1 - SEARCH AND RESCUE FACILITIES IN THE ASIA AND PACIFIC
REGIONS**

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FIJI	Nadi RCC	Website: N/A Telephone 1: (679) 6725777 Ext 4184, 418382 Telephone 2: +679 9983233 Facsimile: (679) 6722470 (20:00-04:30Z Mon-Fri) AFTN: NFFNYCYX email: NADRCC@afl.com.fj Mailing Address: Airports Fiji Limited Private Mail Bag Nadi Airport Fiji Islands	Nadi: ELR/HEL-M, RV/RB
FRENCH POLYNESIA	Tahiti RCC	Website: N/A Telephone 1: (689) 40861153 Telephone 2: (689) 40861151 Facsimile: (689) 40855126 AFTN: NTAAYCYX email: bria@seac.pf Mailing Address: N/A	Papeete: ELR/MRG/HEL-M, RV/RB
HONG KONG, CHINA	Hong Kong RCC	Website: N/A Telephone 1: (852) 22337999 Facsimile: (852) 25417714 AFTN: VHHHYKYX email: hkmrcc@mardep.gov.hk Mailing Address: Marine Department Search and Rescue Section G.P.O.Box 4155 Hong Kong, China	Hong Kong: MRG/HEL-M, RV/RB
INDIA	Mumbai RCC Kolkata RCC Delhi RCC Chennai RCC	Website: https://inmcc.istrac.org Telephone 1: (91.80) 28094546 Telephone 2: (91.80) 28371857 Facsimile: (91.80) 28371857 AFTN: VOBGZSZX email: inmcc@istrac.org Mailing Address: ISTRAC/ISRO Department of Space Plot No.12, Peenya Industrial Estate Bangalore-560058, India	Mumbai: ELR/HEL- M, RV/RB Kolkata: ELR/HEL-M Delhi: ELR/HEL-M, RV/RB Chennai: ELR/HEL-M
INDONESIA	Biak RCC Jakarta RCC Surabaya RCC	Website: http://www.basarnas.go.id Telephone 1: (6221) 65701172	Biak: LRG Jayapura: SRG/HEL- M, RB

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	Ujung Pandang RCC	Telephone 2: (6221) 65867510 Facsimile: (6221) 65867512 AFTN: WIIICYL email: indonesia_mcc@yahoo.com Mailing Address: National Search and Rescue Agency (Badan SAR Nasional) Jln Angkasa Block B15 Kav, 2-3 Jakarta Posat 10720 Indonesia	Merauke: RB Sorong: SRG/HEL-M, RB Jakarta: LRG/HEL-M, RB Medan RSC: LRG/HEL-M, RV/RB Padang RSC: SRG, RV/RB Pekanbaru RSC: SRG/HEL-L, RB Pontianak RSC: SRG/HEL-L, RB Tanjung RSC: SRG, RB Pinang RSC: Surabaya: LRG/HEL- L, RV/RB Balikpapan RSC: SRG/HEL-M, RV/RB Banjarmasin RSC: SRG, RB Denpasar RSC: LRG, RV/RB Kupang RSC: SRG/HRL-M, RB Ujung Pandang: LRG/HEL-L, RV/RB Ambon RSC: SRG, RV/RB Manado RSC: SRG/HEL-L, RV/RB
JAPAN	Tokyo RCC	Website: N/A Telephone 1: (81.3) 35916106 Facsimile: (81.3) 35916107 AFTN: RJTTYKYY email: jcg-jamcc@mlit.go.jp Mailing Address: Japan Coast Guard (JCG) Operation Centre – JAMCC, 2-1-3 Kasumiga- Seki, Chiyodaku, Tokyo 100-8989 Japan	Kushiro: HEL-M, RV Hakodate: HEL-M, RV Hachinohe: LRG, RV Niigata: HEL-M, RV Tokyo: LRG/HEL-M, RV Komatsu: LRG, RV Miho: HEL-M, RV Iwakuni: LRG Fukuoka: MRG/HEL- M, RV Nagasaki: HEL-M, RV Kagoshima: HEL-M Naha: LRG/MRG, RV Ishigaki: HEL-M, RV
LAO PDR	Vientiane RCC	Website: N/A Telephone 1: (856.21) 520478 Facsimile: (856.21) 513041	Vientiane: MRG/HEL- M

