

# Appendix 3.6 -5

Presentation (CRS)

# PROJECT FOR REVIEW OF THE STUDY FOR MARITIME TRAFFIC SAFETY DEVELOPMENT PLAN (JICA MASTER PLAN)

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## COASTAL RADIO STATION (SROP)



# TERMS OF REFERENCE FOR THE ADDITIONAL WORK

## Terms of Reference for the additional work

### Scope of the Additional Work

- There are three components in the additional work (support for arrangement of an establishment plan), namely:

Component 1 : Aids to Navigation and VTS, including "Ships Routeing"

Component 2 : Coastal Radio Station

Component 3 : Vessels for Aids to Navigation

- The goal of the additional work is for NAVIGASI to be able to draft a necessary Master Plan for the future with a view up to 2040 in the above 3 areas using the data collected and analyzed by DISNAV. Thus, the focus of the additional work is on the technical transfer of the necessary knowledge and skills in formulating draft Master Plans in the above 3 areas through advisory services from consultants. Cooperation between NAVIGASI and DISNAV for this purpose will be also strengthened.
- The consultants will guide the whole process including the setting up meetings and provide advices and supports such as policy inputs, advices in guidelines, advices in data compilation and analysis, suggestions of necessary questionnaires, formats, diagrams, charts, etc.
- Local Consultants will assist in coordination for setting up meetings, documentation, data compilation, interpretation in the meetings, and translation of documents. They will be selected by the Consultants following JICA's regulations on the procurement.
- As a deliverable of the technical transfer activities, the Master Plan as described above will be formulated in each component jointly. The consultants will compile them and submit them which will be added to the Draft Final Report (2) and final report. This Master Plan should be elaborated and completed as NAVIGASI's own Master Plan by NAVIGASI themselves after the due internal process.
- Charts and descriptions which NAVIGASI expects to be included in the Master Plan for each component will be summarized after the discussion between NAVIGASI and the

### Outlines of the Necessary Activities

1. Preparation of necessary documents such as Policy, Guideline, and Questionnaire by NAVIGASI with assistance of the Consultants

The Consultants will provide the templates of the following three documents. NAVIGASI will formulate the following documents officially for DISNAV with the advices and supports from the consultants:

- The Policy for fundamental approach in making the Master Plan. The Consultants will guide the points of consideration for preparing the Policy using its template.
- The Guideline for planning and installing aids to navigation in accordance with international standards and in taking into account regional characteristics.
- The format document including Questionnaires for collecting the draft Establishment Plan of DISNAV in line with the Policy and the Guideline and for necessary information in planning the plan.

NAVIGASI with the support from consultants will identify the necessary data and agree with the consultants on the means of data collection through the discussion. In order to facilitate the discussion, the Consultants will provide the draft list of the necessary data as a suggestion for discussions to be built upon. The format of the Questionnaires for collecting those necessary data will be also agreed and developed jointly.

The format of the Establishment Plan which will be used by DISNAV in Activity 4 below "Preparation of the Draft Establishment Plan" will be also agreed and developed jointly.

2. Guidance to DISNAV by NAVIGASI and Consultants

- NAVIGASI will issue a letter with the Director's signature and deliver above Policy, Guidelines, Questionnaires, including Formats to all the DISNAV.
- NAVIGASI will organize online guidance sessions with all DISNAVs using above documents.
- Consultants will provide technical advices in the discussion especially in the Q&A sessions.

3. Data collection by each DISNAV with supports from Consultants

- DISNAV, with the technical support from the Consultants, collect all necessary data using Questionnaire in line with the Policy and the Guidelines.
- Consultants will facilitate the discussion for consultation as a help desk (online-base) for the work going smoothly.
- Examples of necessary data anticipated are:

Component 1: Nautical chart around the requested aid (Nautical chart with existing aids to navigation indicated), Access map to the requested locations (route, means of access), chart of each port, maritime information, AIS, typical ship route, hearings from maritime stakeholders

Component 2: Data from CRS, Operating Log (Communication record) Operational hours, The total time (number of times) of received signals, The total time (number of times) of transmitted signals, Record of equipment trouble

Component 3: Information about buoy base and vessels, etc. which are necessary for estimating work load of each buoy tender, Operation statistics] Logbook (Navigation record) [Calculation of the workload to be done by vessels] interval of lighthouse keeper's shift, Itinerary (distance) for the transportation, Itinerary (distance) for the replacement of buoys, Type of vessels necessary

- Above necessary data will be derived from the concept of the documents in the Activity 1 above.
- Method for completing the format documents and Questionnaires will be discussed through the online meetings among the Consultants, NAVIGASI and each DISNAV, as needed.

4. Preparation of the Draft Establishment Plan by each DISNAV with the support from Consultants

- The draft Establishment plan from DISNAV is a request to NAVIGASI regarding the DISNAV's needs in establishing Aids to Navigation System in their jurisdiction, and to improve the CRS and Vessels for AtoN.

Component 1: The Establishment Plan from DISNAV will be the basis for installing visual aids to navigation, setting up VTS stations and considering Ships Routeing, and will be included in the short and/or long term Master Plan based on the policy, budget, etc.

Component 2: The draft Establishment Plan from DISNAV related to CRS will be basis for considering the modernization of GMDSS and the operation of stations from now on, namely consolidation of stations, and will be reference information on planning the new system. The results of the consideration based on the information will be reflected in the Master Plan.

Component 3: The draft Establishment Plan from DISNAV related to Vessels for AtoN will be basis for considering the renovation including scrap and build and relocation of a vessel that suits the workload. The results of the consideration based on the information will be reflected in the Master Plan.

- DISNAV, with the support from the Consultants, compiles and analyzes collected data, select the priorities, and prepare a draft Establishment plan in accordance with the Policy and the Guideline, and submit it to NAVIGASI.
- Local Consultants will also assist DISNAV in data compilation.

5. Formulation of the draft Master Plan by NAVIGASI and Consultants

- With the technical advices and supports from the consultants, NAVIGASI will aggregate all the Establishment Plans from DISNAVs.
- Local Consultants will also assist NAVIGASI in aggregating the Establishment Plans from DISNAVs.
- Through above process, NAVIGASI and the Consultants will determine the order of implementation of all Establishment Plans from DISNAV. The Consultants will provide the points to be considered in determining the order of implementation.
- The hearings will be considered to gather public comments as necessary.
- By reflecting public comments and order of implementation, aggregated Establishment Plans will be elaborated and formulated as a draft Master Plan by NAVIGASI and the Consultants. The consultants will compile and submit the first draft and added to the Draft Final Report (2) and final report.

## **BACKGROUND:**

1. Jumlah SDM operator dan teknisi di SROP yang terus menurun jumlahnya dan tidak sebanding dengan jumlah rekrutmen untuk SDM yang baru.
2. Coverage/cakupan SROP yang overlap/ tumpang tindih satu sama lain.
3. Sistem SROP di Indonesia saat ini mengadopsi sistem lama yang perlu untuk disesuaikan dengan sistem yang mampu menjadi solusi dalam masalah operasional SROP.
4. Modernisasi GMDSS oleh IMO menjadi suatu tuntutan ke depan untuk dapat diadopsi dalam master plan SROP.
5. Tidak terdapatnya MP untuk SROP menjadikan Disnav mengajukan usulan SROP baru berdasarkan KM 30 yang mana kondisinya sangat jauh berbeda dengan kebutuhan saat ini.
6. Belum adanya suatu kajian yang komprehensif dalam pendirian SROP.

## **MEASURE**

## **OUTPUT:**

1. Keterbatasan SDM dapat teratasi dengan ekspektasi hanya menggunakan 50% dari SDM yang ada saat ini dengan kualitas operator yang tetap handal.
2. Konsolidasi sistem 157 SROP yang telah terbangun saat ini dengan ekspektasi output
  - a. SROP HF menjadi 5 Stasiun
  - b. SROP MF menjadi 31 Stasiun
  - c. SROP VHF konsolidasi kurang lebih 80%
3. Modernisasi GMDSS dengan memasukkan unsur NAVDAT, VDES dan LTE dalam MP.
4. Sebagai acuan dan salah satu komponen utama dalam revisi KM 30 tahun 2006 terkait dengan SROP.



# Inovasi dan pembentukan kembali Stasiun Radio Pantai (SRPOP)

Tujuan utama

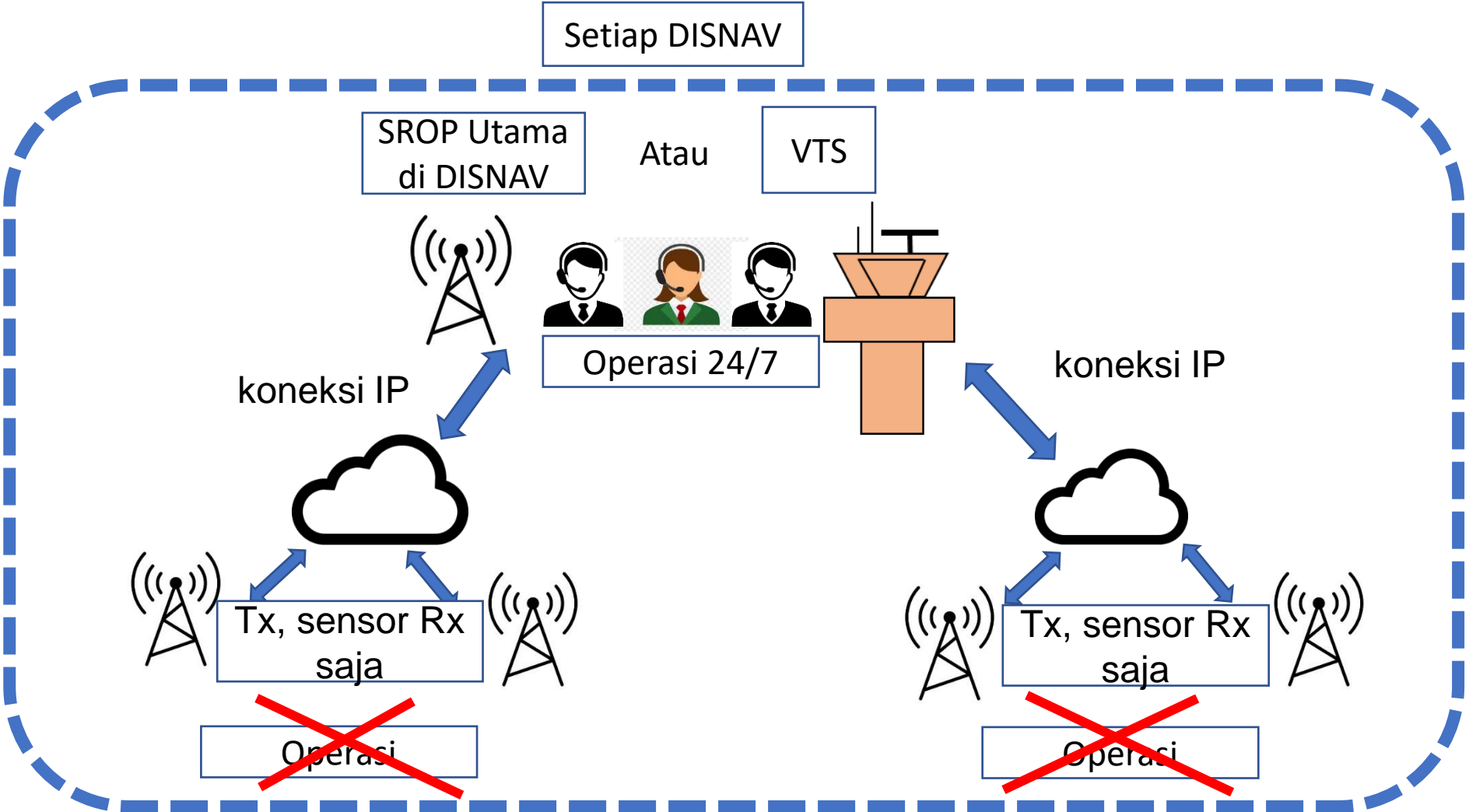
Untuk meninjau dan mencapai  
Operasi yang efisien dan efektif

**Kebijakan**  **Utama**

**Konsolidasi operasi di 157 stasiun  
di bawah setiap DISNAV atau VTS  
untuk memusatkan**

Kelas		Stasiun	Fungsi	GMDSS	Area Layanan	Jam Operasi	Porsi
1		11	Layanan Maritim bergerak termasuk layanan telepon umum, stasiun tidak bergerak	O	A1, A2, A3	24	7%
2		7		O	A1, A2, A3	16-24	4%
3	A	42		O	A1, A2	12-16	31%
	B	7		O	A1, A2	12-16	
4	A	64	Layanan Maritim bergerak dan/atau stasiun tidak bergerak	O	A1, A2	8-12	57%
	B	26		X	A1		
Jumlah		157					

# Rencana konsolidasi



# Alur Pedoman

Situasi operasional saat ini dalam berbagai komunikasi  
Ditugaskan SDM di setiap stasiun  
Fasilitas di setiap stasiun

Tujuan dan isi operasi di  
setiap SROP



- Setiap frekuensi
- Setiap komunikasi
- Setiap lokasi SROP

Penataan ulang SDM  
yang efisien di setiap  
SROP



- Operator radio
- Teknisi
- Admin dan lainnya

# Formulir pelaporan

1. Buku catatan yang diekstraksi dalam durasi tertentu dari setiap stasiun (sampel dikumpulkan sebagian)
2. Master sheet SDM operator, teknisi, staf admin di setiap stasiun di bawah masing-masing DISNAV
3. Lembar induk untuk melengkapi fasilitas di setiap stasiun (sebagian dikumpulkan dalam kuesioner sebelumnya)
4. Informasi penganggaran di setiap DISNAV selama 3 tahun terakhir

# Informasi dasar dengan fasilitas

DISNAV	Tarakan
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## Informasi dasar

Nama lengkap SROP	Alamat	Garis Lintang	Garis bujur	Ketinggian (AMSL)	No Telp / No FAX	Alamat email	jumlah staf	Kelas	Area Pengamatan Laut	Jam operasional harian
Tarakan	Jl. Yos Sudarso No.6 Tarakan Kalimantan Utara	03° 17' 20"N	117°35' 25"BT	20M	(0551) 2029482	<a href="mailto:srop.tarakan@yahoo.com">srop.tarakan@yahoo.com</a>	12	III	A1, A2	24
Nunukan										
Tg. selor										
Tg Redep										

MF/HF												
Pemancar/Penerima/Pemancar				Unit kontrol				Antena dan pengumpan				
Nama model	Pabrikan	jumlah	Tahun terpasang	Kondisi	Nama model	jumlah	Tahun terpasang	Kondisi	Nama model	Tahun terpasang	Kondisi	Tinggi antena
TU6360/TU6260 (500W)	Sailor	2	2015	Baik	CU6301	2	2015	Baik	KABEL	1972	Baik	20

VHF									Stasiun base AIS	
Pemancar				Antena dan pengumpan						
Nama model	Pabrikan	jumlah	Tahun terpasang	Kondisi	Nama model	Tahun terpasang	Kondisi	Tinggi antena	Nama model	Pabrikan
CY51218 (35W)	Sailor	3	2015	Baik	SHAKESPEARE	2015	Baik	20	BS500	Kongsberg

# lembar induk SDM

DISNAV	Tg Priok
Nama Stasiun	panjang
Kelas	IIIA
Jam operasional harian	12

**CONTOH**

## daftar SDM

Nama lengkap	nomor identitas	Jenis Ke-lamin	Kelompok usia							Tugas Pekerjaan				Memiliki sertifikat jika ada	Pengalaman kerja		Tempat asal	Anggota keluarga	Gaji bulanan	
			Per 16 Juni 2022							Operator radio		Teknisi			Administrasi	tugas lainnya				Tahun (Tugas saat ini)
		F/M	21-25	26-30	31-35	36-40	41-45	46-50	51~	Lisensi umum	Lisensi terbatas	Sertifikat	Non Sertifikat							
Akmad Sukrom	850414230893	M				X					X					15	3	Cilacap	Istri dan 4 anak	8.700.000

**CONTOH**



DISNAV	Belawan	Belawan
Nama Stasiun	Belawan	Belawan
Kelas	I	I
Jam Operasional Harian	24	24

**CONTOH**

Operator  
Teknisi  
Tidak bersertifikat

Daftar SDM

No	Nama Lengkap	NIP	Tanggal Lahir	Umur per tahun 2022	Kelompok Umur							Penugasan Pekerjaan				Pengalaman Kerja
					Per tanggal 16 Juni 2022							Operator Radio		Teknisi		Tahun (Penugasan saat ini)
					21-25	26-30	31-35	36-40	41-45	46-50	51~	Lisensi Umum	Lisensi Terbatas	Sertifikat	Non Sertifikat	
1	Maswahyudi	19670305 198903 1 002	1967	55							X	X			33	
2	Anang Suhartono	19641119 198403 1 002	1964	58							X	X			38	
3	Lilik Usnanto	19650523 198910 1 001	1965	57							X	X			33	
4	Marupa Sitohang	19690512 199103 1 003	1969	53							X	X			31	
5	Karianto	19660303 198903 1 001	1966	56							X	X			33	
6	Leo Lupini Gultom	19651213 199103 1 002	1965	57							X	X			31	
7	Refni Handayani	19790202 200812 2 002	1979	43					X		X				14	
8	Maulidina Ulfah	19820127 200803 2 001	1982	40				X			X				14	
9	Jumi 'in	19691010 199803 1 002	1969	53							X		X		24	
10	Anggie Andhika	19770630 201012 1 001	1977	45					X		X				11	
11	Satria Pribadi	19841229 200312 1 005	1984	38				X			X				18	
12	Hidayat	19831121 200212 1 002	1983	39				X					X		19	
13	Irwan Hengki Sukma	19840712 200712 1 001	1984	38				X					X		15	
14	Daniel Tobias	19840312 201012 1 004	1984	38				X			X				11	
15	Nelly Simanjuntak	19751123 200604 2 001	1975	47						X	X				16	
16	Muslim	19780714 200604 1 001	1978	44					X		X				16	
17	Kahairul Fuad	19730819 199303 1 001	1973	49						X					29	
18	Taufik Hidayat	19841120 200712 1 001	1984	38				X			X				11	
19	Lismayani Siregar	19820125 200812 2 001	1982	40				X			X				13	
20	Fernado Sitohang	19841006 200604 1 002	1984	38				X			X				16	
21	Ardilah Effendi	19861001 200712 1 001	1986	36				X					X		14	
22	Hotman Herianto	19820623 201012 1 004	1982	40				X			X				11	
23	Agus Afero	19720817 200604 1 001	1972	50						X	X				16	
24	Rifahmi	19830801 201012 1 002	1983	39				X					X		11	
25	Adrian Willys	19841018 200212 1 003	1984	38				X			X				19	
Rata-rata				45.16				X			20		5			

	Umur per tahun 2032	Kelompok Umur						Penugasan Pekerjaan					
		Per tanggal 16 Juni 2022						Operator Radio		Teknisi			
		21-25	26-30	31-35	36-40	41-45	46-50	51~	Lisensi Umum	Lisensi Terbatas	Sertifikat	Non Sertifikat	
1	53						X		X				
2	50					X			X				
3	55						X		X				
4	48					X			X				
5	49					X					X		
6	48					X					X		
7	48					X			X				
8	57							X	X				
9	54						X		X				
10	59							X					
11	48					X			X				
12	50					X			X				
13	48					X			X				
14	46					X					X		
15	50					X			X				
16	49					X					X		
17	48					X			X				
50.59								13		4			

# Rincian penganggaran

DISNAV	Tg Priok
Jumlah stasiun	5

**CONTOH**

## Penganggaran (tahunan)

nama SROP	Anggaran yang dialokasikan Rp	Kerusakan Rp				Pendapatan penerimaan bukan pajak
		Gaji staf	Pemeliharaan	Pembelian	Biaya operasional	Layanan Telegram
<b>CONTOH</b> Jakarta						
panjang						
Cirebon						
Bengkulu						
Cigading						

# pengumpulan data internet

DISNAV	Tg Priok
Jumlah stasiun	5

**CONTOH**

## Data Internet/3G/4G/LTE

nama SROP	Jaringan yang tersedia Pemberi	Jenis				Hasil tes kecepatan (PING) Mb/s			
		Kabel		GSM		Unduh	Mengunggah		
<b>CONTOH</b>		Serat optik	Logam (ADSL)	3G	4G			LTE	
Jakarta	Telekomsel				X			11.88	28.18

# Analisis isi buku catatan operasi

## BERITA ACARA HUBUNGAN KAPAL

TANGGAL : 01 MARET 2012

Waktu		Stasiun Berhubungan	Nama Panggilan	Frekuensi		Uraian Berhubungan	Paraf Petugas
Jam	Menit			TX	RX		
00	00	AMBONHA RADIO	PKE	2182	2182	STM CW STBY T-LIST NIL	ART / RIS / REL
	00	-	-	8215	8215	STBY T-LIST NIL	-
	00	-	-	CW 16/73	CW 16/73	STBY	ART
	00-03	-	-	2182	2182	SP NIL	-
01	00	-	-	13	12	STBY T-LIST NIL	-
	00-03	-	-	2182	2182	SP NIL	-
	30-33	-	-	2182	2182	SP NIL	-
02	00	-	-	13	12	CLOSE	-
	00-03	-	-	2182	2182	SP NIL	-
	30-33	-	-	2182	2182	SP NIL	-
03	00-03	-	-	2182	2182	SP NIL	RIS
	30	-	-	8	8	STBY T-LIST NIL	-
	30-33	-	-	2182	2182	SP NIL	-
04	00-03	-	-	2182	2182	SP NIL	-
	30	-	-	8/4	8/4	CL / STBY T-LIST NIL	-
	30-33	-	-	2182	2182	SP NIL	-
05	00	-	-	16	12	STBY T-LIST NIL	-
	00-03	-	-	2182	2182	SP NIL	-
	30-33	-	-	2182	2182	SP NIL	-

Model : B-18A

Melihat Kepala SROP Ambon

**CONTOH**

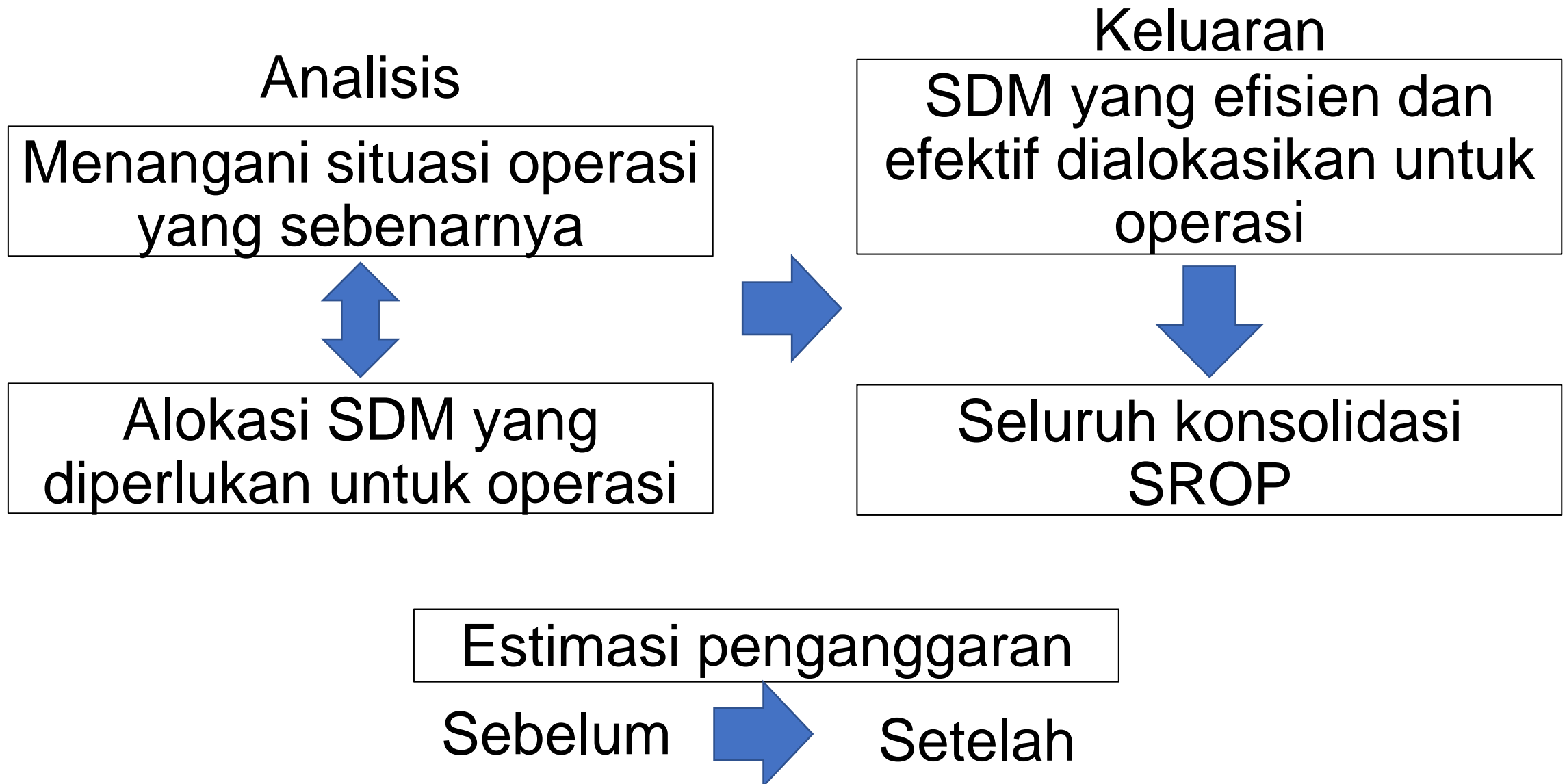


	A	B	C	D	E	F	G	H
1	Ambon							
2				CQ			QSO	
3	Date	Disnav	SROP	VHF	MF	HF	VHF	TOTAL
4				16	2182	6215	16	
5	01-Mar	Ambon	Ambon	1	29	1	4	35
6	02-Mar	Ambon	Ambon	1	32	1	7	41
7	03-Mar	Ambon	Ambon	1	31	1	5	38
8	04-Mar	Ambon	Ambon	1	31	1	8	41
9	05-Mar	Ambon	Ambon	1	31	1	5	38
10	06-Mar	Ambon	Ambon	1	32	1	6	40
11	07-Mar	Ambon	Ambon	1	26	1	4	32
12	08-Mar	Ambon	Ambon	1	31	1	7	40
13	09-Mar	Ambon	Ambon	1	31	1	6	39
14	10-Mar	Ambon	Ambon	1	30	1	5	37
15	11-Mar	Ambon	Ambon	1	32	1	7	41
16	12-Mar	Ambon	Ambon	1	31	1	9	42
17	13-Mar	Ambon	Ambon	1	32	1	7	41
18	14-Mar	Ambon	Ambon	1	31	1	6	39
19	15-Mar	Ambon	Ambon	1	30	1	7	39
20	16-Mar	Ambon	Ambon	1	30	1	8	40
21	17-Mar	Ambon	Ambon	1	32	1	5	39
22	18-Mar	Ambon	Ambon	1	31	1	5	38
23	19-Mar	Ambon	Ambon	1	32	1	3	37
24	20-Mar	Ambon	Ambon	1	31	1	7	40
25	21-Mar	Ambon	Ambon	1	31	1	0	33
26	22-Mar	Ambon	Ambon	1	32	1	8	42
27	23-Mar	Ambon	Ambon	1	30	1	6	38
28	24-Mar	Ambon	Ambon	1	41	1	5	48
29	25-Mar	Ambon	Ambon	1	31	1	4	37
30	26-Mar	Ambon	Ambon	1	32	1	6	40
31	27-Mar	Ambon	Ambon	1	33	1	3	38
32	28-Mar	Ambon	Ambon	1	35	1	7	44
33	29-Mar	Ambon	Ambon	1	31	1	9	42
34	30-Mar	Ambon	Ambon	1	32	1	9	43
35	31-Mar	Ambon	Ambon	1	35	1	7	44
36	<b>TOTAL</b>			31	979	31	185	

Rasio konten operasi bulanan per setiap frekuensi Di setiap SROP

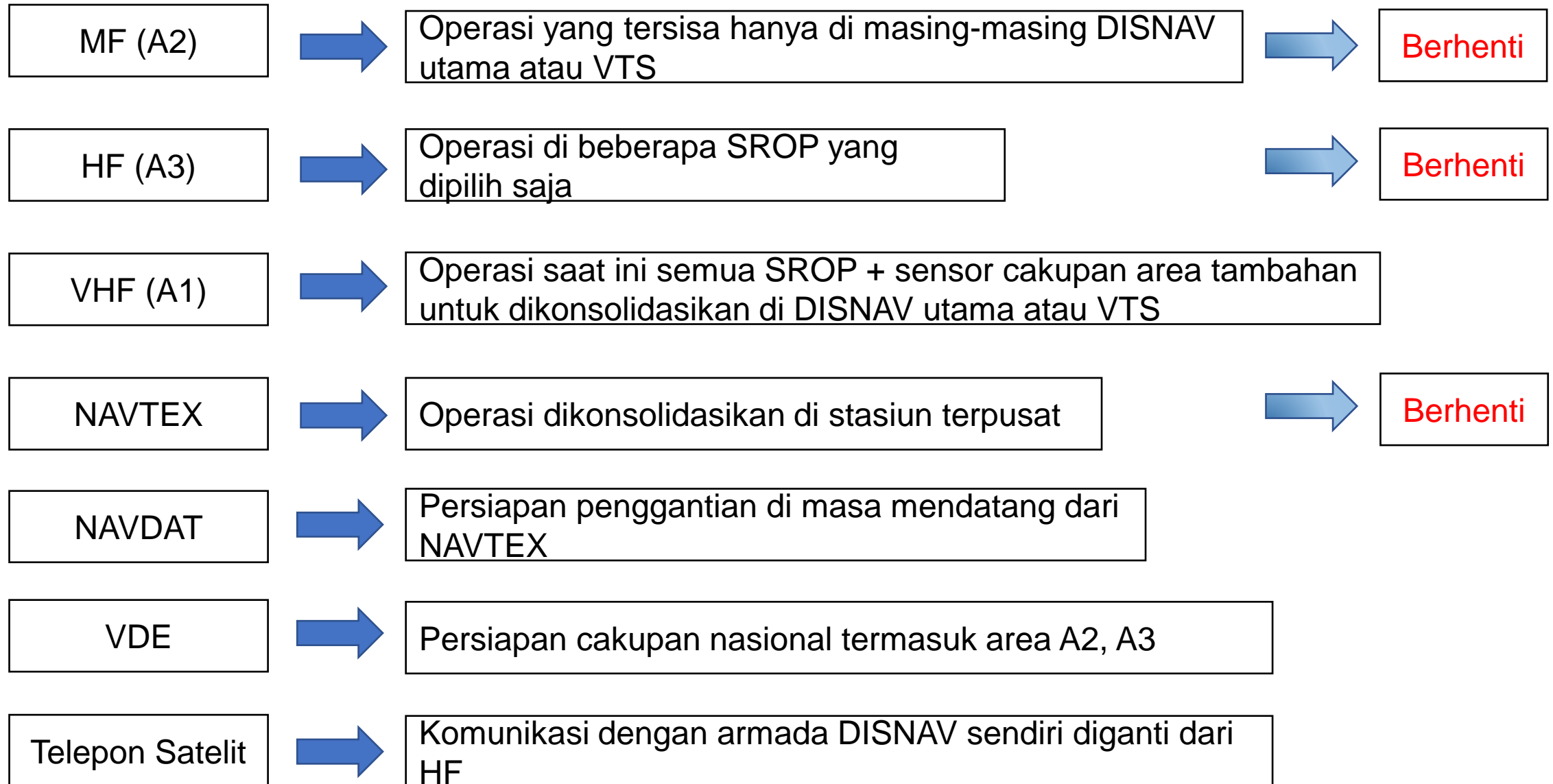
Contoh Kutipan bulan Maret 2022 selama selama 31 hari			Komunikasi harian						
	Disnav	SROP	CQ				QSO		
			VHF	MF	HF	Total	VHF	HF	Total
			16	2182	All channel		Seluruh Channel		
1	Ambon	Ambon	1	32	1	34	6	-	6
2	Banjarmasin	Banjarmasin	-	-	3	3	-	0	0
3	Banjarmasin	Kumani	-	0	-	0	1	-	1
4	Belawan	Pangkalan Susu	1	-	1	2	0	-	0
5	Belawan	Tg Balai	-	-	8	8	-	2	2
6	Belawan	Kuala Langsa	-	-	4	4	-	-	-
7	Bitung	Bitung	0	-	2	2	0	1	1
8	Cilacap	Cilacap	10	-	6	16	1	0	2
9	Dumai	Dumai	2	2	13	17	-	0	0
10	Kendari	Kendari	1	4	1	6	0	1	1
11	Kendari	Kolaka	3	-	3	6	1	4	5
12	Kupang	Kupang	-	-	-	-	4	-	4
13	Palembang	Palembang	-	3	10	13	-	-	-
14	Palembang	Tg Pandan	7	-	6	13	2	-	2
15	Palembang	Pg Balam	2	-	2	4	6	-	6
16	Semarang	Jepara	3	-	6	8	2	-	2
17	Semarang	Pekalongan	1	-	11	12	0	-	0
18	Semarang	Semarang	-	-	16	16	-	0	0
19	Tg Pinang	Batu Ampar	-	-	-	-	2	-	2
20	Tg Pinang	Dabo Singkep	-	-	-	-	5	-	5
21	Tg Pinang	Sei Kolak Kijang	-	-	-	-	5	-	5
22	Tg Pinang	Tarenpa	-	-	-	-	2	-	2
23	Tg Pinang	Tg Pinang	-	-	-	-	14	-	14
24	Tg Pinang	Tg Uban	-	-	-	-	2	-	2
25	Tual	Saumlaki	-	-	8	8	-	2	2
26	Tual	Tual	-	0	23	23	-	2	2
			<b>1.17</b>	<b>1.58</b>	<b>4.78</b>	<b>7.53</b>	<b>2.06</b>	<b>0.47</b>	<b>2.53</b>

