

Current Situation of Air Surveillance Facilities in Indonesia



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RADAR FACILITIES



Radar Facilities

- PSR : 15 Units
- SSR : 17 Units
- MSSR : 17 Units (including 12 units with Mode-S Capability)

PSR Installations

	Locations	Manufacturer	Installation Year	Performance	Usage
1.	Cengkareng	Thomson	1984	Normal	Terminal
2.	Palembang	Thomson	1981	Degraded	Terminal
3.	Pontianak	Thomson	1992	Off	Terminal
4.	Medan	Thomson	1980	Normal	Terminal
5.	Pekanbaru	Thomson	1991	Degraded	Terminal
6.	Tanjung Pinang	Thomson	1992	Degraded	Terminal
7.	Yogyakarta	Thomson	1992	Normal	Terminal
8.	Surabaya	Thomson	1988	Off	Terminal
9.	Surabaya	Eldis	2009	Normal	Terminal
10.	Bali	NEC	1991	Degraded	Terminal
11.	Makassar	Thomson	1980	Off	Terminal
12.	Banjarmasin	Thomson	1996	Off	Terminal
13.	Balikpapan	Thomson	1991	Off	Terminal
14.	Biak	Thomson	1988	Off	Terminal
15.	Jayapura	Thales	2009	Normal	Terminal

PSR Installations

- PSRs are used for terminal area surveillance, no PSR for en-route surveillance.
- Most of PSR installations are degraded and off, because of aging of the radars.

SSR Installations

	Locations	Manufacturer	Installation Year	Performance	Usage
1.	Cengkareng	Thomson	1984	Normal	En-route
2.	Palembang	Thomson	1991	Normal	En-route
3.	Pontianak	Thomson	1986	Normal	En-route
4.	Medan	Thomson	1980	Normal	En-route
5.	Semarang	Thomson	1981	Normal	En-route
6.	Pekanbaru	Thomson	1981	Degraded	En-route
7.	Aceh	Thomson	1991	Off	En-route
8.	Tanjung Pinang	Thomson	1990	Degraded	En-route
9.	Surabaya	Thomson	1988	Off	En-route
10.	Waingapu	Thomson	1992	Normal	En-route
11.	Makassar	Thomson	1991	Off	En-route
12.	Banjarmasin	Thomson	1996	Off	En-route
13.	Balikpapan	Thomson	1991	Off	En-route
14.	Biak	Thomson	1988	Off	En-route
15.	Manado	Thomson	1991	Normal	En-route
16.	Kendari	Thomson	1991	Degraded	En-route
17.	Ambon	Thomson	1990	Normal	En-route