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MACAO, CHINA	Macao RCC	Website: N/A Telephone 1: (853) 2855 9922 Facsimile: (853) 2851 1986 Telex: 88424 Mailing Address: N/A	RV/RB
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MYANMAR	Yangon RCC	Website: N/A Telephone 1: +951-533041 Facsimile: +951-653009 Telex: 08321228 AFTN: VYYYYCYX Mailing Address: 08-02 Sakura Tower 339 Bog Yoke Aung San Road Yangon, Myanmar	Yangon: MRG/SRG/HEL-M, RV/RB
NAURU	Nauru RCC	Website: N/A AFTN: ANAUYFYX Mailing Address: Airport Rescue Fire Service Central Pacific Republic of Nauru Comments: Information to be updated by 15 November 2011	Nauru: ELR/VLR/SRG, RV/RB
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PAKISTAN	Karachi RCC Lahore RCC	Website: N/A Telephone 1: (92.21) 34690793 Telephone 2: (92.21) 34690840 Facsimile: (92.21) 34690797 AFTN: OPKCZSZX email: sckhi@suparco.gov.pk Mailing Address: Space and Atmospheric Sciences Division Space Communication Section P.O.Box 8402, Sector 28, Gulzar-e-Hijri Off University Road SPARCENT, SUPARCO Karachi 75270, Pakistan Comments: Alternative e-mail: pamcc@suparco.gov.pk	Karachi: MRG, RV Lahore: MRG
PAPUA NEW GUINEA	Port Moresby RCC	Website: http://www.nmsa.gov.pg Telephone 1: (675) 321 3033 Telephone 2: (675) 3054 631 Facsimile: (675) 321 3051 (ARCC-24Hrs) AFTN: AYPMYCYXARCCHrs email: mrccpng@nmsa.gov.pg Mailing Address: National Maritime Safety Authority Papua New Guinea P.O.Box 668, Port Moresby N.C.D., Papua New Guinea	Lae: MRG, RB Madang: SRG, RB Port Moresby: ELR, RV Rabaul: RB Wewak: SRG
PHILIPPINES	Manila RCC	Website: N/A	Manila: LRG/HEL-M,

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REPUBLIC OF KOREA	Incheon RCC	<p>Website: N/A Telephone 1: (82.32) 8352252 Telephone 2: (82.32) 8352594 Facsimile: (82.32) 8352895 Telex: (801) 45502 KOMCC email: komcc2@kornet.net Mailing Address: Search and Rescue Division Guard and Rescue Bureau Korea Coast Guard / KOMCC 3-8, SongDo-Dong YeonSu-Gu Incheon City, Republic of Korea</p>	<p>Chuncheon: SRG Daegu: MRG/HEL-L Gangneung: SRG Gimhae: SRG/HEL-M, RV Gimpo: SRG/HEL-M Gunsan: HEL-M Gwangju: MRG/HEL-M Incheon: MRG/HEL-M, RV Jeju: SRG/HEL-M, RV Mokpo: HEL-M Mukho: RV Osan: MRG/HEL-H Pohang: HEL-M, RV Yangyang RSC, RB</p>
SINGAPORE	Singapore RCC	<p>Website: N/A www.caas.gov.sg Telephone 1: (65) 65425024 Telephone 2: (65) 65412668 Facsimile: (65) 65422548 AFTN: WSSSZSZX WSJCZGZX or WSJCYCYX email: CAAS_RCC@caas.gov.sg Mailing Address: MCC Singapore Singapore Air Traffic Control Centre (SATCC) 60 Biggin Hill Road, Singapore 509950 Republic of Singapore</p>	<p>Singapore: LRG/HEL-H, RV/RB</p>
SOLOMON IS.	Honiara RCC	<p>Website: N/A Telephone 1: (677) 21609 Telephone 2: (677) 21535 Facsimile: (677) 23798 AFTN: AGGHYCYX email: mrcc@solomon.com.sb</p>	<p>Honiara: ELR/VLR/SRG, RV/RB</p>