# Alur studi

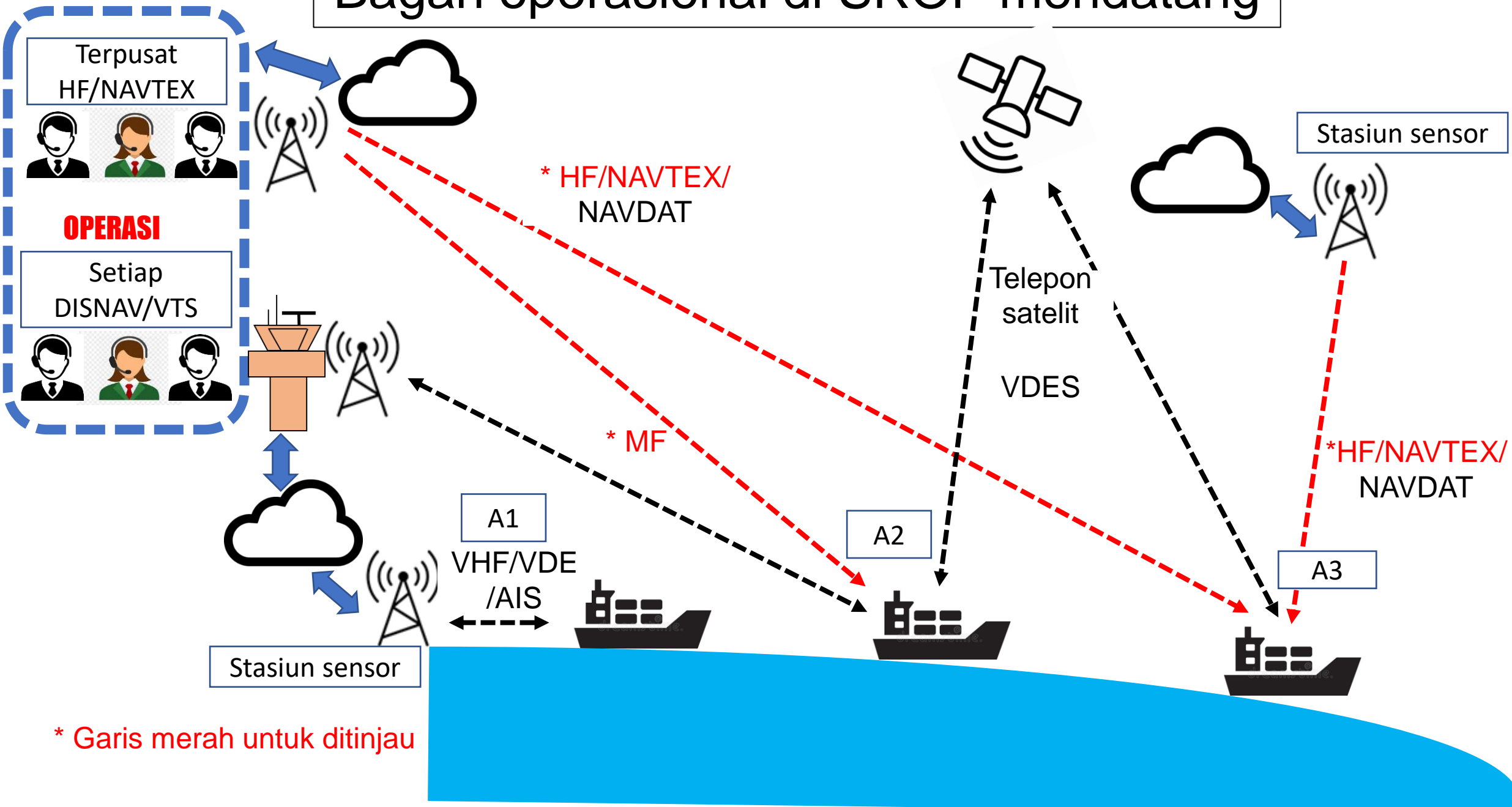




# Output yang diharapkan untuk setiap metode komunikasi



# Bagan operasional di SROP mendatang



# VDE(S) (Pertukaran Data VHF)

Suara, Data teks dapat ditukar dalam rentang VHF

Penyedia layanan data untuk mendapatkan pendapatan bukan pajak



VDES



Pemancar VDE

Stasiun sensor



Rentang A1

Pemancar VDE

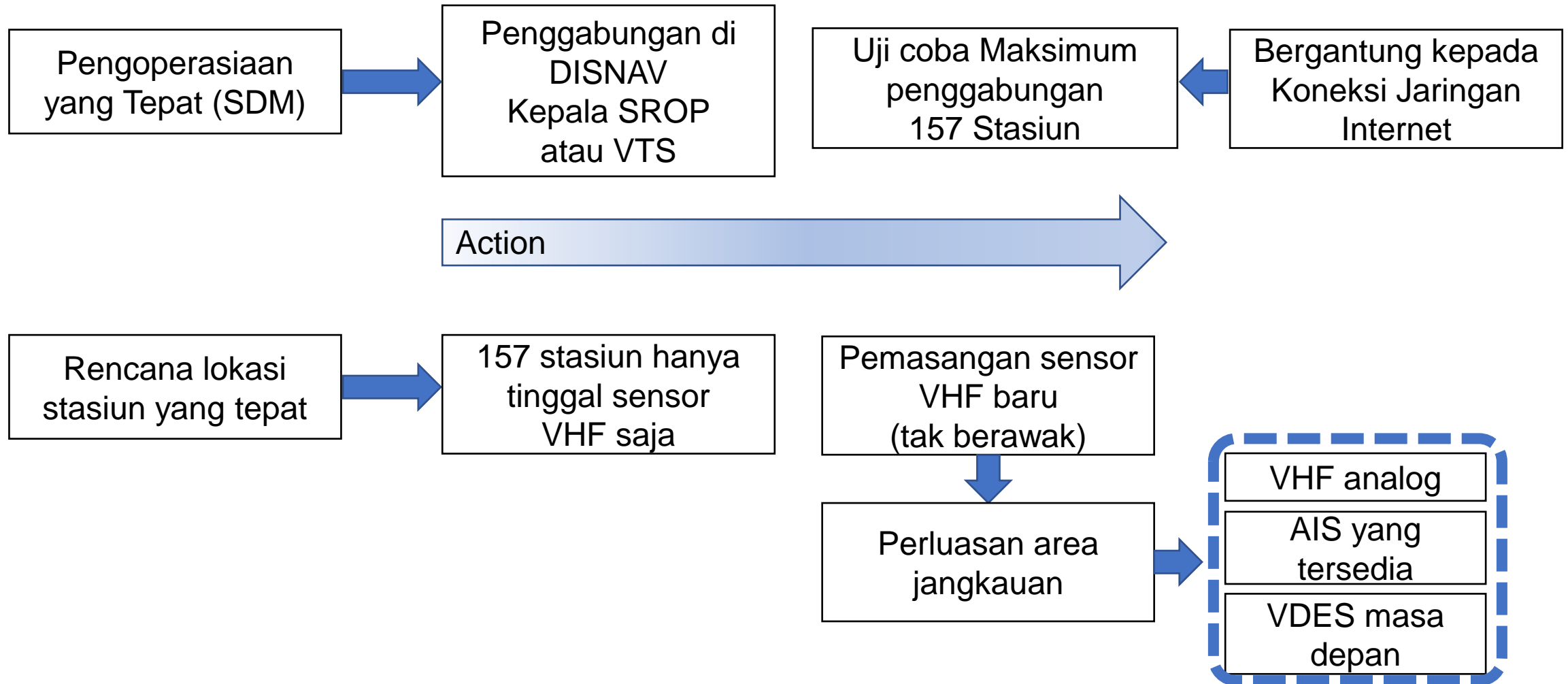
Router Wi-Fi



# KM Wakashio keadaan Marabahaya di Mauritius 2020



# Output yang Diharapkan (Rekomendasi)

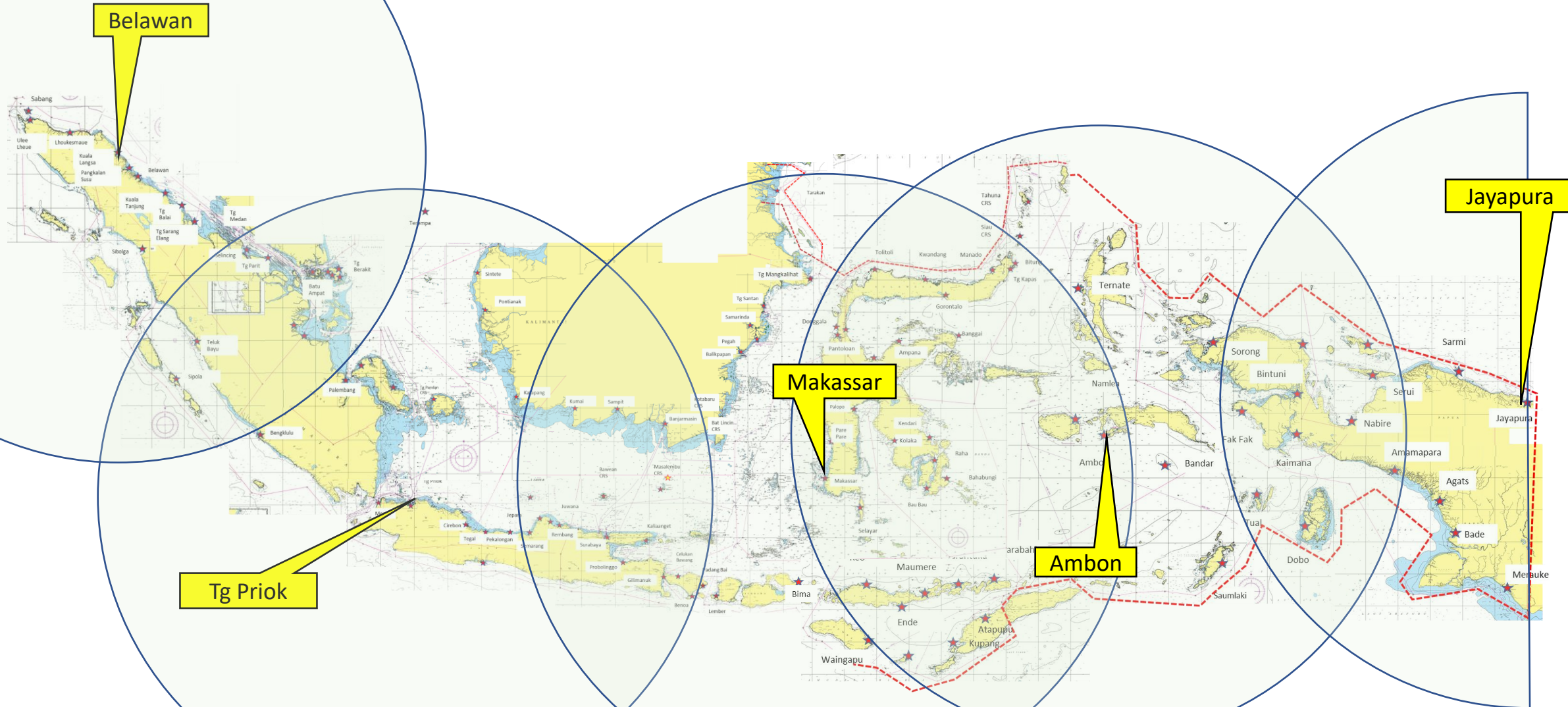




# Pengajuan Konsolidasi sementara menjadi 31 SROP(MF)

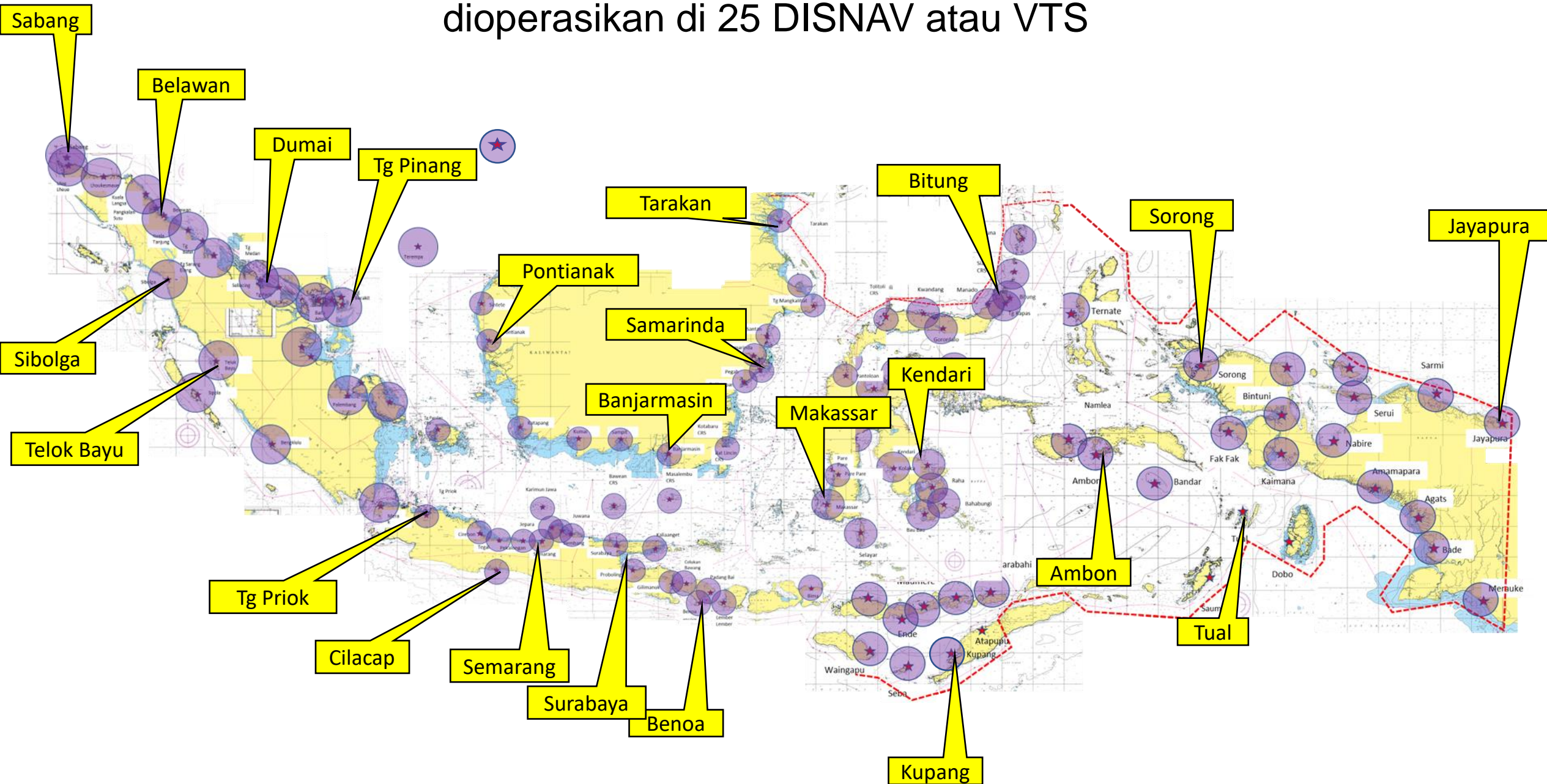


# Konsolidasi sementara menjadi 5 DISNAV (HF)

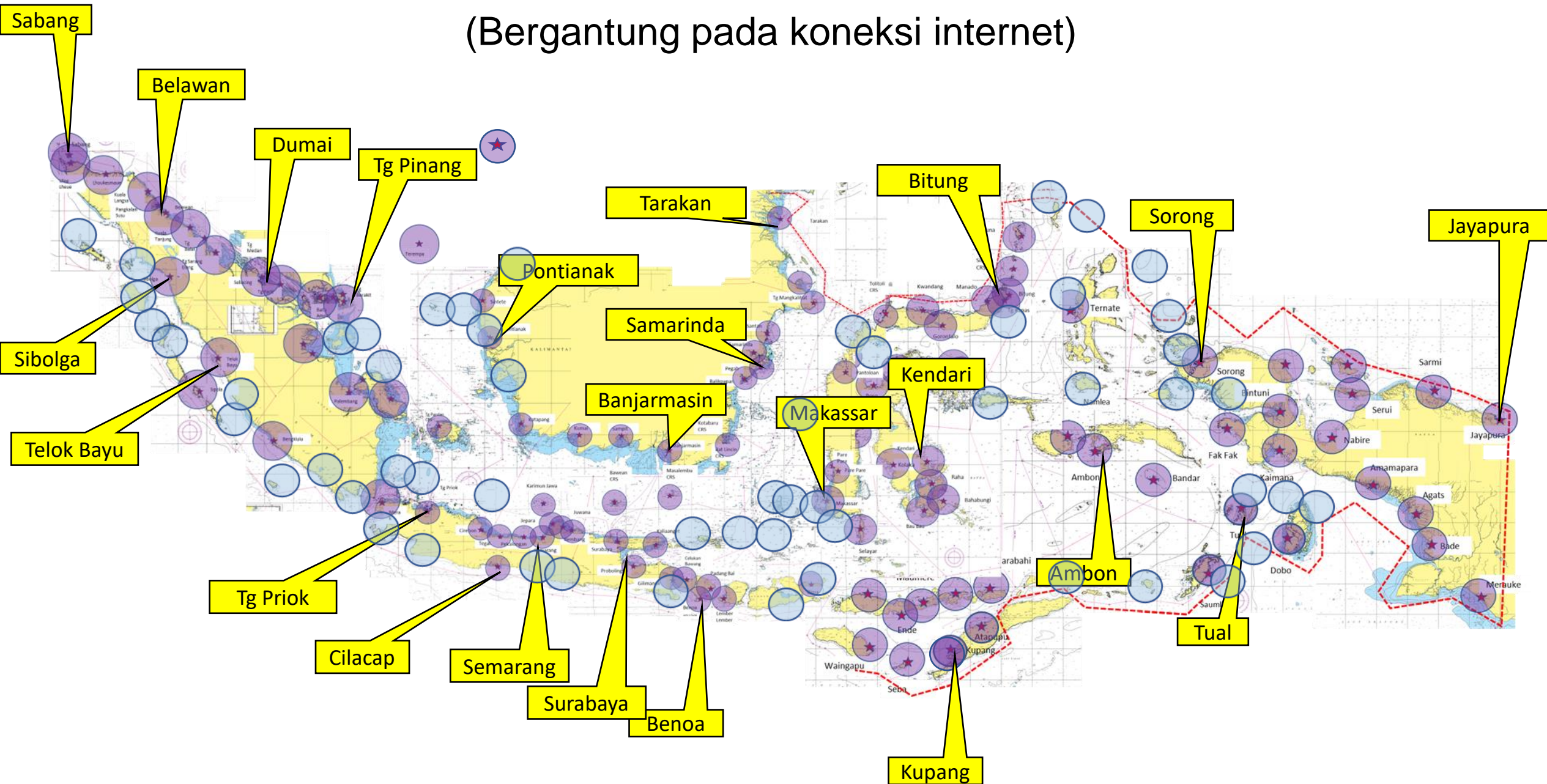




# Konsolidasi Sementara dari 157 SROP (VHF) dioperasikan di 25 DISNAV atau VTS



# Konsolidasi 157 SROP + Menara suar pilihan mencakup area A1 (Bergantung pada koneksi internet)





Terima Kasih

Thank you very much

ありがとうございました

# Appendix 3.6 -6

Presentation (Vessels for AtoN)

# Policy for appropriate management of Navigation Vessels

Navigation Vessels are assigned to the District Navigation Authority (Disnav) to install, operate and maintain navigation signs (AtoN).

Existing Navigation Vessels face many challenges, including many aging vessels, a shortage of seafarers due to the aging of skilled seafarers, and huge fuel costs.

Therefore, by investigating and examining the vessels and crew in detail, we will make a plan to allocate appropriate vessels to each Disnav so that the AtoN managed by each Disnav can be appropriately managed and operated.

### (1) Actual work and workload of Navigation Vessels

In recent years, in the AtoN, the utilization of semiconductors for the light source and solar cells for the power supply enables unmanned lighthouses, less frequency of transportation of fuel for power generation, less replacement of storage batteries for buoys, and less maintenance and inspection work. Since the amount of work for Navigation Vessels in the past has changed, the amount of work for each vessel shall be calculated to study and analyze content for each managed service sea area.

### (2) Handling and activity survey of Navigation Vessels

Clarify the activity / maintenance / waiting rate of each vessel.

### (3) Handling of Navigation Vessels and examination of work capacity

Clarification of daily operation capacity of each vessel (buoy replacement, underwater inspection work, AtoN maintenance inspection work, etc.)

#### (4) Examination of current issues

Collecting requests for Navigation Vessels from each Disnav and clarifying the challenges they face

(5) It is necessary to grasp the current situation and situation of the AtoN (SBNP) group accurately and in detail.

We will update the information as soon as possible due to lack of knowledge about internal meetings between the Nautical Ship Group and the AtoN (SBNP) Group, such as changes to the current status of AtoN (introduction of new technologies such as LED and solar power supply). Information and knowledge about how to manage and operate AtoN is important information for investigating and determining ship operation plans.



# Guide Line

1. Collect and examine the monthly work contents of each ship and output the annual work amount. (3 years)

(1) Buoy Tender

a. Replacing the buoy

b. Underwater survey of buoys

c. Buoy repair

d. AtoN maintenance

e. Transportation of supplies required for AtoN

f. Operations other than the purpose of AtoN

## (2) Aids Tender

- a. AtoN maintenance and inspection
- b. Transportation of the lighthouse keeper
- c. Transportation of fuel for generators
- d. Battery replacement
- e. Transportation of supplies required for AtoN
- f. Operations other than the purpose of AtoN

## (3) Inspection vessel

- a. Transportation of AtoN maintenance inspectors
- b. Transportation of AtoN maintenance supervisors
- c. Operations other than the purpose of AtoN

## 2. Collection of basic data

Collect the following basic data:

- a. Buoy replacement cycle (complete replacement, partial replacement)
- b. Cardinal number exchanged in one voyage
- c. Buoy maintenance site (base, vessels)
- d. Types and numbers of AtoNs accessed by vessels
- e. AtoN Patrol Cycle
- f. Details of AtoN maintenance and the period required for maintenance
- g. AtoN traveling group
- h. Distance from ship base and travel time
- i. Crew training content and training period

### 3. Examination of annual operation results (past 3 years)

Create a monthly operation record table and process the annual operation record.

- a. Number of days of activity per year (including action content)
- b. Annual maintenance days (dock)
- c. Annual maintenance days (crew)
- d. Number of rest days per year

※ The reason for 3 years is to average the cases where there is a special year due to an accident or other reasons.

## 4. Extraction of issues faced by DISNAV

- a. Past repairs and contents of the navigation vessels
- b. Navigation Vessels failures at this time
- c. Crew technical capabilities
- d. Other problems, etc.

5. Create mastersheets for each Disnav staff in the sailors, engineers, buoy base technicians, and other categories related to Navigation Vessels.

a. Career

b. Age group (20-25 years old, 25-30 years old, 30-35 years old, 35-40 years old, 45-50 years old, 50-55 years old, 55 years old ~)

c. Previous work history

d. License, certificate



## 6. Budget allocation for each DISNAV

- a. Ship maintenance costs
- b. Subscription items and budget
- c. Fuel cost
- d. New vessels to be purchased
- e. Other running costs

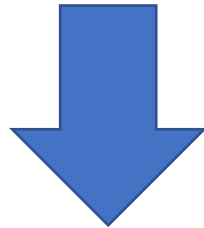
# 7. Collection of survey results

a. Aggregation of survey results

b. Analysis of survey results

## 8. Creation of development plan (draft)

Create a development plan (draft) for disposal and replacement of aging vessels based on the amount of work and issues that Disnav has.



Inquire and adjust opinions to Disnav

## 9. Completion of development plan / notification to Disnav.

Work with Disnav to complete development plan



Notify Disnav

# Appendix 3.9 -1

Minutes for 6th JCC

March 02, 2023

### Minutes of 6th JCC

1 Name of Meeting	6th Meeting of JCC Project for Review of the Study for Maritime Traffic Safety System Development Plan
2 Date	March 02, 2023 09:30 ~ 15:00 (WIT)
3 Meeting Style	Meeting and Seminar (Webcast)
4 Venue	Milenium Hotel – Mutiara Room
5 Participant	Appendix 1 (Participant's List)
6 Subject	Appendix 2 (Meeting Agenda)
7 Moderated by	Mr. Nanditya Darma Wardhana, NAVIGASI

#### 8 Note:

- 1) The meeting was opened by Director of Navigation Mr. Budi Mantoro, Capt. M.SI., M.Mar.

He took the opportunity to extend his sincere appreciation and gratitude to Government of Japan for their excellent support to Government of Indonesia in particular Directorate General of Sea Transportation to enhance maritime traffic safety and security in Indonesia waters. A good cooperation between the government of Indonesia and the government of Japan has made the project to review of the study for maritime traffic safety system development plan available.

He also highlighted that the new master plan is very important for Indonesia government as an umbrella to develop some projects or activities in maritime safety, security and marine environmental protection comprises of Vessel Traffic Services, Aids to Navigation, Ship Routing, Coastal Radio Station and Navigation Vessel. It shall consider some aspects at least developing guideline and policy, optimizing human resources and modernization infrastructure.

He also hoped for the development of Human Resources capabilities by means of Human Resources Training.

Finally, he looked forward that JICA could continue to support the government of Indonesia to enhance maritime safety and security in Indonesia in the future.



2) Overview of the draft report by the representative of each component:

- Component-1 AtoN, VTS and Ship Routing by Mr. Yoku SANTO
- Component-2 Coastal Radio Station by Mr. Goro TSUKAKOSHI
- Component-3 Navigation Vessel by Mr. Hajime KOGA

3) Question and Answer (Free discussion)

1. Mr. Ison Hendrasto, Deputy Director of Sea Lane and Passage Arrangement

He thanked JICA and JANA for carrying out a review of the Navigation Master Plan. According to the presentation from JANA, the method for determining the needs of ATON, which has been conducted this time, was by collecting Questionnaires and compiling their results. And then, a hearing will be conducted, and based on its results, a feasibility study will be performed for the implementation plan.

The question is whether the method used by JANA this time will also be implemented in Japan, because we, the Directorate of Navigation, determine the amount needed for ATON by identifying the channels, especially the inlet to the port, so that we can determine its adequacy. For information, in Indonesia there are 636 port entry channels, while we only have 106 port entry channels, so there are a minimum of 520 channels.

(Ans.) by SANTO, JANA

In Japan, the necessity and appropriateness of the establishment of ATON is fundamentally considered based on user's requests, which are gotten from such as a hearing session, a petition and a safety commission. If there are nearly 500 channels remaining which have already been nominated in your country, the first step is to conduct a hearing at those ports and listen to the users' requests. A hearing session is an important process in developing an establishment plan of ATON.

2. Response from Mr. Raymond, DISNAV Tanjung Priok:

Mr. Raymond explained that Indonesia is:

- The largest archipelagic country in the world
- Member of International Maritime Community
- Acceleration of Industry and economic development.

So, the following things are needed:

- a. Ships Routing
- b. Aids to Navigation
- c. CRS and VTS
- d. Manning and Capacity Building
- e. Navigation Vessel
- f. And Financing Strategy.

Can the things that he described above become a FOCUS in the preparation of this Navigation Master Plan so that they become the basis for making regulations and policies for the future leadership?

3. Mr. Ketut Aries, DISNAV Benoa:

He greatly appreciated the results of JANA's study regarding the consolidation of the Coastal Radio Station (CRS) and Vessel Traffic Service (VTS) which would reduce HR requirements by 60%.

At this time in Indonesia in general data communication networks are not evenly distributed as a whole, especially in remote areas, what are the strategies to overcome the limitations of data communication in remote areas.

At this time there are several class 4 CRS that have MF/HF devices while in carrying out their duties Class 4 CRS do not serve MF/HF communication, the question is if the CRS is consolidated how will the existing equipment be? Will it be used as a spare if in the future there is damage to the main device?

At this time the CRS officer also doubles as an officer who collects Non-Tax State Revenue, is there any study related to the collection of Non-Tax State Revenue considering that CRS will be unmanned later.

(Ans.) by SANTO, JANA

As dealing with the existing equipment in consolidating the stations, they will most likely be replaced by new ones because many of those are to be past their useful life.

(Ans.) by Goro Tsukakoshi, JANA

As to current Non-Tax State Revenue collection and billing work, CRS consolidation does not mean to cease operation in each class 4 station. Operation including non-tax revenue such as telegram service is still carried on at DISNAV Head CRS or VTS. All the operation will be centralized and remotely continued to follow up in each unmanned sensor station even after consolidation.

4) Remarks by Mr. Yukimatu, JCG

He appreciated the cooperation of JANA and DGST to conveyed the masterplan report and he thinks the draft submitted in this meeting have reflected the current situation and issues of maritime traffic system in Indonesia. He hoped the report will be effectively utilized.

5) Remarks by Mr. Nakagawa, JICA Tokyo

He expressed his sincere appreciation for support and cooperation to complete the project for almost four years by DGST and related organizations, both in Indonesia and Japan. He was glad to have fruitful discussion of the result of the study. These days navigation system in maritime are changing due to digital technology such as GPS, so he believed that now is the right time to review the last masterplan for maritime system which was formulated nearly twenty years ago. Both Indonesia and Japan are maritime country and the sea is vital in the people life and economy. He believed this project can contribute to the economic and social development of Indonesia.

6) Closing comment by Mr. Nanditya, NAVIGASI

Indonesia hopes that further cooperation and support by Government of Japan, such as to realize the plan for capacity building of a VTS instructor and for a CRS consolidation project which have been proposed in this masterplan.

7) Seminar by Mr. T. Takimoto

Question by Mr. Fhatan, NAVIGASI

- Actual contents of service extendable in Indonesia
- Establishment of land infrastructure (land station)
- Demonstration of VDES

(Ans.) by Mr. Takimoto

A demonstration system would be available by the end of 2023 or 2024.  
Sustainable necessary cooperation work about VDES could be proposed to NAVIGASI accordingly.

---

Capt. BUDI MANTORO, M.Si, M.Mar.  
Director, Directorate of Navigation  
Directorate General of Sea Transportation  
Ministry of Transportation  
The Republic of Indonesia

---

HONZU Shigeo  
Senior Representative  
JICA Indonesia

*※ Pictures of 6th JCC & Seminar are attached on the next pages.*

## Picture of 6th JCC & Seminar



Opening Ceremony



Moderator (Mr. Nanditya)



Opening remarks by Director of NAVIGASI



Briefing on each component (AtoN, CRS, AtoN Vessel)



Question from participants



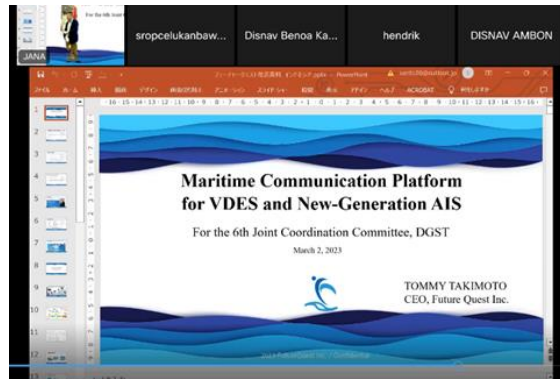
Interpreter



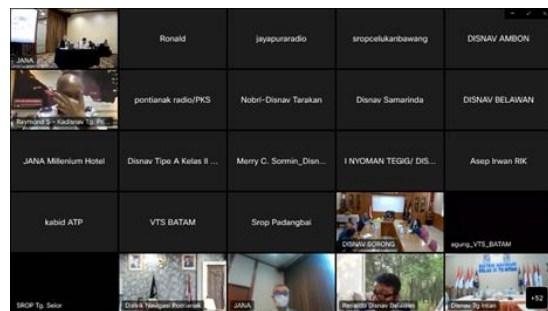
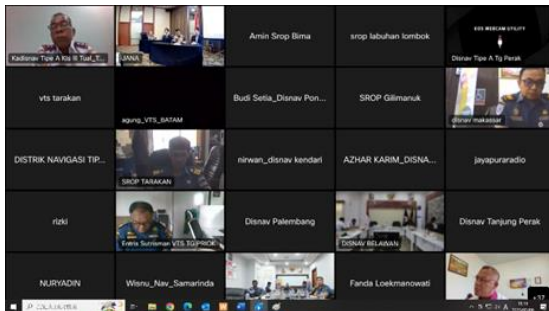
Remarks by JCG



Remarks by JICA, Tokyo



Seminar by Mr. Takimoto



On-line participants (105 at its peak)

## Participants of 6th JCC Meeting and Seminar

DGST			JICA / JST		
No	Name	Title/Section	No	Name	Title/Section
1	Budi Mantoro	Director of NAVIGASI, DGST	1	Shigeo Honzu	Senior Representative, JICA Indonesia
2	Indra Santosa	Deputy Director for Maritime Telecommunication - Directorate of Navigation	2	Naoya Kuboshima	Project Formulation Adviser, JICA Indonesia
3	Nanditya Darmawan	Deputy Director for Technical Planning of Navigation - Directorate of Navigation	3	Syunsuke Yukimatu	Officer, Maritime Traffic Department, JCG
4	Ison Hendrasto	Deputy Director for Hip Routing and Passage Arrangement of Navigation - Directorate of Navigation	4	Tomoki Takimoto	CEO, Future Quest, Inc.
5	Fathan M.	Staff of Deputy Director for Maritime Telecommunication	5	Yoku Santo	JST, JANA
6	Rizki Cahyadi	Staff of Deputy Director for Maritime Telecommunication	6	Goro Tukakoshi	JST, JANA
7	Ms. Heny	Staff of Directorate of Navigation	7	Hajime Koga	JST, JANA
8	Zahara	Staff of Directorate of Navigation	8	Dhana Mulyana	Local staff, JANA
9	Arthur	Staff of Deputy Director for Maritime Telecommunication	9	Ms. Apsari Amanda P	Local staff, JANA
10	M. Arifin	Staff of Deputy Director for Maritime Telecommunication	10	Brigantono Tomo	Local Consultant, Tomo & Son
11	Dofito	Staff of Deputy Director for Maritime Telecommunication	11	Andre	Local Consultant, Tomo & Son
12	Ms. Andriany	Planning Bureau for Ministry of Transportation	12	Ms. Shadrinna	Local Consultant, Tomo & Son
13	Shandri	Staff of Directorate of Navigation	13	Arman	Interpreter
14	Tony Rafiq	Staff of Deputy Director for Maritime Telecommunication	14	Ms. Lina	Interpreter
15	Malik Aziz	Staff of Directorate of Navigation	15		
16	Ryan	Staff of Directorate of Navigation	16		
17			17		
On-line Participant		JCC : 105			
		Seminar : 69			



Program of the Meeting  
on  
The Six Joint Coordination Committee and the Seminar  
for  
The Project for Review of the Study for Maritime Traffic Safety System Development Plan  
(Date / Venue : March 2, 2023 / Milenium Hotel, Jakarta)

1. Opening Remarks by Director of Navigation ----- 0900 - 0915
2. Briefing on the Overview of the Draft Report  
for the Phase-2 Activities by JANA ----- 0915 - 1030
3. .... (Coffee Break) ..... 1030 - 1045
4. Q & A, Free Discussion ----- 1045 - 1115
5. Remarks by Mr. Yukimatu, JCG ..... 1115 - 1130
6. Remarks by Mr. Nakagawa, JICA ..... 1130 – 1145
7. .... (Buffet Lunch) ..... 1145 – 1300
8. Seminar (Presentation by Mr. T. Takimoto) ----- 1300 - 1400  
(Title : Maritime Communication Platform)

※ The Session and the Seminar will be webcast (Web-Broadcast) with “Webex”.

Join from the meeting link

<https://jana.webex.com/jana-en/j.php?MTID=ma199a01db9f8c2df4e99f65ffaad1541>

Meeting number (access code): 2517 679 0986

Meeting password: cpFwhVp4U74

Seminar : By Mr. Takimoto



## Maritime Communication Platform for VDES and Next-Generation AIS

CoastalLink is a digital platform which enables all ships and ports to share their location and other information and to communicate with each other.

**VDES** (VHF Data Exchange System) is a new maritime communication standard introduced by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and the International Telecommunication Union (ITU), and it is known as the next generation AIS. Currently, some countries are developing **VDES Relay Communication Satellite** with additional messaging and data exchange capacity, and dedicated satellite constellations are scheduled to be launched in 2023.