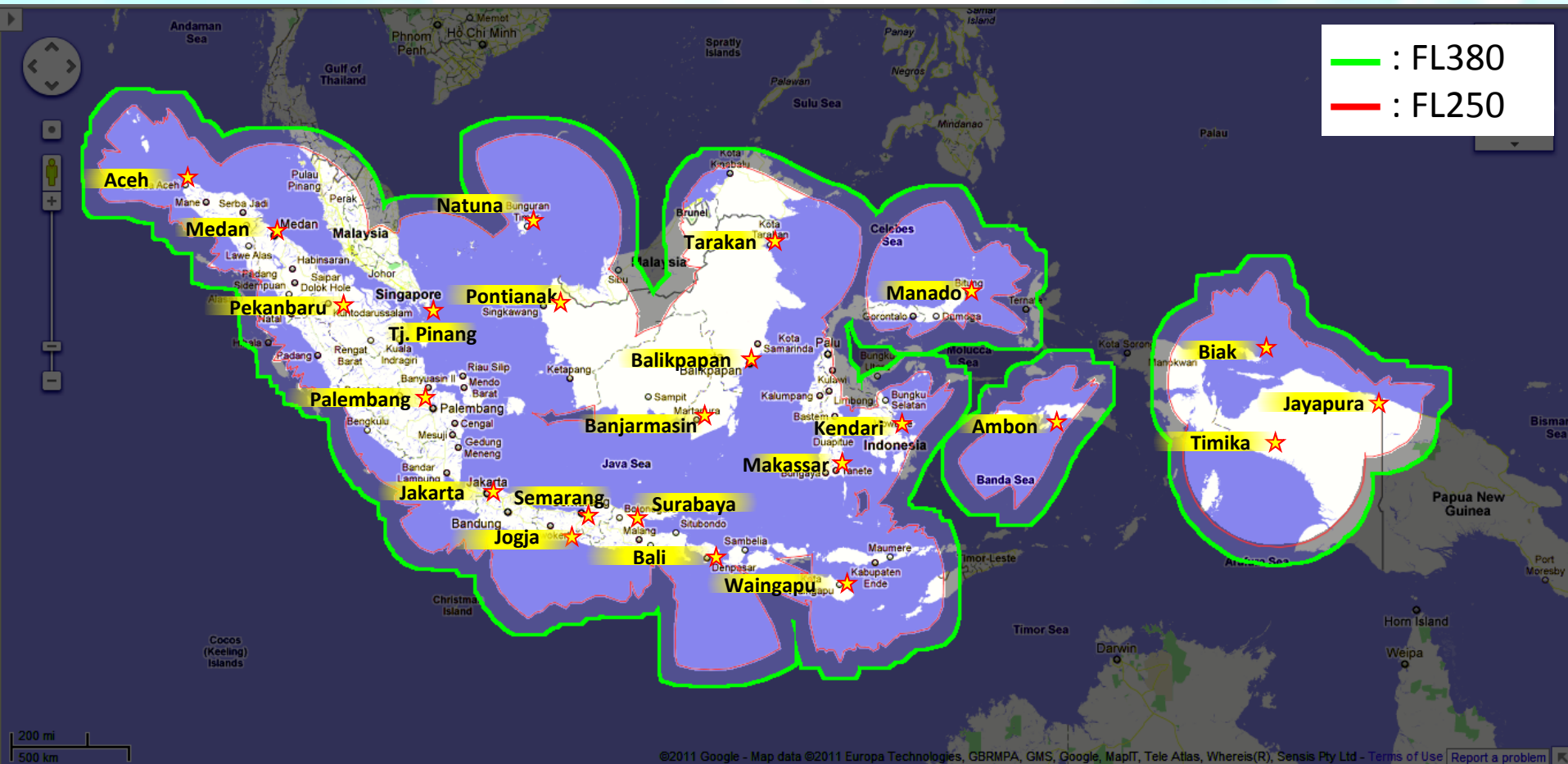
MSSR and Mode S Radar Installations

	Locations	Manufacturer	Mode S Capability	Installation Year	Performance	Usage
1.	Cengkareng	Thales	-	2000	Degraded	En-route
2.	Natuna	Cardion	-	1997	Off	En-route
3.	Medan	Thales	-	2003	Normal	En-route
4.	Medan Kualanamu	Indra	Available	2010	Normal	En-route & Terminal
5.	Aceh	Thales	Available	2009	Normal	En-route
6.	Yogyakarta	Thales	-	1998	Normal	En-route
7.	Surabaya	Eldis	Available	2009	Normal	En-route
8.	Bali	NEC	-	1991	Normal	En-route
9.	Bali	Indra	Available	2010	Normal	En-route
10.	Waingapu	Selex	Available	2010	Normal	En-route
11.	Makassar	Eldis	Available	2008	Normal	En-route & Terminal
12.	Banjarmasin	Eldis	Available	2008	Normal	En-route
13.	Balikpapan	Eldis	Available	2008	Normal	En-route & Terminal
14.	Ambon	Eldis	Available	2012	Normal	En-route
15.	Jayapura	Indra	Available	2008	Normal	En-route & Terminal
16.	Tarakan	Indra	Available	2010	Normal	En-route & Terminal
17.	Timika	Indra	Available	2011	Normal	En-route & Terminal