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		Comments: Solomon Islands SRR	
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THAILAND	Bangkok RCC	Website: N/A Telephone 1: (66 2) 2860506 Telephone 2: (66 2) 2860594 Facsimile: (66 2) 2873186 AFTN: VTBAYCYX email: bkkrc@aviation.go.th Mailing Address: Flight Standards Bureau Department of Civil Aviation Tung Mahemek Bangkok 10120, Thailand Comments: Optional e-mail: bkkrc@yahoo.com	Bangkok: MRG/HEL-L Sattahip: MRG/HEL-L Songkhla: SRG/HEL-L Khok Kathiam: SRG/HEL-L Prachuap Kiri-Khan: SRG
UNITED STATES	Elmendorf RCC Honolulu RCC Juneau RCC Langley RCC Long Beach RCC Seattle RCC	Website: N/A Telephone 1: 1-301-817- 4576 Facsimile: 1-301-817- 4568 AFTN: KCDCZSZA email: usmcc@noaa.gov Mailing Address: USMCC NSOF, E/SPO53 1315 East West Hwy Silver Spring MD 20910 USA Comments: Physical Address: 4231 Suitland Road Suitland Maryland USA	Anchorage: ELR Fairbanks: ELR Guam I: ELR Hito: HEL-M, RV Honolulu: VLR/HEL-L, RV/RB Adak: VLR Juneau: RV Ketchikan: RV Kodiak: VLR/HEL-L/ HEL-M, RV Sitka: HEL-M, RV Eureka: HEL-L Long Beach: VLR Los Angeles: ELR/SRG/ HEL-L, RV Sacramento: VLR San Diego: ELR/SRG/HEL-L, RV

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REGIONS**

			San Francisco: HEL-M, RV Astoria: SRG/HEL-L, RV Port Angeles: HEL-L, RV
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VIET NAM	Ha Noi RCC Ho Chi Minh RCC	Country/Region Code (MID): 574 Website: N/A Telephone 1: (84.4) 37683051 Telephone 2: (84.4) 37683050 Facsimile: (84.4) 37683048 Mailing Address: No.8 Pham Hung St., Cau Giay Dist., Hanoi, Vietnam	Cat Bi: HEL-M, RV/RB Gia Lam: LRG/SRG/HEL-H Hoa Lac: HEL-H/HEL-M Noi Bai: LRG/MRG/HEL-H Vinh:MRG/HEL-M, RV/RB Can Tho: SRG/HEL-M, RV/RB Da Lat/Lien Khuong: SRG/HEL-M Da Nang RSC: LRG/MRG/SRG/HEL-L/HEL-M, RV/RB Nha Trang: MRG/HEL-H, RV/RB Phu Cat: SRG/HEL-H/HEL-M, RV/RB Tan Son Nhat: LRG/SRG/HEL-L Vung TauHEL-H, RV

Abbreviations

SPOC – SAR Point of contact for the reception of alert messages detected by the COSPAS-SARSAT system

Minimum requirements for land rescue units (LRU) including mountain rescue units (MRU) and desert rescue units (DRU), parachute rescue units (PRU) and the automated mutual-assistance vessel rescue (AMVER) system.

Extra long-range (ELR) – aircraft with a radius of action of 2 780 km (1 500 NM) or more, plus 2 ½ hours search remaining.

**TABLE SAR II-1 - SEARCH AND RESCUE FACILITIES IN THE ASIA AND PACIFIC
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Very long range (VLR) – aircraft with a radius of action of more than 1 850 km (1 000 NM) plus 2 ½ hours search remaining.

Long range (LRG) – aircraft with a radius of action of 1 390 km (750) plus 2 ½ hours search remaining.

Medium range (MRG) – aircraft with a radius of action of 740 km (400 NM) plus 2 ½ hours search remaining.

Short range (SRG) – aircraft with a radius of action of 280 km (150 NM) plus ½ hour search remaining.

Helicopter (HEL-L) – light helicopter with a radius of action for rescue purposes of up to 185 km (100NM) and a capacity for evacuating 1 to 5 persons.

Helicopter (HEL-M) – medium helicopter with a radius of action for rescue purposes of 185 to 370 km (100 to 200 NM) and a capacity for evacuating 6 to 15 persons.

Helicopter (HEL-H) – heavy helicopter with a radius of action for rescue purposes of more than 370 km (200 NM) and a capacity for evacuating more than 15 persons.

Rescue boat (RB) – short-range coastal or river craft with an approximate speed of 14 knots or higher.

Rescue vessel (RV) – vessel possessing sea-going qualities, long range and reasonable speed. Patrol, customs, pilotage and other craft fulfil the purpose if assigned a high priority for search and rescue operations.