Source : "FutureQuest HP"

# Appendix 3.9 -2

Presentation (AtoN)



**Directorate General of Sea Transportation  
Ministry of Transportation  
Republic of Indonesia**

## **The 6th Meeting of JCC**

# **The Project for Review of the Study For Maritime Traffic Safety System Development Plan**

March 2, 2023



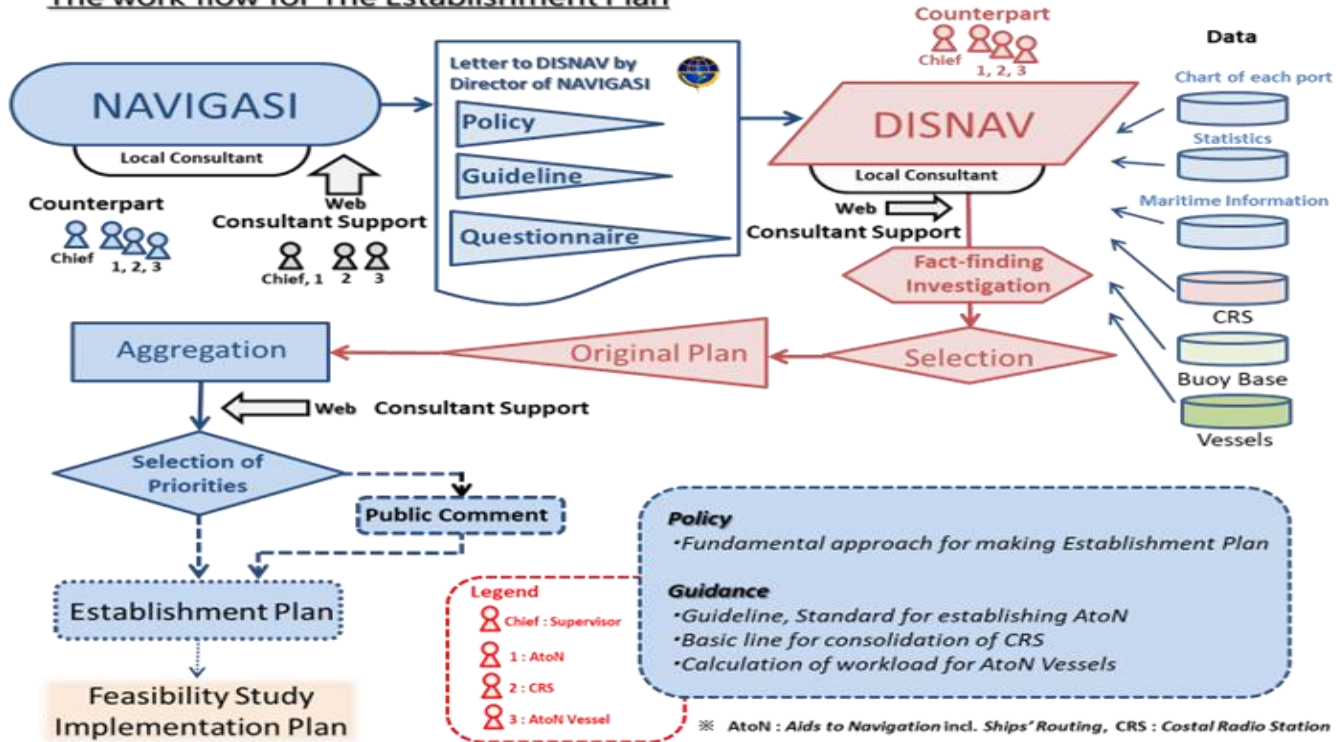
Japan International Cooperation Agency (JICA)



Japan Aids to Navigation Association (JANA)

# Outline of Activities

## The work flow for The Establishment Plan



## Schedule for Activities

		2022											2023				
		2	3	4	5	6	7	8	9	10	11	12	1	2	3		
Consultant	Domestic Work	[Continuous bar from month 2 to 3 of 2023]															
	Oversea Work				Meeting	Workshop					Meeting					Seminar	
NAVIGASI	Activities	[Red bars indicating activities: Meeting, Workshop, Meeting, Seminar]															
DISNAV	Activities					Workshop	[Orange bar indicating activities from month 6 of 2022 to month 2 of 2023]										Seminar
Events			▲ 5th JCO			▲ Workshop (IWRAP)										▲ Seminar 6th JCO	

# *Preparation of Establishment Plan*

## ➤ *Component 1 : Aids to Navigation and VTS, including Ship Routing*



## ➤ *Component 2 : Coastal Radio Station*



## ➤ *Component 3 : Vessels for Aids to Navigation*





# Component 1

Aids to Navigation and VTS, including “Ships Routing”

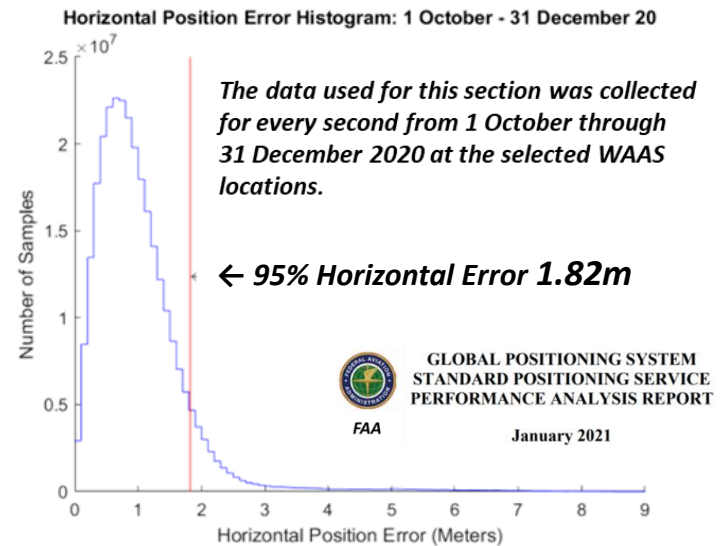
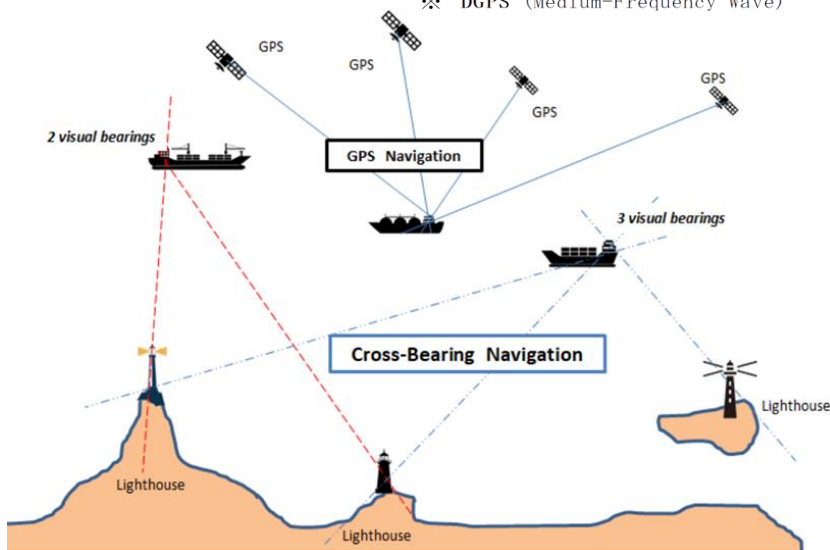




# Fixing Position of a Huge Vessel at Sea

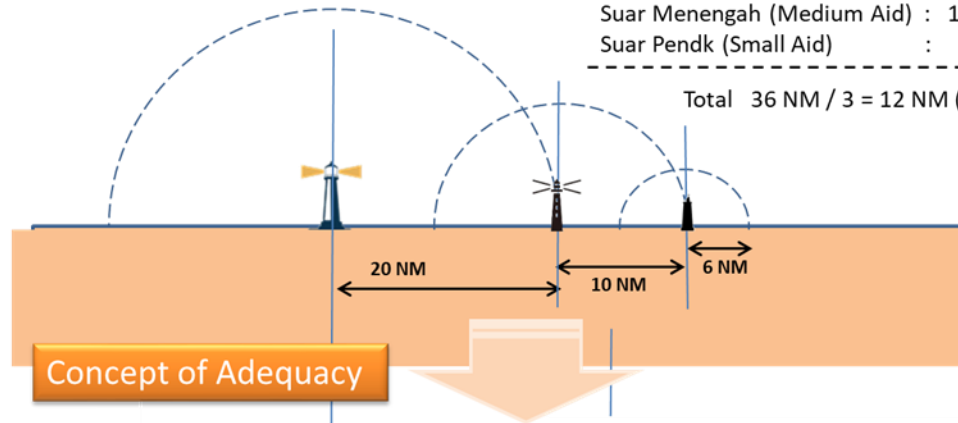
	Visual Observation		Satellite System			Radio Navigation System		Auxiliary Device	
	Cross Bearing	Celestial Navigation	NNSS	GPS	SBAS	DGPS	AIS	ARPA	ECDIS
1960' s	Visual Observation (Blue Arrow)	INS	1964						
1970' s									
1980' s									
1990' s		1998 Exclusion from US Navy	1996	1990					
2000' s				2000 Cancellation of SA	2002	1997	2008	1985	
2010' s						2019 Termination in Japan			2012

- ※ SBAS (Satellite Based Augmentation System)
- ※ DGPS (Medium-Frequency Wave)

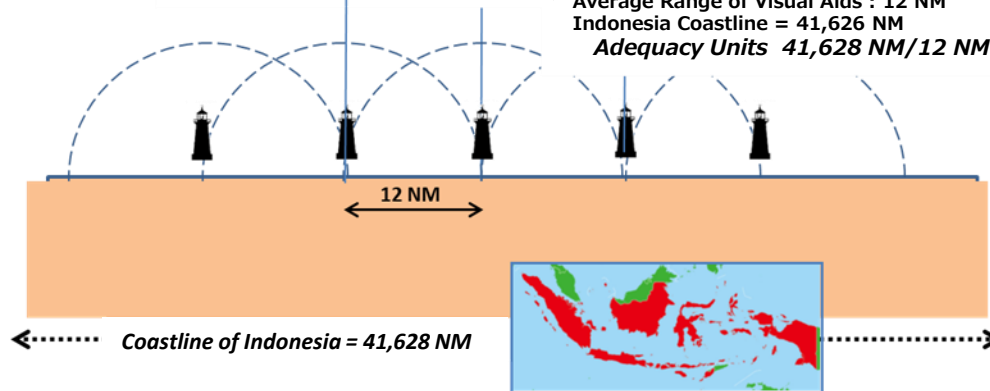


Suar Utama (Large Aid) : 20 NM  
 Suar Menengah (Medium Aid) : 10 NM  
 Suar Pendk (Small Aid) : 6 NM

Total 36 NM / 3 = 12 NM (Average)



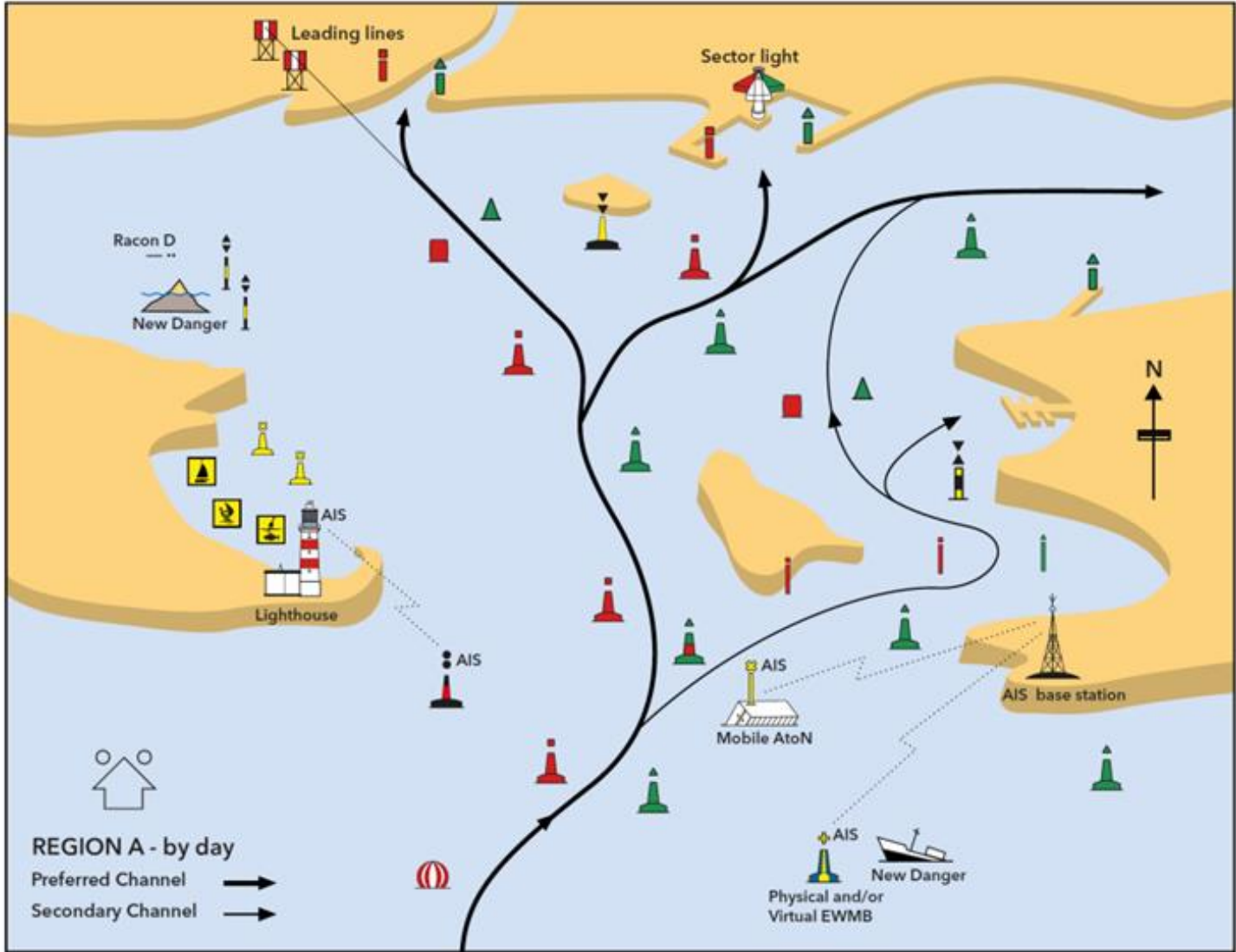
Average Range of Visual Aids : 12 NM  
 Indonesia Coastline = 41,626 NM  
 Adequacy Units  $41,628 \text{ NM} / 12 \text{ NM} = 3,469 \text{ Units}$



Development/Establishment Status	2002	2016		2019	
	Existing	Five-Year Plan	Existing	Five-Year Plan	Existing
Lighthouse	235	286	282	306	284
Light Beacon	DGST	1,168	1,557	2,281	1,877
	Non-DGST	437	743		843
Total	1,840	(2,042)	2,582	(2,587)	3,004
<b>Adequacy (%)</b>	<b>53 %</b>		<b>74 %</b>		<b>87 %</b>

Calculated Adequacy Number of SBNP 3,469 Units / 41,628 Mile, as of 2015

# IALA Maritime Buoyage System



## **Policy of Establishment Plan for providing Aids to Navigation**

### **a. Eliminating unlit bays and harbors**

Navigation at night is very dangerous to approach a coastal area and / or a harbor without marine lighted aids to navigation, even though with the advantage of local knowledge.

### **b. Transformation into a port where vessels can enter more safely**

Regional ports are expected to increase in vessel traffic progressively, and further safety of their navigation must be ensured.

In order to mitigate navigation risks caused by in traffic volume, it is necessary to properly and more effectively arrange marine aids to assist navigators with determining their position, a safe course and to warn them of dangers and obstructions.

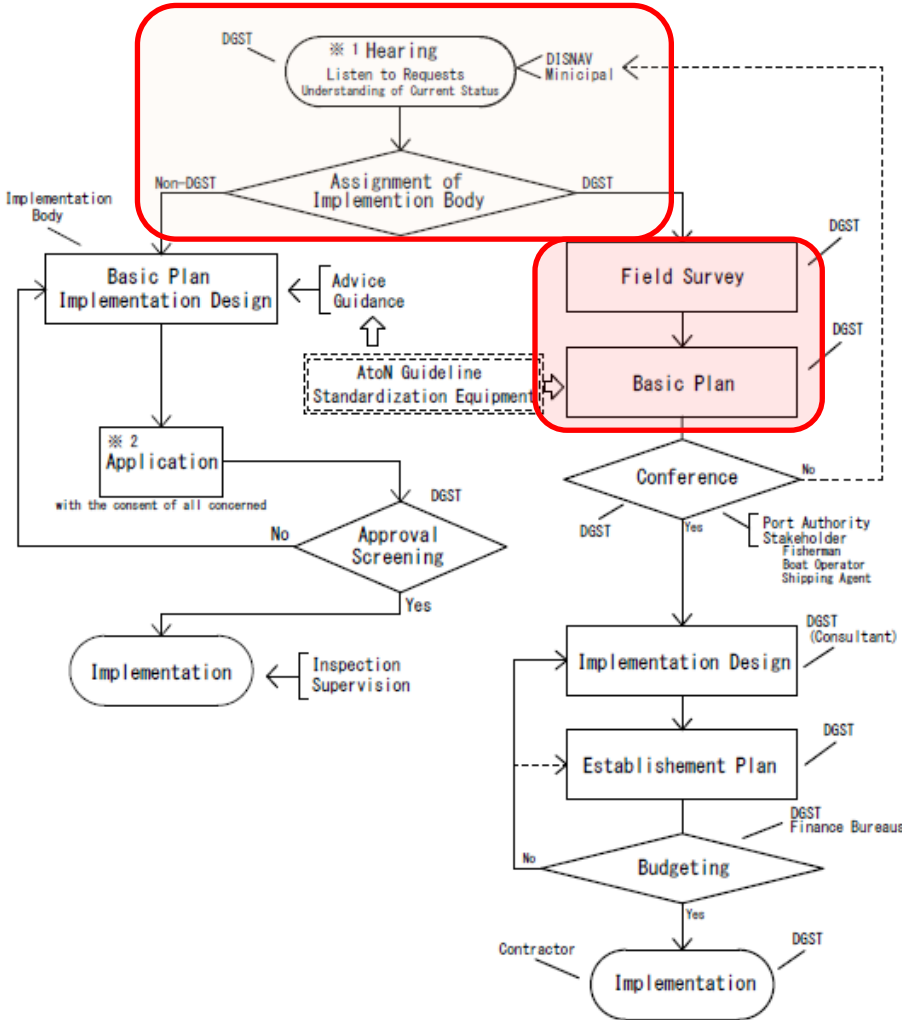
### **c. A goal is the port that vessels can navigate safely and efficiently at any time**

For the prosperity of the region and the nation, it goes without saying that safe and stable marine traffic is secured, but for further prosperity a port that is always open is required.

To achieve this goal, it is indispensable to establish aids to navigation suitable for the purpose and to provide appropriate and reliable maritime information.

Maritime Traffic Safety Measures  
- establishing Process

Existing Port/Harbor

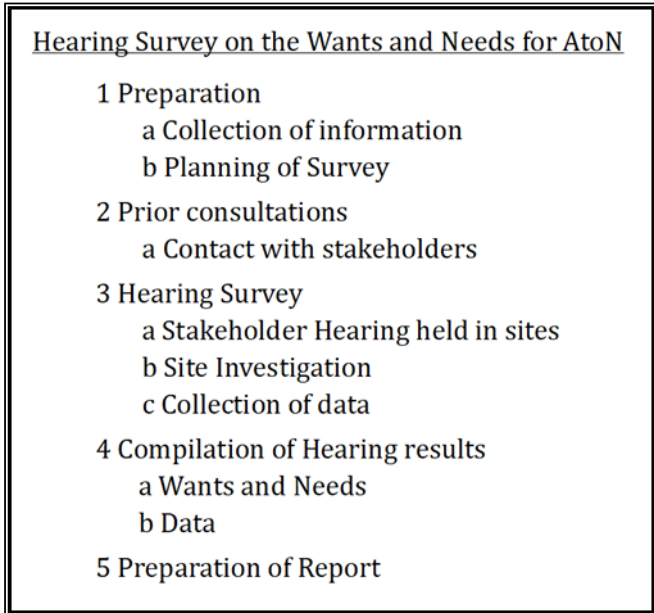


DGST



DISNAV  
Municipal

※1 Hearing will be held once a year at DISNAV

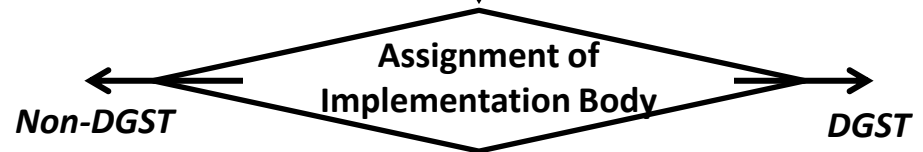


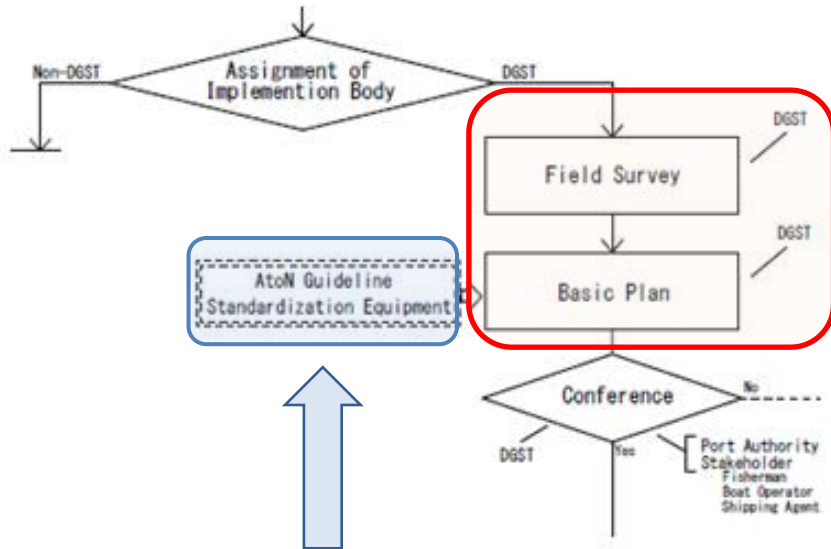
Stakeholders

- Sailor
- Fisher
- Marine engaged person
- Maritime Administration

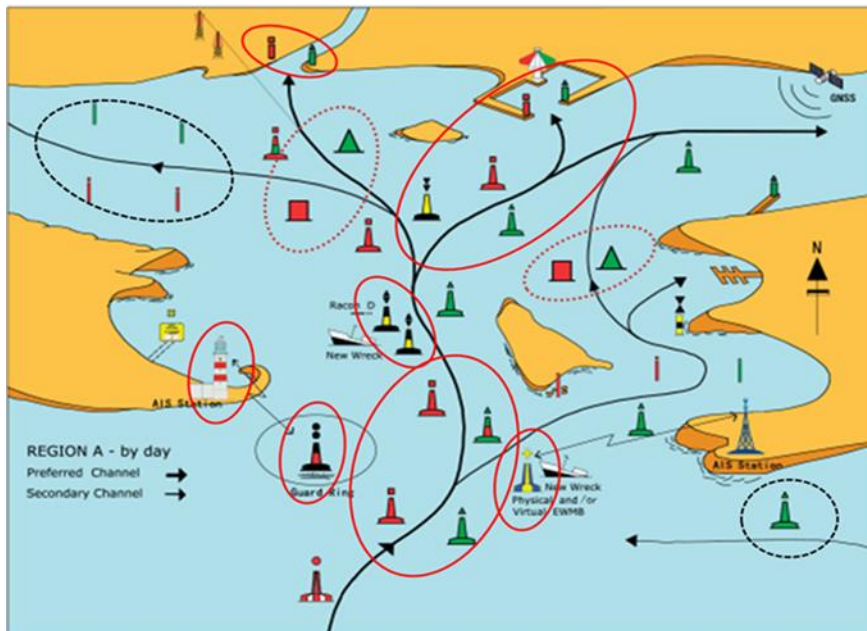
Information

- Marine Accidents
- Volume of Traffic
- Development of Port
- Marine Chart





**Explanatory Figure** for Classification of significance for the installation



## Feasibility Study & Implementation Design

### 1 Preparation

- a Collection of information
- b Planning of Investigation

### 2 Prior consultation

- a Contact with related parties

### 3 Site survey

- a Hearing of user's opinion
- b Collection of data
- c Selection of AtoN
- d Field validation

### 4 Designing

- a Decide on specification
- b Risk Management  
(Identification, Analysis, Assessment)

### 5 Estimation of Cost

### 6 Preparation of Report



# Questionnaires Sheet - ①, - ②

Sheet ① Reporting Format for Nominated Area of Establishing VTS

District:

Priority	Name (Area/Port) (Fill out)	1. Main Purpose of VTS	2. VTS Area	Necessary Data/Information						Reference (Fill out)	
				3. Nautical Chart	4. AIS Data	5. Conventional Route	6. Traffic Volume	7. Marine Accident Data	8. Stakeholder Demands	National Strategy	Special Situation
Example		a INS, TOS	b Port/Harbour	b General Scale	a Independent	a Existing	a Existing	a Existing	a Sailor	Tourism	Target of small vessels
1											
2											
3											

Sheet ② Reporting Format for Nominated Area of Establishing/Planned VTS

Name of Sea Area / Port:

District:

Chart No (Name):

Sheet ② List of Existing/Planned VTS

Reference Number	1. Region	Location of Center (Full out)		Type of VTS		3. Facilities (Number)								Legal Basis Regulation/Law (Fill out)
		Name of VTS	Position Longitude Latitude	2. VTS Area	Purpose (Multiple Answers)	Operation Center	Radar	AIS	CCTV	Hydrological Instruments	VHF	Traffic/Goal Signal	Other (Fill out)	
Example	a Existing	ABCD	01-27-45.00S 125-34-00.25E	b Port/Harbour	INS, TOS, NAS, Surveillance, Allied Service	1	2	2	2	1	2	1		
	b Planning	GHDKL	00-56-06.33S 133-10-45.10E	a Coastal Waters	INS, NAS, Surveillance	1	2	2	1	2	3	0		
1														
2														
3														
4														

## Drop Down List

### 1. Main Purpose of VTS

1	a INS, TOS	INS (Information Service), TOS (Traffic Organisation/Management Service)
2	b INS, TOS, NAS	NAS (Navigation Assistance Service)
3	c INS, NAS	
4	d INS	
5	e TOS	
6	f NAS	
7	g Surveillance	Coastal Surveillance and Maritime Security
8	h Allied Service	Pilotage, Immigration, Customs, Coast Guard

### 2. VTS Area

1	a Coastal Waters	
2	b Port/Harbour	
3	c Inland Water (River)	

### 3. Nautical Chart

1	a Big Scale	Scale : 1/15000, 1/50000
2	b General Scale	Scale : 1 / 250000
3	c None	Ocean Seemap, Google Map

### 5. Conventional Route

1	a Existing	Regulated route, Traditional lane, Habitual course
2	b None	

### 6. Traffic Volume

1	a Existing	Number of Vessels in each vessel's type
2	b None	

### 4. AIS Data

1	a Independent	Stand-alone, VTS
2	b Internet	Marinetraffic.com
3	c None	

### 8. Stakeholder Demands

1	a Sailor	Navigator, Seaman, Pilot
2	b Fisherman	
3	c Marine Person	People who is engaged in marine activities, business.
4	d Sailor, Fisherman	
5	e Sailor, Marine Person	
6	f None	

### 7. Marine Accident Data

1	a Existing	Number of accidents in each type of accident
2	b None	

# Questionnaires Sheet - ③

## Sheet ③ Reporting Format for Planned AtoN

Name of Sea Area / Port

District

Chart No (Name)

### List of Planned Aids to Navigation

#### Sheet ③

Reference Number	Location			Aid		Category		Type of Marks				Remarks
	Name of AtoN	Position		Type (*1)	Specification (*2)	Sea Area (*3)	Significance (*4)	Lateral (*5)	Cardinal (*6)	Special (*7)	Light Color (*8)	
		Longitude	Latitude									
Example	ABCDEF	00-25-45.00N	130-23-55.00E	Lighted Beacon	Short range Light	Harbor/Port (Restricted area)	Category 2 (Important)	Port	Not Applicable (n/a)	Special Marks (Quarantine Area)	Red	
1												
2												
3												
4												

### Drop Down List

No	Name of Aid	Items
1	Type (*1)	Lighthouse
		Breakwater Light
		Harbor Light
		Lighted Beacon
		Lighted Buoy
		Leading Lights
		Sector Light
		Beacon (Unlighted)
		Buoy (Unlighted)
Landmark		
AtoN AIS		

No	Name of Aid	Items
2	Specification (*2)	Landfall Light
		Long-range Light
		Medium-range Light
		Short-range Light
		Channel Light
		Radio Aids (Medium-range)

No	Category	Items
3	Sea Area (*3)	Offshore waters
		Coastal waters
		Congested area
		Harbor/Port (Restricted area)
		Inland waters (River)












No	Category	Items
4	Significance	Category 1 (Vital)
		Category 2 (Important)
		Category 3 (Necessary)

No	Type of Marks	Items
5	Lateral (*5)	Starboard
		Port
		Preferred Channel of Starboard
		Preferred Channel of Port
		Not Applicable (n/a)

No	Type of Marks	Items
6	Cardinal (*6)	North
		East
		South
		West
		Not Applicable (n/a)

No	Type of Marks	Items
7	Special (*7)	Special Marks (Work Zone)
		Special Marks (Quarantine Area)
		Special Marks (Anchorage)
		Special Marks (Wreck Marking)
		Transition Mark
		Safe Water Mark
		Approach Mark
		Not Applicable (n/a)

No	Type of Marks	Items
8	Light Color (*8)	White
		Red
		Yellow
		Green

Category		Shape	
1	LATERAL MARKS	1-1	Single red cylinder (can) 
		1-2	Single green cylinder (can) 
		1-3	Single green cone, point upwards 
		1-4	Single red cone, point upwards 
2	CARDINAL MARKS	2-1	2 black cones, one above the other, pointing upward 
		2-2	2 black cones, one above the other, base to base 
		2-3	2 black cones, one above the other, points downward 
		2-4	2 black cones, one above the other, point to point 
3	ISOLATED DANGER MARKS	3	2 black spheres, one above the other 
4	SAFE WATER MARKS	4	Single red sphere 
5	SPECIAL MARKS	5	Single yellow "X" shape (St Andrew's Cross) 



## Status of Reply to Questionnaire for Aton

As of December 12, 2022

NO	AREA	CLASS	SHEET 1	SHEET 2	SHEET 3	DATA	NO	AREA	CLASS	SHEET 1	SHEET 2	SHEET 3	DATA
1	Sabang (1)	Class II	Nominal Area VTS * (2010)	Existing/Planned VTS (2010)	Planned AtoN (2010)	Ship Routing Report	14	Kupang (14)	Class II	-	Existing AtoN * (0811)	-	-
2	Belawan (2)	Class I	-	Existing/Planned VTS	-	-	15	Benjarmasin (15)	Class II	Nominal Area VTS	Existing AtoN & Existing/Planned VTS	-	-
3	Sibolga (3)	Class III	-	-	-	Report of existing AtoN (5111) Master Plan Navigasi Sibolga (5111)	16	Tarakan (16)	Class III	Nominal Area VTS * (2010)	Existing/Planned VTS * (2010)	-	Chart / Data - Traffic Lane to enter Port of Tarakan (2110) - Establishment Plan VTS Center Tarakan Center Sta/Tg. Batu Putih Bunyu (2110) - Traffic Volume 2022 (2110) - List of Marine Accident (2010)
4	Teluk Bayur (4)	Class I	-	Existing AtoN (2011)	Planned AtoN (2011)	-	17	Samarinda (17)	Class I	Nominal Area AtoN & Nominal Area VTS * (2510)	Existing AtoN Existing & Planned VTS	Planned AtoN	Chart / Data - Nautical Chart (2010)
5	Tg. Pinang (5)	Class I	Nominal Area VTS	Existing/Planned VTS & Existing AtoN * Existing AtoN (1811)	Planned AtoN	-	18	Makassar (18)	Class I	Nominal Area AtoN	Existing VTS * (2510)	Planned AtoN * Planned AtoN (2510)	-
6	Dumai (6)	Class I	Nominal Area AtoN & Nominal Area VTS	Existing AtoN & Existing/Planned VTS	Planned AtoN	-	19	Kendari (19)	Class III	-	Existing/Planned VTS	-	-
7	Palembang (7)	Class I	-	Existing/Planned VTS	-	-	20	Bitung (20)	Class I	-	Existing AtoN * (1212)	-	-
8	Pontianak (8)	Class III	Nominal Area AtoN & Nominal Area VTS	Existing/Planned VTS	-	-	21	Ambon (21)	Class I	Nominal Area VTS	Existing/Planned VTS & Existing AtoN * (0510)	-	-
9	Tg. Priok (9)	Class I	Nominal Area AtoN & Nominal Area VTS	Existing AtoN & Existing/Planned VTS	Planned AtoN	-	22	Sorong (22)	Class I	-	Existing/Planned VTS	-	-
10	Gilicap (10)	Class III	Nominal Area AtoN	Existing AtoN * Existing AtoN (2110)	Planned AtoN (NL) Planned AtoN (2110)	-	23	Jayapura (23)	Class II	-	Existing AtoN * (0811)	Planned AtoN * (0811)	Nautical Chart (0811) Nautical Chart with AtoN position (1011)
11	Semarang (11)	Class III	-	Existing/Planned VTS	-	Ship Routing (Kommun Crossing Route, Legat Eksp. Sailing Route, Komun. Judo Route, Eksp. Route, Thematic Chart (Jepara, Kendi, Pakalongan, Rembang, Semarang) (2111)	24	Merauke (24)	Class III	-	-	-	-
12	Surabaya (12)	Class I	Nominal Area AtoN (2110)	Existing/Planned VTS	-	(Chart) 7. Tematik Penetapan AtoN Tg. Paksi 2021 8. Tematik Penetapan AtoN Tandan 2021 9. Penetapan AtoN Bona 2022 standar RKM 10 Penetapan AtoN Kabaui 2022 standar RKM	25	Tual (25)	Class III	Nominal Area AtoN	Planned VTS	-	-
13	Benoa (13)	Class II	Nominal Area AtoN * (0811)	Existing AtoN & Existing/Planned VTS	Planned AtoN * (0811)	(Chart) AtoN Labuhan Lombok AtoN Pantai Jember dan Sekeloa AtoN Penampang AtoN Sampolan Nautical Chart Existing AtoN & Planned AtoN (0811)							

### Summary Table for Planned AtoN requested by DISNAV

*December 12, 2022*

No	DISNAV	Number of Nominated Area	Number of Planned AtoN	Planned AtoN		
				<i>Lighthouse</i>	<i>Lighted Beacon</i>	<i>Lighted Buoy</i>
1	Sabang	2	4	2	2	
2	Belawan	0	0			
3	Sibolga	0	0			
4	Teluk Bayur	2	3		3	
5	Tg. Pinang	3	----	---	---	---
6	Dumai	3	7		7	
7	Palembang	0	0			
8	Pontianak	1	----	---	---	---
9	Tg. Priok	2	7		7	
10	Cilacap	2	2		2	
11	Semarang	2	8		4	4
12	Surabaya	1	----	---	---	---

No	DISNAV	Number of Nominated Area	Number of Planned AtoN	Planned AtoN		
				<i>Lighthouse</i>	<i>Lighted Beacon</i>	<i>Lighted Buoy</i>
13	Benoa	6	15		15	
14	Kupang	0	0			
15	Banjarmashin	0	0			
16	Tarakan	0	0			
17	Samarinda	2	10		3	7
18	Makassar	3	8			8
19	Kendari	0	0			
20	Bitung	0	0			
21	Ambon	2	4	4		
22	Sorong	0	0			
23	Jayapura	5	21	1	12	8
24	Merauke	0	0			
25	Tual	0	0			
Total		36	89	7	55	27