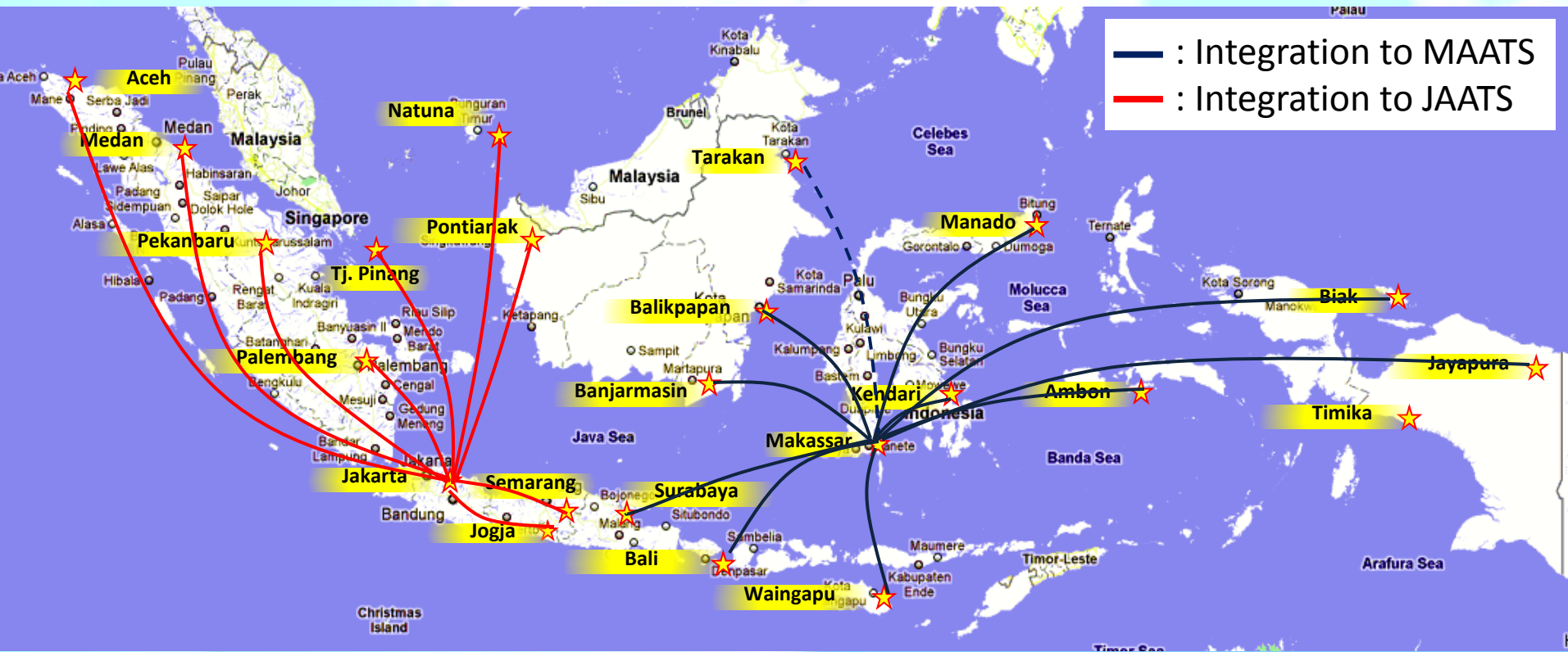
SSR & MSSR Installations

- Most of aging SSRs are replaced with new MSSR Mode S radars.
- Replacement for Tanjung Pinang, Natuna, Pontianak, Sorong and Merauke radars will be installed this year.
- Some ATC systems can't take advantages of new Mode S capability, therefore radar output in certain locations are degraded to only deliver mode A/C messages in non-Asterix format (e.g Aircat, EV760)

Radar (SSR & MSSR) Coverage on FL250 & FL380



Radar Integration for ACC (JAATS & MAATS)



- Radars at western area integrated to JAATS
- Radars at eastern area integrated to MAATS
- Tarakan radars not integrated yet, but it will be integrated to MAATS
- Timika radars integrated to APP system at Jayapura.