International Civil Aviation Organization

**The Second Meeting of the APANPIRG ATM Sub-Group
(ATM /SG/2)**

Hong Kong, China, 04-08 August 2014

Agenda Item 4: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

**INTEGRATION OF HUMAN FACTORS IN RESEARCH,
OPERATIONS AND ACQUISITION**

(Presented by the United States of America)

SUMMARY

This paper presents the Federal Aviation Administration’s use of Human Factors analysis in the development and operations of air traffic management (ATM) systems. It addresses research on human performance, safety analysis, and system optimization through human factors engineering. It identifies the importance of incorporating the human component throughout system development life cycle.

1. INTRODUCTION

1.1 The FAA defines Human Factors as a multidisciplinary effort to generate and compile information about human capabilities and limitations and apply that information to produce safe, comfortable and effective human performance. In the field of Air Traffic Management (ATM), where safety, efficiency, and continuity are critical elements of virtually every area of expertise, people are often both the greatest assets and the greatest source of risk. Human Factors (HF) research has indicated that the top 5 safety risks in ATM nearly always involve ‘Human Error’. As airspace air traffic and ATM systems become more complex, the analysis and optimization of the human component becomes essential.

2. DISCUSSION

Why Does “Human Factors” Matter?

2.1 The people involved in the ATM are the ultimate solution providers, whether in ATM, systems development and integration, maintenance, or a whole series of other essential roles. Human factors analysis of these roles can improve overall performance, reduce technical risk in system acquisitions, lower lifecycle costs of systems and equipment, improve human interfaces with the system and contribute to economic decisions on controller training, as well as providing other benefits.

2.2 In addressing system performance HF analysis examines and optimizes human-computer interaction and usability for both hardware and software. By researching the systems’ users, researchers gain better understanding of required aptitudes and abilities, how to develop more effective training, and address the risks associated with fatigue. HF also studies the work environment, finding ways to optimize operating conditions, organizational structures, procedures, equipment configurations and other environmental issues.

ATM Research - Human Performance and Safety

2.3 Two of the most fundamental objectives of HF in the FAA are to improve safety and the performance of the people involved in the system. Researchers develop methodologies for gathering data, performing analysis and making recommendations on a wide variety of procedures. HF analysis provides guidance for the implementation of new technologies and improvements to training techniques. Some examples include developing techniques to analyze controller voluntary incident reports as part of Air Traffic Safety Analysis Program (ATSAP) and performing controller impact studies on expanding the use of automated handoff and the use of RNAV/RNP procedures. Some of the outcomes of the research are assessment of changes in controller performance from time on task and guidance for top safety risk mitigations.

2.4 One of the most significant patterns identified in HF research is that the top 5 safety risks nearly always involve ‘human error’. Historically, the FAA considered human error as a cause of failure, but with HF analysis that view has evolved to see human error not as a cause but as a symptom of system failure. This change in approach has provided impetus for better participation by controllers and other system users, which in turn provides more accurate data resulting in more accurate analyses. One of the significant challenges identified is that safety was not inherent in most ATM systems. The systems themselves were contradictions between multiple goals (safety and efficiency) that controllers must pursue simultaneously.

Human Factors Application in ATM Acquisition Programs

2.5 The FAA has integrated HF analysis and engineering into all six stages of its acquisition life cycle; service analysis and strategic planning, concepts and requirements definition, initial investment analysis, final investment analysis, solution implementation and in-service management. HF performs unique monitoring and analysis during each stage and provides guidance throughout the cycle.

Integration of Human Factors Programs into ATM Systems

2.6 While the FAA had found significant benefits from the implementation of Human Factors analysis in its operations and acquisitions systems, integration was and continues to be challenging. The Human Factors Division uses three concepts to develop better understanding and cooperation with its customers:

- Education; help program and operational managers to understand human factors costs and benefits,
- Leveraging standards and best practices for consistent human factors integration and avoid duplication, and
- Building communications across FAA lines of business on human factors in research, acquisitions, and operations.

2.7 The FAA’s Human Factors Division also works to normalize HF analysis and protocols on an international level by coordinating activities with EUROCONTROL on safety and human performance through cooperative work agreements. One example was a joint FAA - Eurocontrol program to develop principles for integrating automation in controller workstations.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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