Table of Establishment Plan for AtoN

(1/9)

No.	DISNAV	Nominated Area	Planned AtoN	Item	Implementation (AtoN)						Reference
					2024	2025	2026	2027	2028	Subsequent Year til 2040	
1	Sabang (II)	2	4	Hearing Survey						Ox2	Pulau Sumat Ache
				Feasibly Study	Oa		Oa				
				Implementation Design							
				Construction		OL		OL	OLB x2		
				Budget	IDR 830.M	IDR 3,000.M	IDR 830.M	IDR 3,000.M	IDR 1,750.M	IDR 490.M	
2	Belawan (I)	0	0	Hearing Survey	O		O		O	Ox2	
				Feasibly Study							
				Implementation Design							
				Construction							
				Budget	IDR 245.M						
3	Sibolga (III)	0	0	Hearing Survey	O						
				Feasibly Study							
				Implementation Design							
				Construction							
				Budget	IDR 245.M						

Table of Establishment Plan for AtoN

(2/9)

No.	DISNAV	Nominated Area	Planned AtoN	Item	Implementation (AtoN)						Reference
					2024	2025	2026	2027	2028	Subsequent Year til 2040	
4	Teluk Bayur (I)	2	3	Hearing Survey				O		Ox2	
				Feasibly Study	Oa						
				Implementation Design							
				Construction		OLB	OLB x2				
				Budget	IDR 830.M	IDR 1,000.M	IDR 1,500.M	IDR 245.M		IDR 490.M	IDR 4,065.M
5	Tg. Pinang (I)	3	---	Hearing Survey	O		O		O	Ox2	
				Feasibly Study	Oa						
				Implementation Design							
				Construction							
				Budget	IDR 915.M		IDR 245.M		IDR 245.M	IDR 490.M	IDR 1,895.M
6	Dumai (I)	3	7	Hearing Survey			O		O	Ox2	
				Feasibly Study	Oa						
				Implementation Design							
				Construction		OLB x2	OLB x2	OLB x2	OLB		
				Budget	IDR 830.M	IDR 1,500.M	IDR 1,745.M	IDR 1,500.M	IDR 1,245.M	IDR 490.M	IDR 7,310.M

# 1-A Summary Table for Planned AtoN

## 1 DISNAV Sabang

No	Area	Planned AtoN				Reference (Purpose)	
		No	Name	Location			Type
				Latitude	Longitude		
1	Pulau Siumat	1	Mensu Pulau Siumat Sinabang	02°38' 44.43" N	096°23' 46.82" E	Lighthouse	Long-range Light
2	Aceh	1	Mensu Peusangan Bireun	05°16' 25.16" N	096°51' 6.29" E	Lighthouse	Long-range Light
		2	Ramsu Ujung Raja Sigli	05°14' 15.68" N	096°27' 55.20" E	Lighted Beacon	Middle-range Light
		3	Ramsu Merdu Sigli	05°15' 43.10" N	096°15' 33.09" E	Lighted Beacon	Middle-range Light

### 1 Sabang ( II )

#### Planned AtoN

Pulau Siumat

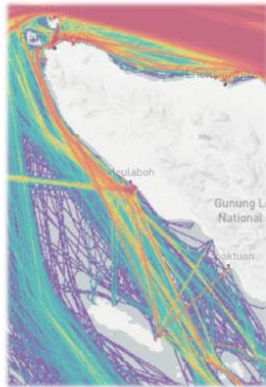
1 Mensu Pulau Siumat Sinabang (*L*)

Ache

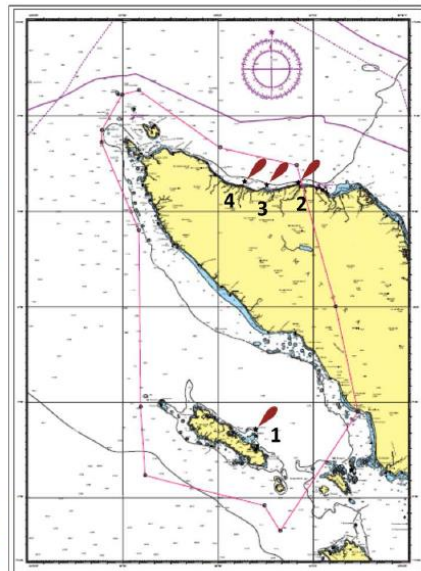
2 Mensu Peusangan Bireun (*L*)

3 Ramsu Ujung Raja Sigli (*LB*)

4 Ramsu Merdu Sigli (*LB*)



Location Map



#### Planned AtoN

1 Mensu Pulau Siumat Sinabang

(02° 38' 44.43" N 96° 23' 46.82" E)

(*Lighthouse*)

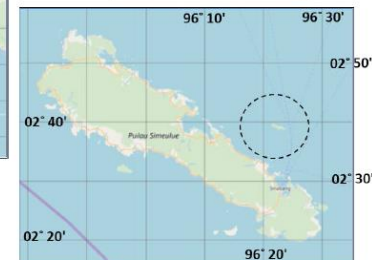


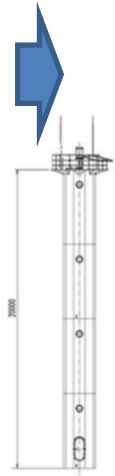
Table of Establishment Plan for AtoN (1/9)

No.	DISNAV	Nominated Area	Planned AtoN	Item	Implementation (AtoN)						Reference
					2024	2025	2026	2027	2028	Subsequent Year til 2040	
1	Sabang ( II )	2	4	Hearing Survey						Ox2	Pulau Slumat Ache
				Feasibly Study	Oa		Oa				
				Implementation Design							
				Construction		OL		OL	OLB x2		
				Budget	IDR 830.M	IDR 3,000.M	IDR 830.M	IDR 3,000.M	IDR 1,750.M	IDR 490.M	

- Feasibility Study & Implementation Design
- 1 Preparation
    - a Collection of information
    - b Planning of Investigation
  - 2 Prior consultation
    - a Contact with related parties
  - 3 Site survey
    - a Hearing of user's opinion
    - b Collection of data
    - c Selection of AtoN
    - d Field validation
  - 4 Designing
    - a Decide on specification
    - b Risk Management  
(Identification, Analysis, Assessment)
  - 5 Estimation of Cost
  - 6 Preparation of Report



Detail design  
Specifications  
Drawings



Contract  
Construction



# 1-A Summary Table for Planned AtoN

## 6 DISNAV Dumai

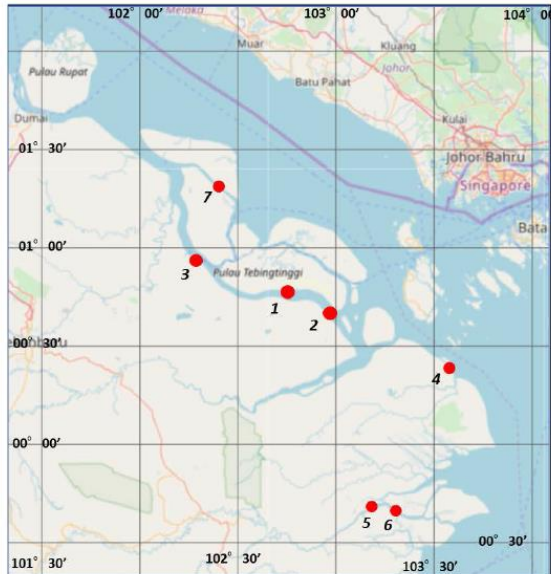
No	Area	Planned AtoN				Reference (Purpose)	
		No	Name	Location			Type
				Latitude	Longitude		
1	Pulau Tebingtinggi	1	Ramsu Selat Panjang 1	00° 45' 25.46" N	102° 47' 43.52" E	Strait	Restricted area
		2	Ramus Selat Panjang 2	00° 40' 33.80" N	102° 58' 06.62" E	Strait	Restricted area
2	Pulau Pandang	3	Ramsu Tg. Buton	00° 55' 56.03" N	102° 18' 08.46" E	Strait	Harbor
		7	Ramsu Selat Padang	01° 19' 58.61" N	102° 22' 23.15" E	Strait	Restricted area
3	Sungai Guntung Sungai Indragiri	4	Ramsu Sungai Guntung	00° 22' 38.79" N	103° 36' 25.46" E	Strait	Restricted area
		5	Ramsu Sungai Indagiri 1	00° 18' 09.22" S	103° 12' 41.68" E	Strait	Restricted area

6	Dumai (I)	3	7	Hearing Survey				○	○	○x2		
				Feasibly Study	○a							
				Implementation Design								
				Construction		○LB x2	○LB x2	○LB x2	○LB			
				Budget	IDR 830.M	IDR 1,500.M	IDR 1,745.M	IDR 1,500.M	IDR 1,245.M	IDR 490.M	IDR 7,310.M	

Planned AtoN

- 1 Ramsu Selat Panjang
- 2 Ramsu Selat Panjang
- 3 Ramsu Tg. Buton
- 4 Ramsu Sungai Guntung
- 5 Ramsu Sungai Indagiri
- 6 Ramsu Sungai Indagiri
- 7 Ramsu Selat Padang

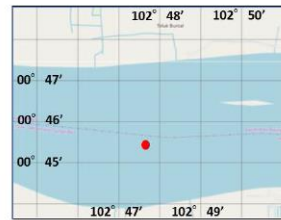
- 1 ( 00°45'25.46" N 102°47'43.52" E )
  - 2 ( 00°40'33.80" N 102°58'06.62" E )
  - 3 ( 00°55'56.03" N 102°18'08.46" E )
  - 4 ( 00°22'38.79" N 103°36'25.46" E )
  - 5 ( 00°18'09.22" S 103°12'41.68" E )
  - 6 ( 00°19'53.64" S 103°18'44.40" E )
  - 7 ( 01°19'58.61" N 102°22'23.15" E )



Planned AtoN

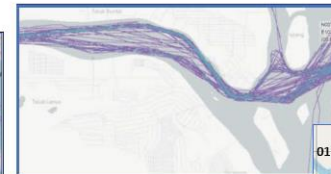
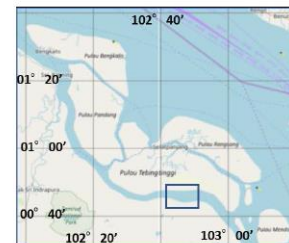
### 1 Ramsu Selat Panjang

( 00°45'25.46" N 102°47'43.52" E )



### 2 Ramsu Selat Panjang

( 00°40'33.80" N 102°58'06.62" E )





5	Tg. Pinang ( I )	3	-----	Hearing Survey	○	○	○	Ox2		
				Feasibly Study	Ob					
				Implementation Design						
				Construction						
				Budget	IDR 915.M	IDR 245.M	IDR 245.M	IDR 490.M	IDR 1,895.M	

1-B Outline Map of Planned AtoN

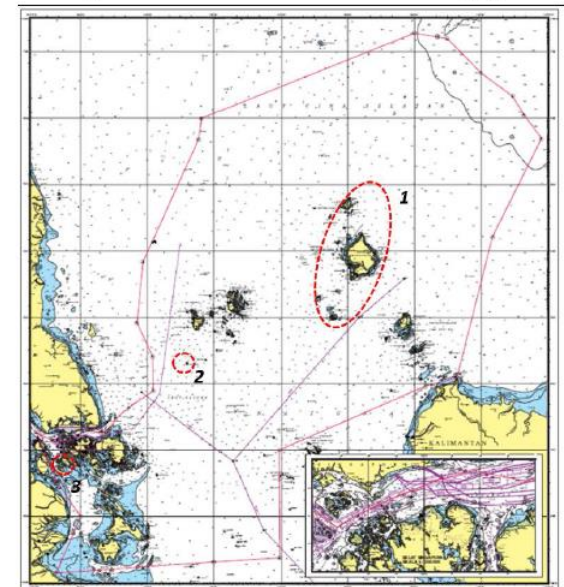
5 Tg. Pinang ( I )

Planned AtoN (Nominated Area)

- 1 Pelabuhan Selat Lampa
- 2 Rambu Suar Malang Biru
- 3 Rambu Suar Menvil



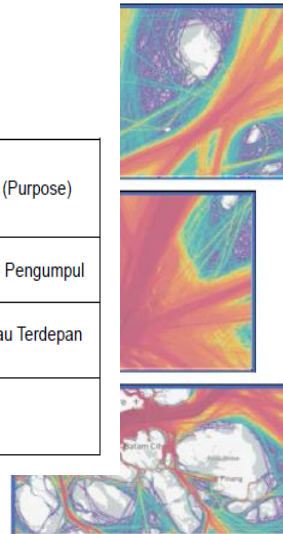
Location Map



1-A Summary Table for Planned AtoN

5 DISNAV Tg. Pinang

No	Area	Planned AtoN				Reference (Purpose)	
		No	Name	Location			Type
				Latitude	Longitude		
1	Pelabuhan Selat Lampa		----	----		Harbor/Port	Pelabuhan Pengumpul
2	Rambu Suar Malang Biru		----	----		Offshore Water	Tanda Pulau Terdepan
3	Rambu Suar Menvil		----	----		Offshore Water	



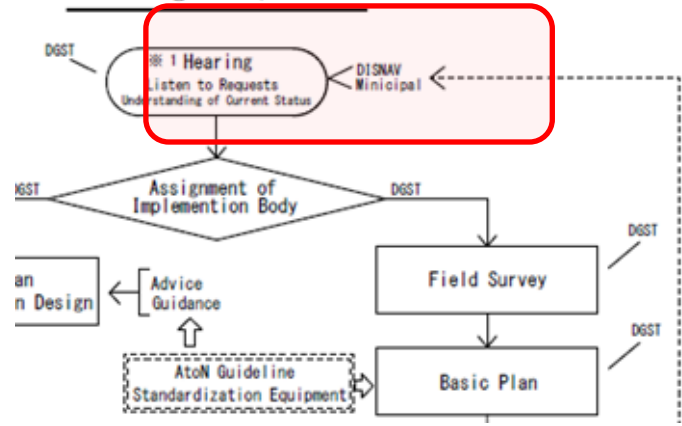
No.	DISNAV	Nominated Area	Planned AtoN	Item	Implementation (AtoN)						Reference
					2024	2025	2026	2027	2028	Subsequent Year til 2040	
2	Belawan ( I )	0	0	Hearing Survey	○		○		○	○x2	
				Feasibly Study							
				Implementation Design							
				Construction							
				Budget	IDR 245.M		IDR 245.M		IDR 245.M		IDR 490.M
3	Sibolga ( III )	0	0	Hearing Survey	○		○		○	○x2	
				Feasibly Study							
				Implementation Design							
				Construction							
				Budget	IDR 245.M						

**Hearing Survey on the Wants and Needs for AtoN**

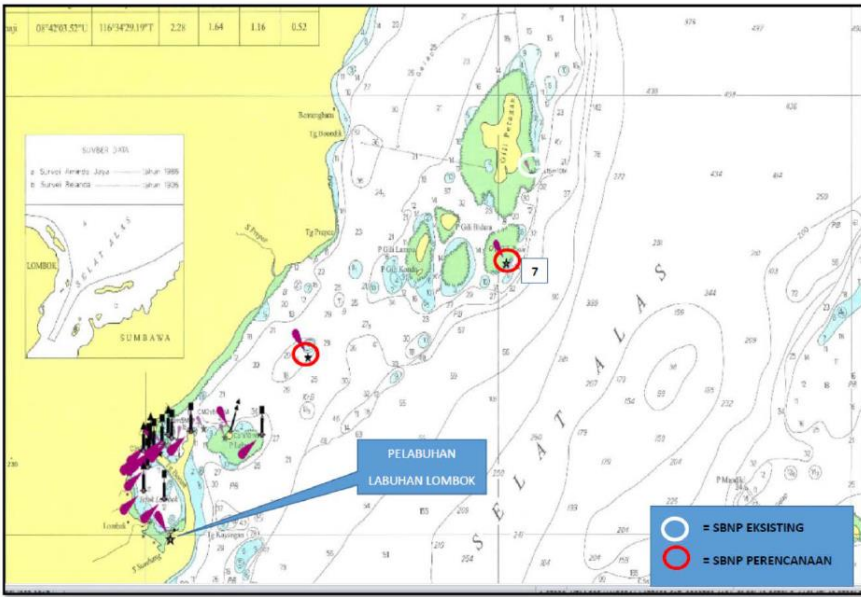
- 1 Preparation
  - a Collection of information
  - b Planning of Survey
- 2 Prior consultations
  - a Contact with stakeholders
- 3 Hearing Survey
  - a Stakeholder Hearing held in sites
  - b Site Investigation
  - c Collection of data
- 4 Compilation of Hearing results
  - a Wants and Needs
  - b Data
- 5 Preparation of Report

- Marine Accidents
- Volume of Traffic
- Development of Port
- Marine Chart

**Existing Port/Harbor**

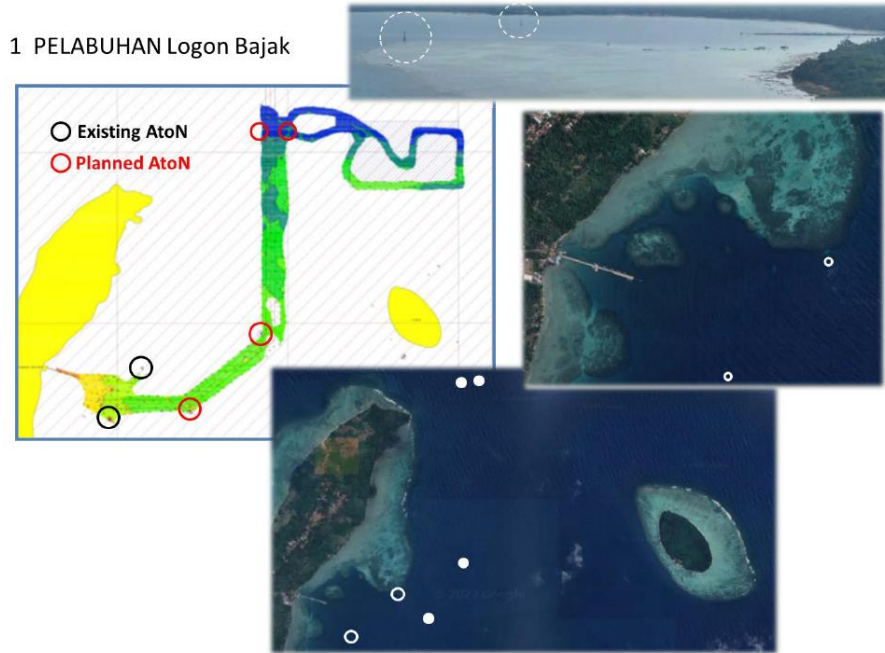






7 Rambu Suar Pulau Pasir : 116° 45' 06.4407" BT / 08° 26' 54.3896" LS di laut pada kedalaman -3 mLws tinggi 10 meter;

### 1 PELABUHAN Logon Bajak



### Marine Accident (2021~2022)

- Tarakan VTS
- Planned Sensor St. for VTS

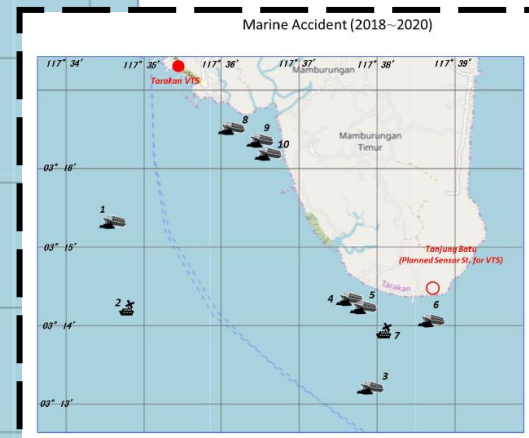
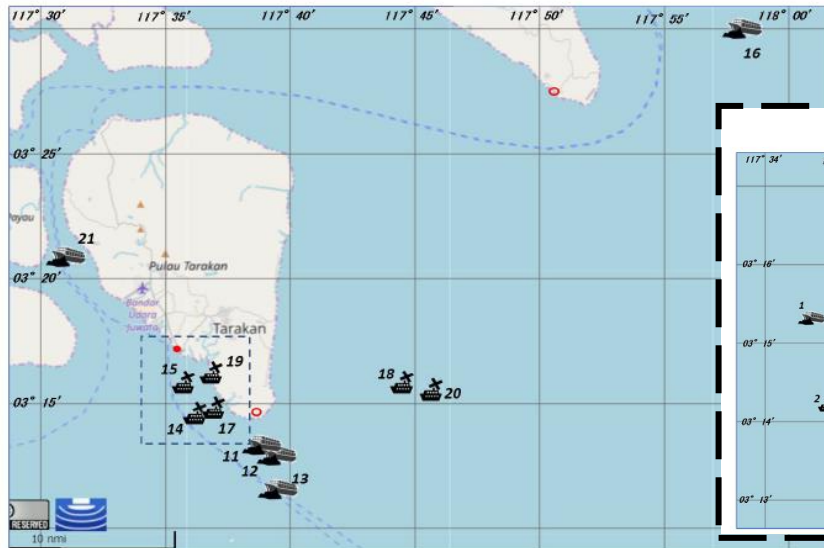


Table of Budget Plan for AtoN

No.	DISNAV	Nominated Area	Planned AtoN	Implementation Cost (AtoN)						Total
				2024	2025	2026	2027	2028	Subsequent Year til 2040	
1	Sabang ( II )	2	4	IDR 830.00M	IDR 3,000.00M	IDR 830.00M	IDR 3,000.00M	IDR 1,750.00M	IDR 490.00M	<b>IDR 9,900.00M</b>
2	Belawan ( I )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
3	Sibolga ( III )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
4	Teluk Bayur ( I )	2	3	IDR 830.00M	IDR 1,000.00M	IDR 1,500.00M	IDR 245.00M		IDR 490.00M	<b>IDR 4,065.00M</b>
5	Tg. Pinang ( I )	3	---	IDR 915.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,895.00M</b>
6	Dumai ( I )	3	7	IDR 830.00M	IDR 1,500.00M	IDR 1,745.00M	IDR 1,500.00M	IDR 1,245.00M	IDR 490.00M	<b>IDR 7,310.00M</b>
7	Palembang ( I )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
8	Pontianak ( III )	1	---			IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 980.00M</b>
9	Tg. Priok ( I )	2	7	IDR 830.00M	IDR 3,670.00M	IDR 2,425.00M	IDR 1,000.00M	IDR 245.00M	IDR 490.00M	<b>IDR 8,660.00M</b>
10	Cilacap ( III )	2	2	IDR 830.00M	IDR 1,000.00M	IDR 1,245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 3,810.00M</b>
11	Semarang ( II )	2	8	IDR 830.00M	IDR 4,830.00M	IDR 3,245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 9,640.00M</b>
12	Surabaya ( I )	1	---			IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 980.00M</b>
13	Benoa ( II )	6	15	IDR 830.00M	IDR 3,830.00M	IDR 4,580.00M	IDR 3,245.00M	IDR 2,250.00M	IDR 490.00M	<b>IDR 15,225.00M</b>
14	Kupang ( II )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
15	Banjarmashin ( II )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
16	Tarakan ( III )	0	0		IDR 245.00M	IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
17	Samarinda ( I )	2	10	IDR 830.00M	IDR 2,250.00M	IDR 3,830.00M	IDR 2,495.00M		IDR 490.00M	<b>IDR 9,895.00M</b>
18	Makassar ( I )	3	8	IDR 830.00M	IDR 1,830.00M	IDR 4,830.00M	IDR 2,250.00M	IDR 245.00M	IDR 490.00M	<b>IDR 10,475.00M</b>
19	Kendari ( III )	0	0			IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 980.00M</b>
20	Bitung ( I )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
21	Ambon ( I )	2	4	IDR 670.00M	IDR 425.00M	IDR 3,670.00M	IDR 2,825.00M	IDR 3,000.00M	IDR 490.00M	<b>IDR 11,080.00M</b>
22	Sorong ( I )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
23	Jayapura ( II )	5	21	IDR 830.00M	IDR 3,330.00M	IDR 3,830.00M	IDR 3,000.00M	IDR 3,245.00M	IDR 490.00M	<b>IDR 14,725.00M</b>
24	Merauke ( III )	0	0	IDR 245.00M		IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 1,225.00M</b>
25	Tual ( III )	0	0			IDR 245.00M		IDR 245.00M	IDR 490.00M	<b>IDR 980.00M</b>
	<b>Total</b>	<b>36</b>	<b>89</b>	<b>IDR 11,845.00M</b>	<b>IDR 26,910.00M</b>	<b>IDR 35,160.00M</b>	<b>IDR 19,560.00M</b>	<b>IDR 15,900.00M</b>	<b>IDR 12,250.00M</b>	<b>IDR 121,625.00M</b>

Table of Establishment Plan for AtoN

No.	DISNAV	Nominated Area	Planned AtoN	Item	Implementation Cost (AtoN)						Total
					2024	2025	2026	2027	2028	Subsequent Year til 2040	
1	DISNAV (1-25)	36	89	Hearing Survey	IDR 2,205M	IDR 490M	IDR 4,410M	IDR 980M	IDR 4,900M	IDR 12,250M	IDR 25,235M
				Feasibly Study	IDR 9,640M	IDR 3,990M	IDR 4,820M				IDR 18,450M
				Implementation Design		IDR 180M	IDR 180M	IDR 180M			IDR 540M
				Construction		IDR 22,250M	IDR 25,750M	IDR 18,400M	IDR 11,000M		IDR 77,400M
				Budget	IDR 11,845M	IDR 26,910M	IDR 35,160M	IDR 19,560M	IDR 15,900M	IDR 12,250M	IDR 121,625M

## Summary Table for Planned VTS requested by DISNAV

*As of December 12, 2022*

No	DISNAV	Number of Nominated Area	Number of Planned VTS
1	Sabang	1	1
2	Belawan	0	0
3	Sibolga	0	0
4	Teluk Bayur	0	0
5	Tg. Pinang	13	3
6	Dumai	0	0
7	Palembang	0	0
8	Pontianak	2	----
9	Tg. Priok	1	1
10	Cilacap	0	0
11	Semarang	0	0
12	Surabaya	0	0

No	DISNAV	Number of Nominated Area	Number of Planned VTS
13	Benoa	0	0
14	Kupang	0	0
15	Banjarmashin	0	0
16	Tarakan	1	1
17	Samarinda	2	3
18	Makassar	0	0
19	Kendari	1	1
20	Bitung	0	0
21	Ambon	1	1
22	Sorong	0	0
23	Jayapura	0	0
24	Merauke	0	0
25	Tual	3	3
<b>Total</b>		<b>25</b>	<b>14</b>

1 Sabang ( II )

Planned VTS

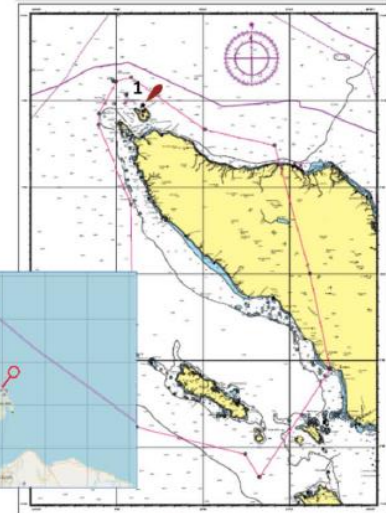
1 Sabang

VTS Center  
( 5 53 59.67N 95 19 21.10E )

- Facilities
- AIS x 1
  - VHF x 2
  - VHF x 2
  - Tide St. x 1



Location Map



1-A Summary Table for Planned VTS

1 DISNAV Sabang

No	Name (Place)	Type	Location		Other
			Latitude	Longitude	
1	Sabang VTS	Port/Harbor	5°53' 59.67" N	95°19' 21.10" E	

Facilities							
Operation Center	Radar	AIS	CCTV	Meteorological Instrument	VHF	Traffic/Tidal Signal	Other
1	0	1	0	0	2		Tide Station

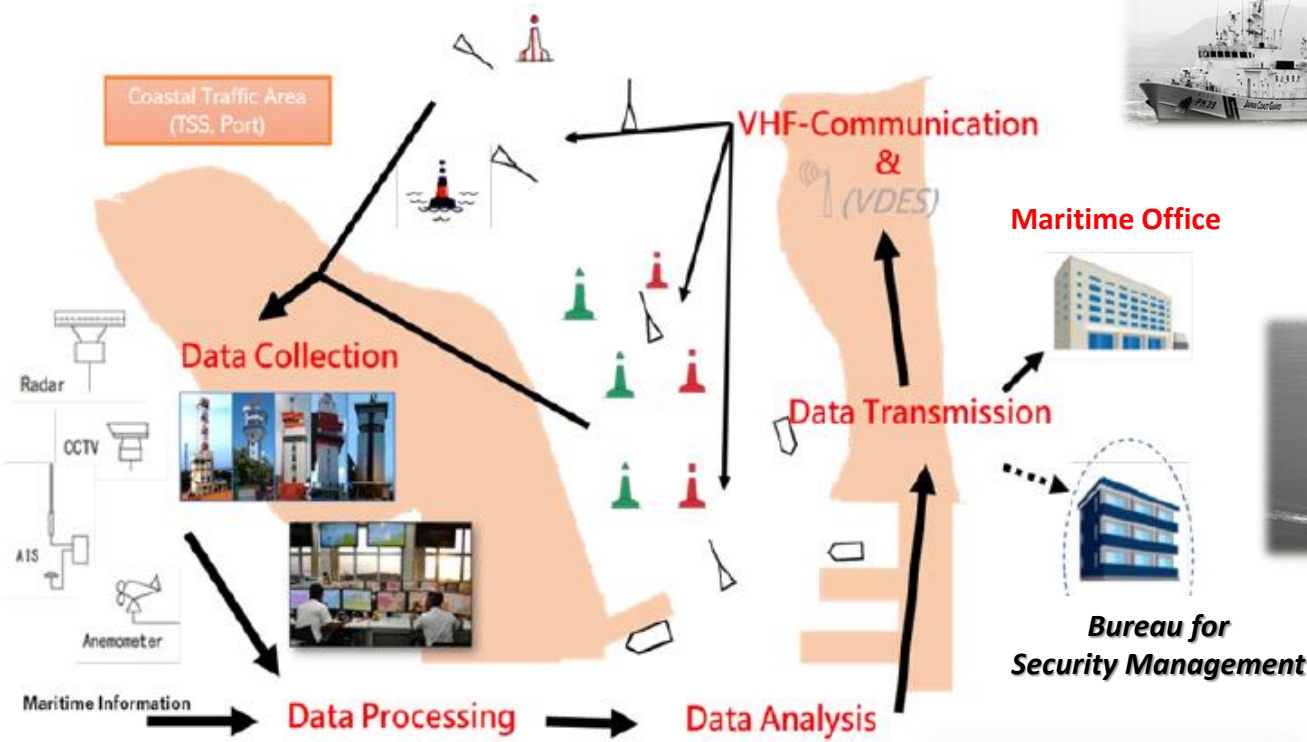
Table of Establishment Plan for VTS

(1/9)

No.	DISNAV	Nominated Area	Planned VTS	Item	Implementation (VTS)						Reference
					2024	2025	2026	2027	2028	Subsequent Year till 2040	
1	Sabang ( II )	1	1	Hearing Survey				○		○x2	
				Feasibly Study	○b						
				Implementation Design		○					
				Construction			○ 1, 2	○ 3, 4, 5	◎		◎ : Training
				Budget	IDR 670.00M	IDR 180.00M	IDR 6,000.00M	IDR 16,545.00M	IDR 710.00M	IDR 490.00M	IDR 24,595.00M