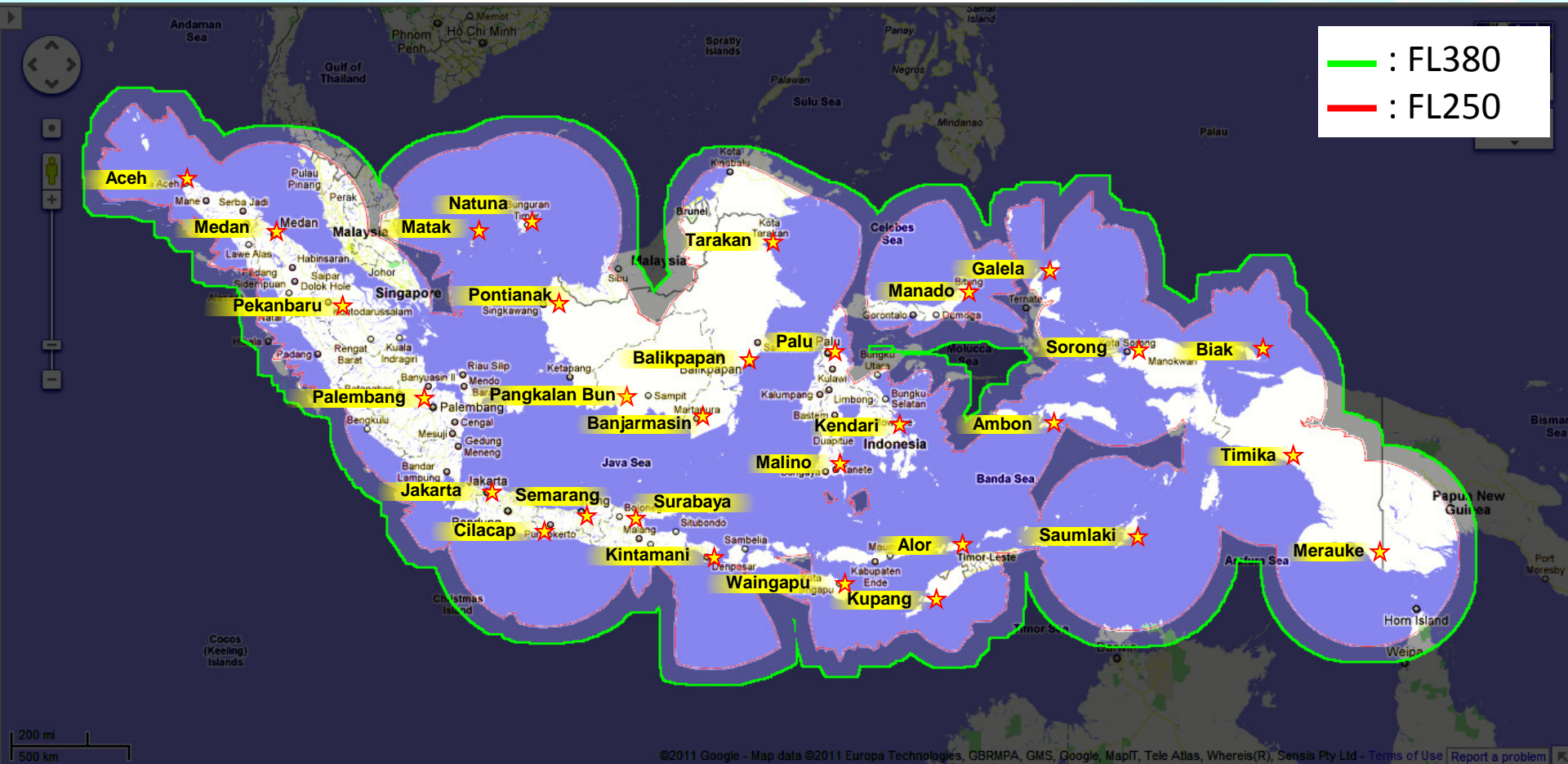
ADS-B FACILITIES



ADS-B Facilities

- ADS-B groundstations are spread throughout 30 locations in Indonesia plus 1 groundstation in DGCA headquarter used for monitoring and configuration all other groundstations.
- Currently the groundstations can process Extended Squitter version 0 format.
- Indonesia have ADS-B data sharing agreement with Singapore and Australia.
- ADS-B groundstation connected via VSAT link.

ADS-B Coverage on FL250 & FL380



Surveillance Data Connection

- All ADS-B and radar data, which are used for ACC control, from groundstation inside Jakarta FIR are delivered to JAATS (radar only) and E-JAATS (radar & ADS-B) system in Soekarno-Hatta Airport.
- All ADS-B and radar data, which are used for ACC control, from groundstation inside Ujungpandang FIR are deliver to MAATS system in Makassar.
- All ADS-B data from both FIR are also deliver to DGCA Head Office for monitoring and analyzing.

MULTILATERATION



Multilateration

- There are 2 (two) airports that implements multilateration system which are Budiarto Airport and Soekarno-Hatta Airport.
- Budiarto airport implement terminal and wide area multilateration, while Soekarno-Hatta airport implement terminal area multilateration and used for their A-SMGCS system.

ATC AUTOMATION FACILITIES

The image features a vibrant blue background with a sky and clouds. On the right side, there is a glowing blue sphere with a trail of white and blue particles. At the bottom, there is a curved blue band that spans the width of the image.