# Function and Mission of VTS



**Search & Rescue**



**Sea Patrol**



**Drug Enforcement**

**Ship-to-Ship  
Illegal Transfer**



**Maritime Refugees**

**Monitoring and Surveillance**

## Extended Cooperative Network VTS Mission

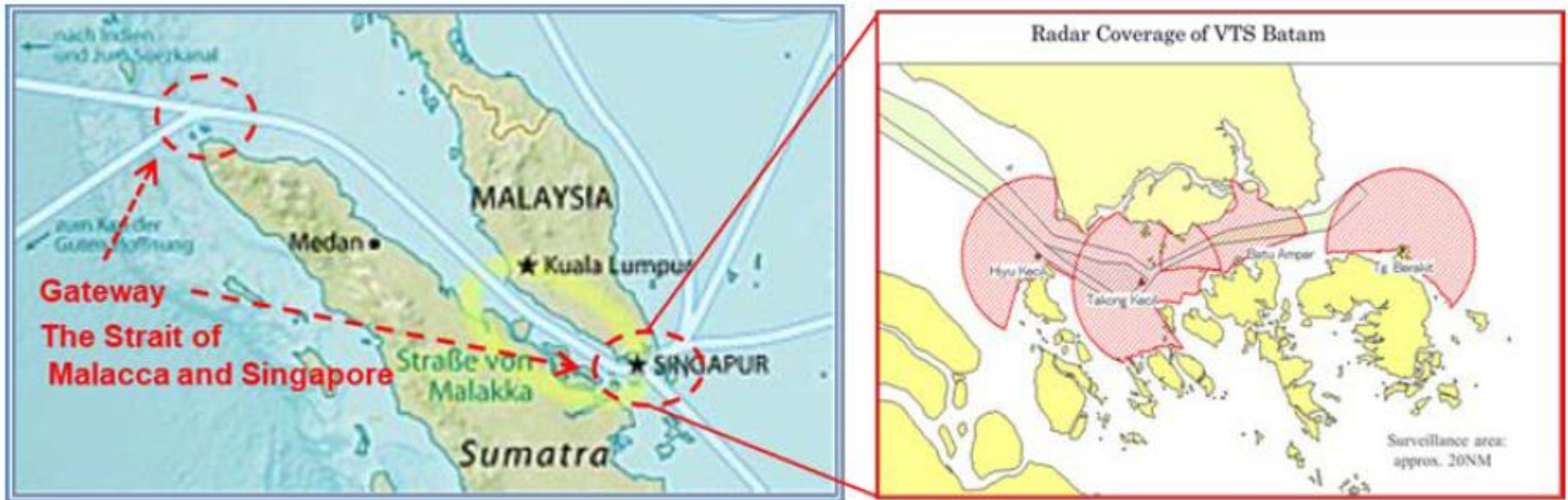


Figure 7.2.4 -2 : Gateways of the Straits of Malacca and Singapore

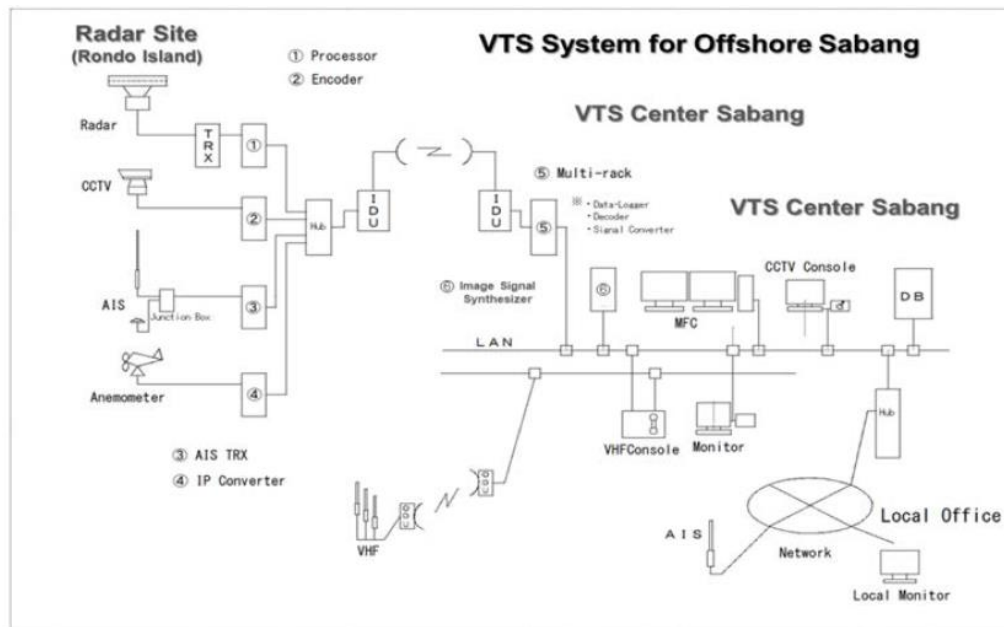


Figure 7.2.4 -3 : Fundamental Configuration of VTS

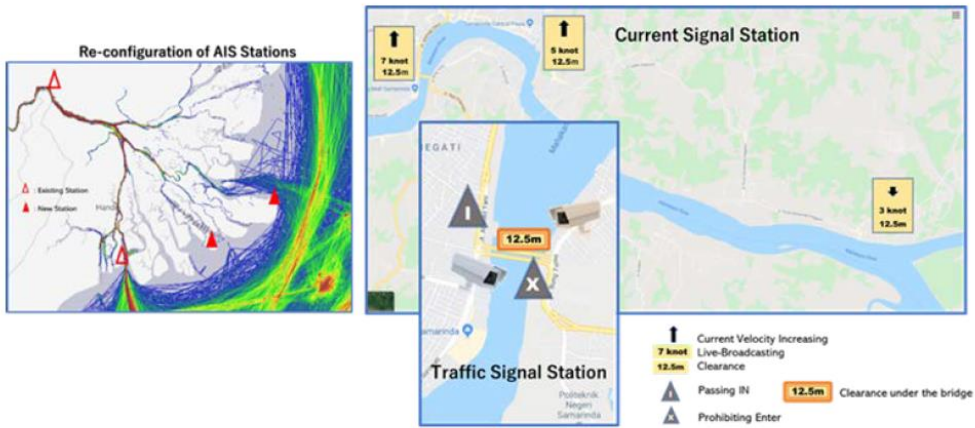


Figure 7.2.4-8 : Layout of New AIS Station and Signal Station

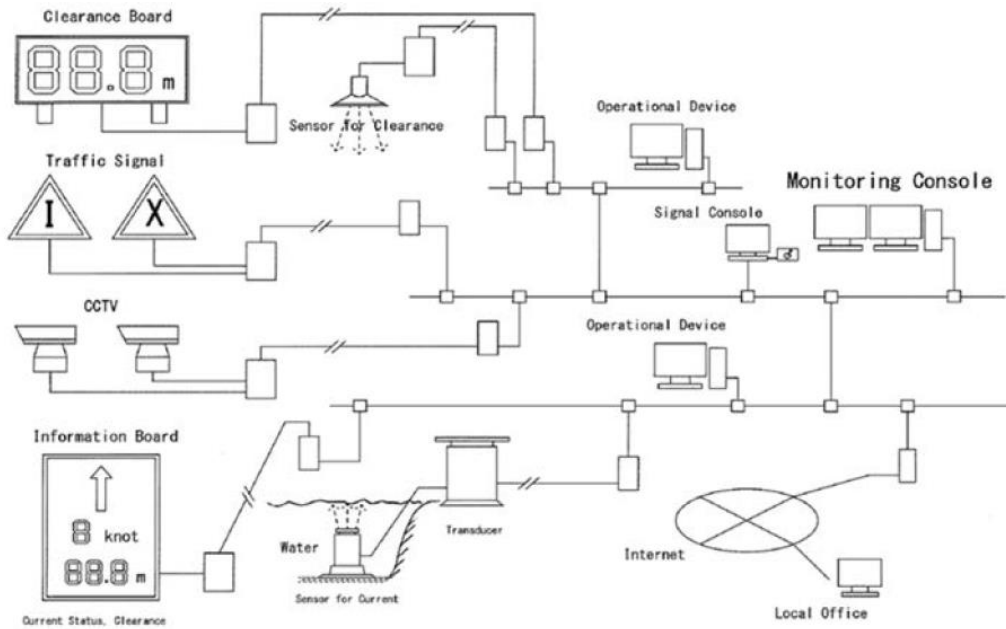


Figure 7.2.4-9 : System Configuration of New Information System





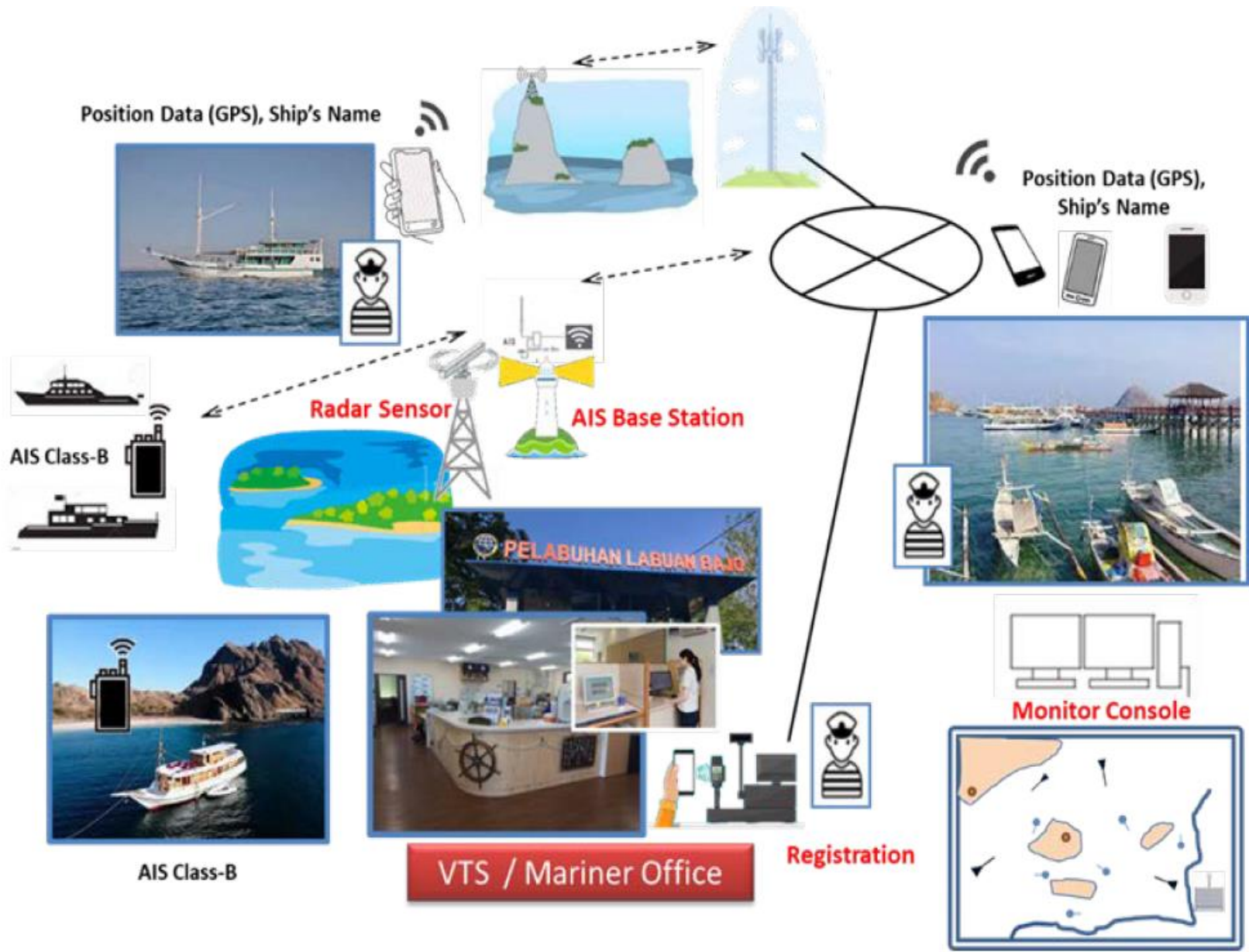


Figure 7.3.4 -1 : Marine Safety System for Small Craft

● Development of Capacity Building

★ Setting up the Management Group

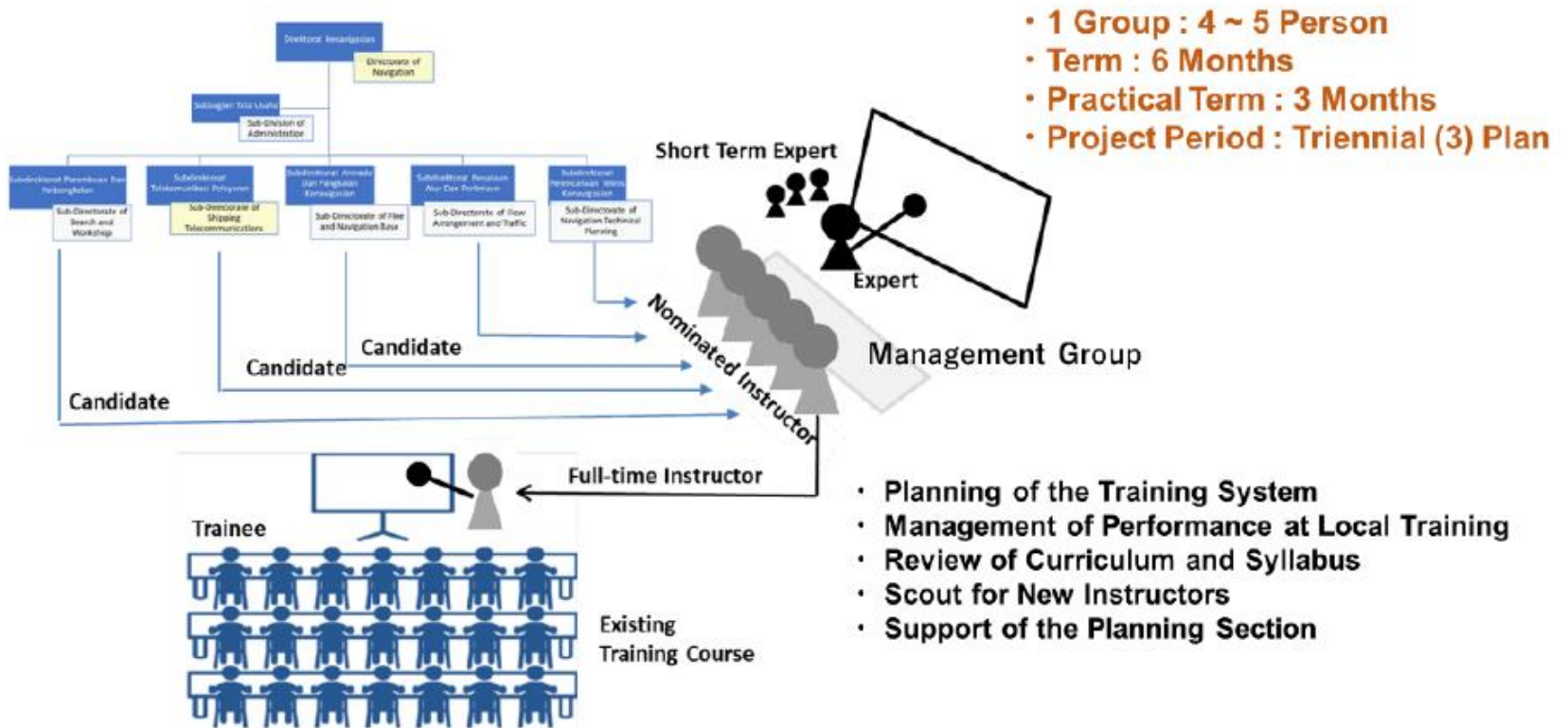
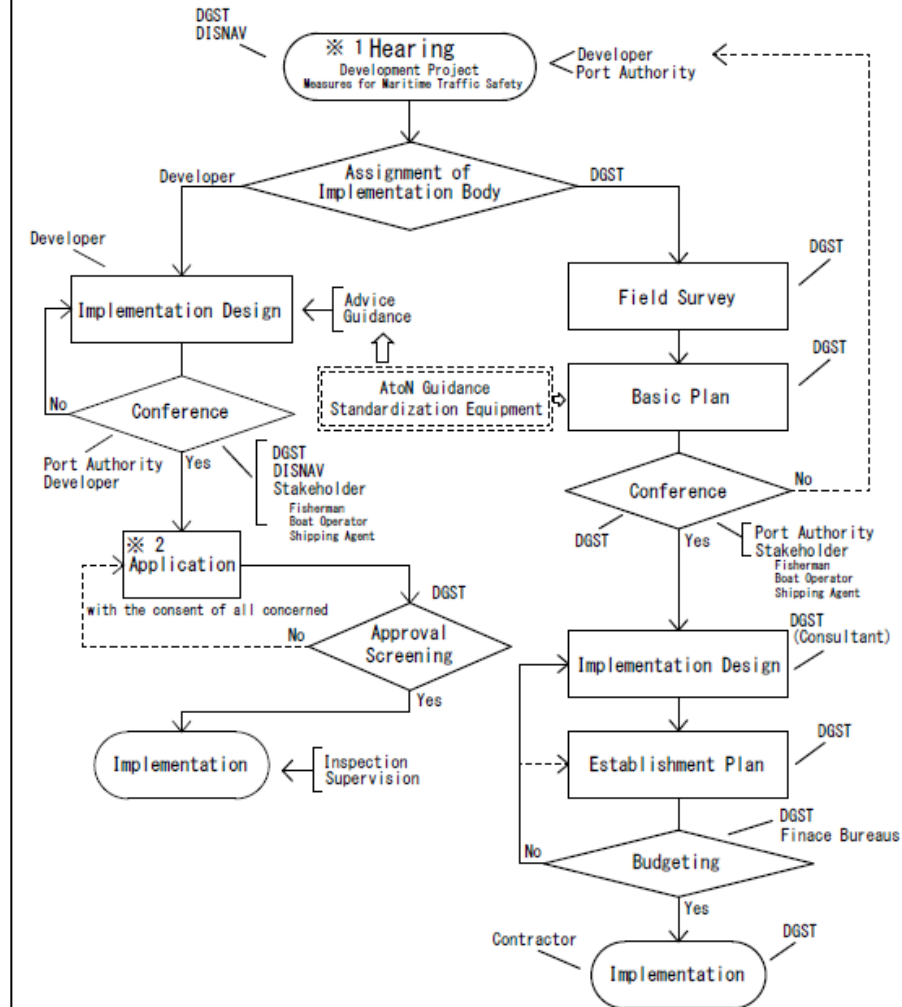


Figure 7.3.1 1) -1 : Image of Training

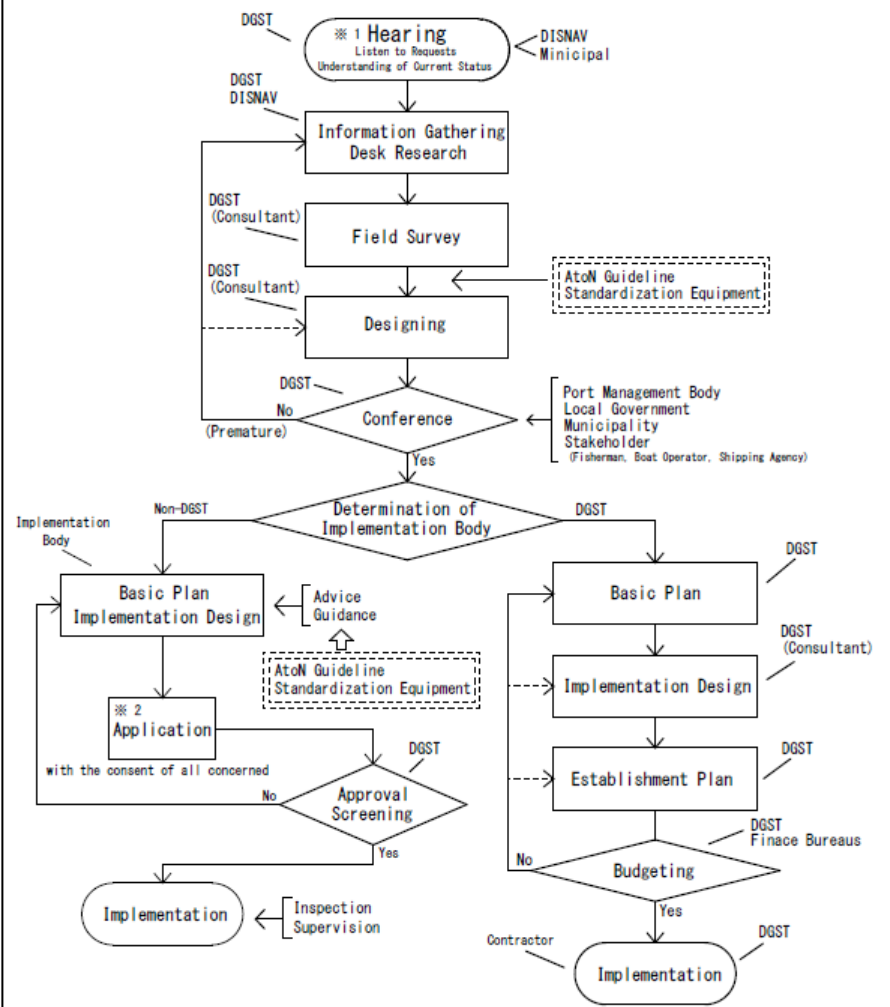
## Maritime Traffic Safety Measures - establishing Process

### New Port/Harbor

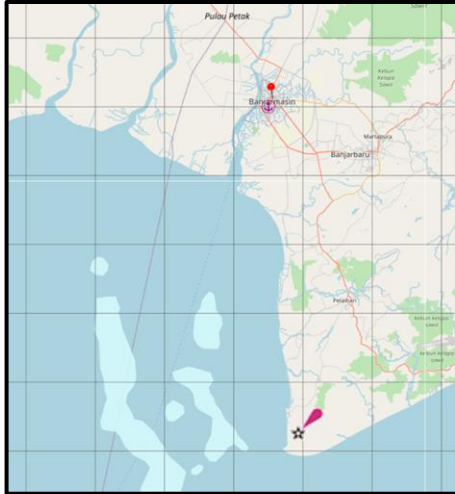


## Maritime Traffic Safety Measures - establishing Process

### Undeveloped Port/Harbor

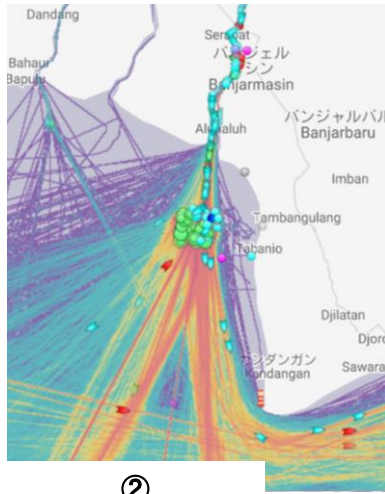


## South Kalimantan



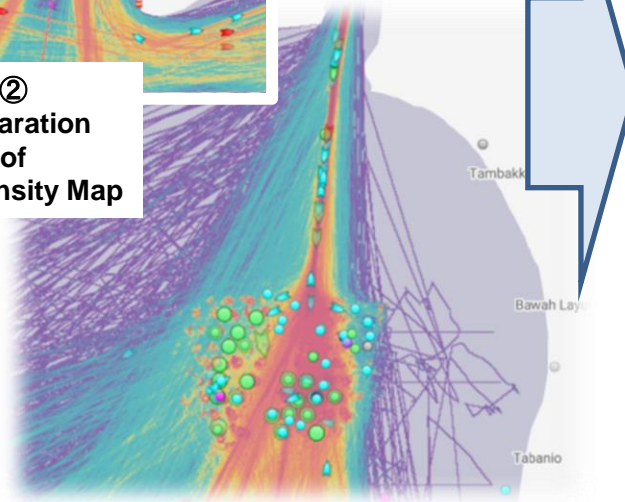
①  
Preparation  
of  
Marine Chart

## Banjarmashin

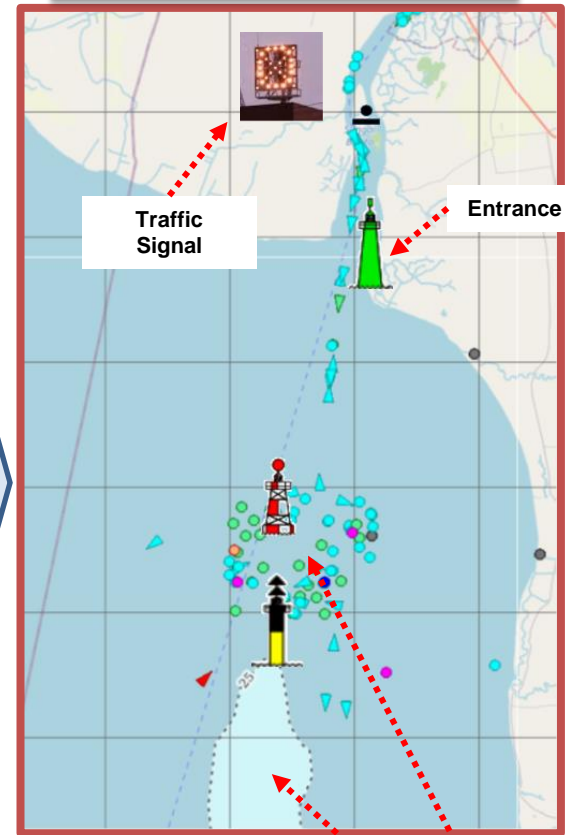


②  
Preparation  
of  
AIS Density Map

③  
Arrangement  
of  
Aids to Navigation



## Example of Installation



Safe Water Mark  
North Cardinal Mark  
Anchorage Area  
Shoaly Waters

Selection of Area → Gather of data

Chart → AIS Density Map → Planning

# Appendix 3.9 -3

Presentation (CRS)





The Project for Review of the Study for  
Maritime Traffic Safety System Development Plan  
Report (Phase-2)

Component 2 Coastal Radio Station (CRS)

2<sup>nd</sup> Mar 2023



Japan Aids to Navigation Association (JANA)

## Main policy

- Maintaining CRS services to cover whole Indonesian water is the kind of mandatory measure to provide navigational safety, security and marine environmental protection of all the beneficiaries of stakeholders.
- Public service provider of CRS has to take care of those beneficiaries without any break, without any blind spot and without any downgraded service level.
- Nothing of distress case happened until today does not mean nothing happened on tomorrow. This is the main objectives for navigational safety service to sustain to provide without any break. This is kind of insurance for service provider (DGST) and beneficiary of user (vessel operator).



If efficient traffic control failed



Grounding & oil spill Mauritius 2020



Collision airport access bridge,  
Osaka, Japan 2018

## Methodology of analysis data to output

1. Logbook analysis (extracted 38 CRS)
2. Basic information of all station in each DISNAV
3. Human relation (SDM) in each DISNAV
4. Budget analysis
5. Internet connectivity in each station
6. Radio equipment installed all incoming vessels



Reality of current operation (HR & others against facilities)



Realistic & ideal solution for next decades

## Logbook analysis (extracted 38 CRS only)

CQ/To all ships only							
VHF	MF	HF	Total	VHF	MF	HF	Total
Monthly total count (average)				Daily average			
46.32	50.62	129.00	225.93	1.49	1.63	4.16	7.29

Times/day

QSO with ship					
VHF	HF	Total	VHF	HF	Total
Monthly total count (average)			Daily average		
58.26	10.53	68.79	1.88	0.34	2.22

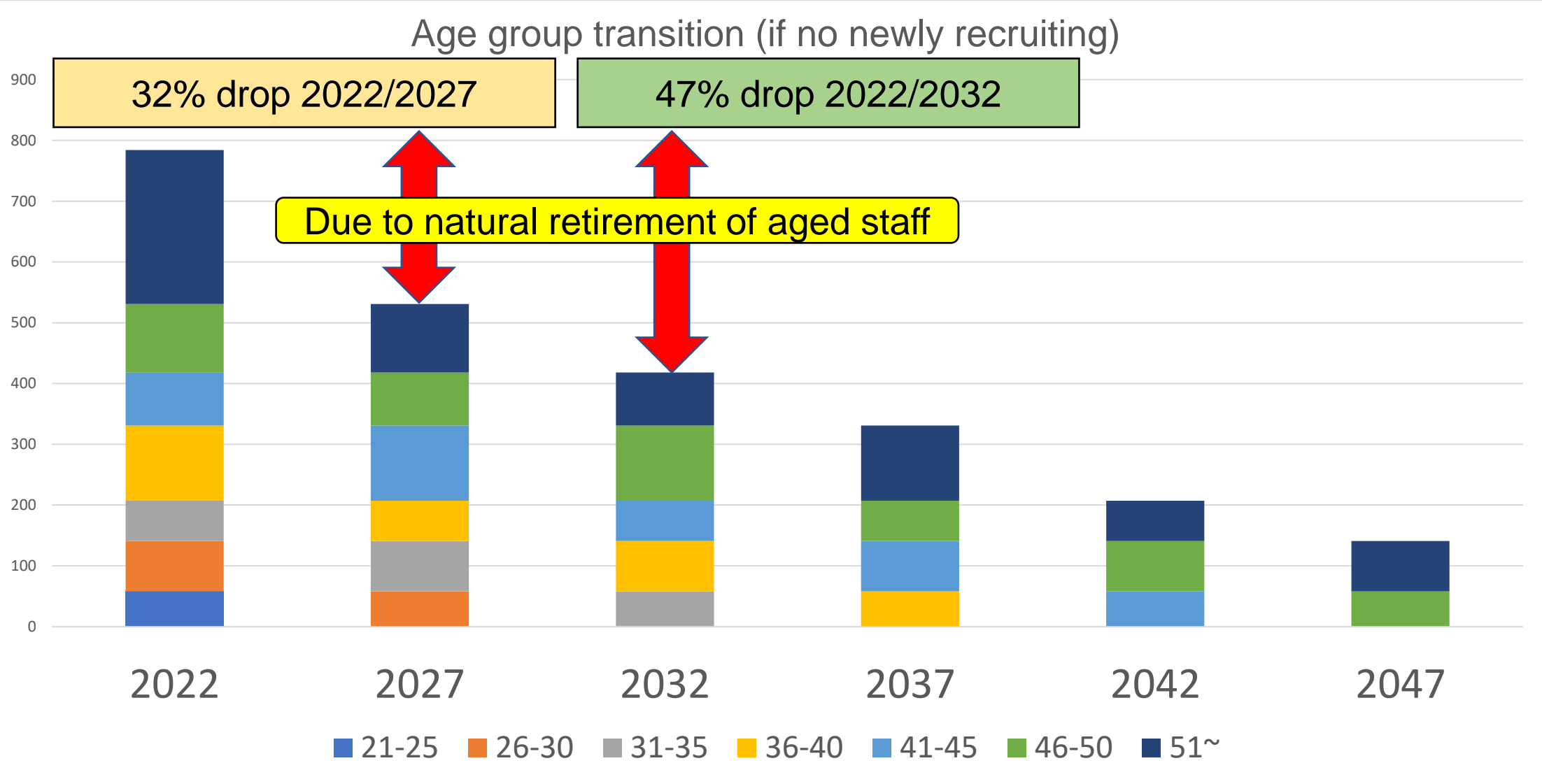
Times/day

(unit=numbers of call/communication)

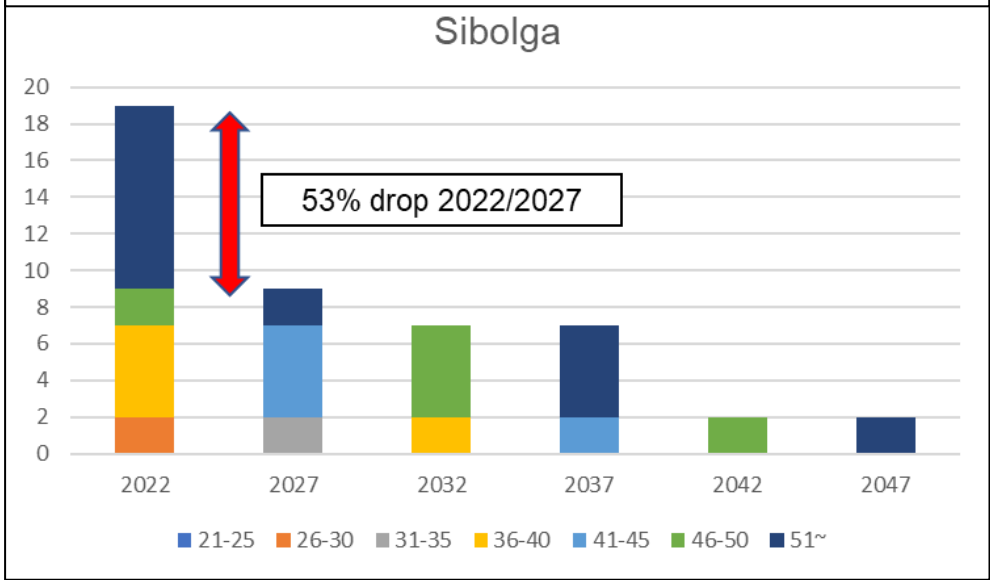
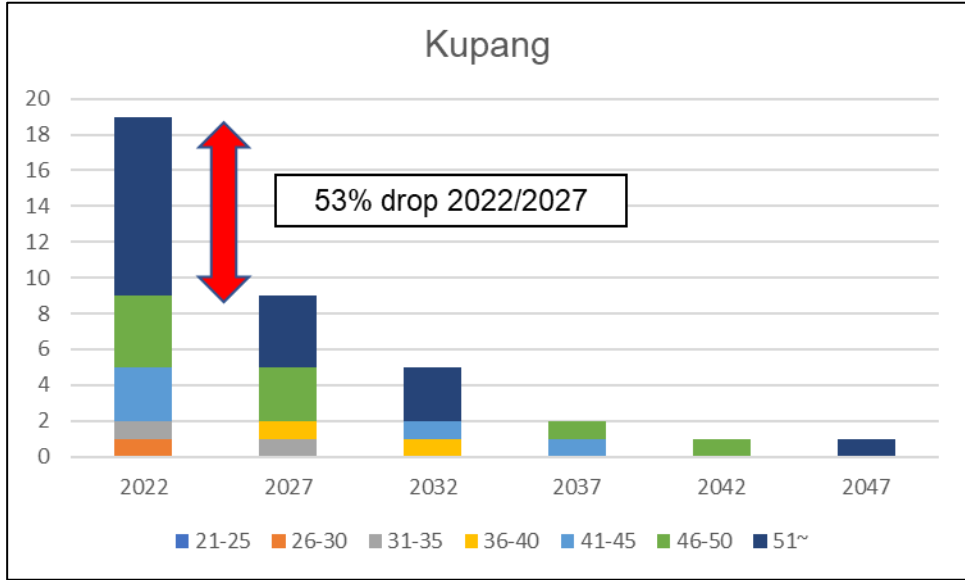
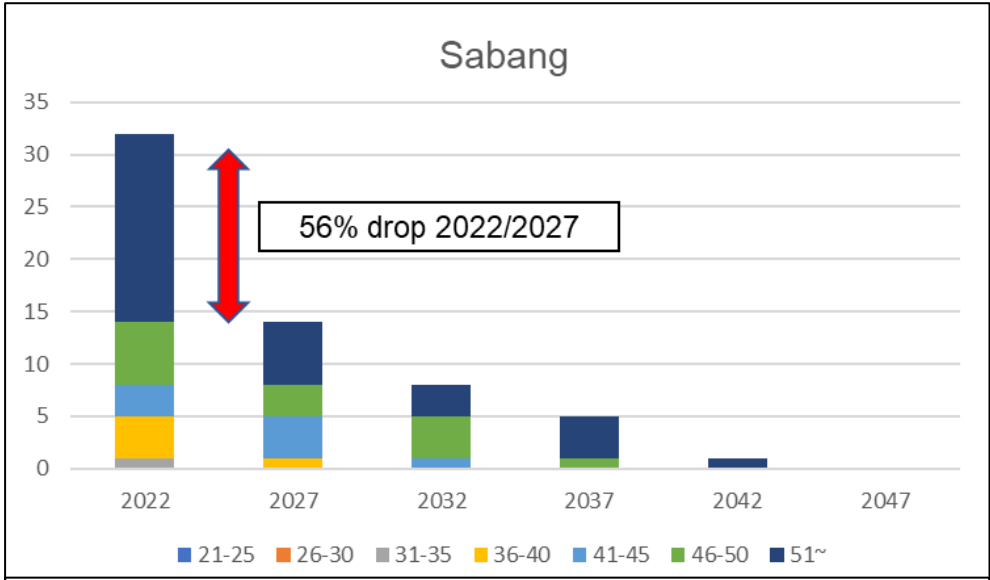
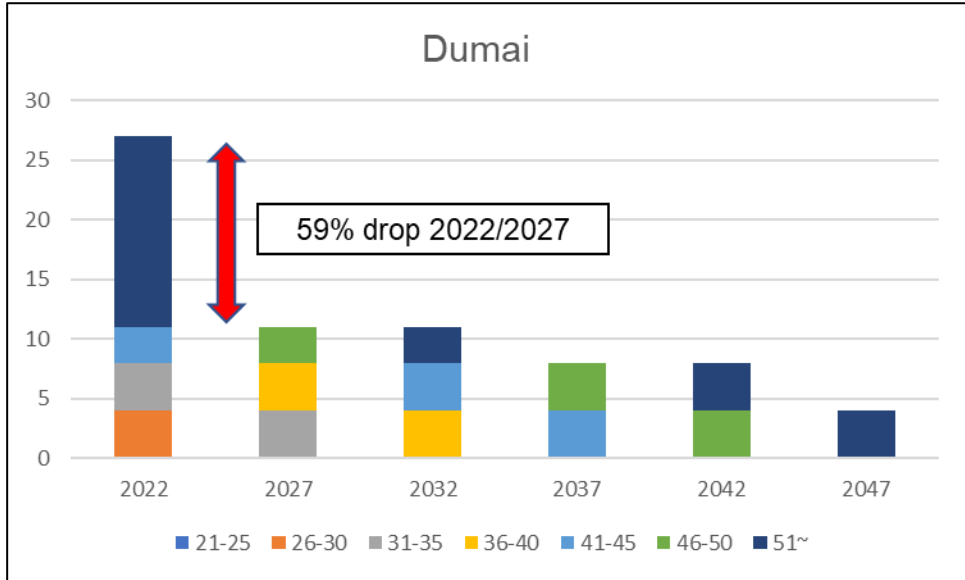
## SDM analysis

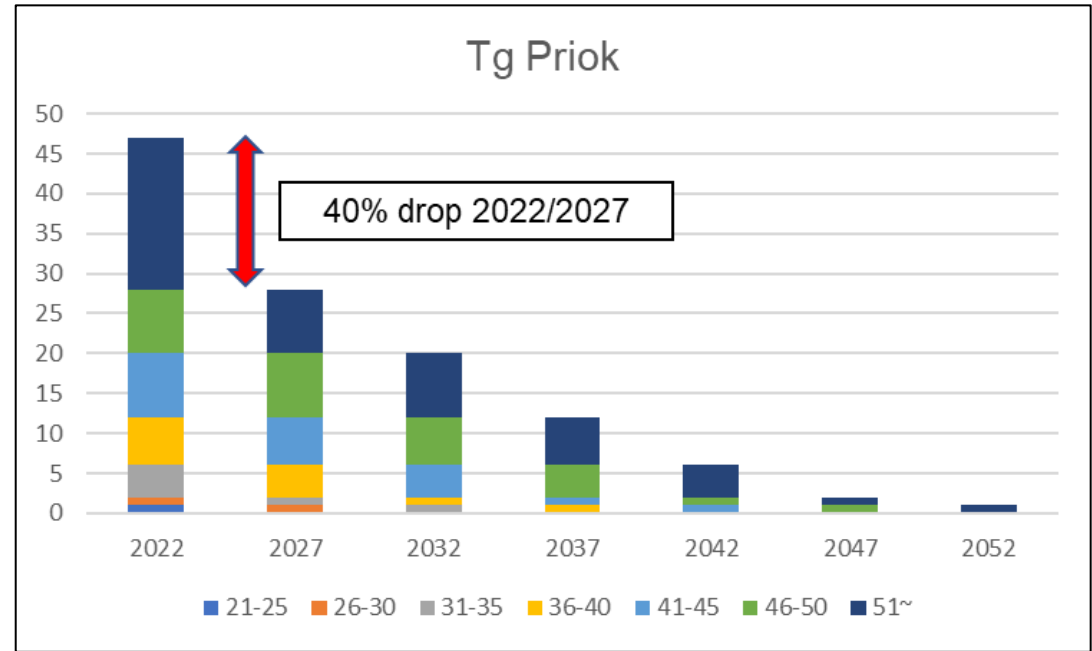
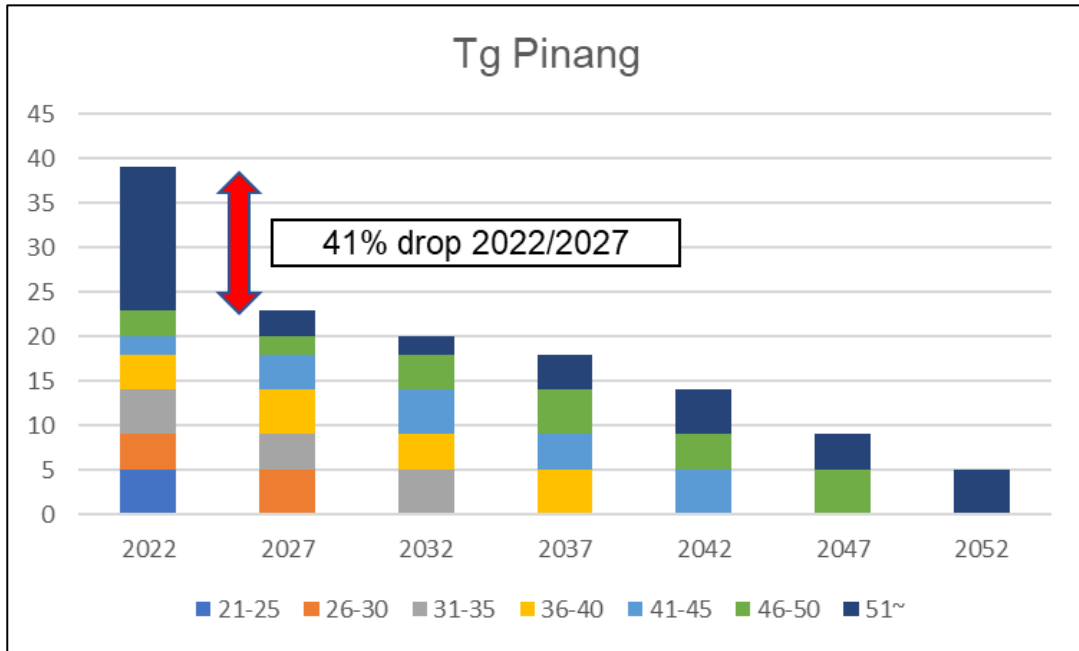
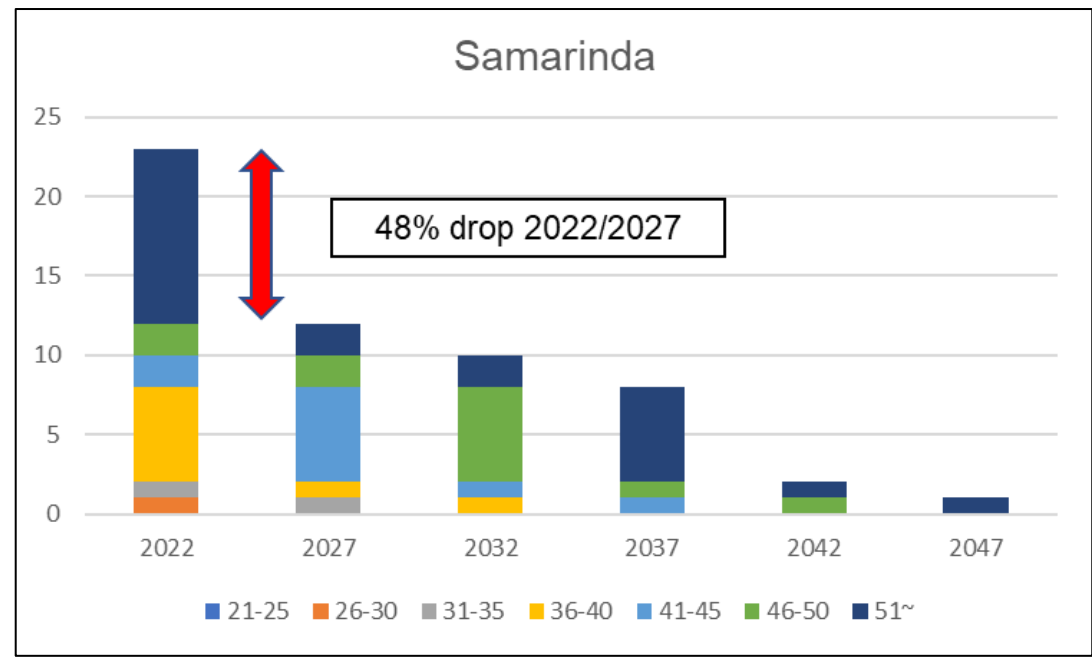
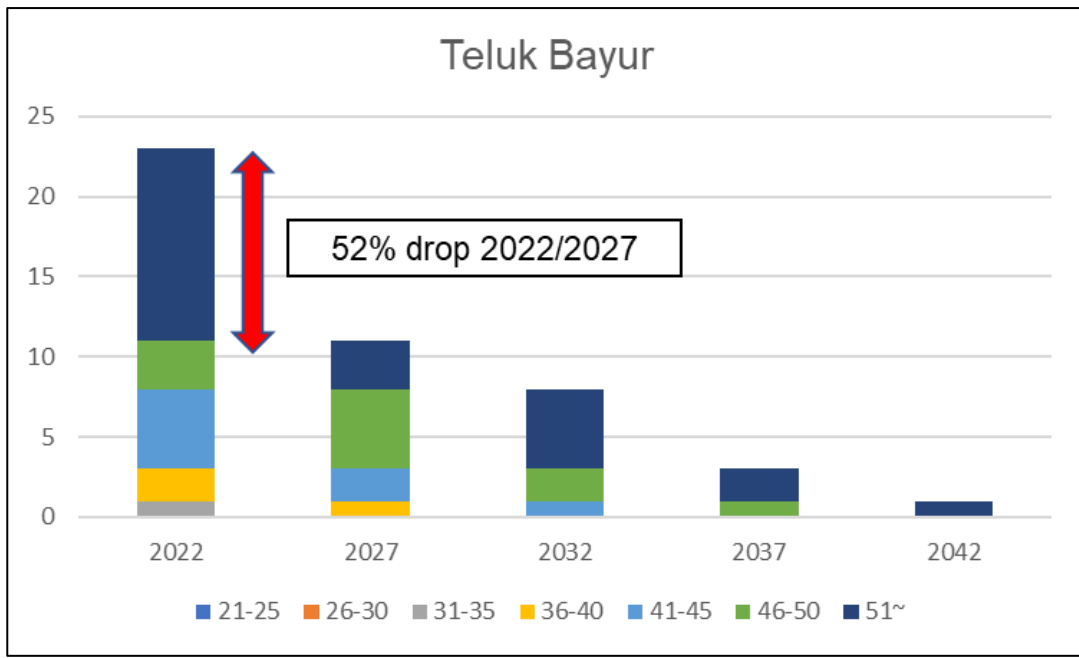
1. All SDM of CRS in 25 DISNAV
2. Age group in each DISNAV
3. Age transition in next few decades
4. Single, Double, Triple operator station
5. Technician in each DISNAV
6. Place of origin for staff

# Age group transition in each DISNAV



# Worst 8 DISNAV in next 5 years







## Technician allocation in each DISNAV

DISNAV	Technician	Ave age	Both Operator/Technician
Sabang	8	46.8	5
Belawan	4	44.0	4
Sibolga	1	55.0	0
Dumai	7	45.6	7
Tg Pinang	1	53.0	1
Teluk Bayur	7	50.4	0
Palembang	1	55.0	0
Tg priok	6	39.5	0
Semarang	6	47.9	1
Cilacap	4	48.5	3
Surabaya	3	50.5	3
Benoa	4	48.5	1
Kupang	3	46.0	2
Pontianak	1	50.0	0
Banjarmasin	3	51.0	2
Samarinda	2	46.0	0
Tarakan	3	45.8	3
Makassar	5	53.1	0
Kendari	2	54.0	2
Bitung	2	43.0	1
Ambon	5	45.5	0
Tual	1	43.0	0
Sorong	6	37.0	4
Jayapura	4	49.3	0
Merauke	4	37.5	4
Total	93	46.0	43

## Place of origin (same province) in each DISNAV (answered only)

DISNAV	Total SDM	Same origin (province)	Portion
Cilacap	24	19	79%
Jayapura	21	14	67%
Tarakan	18	18	100%
Bitung	49	45	92%
Tg Pinang	11	6	55%
Sorong	32	31	97%
Surabaya	20	20	100%
Ambon	36	28	78%
Pontianak	20	19	95%
Semarang	42	41	98%
Palembang	13	11	85%
Merauke	17	17	100%
Banjarmasin	25	24	96%
<b>Total</b>	<b>328</b>	<b>293</b>	<b>89%</b>

## Employment in each DISNAV

DISNAV	Fulltime		Honorer	
Sabang	32	100%	0	0%
Belawan	35	100%	0	0%
Sibolga	17	74%	6	26%
Dumai	30	73%	11	27%
Tg Pinang	38	72%	15	28%
Teluk Bayur	37	88%	5	12%
Palembang	13	100%	0	0%
Tg Priok	47	46%	55	54%
Semarang	36	60%	24	40%
Cilacap	19	79%	5	21%
Surabaya	29	78%	8	22%
Benoa	28	61%	18	39%
Kupang	19	100%	0	0%
Pontianak	12	60%	8	40%
Banjarmasin	25	100%	0	0%
Samarinda	23	66%	12	34%
Tarakan	18	69%	8	31%
Makassar	29	100%	0	0%
Kendari	17	37%	29	63%
Bitung	35	56%	28	44%
Ambon	36	72%	14	28%
Tual	12	100%	0	0%
Sorong	15	44%	19	56%
Jayapura	21	68%	10	32%
Merauke	17	100%	0	0%
G.total	640	70%	275	30%

# Summarized SDM against operation

Very limited numbers of communication in each CRS

No communication means no distress case?

Not enough SDM in all DISNAV

Depends on senior operator critically

Depends on single/two/three operator only to manage half of CRS

Depends on aged and very limited numbers of technician for maintenance

Depends on majority of local employment /no flexibility to relocate

Option 1

No further action

No more function at least half station in next 10 years

Option 2

Closed majority of station

Against national maritime safety & security policy?

Option 3

Consolidation

Reduce total SDM

Efficient & economical operation remotely

## Internet availability

DISNAV	Total CRS	Fibber optic	ADSL	4G	LTE	N.A.	
Sabang	9	5		4			
Belawan	7	6		1			
Sibolga	7	3	1	2		1	P Tello
Dumai	8	8					
Tg Pinang	10	10					
Teluk Bayur	4	2		1		1	Sikakap
Palembang	7	6		1			
Tg Priok	5	5					
Semarang	7	6			1		
Cilacap	2	1				1	Pacitan
Surabaya	11	9	1		1		
Benoa	8	8					
Kupang	9	9					
Pontianak	3	3					
Banjarmasin	4	3				1	Kumai
Samarinda	3	3					
Tarakan	4	4					
Makassar	5	5					
Kendari	6	5		1			
Bitung	14	14					
Ambon	7	7					
Tual	4	2		2			
Sorong	6	6					
Jayapura	5	5					
Merauke	3	1			2		
<b>Total</b>	<b>158</b>	<b>136</b>	<b>2</b>	<b>12</b>	<b>4</b>	<b>4</b>	

# Transition of each mode in estimated time schedule

2022

2027

2032

2037

2042

2047

MF (A2)



Ceased

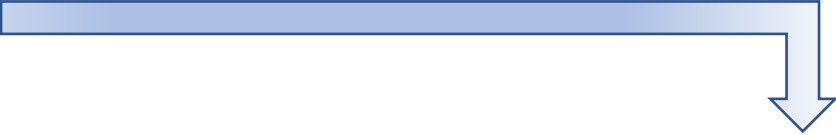
HF (A3)



VHF (A1)



NAVTEX



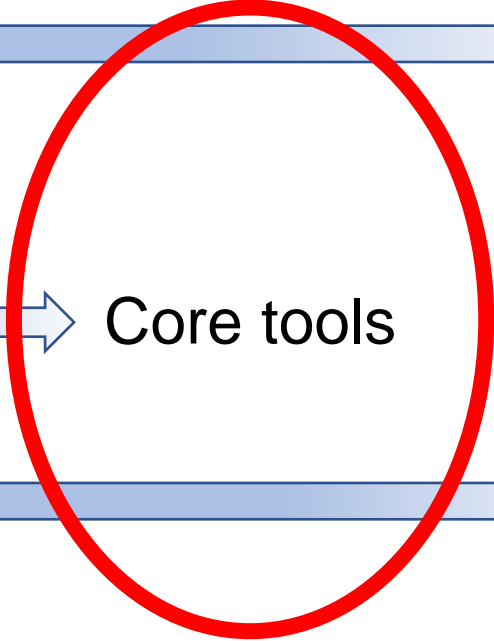
NAVDAT



VDES



Satellite Service

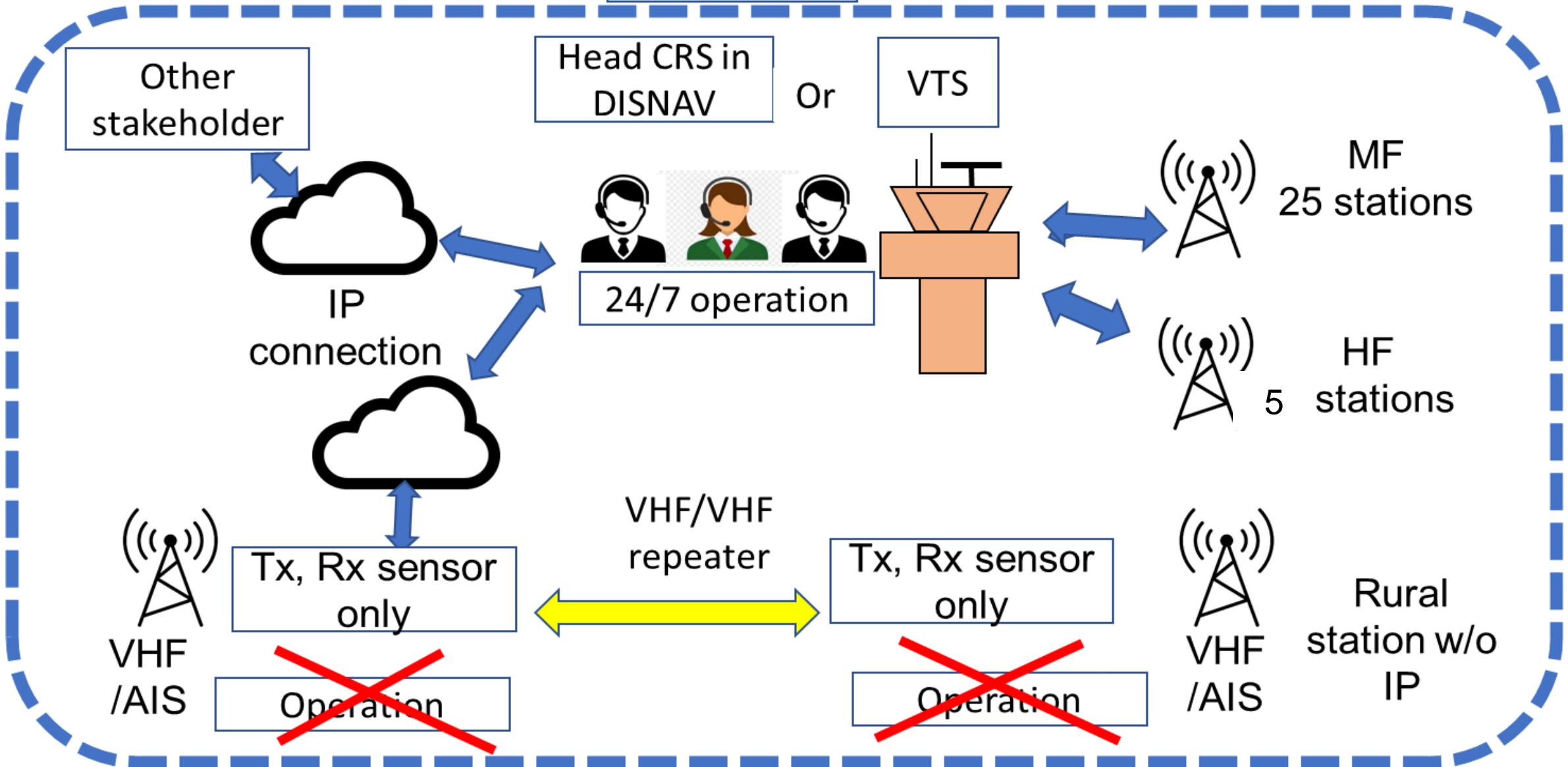


Core tools

?

# Basic function of consolidation

Each DISNAV





Re-organized to only 5 VTS/CRS (existing HF)

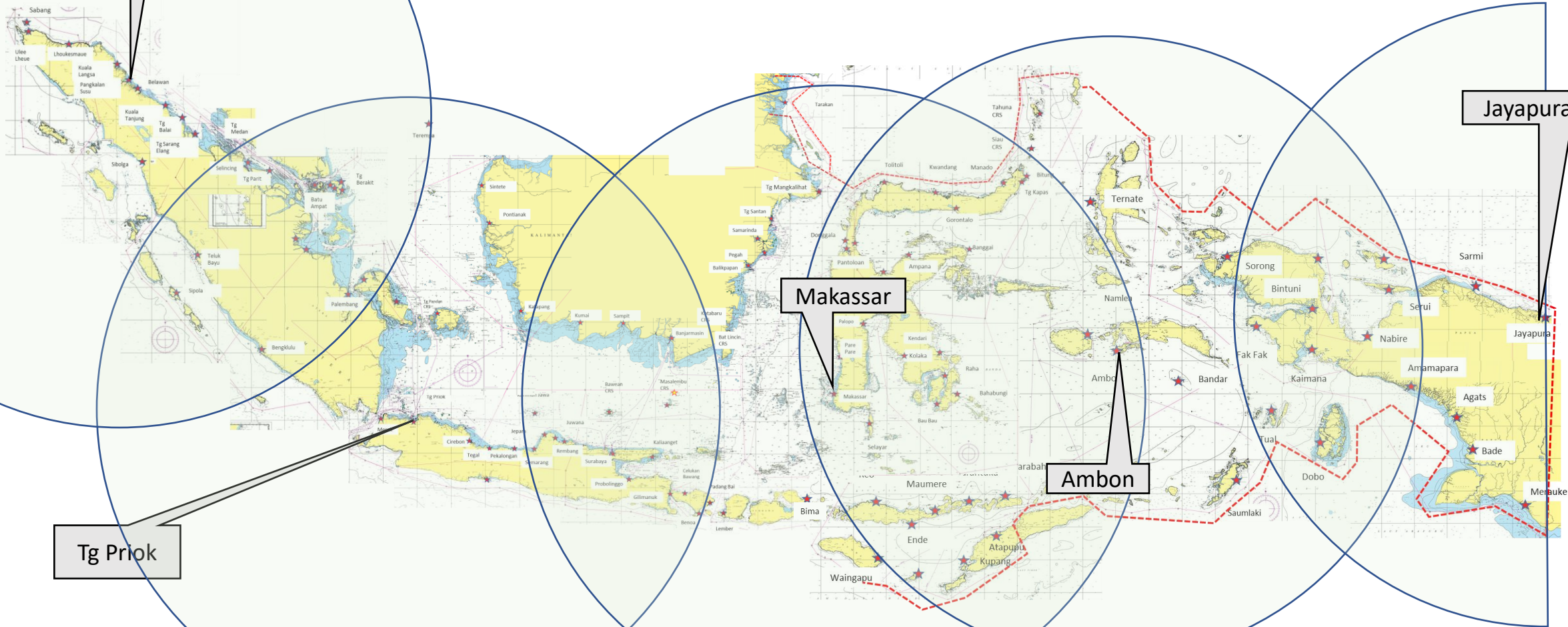
Belawan

Jayapura

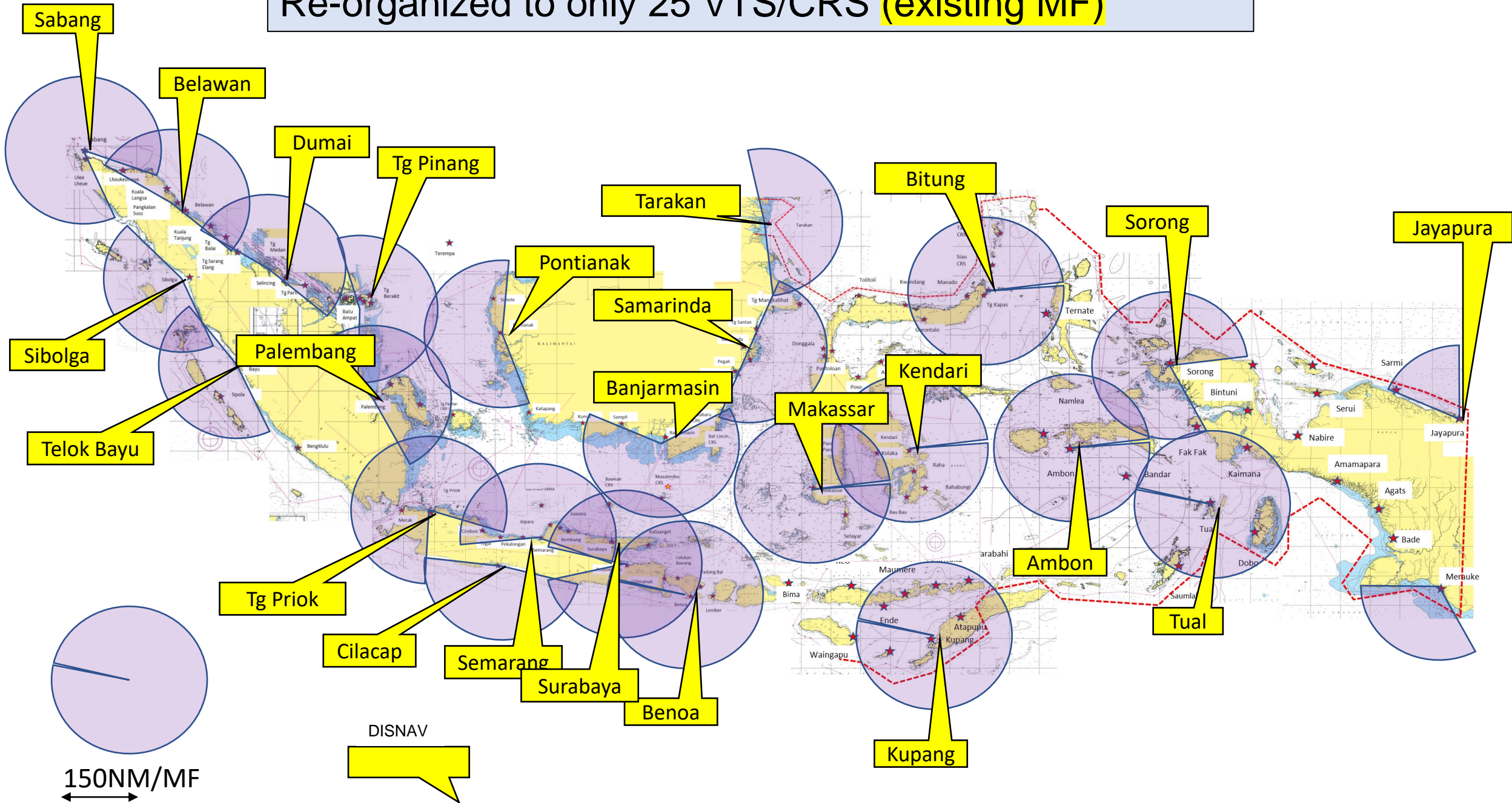
Makassar

Ambon

Tg Priok



# Re-organized to only 25 VTS/CRS (existing MF)



Sabang

Belawan

Dumai

Tg Pinang

Tarakan

Bitung

Sorong

Jayapura

Sibolga

Palembang

Pontianak

Samarinda

Banjarmasin

Makassar

Kendari

Ambon

Tual

Kupang

Telok Bayu

Tg Priok

Cilacap

Semarang

Surabaya

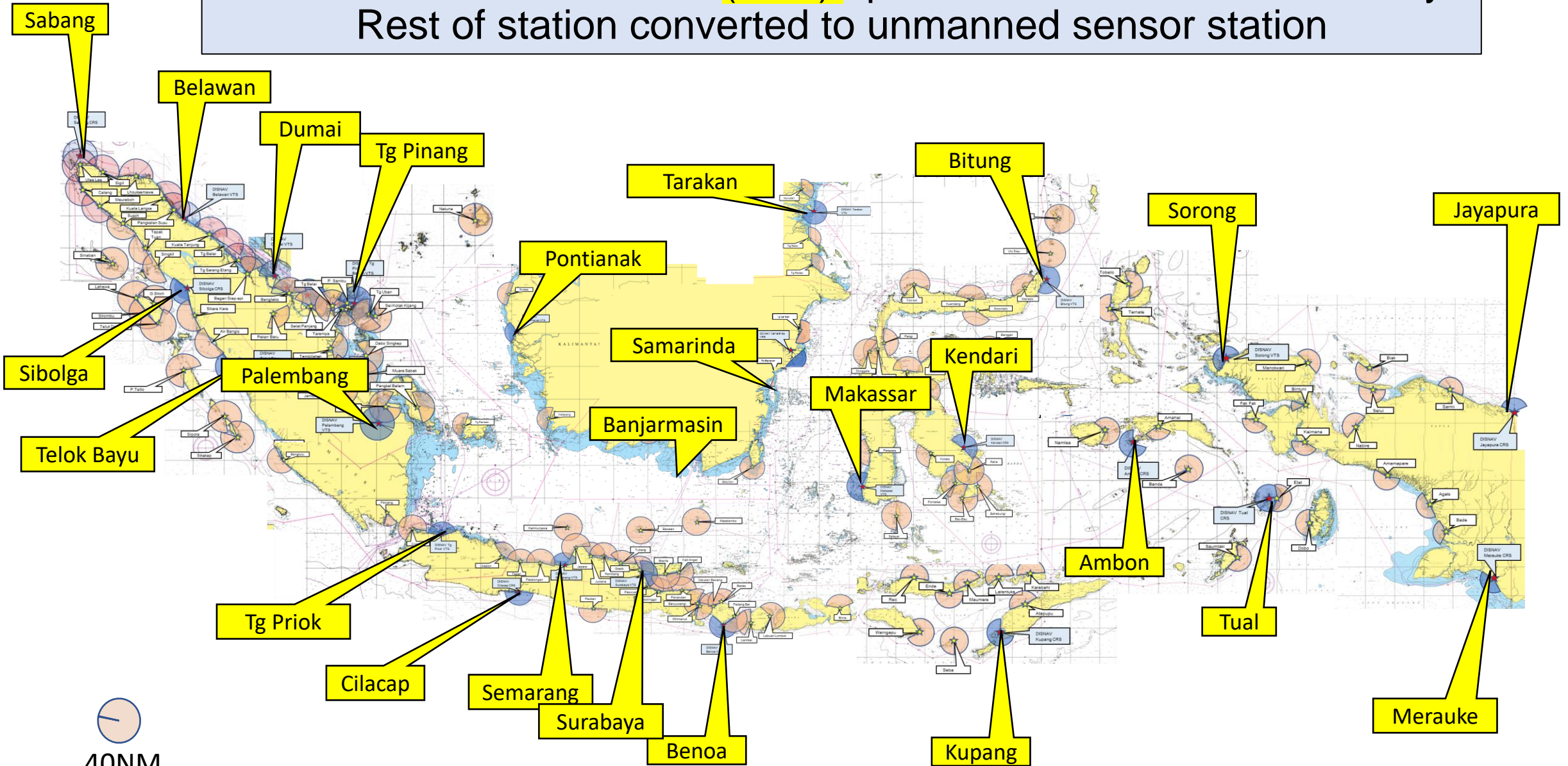
Benoa

DISNAV

150NM/MF



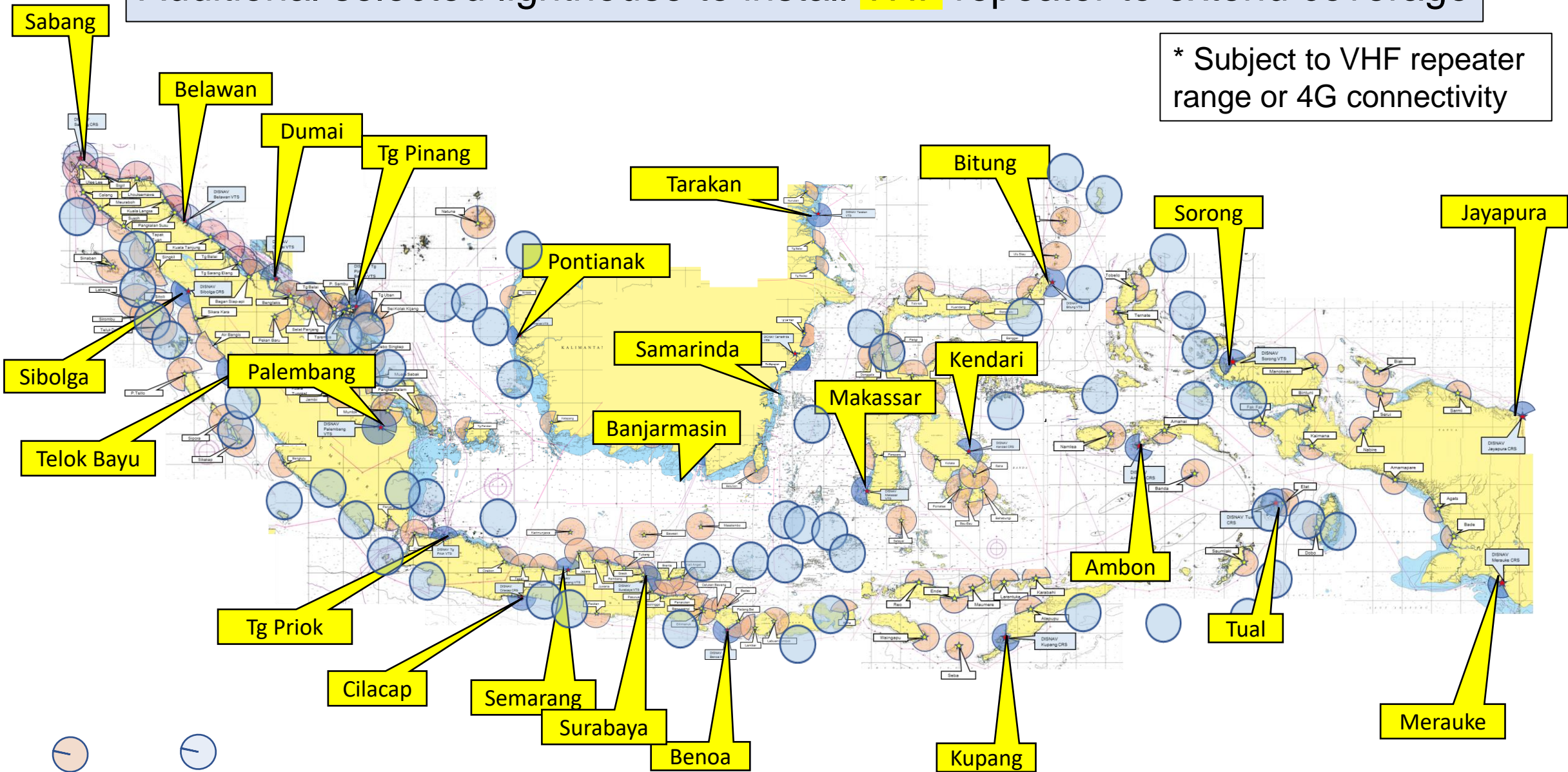
Consolidation of 158 CRS (VHF) operated in 25 DISNAV/VTs only  
Rest of station converted to unmanned sensor station



40NM

# Additional selected lighthouse to install VHF repeater to extend coverage

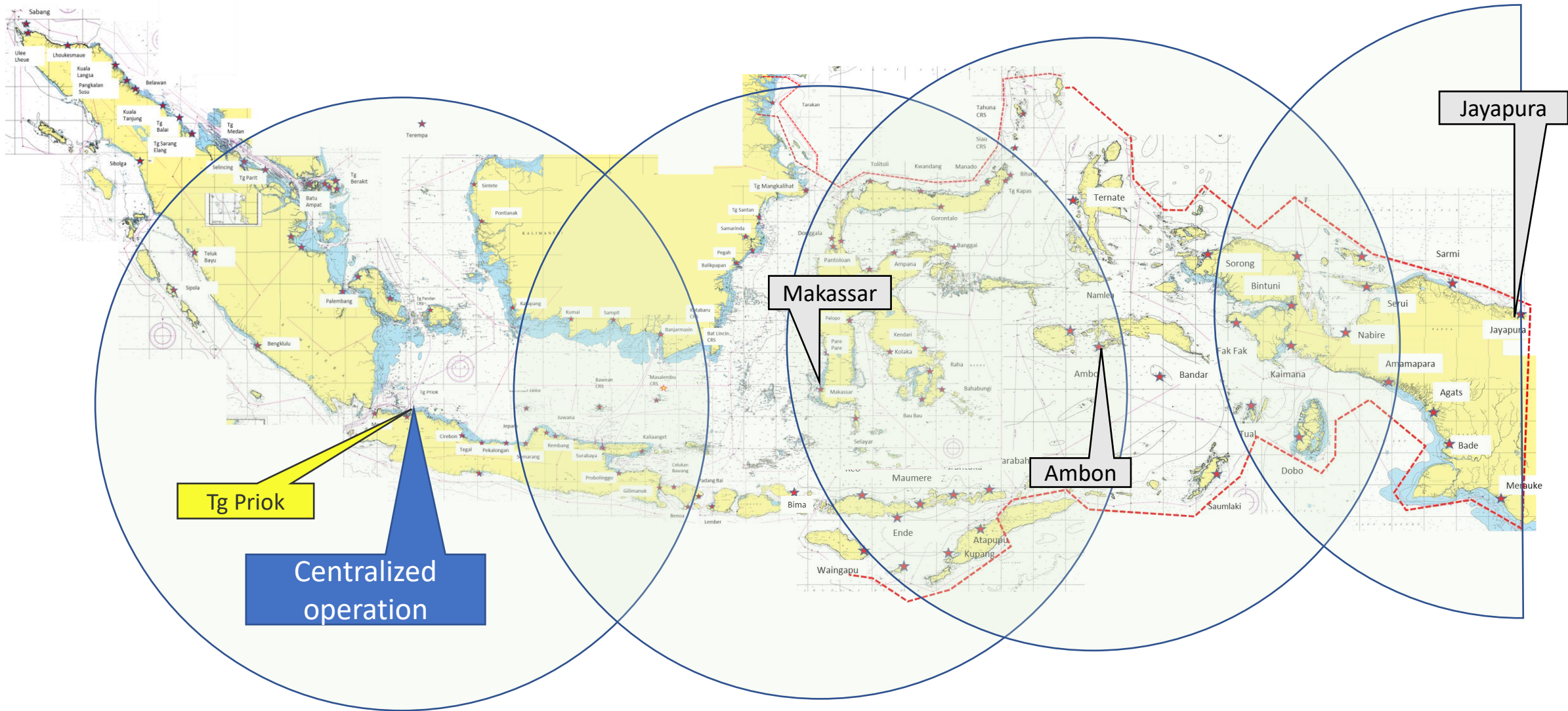
\* Subject to VHF repeater range or 4G connectivity