ATC AUTOMATION

There are 2 ATC AUTOMATION for ACC In Indonesia :

1. JAATS (Jakarta Automated Air Traffic Control System)

- Operated on 1997.
- Test Bench Developed by PT. Angkasa Pura II on 2006.
- Need to be replaced because it's difficult to find the spare part and does not have new CNS/ATM capability.
- Radar input from 12 Locations.
- Aging hardware with Pentium I processor generation, which is have limitation in Radar Data Processing System (RDPS), Flight Data Processing System (FDPS), Air Ground Data Processing.
- Jakarta Automatic Sistem Support (JAAS) developed by PT. Angkasa Pura II on 2006. JAAS serve as back up to JAATS.
- JAATS Software application is not armed with with New CNS/ATM capability such as AIDC, ADS-B, Multilateration, ADSC/CPDLC, RVSM, RNAV, Radar Mode S-Elementary and Enhanced, ATN, etc)
- Currently New JAATS system (called JATMS) is under procurement of PT. Angkasa Pura II (Persero) and new JAATS Buildings are being built by DGCA.

ATC AUTOMATION

2. MATSC (Makassar Air Traffic Services Center)

- Operation started on year 2005
- Radar Input from 12 Location. (8 radars are Mode S radar)
- DGCA have upgraded the system software to version 3.18 with support of new CNS/ATM including ADS-B and Mode S application
- MAATS Software application does not have New Flight Plan Format processing. (Uses FPL converter)
- MAATS only covered Ujung Pandang FIR, not covered Jakarta FIR yet as in national contingency plan.

ATC Automation Systems

No	Locations	Manufacturer	Installation Year	New CNS/ATM Capability	Radar Sources
1.	Jakarta (JAATS)	Hughes	1995	-	Aceh, Cengkareng, Jogja, Medan, Natuna, Pekanbaru, Palembang, Pontianak, Semarang, Tanjung Pinang
2.	Jakarta (E-JAATS)	Comsoft	2011	Mode S, ADS-B, CPDLC, FPL 2012	Aceh, Cengkareng, Jogja, Medan, Natuna, Pekanbaru, Palembang, Pontianak, Semarang, Tanjung Pinang
3.	Surabaya	Nova	2008	-	Surabaya, Jogja, Bali, Semarang
4.	Jayapura	Indra	2008	Mode S, ADS-B	Sentani, Timika
5.	Makassar (MAATS)	Thales	2005	Mode S, ADS-B, CPDLC	Surabaya, Denpasar, Waingapu, Makassar, Banjarmasin, Balikpapan, Manado, Kendari, Ambon, Jayapura
6.	Bali	Nova	2008	-	Surabaya, Waingapu, Bali
7.	Palembang	Intelcan	2006	-	Palembang
8.	Berau	Indra	2011	Mode S, ADS-B	Tarakan
9.	Tarakan	Comsoft	2011	Mode S, ADS-B	Tarakan
10.	Waingapu	Selex	2011	Mode S, ADS-B	Waingapu
11.	Medan Kualanamu	Indra	2011	Mode S, ADS-B, FPL 2012	Medan, Pekanbaru, Aceh

ATC Automation Development

- Upgrading MAATS with capability New Flight Plan Format
- Back-Up MAATS development for congest position on FIR Ujung Pandang
- Development / improvement of MAATS System for covered Jakarta FIR and become JAATS Back-up.
- Integrated of JATMS with MAATS
- Coordination between ATS Unit with Adjacent Centres use ATS Interfacility Data Communication (AIDC)
- Improvement ATC Automation System TMA/APP on Medan, Palembang, Surabaya, Bali, Sentani with capability New Flight Plan Format, New CNS/TM such as : Mode S, ADS-B, ADS-C, PBN.
- Integrate ATC Automation System TMA/APP on Medan, Palembang, Surabaya, Bali, Sentani integrated with JATMS and MAATS.

HUMAN RESOURCES



AIR NAVIGATION HUMAN RESOURCES

QUALIFICATION	DGCA	AP I	AP II	TOTAL
AIR TRAFFIC CONTROLLER (ATC)	367	471	472	1300
FLIGHT SAFETY OFFICER (FSO)	97	112	66	275
AERONAUTICAL INFORMATION SERVICES (AIS)	10	50	63	123
RADIO NAVIGATION TECHNICIAN	244	329	300	873
Sub TOTAL				2571

Thank You
for your attention