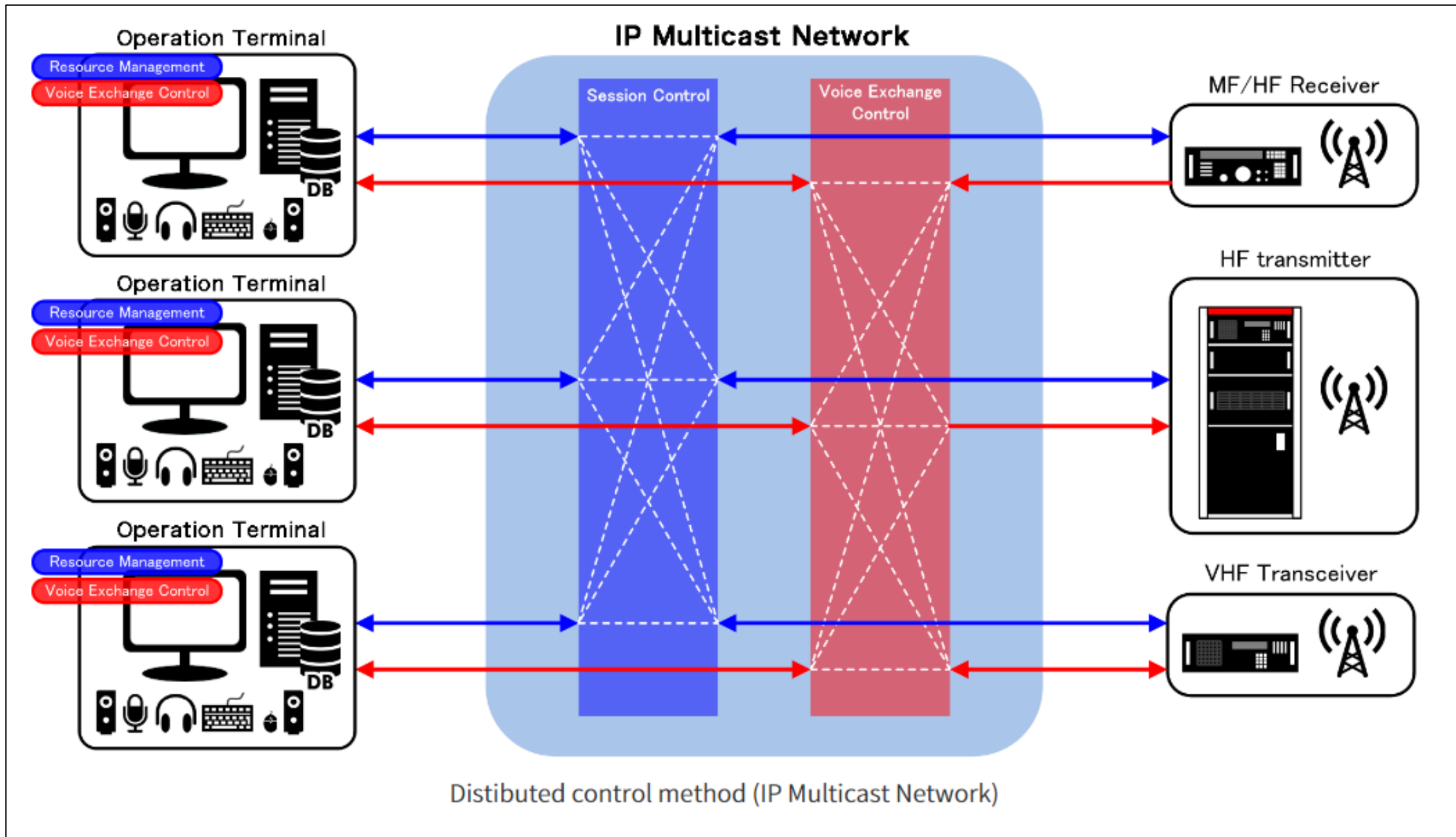


40NM  
SBNP



# NAVTEX consolidated operation in Jakarta to control remotely others



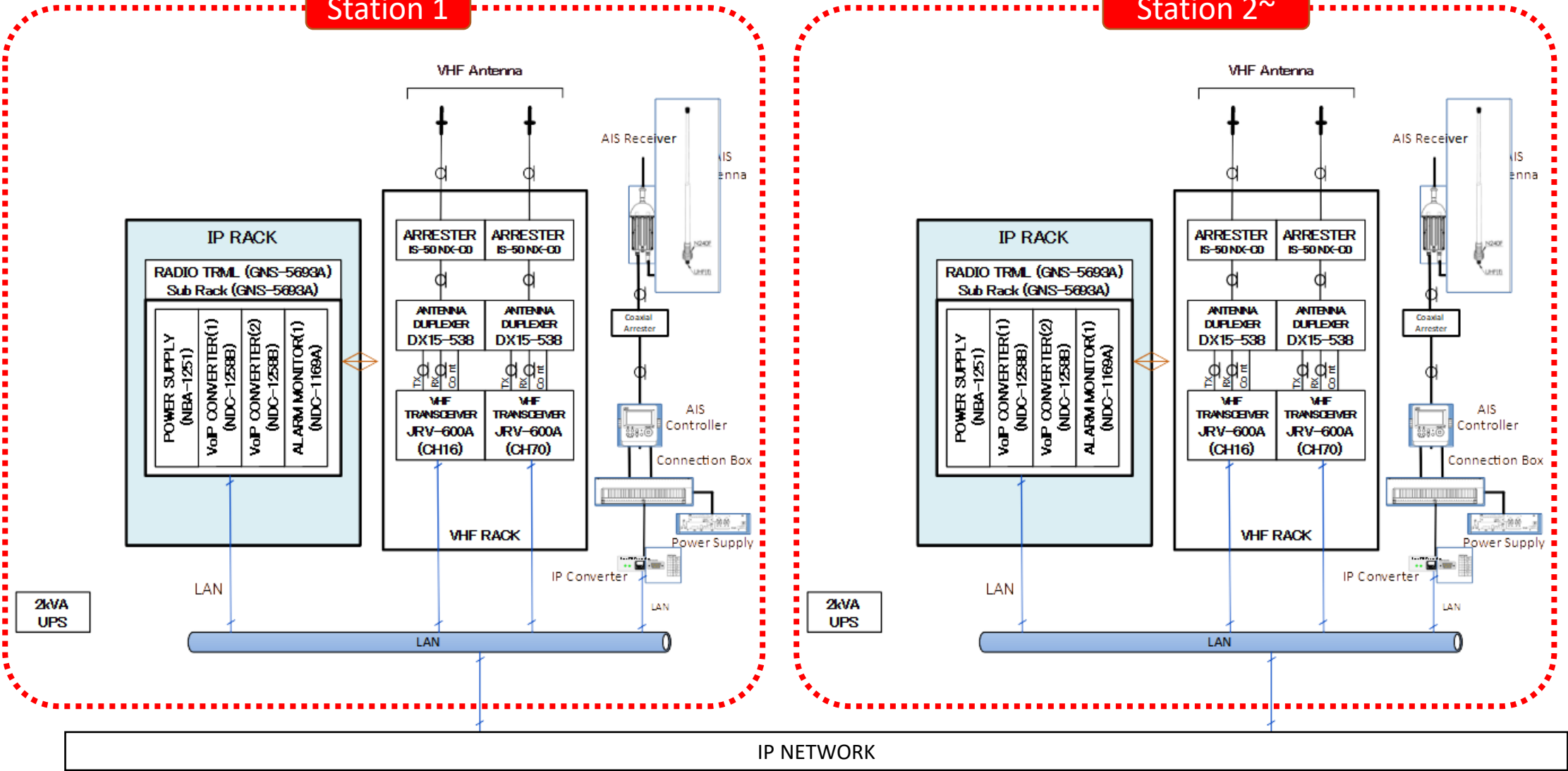




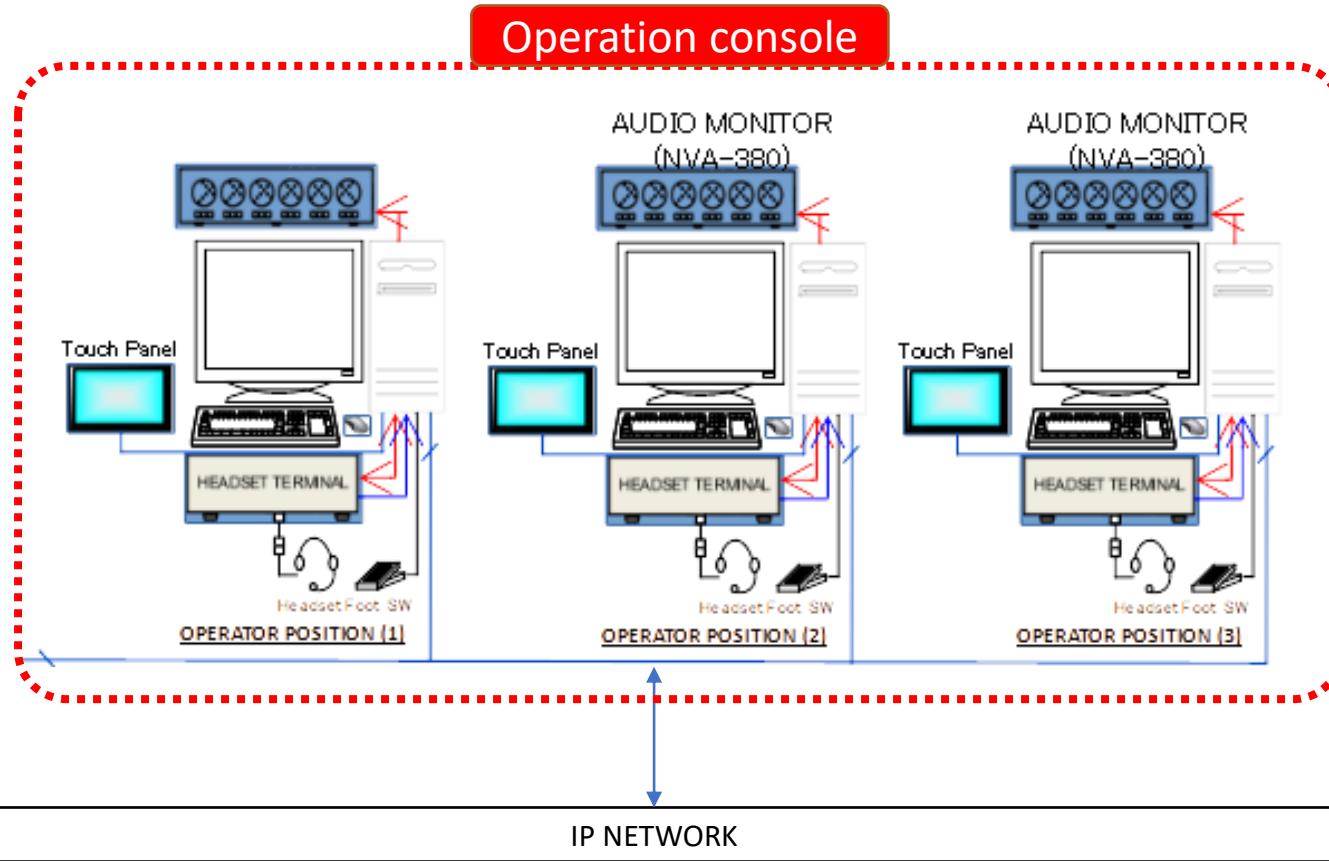
# Each sensor station (multiplied)

Station 1

Station 2~



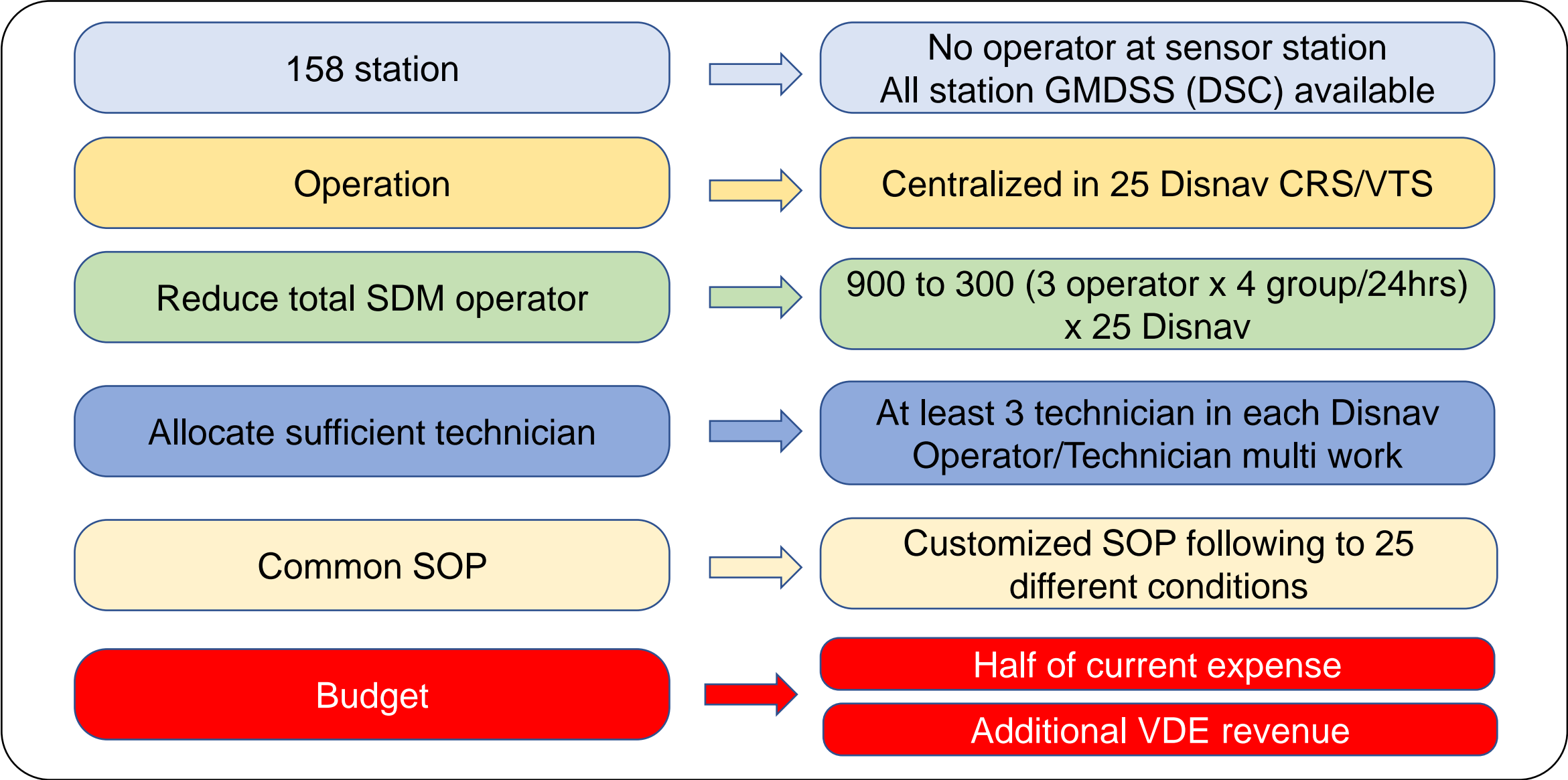
# Consolidated operation center without TX/RX



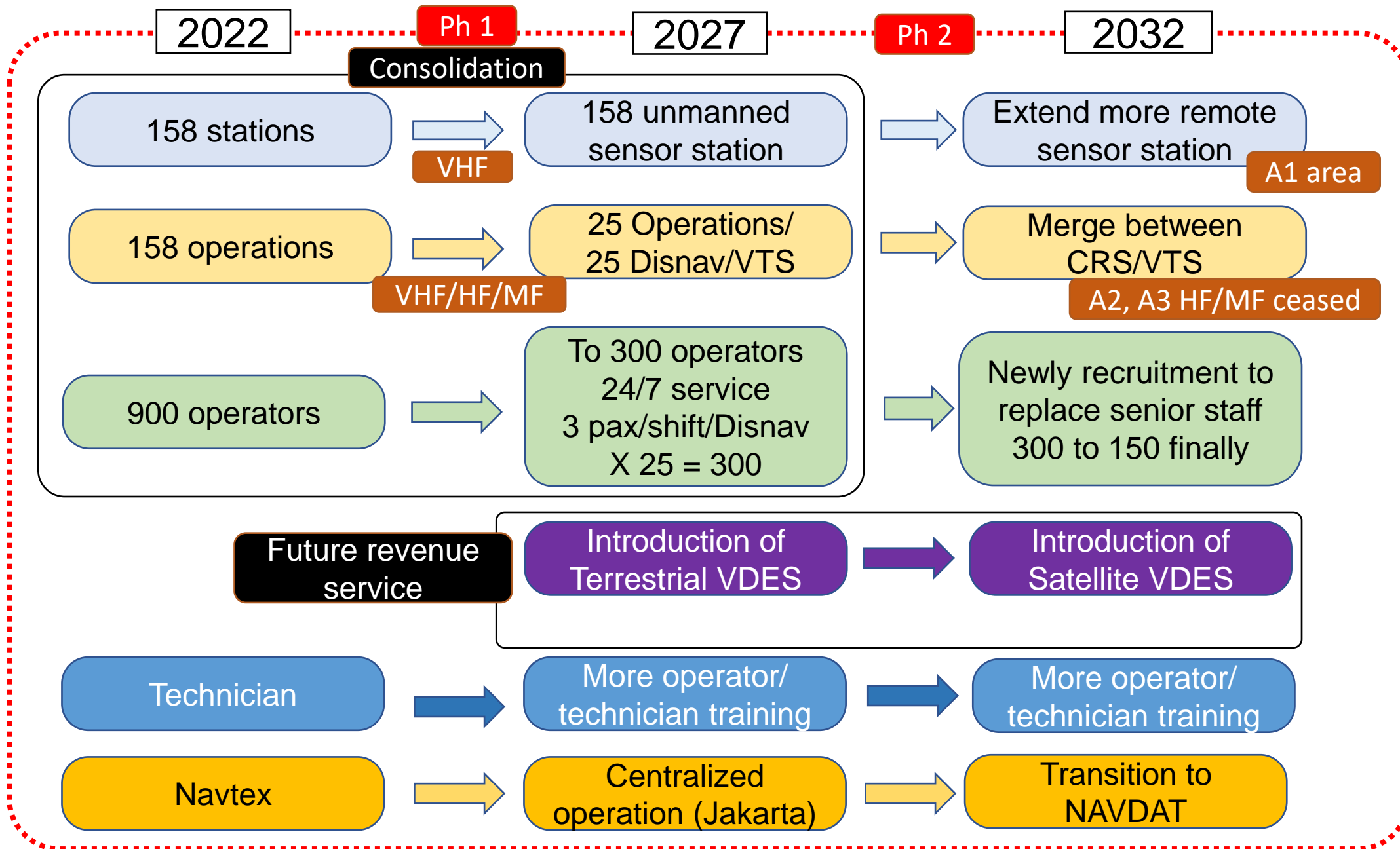
## Objectives

1. This is the first and last chance for all CRS to consolidate drastically including possibility of merge with VTS. If not take this opportunity, at least half of station would be non functionable within next 10 years.
2. DGST has the only authorized competent agency to own complete coastal navigational facilities including CRS, SBNP, VTS which is able to cover most of national coastal line. Only DGST enables to be a Navigational Public Service Provider to follow any kinds of maritime information to provide to all stake holders.
3. Annual 600,000 ship call consisting 90% domestic and 10% international vessels are the potential demand (beneficiary) of public service provided by CRS, VTS, SBNP. Those service qualities and quantities shall not be downgraded from current level so long DGST as the public service provider.

# Action plan (next 5 years)



# Estimated time schedule (next 10 years)




## Cost Estimation -1- (Approx of example)

1) Overall expenses in 25 DISNAV total estimated by extract numbers

Unit: Million IDR	2021	2020	2019
Wages	65,893	79,267	79,936
Maintenance	8,216	5,279	8,365
Running expenses	5,868	5,672	6,860
Sub total	79,977	90,219	95,161

2) Overall estimated cost of consolidation system 158 sensors + 25 operation

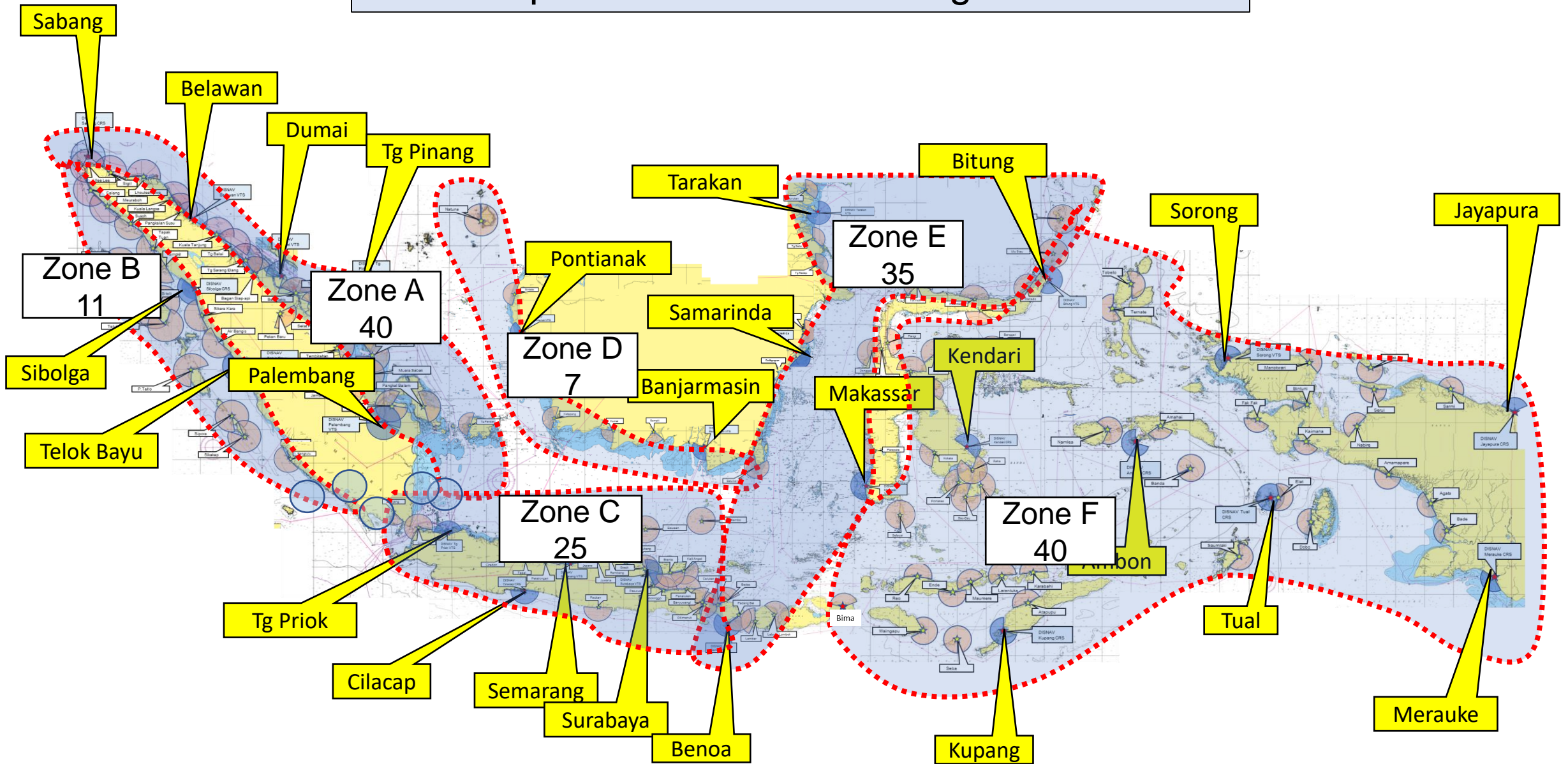
Unit: Million IDR	Unit cost	Qty	Total
Sensor stations	2,500	158	395,000
Operation centre	5,000	25	125,000
System maintenance 5 years	Need to evaluate the details just example only		52,000
Gross total	Need to evaluate the details just example only		572,000



Annual depreciation of new investment (22yrs)			28,000
---	--	--	--------



# Second phase: CRS/VTS zoning consolidation

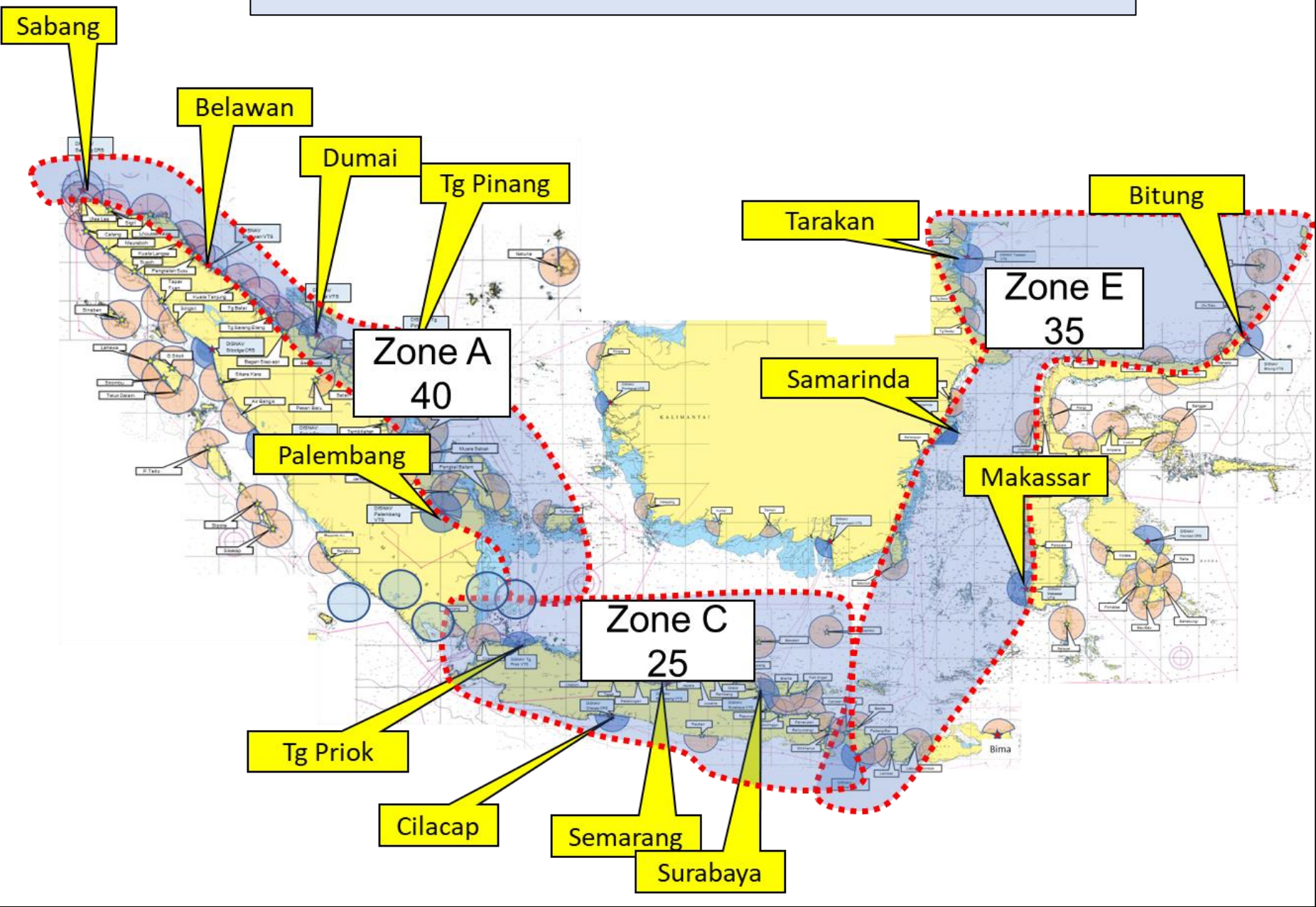


Re-organize VTS/CRS up to 6 key stations

## 2020 statistic Ship call and handling cargo

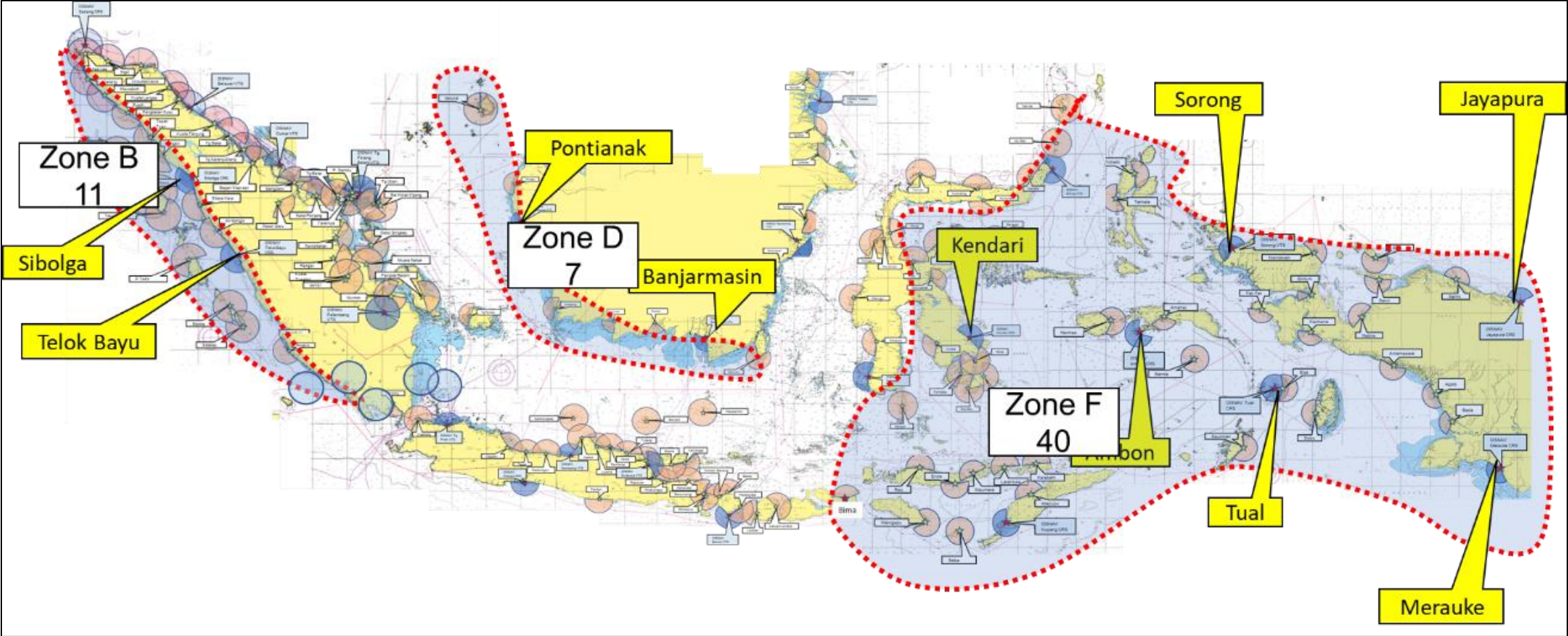
Zone	Area	DISNAV		2020 statistics total		2020 statistics total	
		Nos	name	Ship call	Portion	Cargo GT	Portion
A	Sumatra Riau	5	Sabang, Belawan, Dumai, Tg Pinang, Palembang	237,023	37.0%	112,832,487	10.1%
B	Sumatra West	2	Sibolga, Teluk Bayur	12,247	1.9%	17,545,568	1.6%
C	Jawa	4	Jakarta, Semarang, Surabaya, Cilacap	73,226	11.4%	289,414,778	26.0%
D	Kalimantan East	2	Pontianak, Banjarmasin	66,088	10.3%	290,259,910	26.1%
E	Bali-Sulawesi West	5	Benoa, Makassar, Samarinda, Tarakan, Bitung	124,651	19.4%	337,546,963	30.3%
F	Sulawesi East-East Indonesia	7	Kupang, Ambon, Tual, Kendari, Sorong, Merauke, Jayapura	127,852	19.9%	66,535,233	6.0%
G.tot al		25		641,087	100.0%	1,114,134,939	100.0%

# Consolidation priority 1

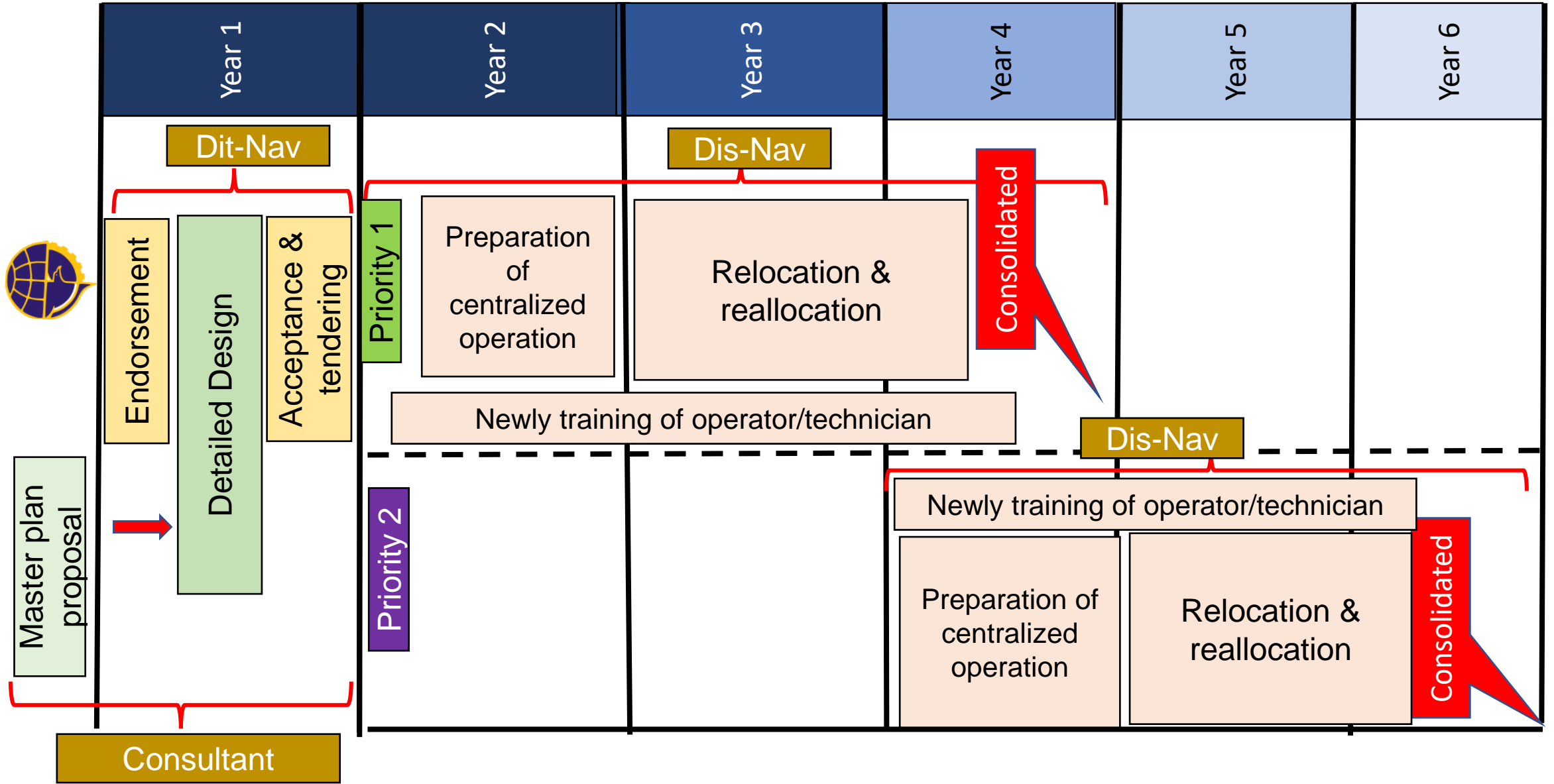




# Consolidation priority 2



Zone	Area	DISNAV	Target CRS	Approx cost
		Nos	Consolidated	Million IDR
<b>Priority 1</b>				
A	Sumatra- Riau	5	40	125,000
C	Jawa	4	25	82,500
E	Bali-Sulawesi West	5	35	112,500
S.Total		14	100	320,000
Overall cost				
<b>Priority 2</b>				
B	Sumatra West	2	11	37,500
D	Kalimantan East	2	7	27,500
F	Sulawesi East-East Indonesia	7	40	135,000
S.Total		11	58	200,000
Overall cost				
Nex 5 years maintenance cost (10%)			158	52,000
<b>G.Total</b>				<b>572,000</b>





## Final conclusion (Repeat and remind)



- This is the first and last chance for all CRS to consolidate drastically.
- CRS is still needed to cover whole nation without blind spot/break.
- Watching/monitor any distress case is kind of Insurance to prepare all-time.
- CRS facilities located in whole nation is very useful resources of DGST as Public Service Provider.
- Future communication mode of VDES is being prepared to introduce in next generation.

# Introduction of NAVDAT

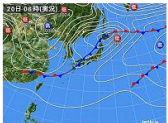
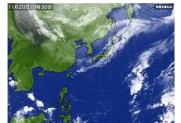
- NAVDAT (NAVigational DATa)
  - ❖ Digital Navigational data system with advanced NAVTEX functionality
  - ❖ Anticipation of adaptation of the GMDSS
- Launch in the market by year 2024 under development of prototype
  - ❖ Current MF 5kw transmitter for NAVTEX is cable to upgrade to NAVDAT transmitter with modifying few part contents



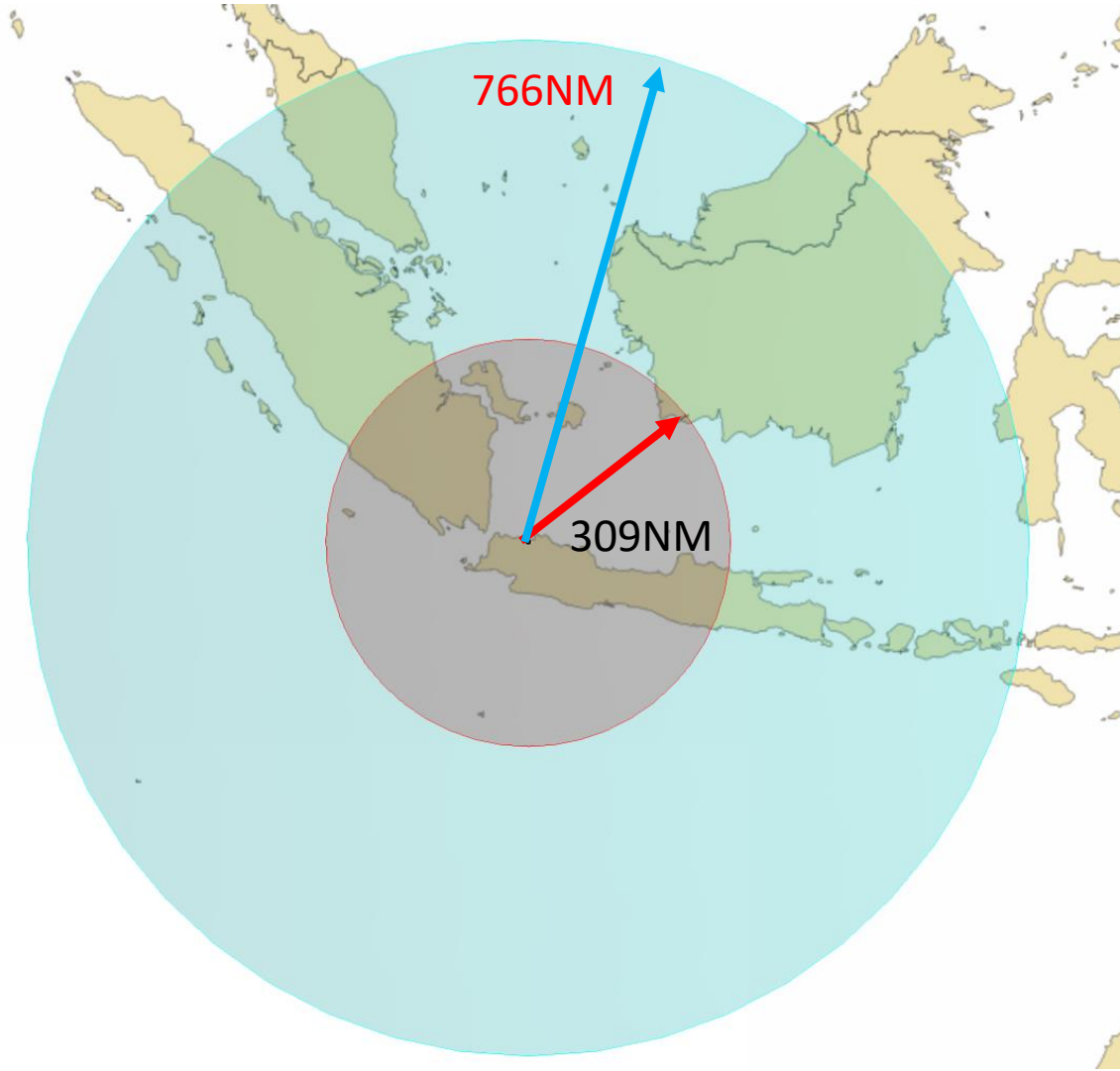
NAVDAT transmitter (prototype)

	NAVTEX receiver	NAVDAT receiver (Image)
Throughput	<b>50bps</b>	Throughput <b>26kbps (64-QAM)</b>
Tx Freq.	<b>424/490/518kHz</b>	Tx Freq. <b>500kHz</b>
Content	<b>Text ONLY</b> 	<b>Graphical Information</b> 

	Text		
	Text	Graphic image	Picture
File size	2kB	30kB	100kB
Transmission time	5min	82min	273min
		<b>0.6sec</b>	<b>9sec</b>
			<b>32sec</b>

## Service area :NAVDAT vs NAVTEX



Simulation Condition for NAVDAT and NAVTEX

	NAVDAT	NAVTEX
Frequency[kHz]	500	518
Modulation	64QAM	FSK

\*The communication range may be narrowed depending on the season.

Thank you very much

Terima Kasih

有難うございました (Arigato gozaimashita)



# Appendix 3.9 -4

Presentation (Vessel)



The Project for Review of the Study  
for  
Maritime Traffic Safety System Development Plan  
Report (Phase 2)  
Component 3 Vessels for Aids to Navigation  
Japan

March 2, 2023



Japan International Cooperation Agency (JICA)



Japan Aids to Navigation Association (JANA)



# Policy

Vessels for Aids to Navigation are assigned to the District office of Navigation (DISNAV) to install, operate and maintain Aids to Navigation (AtoN).

## Challenges to face

- Many old vessels
- Shortage of skilled crew members
- Huge fuel costs, etc.

By investigating and studying the vessels and crew in detail, we will make a plan to assign appropriate vessels to each Disnav in order to properly manage and operate the AtoN managed by each Disnav.

# Collection of basic data

- a. Built year (ship age)
- b. Business content
- c. Docking interval, docking days
- d. Type and number of AtoNs accessed by Navigation Vessels
- e. Buoy replacement cycle (complete replacement, partial replacement)
- f. AtoN Patrol Cycle
- g. AtoN maintenance content and time required for maintenance
- h. Details of past repairs and current failures
- i. Crew training content and training period
- j. Technical skills of the crew, etc.

Navigation Vessels										
English	Bahasa Inggris	Japanese								
Jurisdiction	yurisdiksi	管区	13							
DISNAV	DISNAV	DISNAV	Benoa							
class	kelas	クラス	I							
Ship name	Nama kapal	船名	KN Nusa Perida							
Ship type	Jenis kapal	船種	KIP							
base	basis	基地	Benoa							
Year of built	Tahun dibangun	建造年	2017							
Ship age	usia kapal	船齢 (2022)	5							
Dock interval and duration	Interval dan durasi dok	ドックの間隔及び期間	Interval :	1 year	Period :	25 day				
Power supply while the base is moored	Catu daya saat pangkalan ditambatkan	基地停泊中の電源	Generator Engine							
How to communicate with the base during the voyage	Bagaimana berkomunikasi dengan pangkalan selama perjalanan	航海中の基地との通信方法	Mobile Phone							
Work contents	Isi pekerjaan	業務内容	New installation of buoy	Replacing the buoy	Underwater survey of buoys	Buoy repair	AtoN maintenance	Transportation of supplies required for AtoN	Operations other than the purpose of AtoN	
For operations other than the purpose of AtoN (Specifically described)	Untuk operasi selain tujuan AtoN (Secara khusus dijelaskan)	AtoN以外の作業の場合 (具体的に記載)	Making of navigation video							
Training contents of seafarers	Isi pelatihan pelaut	船員の訓練内容	Emergency escape training	Fire extinguishing training						
Training frequency	Frekuensi pelatihan	訓練頻度	Once every six months	Once a year						
Number of AtoN managed using the vessel	Jumlah AtoN yang dikelola menggunakan kapal	船舶により管理するAtoNの数	Light House	Light Beacon	Light Buoy	Unlighted Buoy				
			Mercu Suar	Suar Cahaya	Pelampung Ringan	Pelampung Tanpa Cahaya	2	3	10	3
Please fill in the following items:										
Past repairs	Perbaikan sebelumnya	過去の修繕								
Repair details	Detail perbaikan	修繕内容								
Current failure location	Lokasi kegagalan saat ini	現時点の障害箇所	Engine							
Failure content	Konten kegagalan	障害内容	Vibration occurs when the engine is fully operated.							
Crew technical skills	Keterampilan teknis kru	乗組員の技術力	Those with qualifications (voyage, engine) are scheduled to retire in the next five years.							
Other issues	Masalah lain	その他の問題								
Opinion	pendapat	意見								

Buoy Tender						
Number of AtoN managed using the vessel	Jumlah AtoN yang dikelola menggunakan kapal	船舶により管理するAtoNの数	Light House	Light Beacon	Light Buoy	Unlighted Buoy
			Mercu Suar	Suar Cahaya	Pelampung Ringan	Pelampung Tanpa Cahaya
			0	0	10	3
Regular replacement of buoys	Penggantian pelampung secara teratur	ブイの定期交換	Nothing		Yes	
Buoy replacement cycle	Siklus penggantian pelampung	ブイの交換サイクル			4 years	
Criteria for exchange	Kriteria pertukaran	交換の判断基準	Check by pulling it up on the ship once a year.			
process	proses	船種	If there is a problem, replace it. Paint the buoy and put it back.		Replace one set of buoys (including iron chains, sinkers, etc.) Maintain and store the salvaged items	
Number of Buoys that can be loaded on the Vessel (including Mooring chain and Sinker, etc.)	Jumlah Pelampung yang dapat dimuat di Kapal (termasuk rantai Mooring dan Sinker, dll.)	Vesselに積載できるBuoyの数 (鉄釘、沈み石等)	Light Buoy : 1 unit		Light Buoy : 1 unit	
Number of buoys to be exchanged in one voyage	Jumlah pelampung yang akan ditukar dalam satu perjalanan	1回の航海で交換するブイの数	1 unit		1 unit	
Buoy maintenance location	Lokasi perawatan pelampung	ブイの整備場所	On board the Vessels		Buoy base	
Aids tender						
Number of AtoN managed using the vessel	Jumlah AtoN yang dikelola menggunakan kapal	船舶により管理するAtoNの数	Light House	Light Beacon	Light Buoy	Unlighted Buoy
			Mercu Suar	Suar Cahaya	Pelampung Ringan	Pelampung Tanpa Cahaya
			5	7	10	3
AtoN patrol cycle	Siklus patroli AtoN	AtoNの巡回周期	3 months	3 months	3 months	3 months
Maintenance details	Detail perawatan	メンテナンス内容	Voltage, current, connection status, device operation, etc.	Voltage, current, connection status, device operation, etc.	Check voltage, current, connection status, device operation, installation location, etc.	Appearance check, installation location, etc.
Average time required for maintenance	Rata-rata waktu yang dibutuhkan untuk pemeliharaan	メンテナンスに必要な平均時間	1 hour	1 hour	30 minutes	20 minutes

# Annual operation performance

Aggregation of annual operation performance

- a. Annual activity days (including activity content)
- b. Maintenance days per year (docking)

✂Initially, it was planned to aggregate and average data for the three years from 2019 to 2021, but in 2020 and 2021, due to fuel cost budget cuts, actions were restricted and planned actions were not possible.

In a meeting with NAVIGASI, it was necessary to consider geographical conditions, and was advised to use the vessel route pattern of each DISNAV.

When we requested the vessel route pattern for each DISNAV, we were presented with the vessel route pattern for 3 DISNAVs.

When I asked for the number of days of behavior in these patterns, only DISNAV Semarang could be confirmed.

Therefore, we aggregated the number of action days from the 2019 “Vessel Voyage Monthly”, which was not affected by the fuel cost reduction.

# Navigation vessels operating rate

$$\text{Operating rate(\%)} = \text{operation days} \div (365 - \text{docking days}) \times 100$$

- Occupancy rate is the number of active days divided by the annual number of active days
- Action days are the number of days that Navigation Vessels operated for business purposes.

When summarizing from execution actions, actions such as temporary standby and search & rescue due to bad weather that cannot be predicted at the time of planning are included.

When summarizing from the action plan, it is necessary to consider that unforeseen actions are not included at the planning stage.



DISNAV	Class	Navigation Vessel						Annual operating rate	Operating rate total
		Type of Vessel	Class	Name of Vessel	Year of Built	Age as of 2023			
Pontianak	III	KBP	I	KN ALNILAM	2008	15	14	26	
		KPP	III	KN PENGIKI	2016	7	12		
Cilacap	III	KIP	I	KN PRAJAPATI	1971	52	11	11	
Semarang	II	KIP	I	KN KUMBA	1972	51	27	95	
		KBP	III	KN SUAR-011	1980	43	34		
		KBP	III	KN B-126	1961	62	39		
		KPP	III	KN KARIMUN JAWA	2016	7	22		
Surabaya	I	KIP	I	KN BIMASAKTI UTAMA	2008	15	16	34	
			I	KN MASALEMBO	2017	6	18		
		KBP	III	KN SUAR-003	1971	52	16	37	
		KPP	III	KN AE-029	1971	52	21		
Benoa	II	KIP	I	KN NUSA PENIDA	2017	6	21	21	
		KBP	I	KN MIZAN	1996	27	12	12	
Banjarmasin	II	KIP	I	KN KUNYIT	2017	6	11	9	
		KBP	I	KN ALTAIR	1999	24	7		
		KBP	I	KN SUAR-003	1971	52	2		
		KBP	I	KN AE-032	1971	52	0		
Tarakan	III	KIP	I	KN MARATUA	2017	6	23	23	
		KPP	III	KN SARANG ALOE	2010	13	11	11	
Samarinda	I	KIP	I	KN MITHUNA	1975	48	23	47	
			I	KN MIANG BESAR	2017	6	24		
		KBP	III	KN SUAR-010	1975	48	32	52	
		KPP	III	KN MARAPAS	1999	24	20		
Merauke	III	KBP	I	KN MERPATI	1997	26	12	12	

From the operating rate of the actual action.

- a. Since DISNAV Pontianak has an operating rate of 26%, it is believed that one KN ALNILAM will be able to carry out the work.
- b. DISNAV Semarang has 3 vessels, 2 KBPs and 1 KIP, with a utilization rate of 95%, so KN SUAR11 is scheduled to be scrapped, resulting in a 2-vessel system. However, since KN B-126 has been built for 62 years, it seems that a replacement ship is urgently needed from a safety point of view.
- c. DISNAV Surabaya's KIP Buoy Tender has a two-vessel system, but if we look only at the utilization rate, two ships are 34%, so it seems possible to carry out the work with one.
- d. DISNAV Samarinda has two vessels for both Buoy Tender and Aids Tender, but since the two vessels have an operating rate of 47% and 52%, respectively, it seems possible to carry out the work with one vessel.

Type of Vessel	Class	Name of Vessel	Docking days	Operation days per years	Day of Operation	Annual operating rate	Operatin grate total
KIP	I	KN KUMBA	49	365	194	62	62
KBP	III	KN SUAR11	30	365	88	27	90
KBP	III	KN B126	30	365	89	27	
KPP	III	KN KARIMUN JAW	30	365	118	36	

From the operating rate of the action plan

The operating rate will be 62% for Buoy Tender KN KUMBA and 90% for the remaining three Vessel.

KN SUAR11 is scheduled to be scrapped and will be a two-vessel system, but it seems that the remaining two vessels will be able to carry out the work.

However, KN B-126 is 62 years old, so a replacement vessel is urgently needed from a safety standpoint.

In addition, although the operating rate was calculated from the annual action plan, it is necessary to consider that the number of annual operating days does not include actions that cannot be predicted at the planning stage.

Example: Temporary standby due to bad weather during patrol  
Action by Search & Rescue

## Points to consider when creating an establishment plan

### 1) Annual operating rate

If there are vessels of the same type among Vessels for Aids to Navigation belonging to DISNAV, consider the sum of the operating rates of the same vessels type.

### 2) Vessel age

The service life of a vessel is generally said to be 20 years for steel vessels.

### 3) Status of installed equipment

Condition of cranes and other equipment necessary for operations, as well as engines, radar, and other equipment necessary for navigation.

### 4) Technical skills of the crew

The following technical capabilities are required.

- a. Engine-related technical capabilities that can respond in the event of an engine failure
- b. Ability to navigate safely to the nearest port without navigational instruments if navigational instruments become unavailable.
- c. Effective and efficient maintenance capability

In order to acquire these skills, education at a specialized training institution is necessary.

### 5) Special characteristics of sea areas

Selection of Vessel considering the peculiarities of the sea area

# Promotion of the Vessels for Aids to Navigation Establishment Plan

## 1) Early scrapping of aging Vessels

Vessels over 40 years old are scrapped for safety reasons.

At that time, DISNAV, which owns multiple vessels, will consider whether the remaining vessels can carry out the work and determine the necessity of alternative vessels.

The fact that there are many affiliated ships means that the maintenance cost that can be used for one ship is small, and only half-finished maintenance can be performed.

## 2) Improving technical skills of crew members

According to a report from DISNAV, training of young crew members is necessary as most ships will retire within five years (some within a year).

Acquisition of qualifications is of the utmost importance, and it is necessary to have the crew obtain nautical, engineering or communications qualifications.

In addition to qualifications, reliable maintenance of each facility and equipment by the person in charge of navigation, organization or communication will maintain the function of the ship appropriately.

In order to improve such skills, it is necessary to educate at a specialized institution, and it seems possible by taking turns educating the crew members who will be scrapped.

### 3) Hybrid Navigation Vessels

When building new Navigation Vessels, it is possible to bring the crew of a scrapped ship onboard by making a large Navigation Vessels that is a hybrid of a buoy tender and an AIDS tender.

### 4) Early acquisition of route patterns and action plans for Navigation Vessels

Obtain the route pattern and action plan of the current Navigation Vessels to understand the number of action days per year.

In the future, it will be important to obtain early plans for changes to Navigation Vessels' operations, such as the establishment of AtoN.

If you get it early, it will be possible to deal with large-scale changes.

# Appendix 3.9 -5

Presentation (Seminar)



# **Maritime Communication Platform for VDES and New-Generation AIS**

For the 6th Joint Coordination Committee, DGST

March 2, 2023



**TOMMY TAKIMOTO**  
CEO, Future Quest Inc.

# Transforming the Maritime Landscape: The Impact of VDES

- Streamlining of administrative services for ports, routes, and sea areas by VDES
- Enablement of port and route adaptation for future MASS (autonomous ships) integration through VDES

To achieve this:

# Executive Summary

1. Transition from hardware ownership (radio equipment) to centralized-service (SaaS) usage
2. Digitization of operations and data by leveraging the knowledge and manuals held by human staff, specifically:
  - Adaptation to VDES by port stations
  - Adaptation of current maritime administrative services to new information systems
  - Development of IT professionals with maritime expertise

What is Maritime SaaS?

“A communication service that can be used through the web without owning a radio.”

## Tommy TAKIMOTO

2021 **Founded Future Quest Inc.**

---

2018 **Withdrawal from Ph. D Program (Maritime Sciences),  
after completing the required credits, Kobe University**

2017 **Assistant Professor, Kagawa University**

2014 **Research Fellow (Ocean Policy), The Sasakawa Peace Foundation**

2012 **MS (Sociology), Kyushu University**

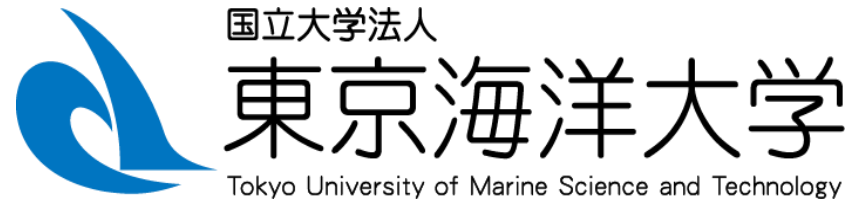
2010 **BA (Maritime Science), Kobe University**



# Company Profile

Company Name	Future Quest Inc.
CEO	Tomoki TAKIMOTO
Foundation:	January 2021
Location	Fukuoka, Japan
Business:	Maritime Communication Platform
Web	<a href="https://futurequest.jp/en/">https://futurequest.jp/en/</a>
Contact (email):	<a href="mailto:office@futurequest.jp">office@futurequest.jp</a>

Our respected supporters, cooperators, and partners





# “One Ocean” - Bringing All Maritime Communications Together

VDES  $\rightleftharpoons$  IP Interconnection A "Maritime Communications Provider" Between Ports and Vessels

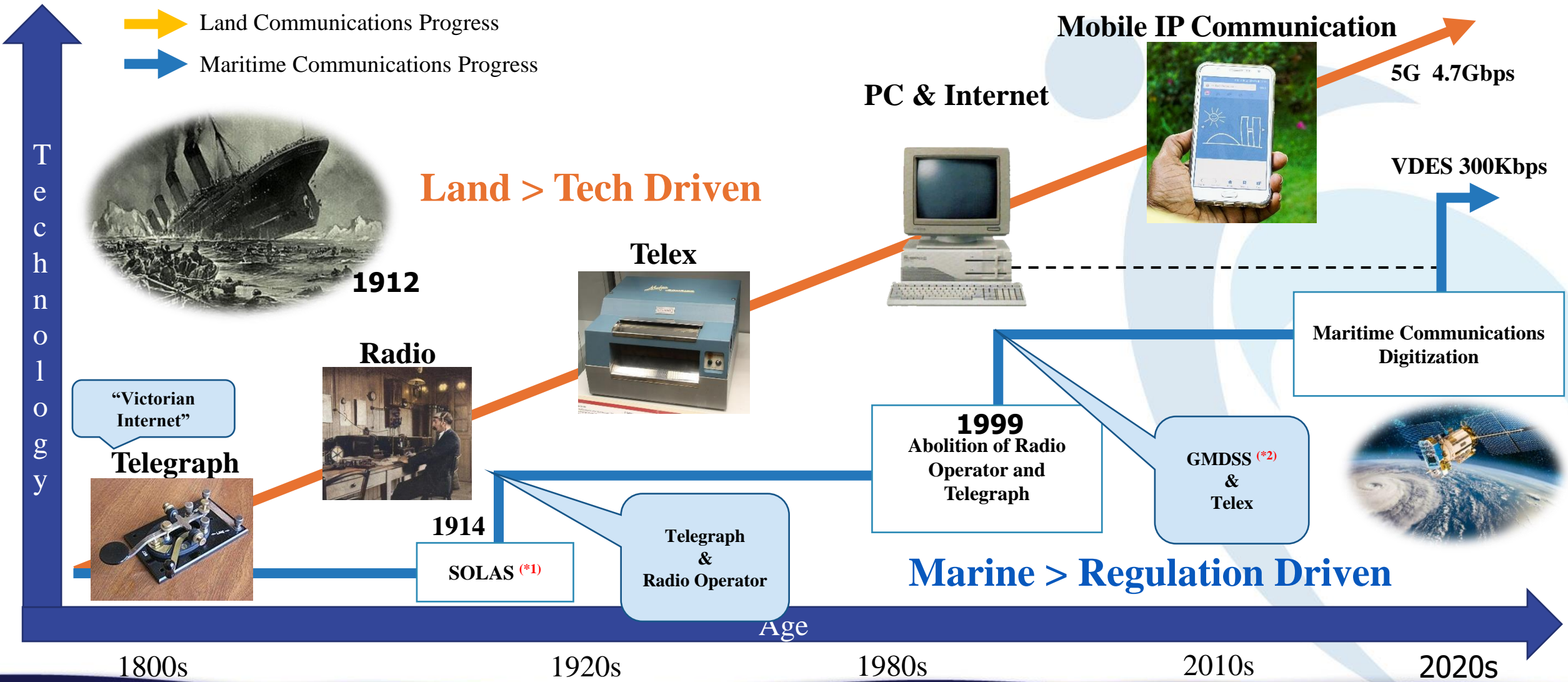




# History of Maritime Communication



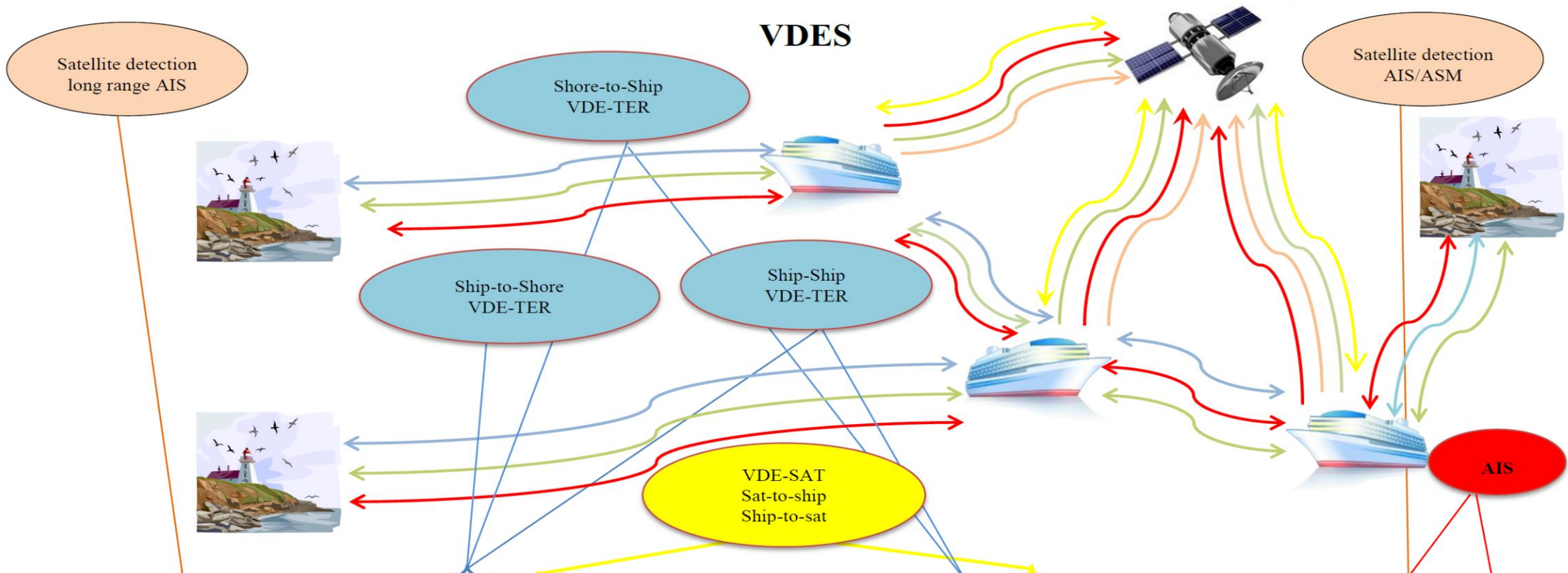
# Linear vs. Staged in Communication Evolution



(\*1) International Convention for the Safety of Life at Sea

(\*2) Global Maritime Distress & Safety System

# VDES



75	76
Long range AIS	

1024	1084	1025	1085	1026	1086
VDE-TER			VDE-SAT		

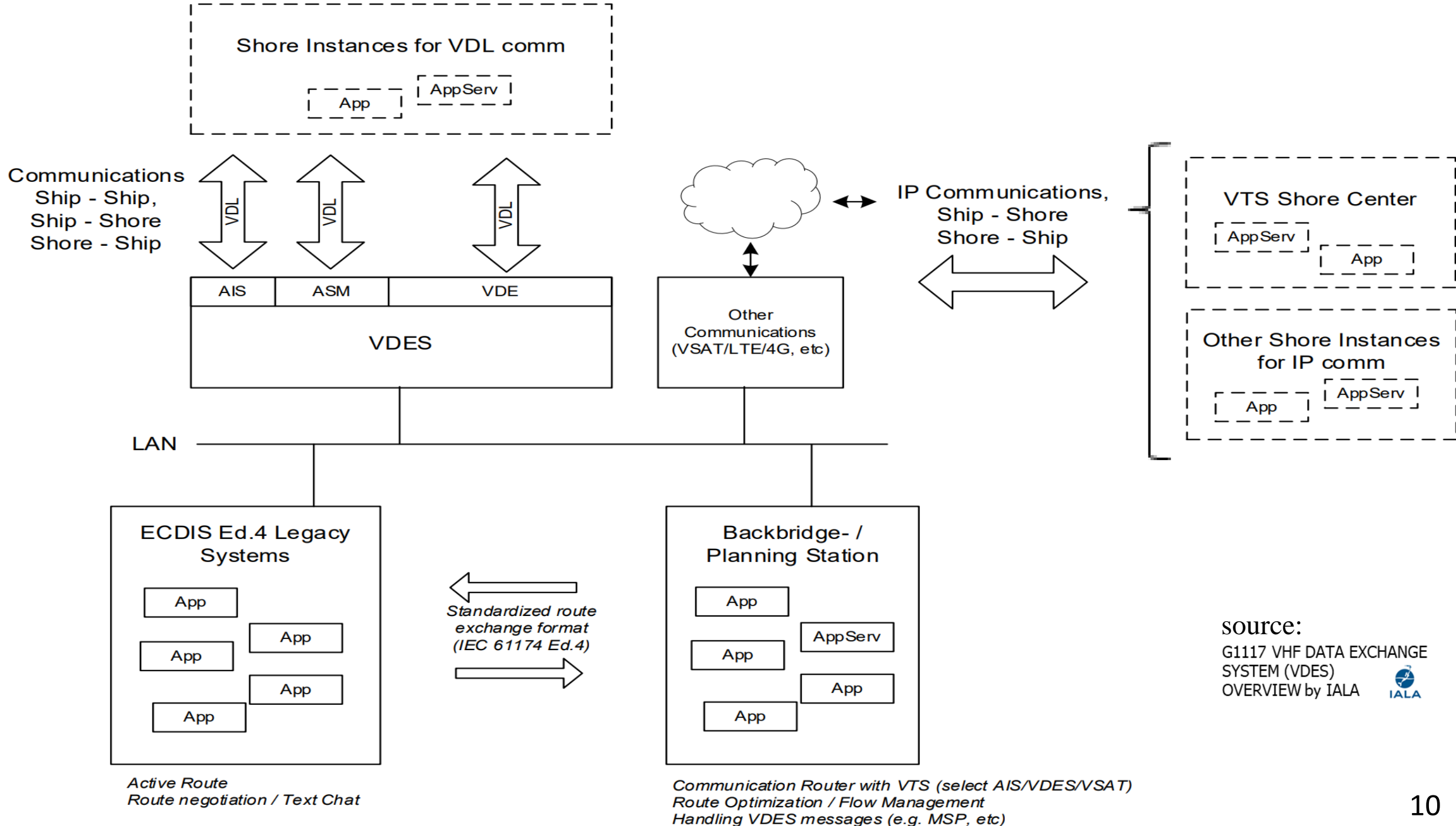
2024	2084	2025	2085	2026	2086
VDE-TER			VDE-SAT		


2027	AIS1	2028	AIS2
ASM 1		ASM 2	
AIS/ASM Terrestrial and satellite			

4.6 MHz separation

source:  
G117 VHF DATA EXCHANGE SYSTEM (VDES) OVERVIEW by IALA





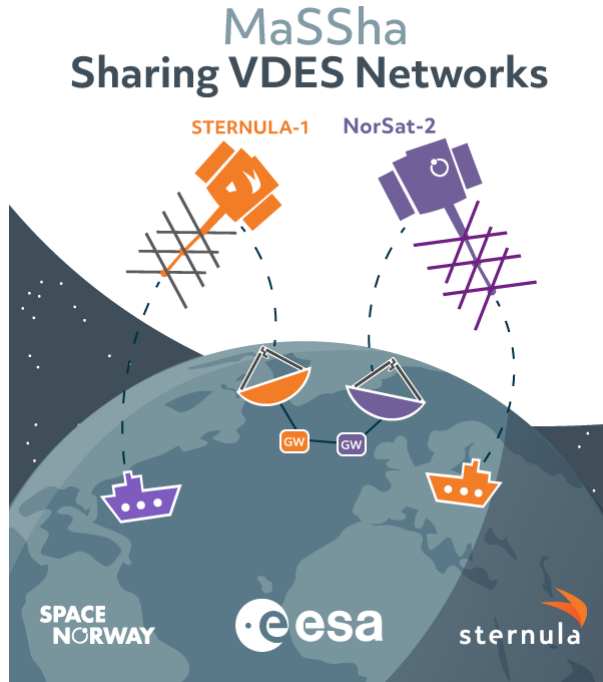
source:  
 G1117 VHF DATA EXCHANGE SYSTEM (VDES) OVERVIEW by IALA 

*Active Route  
 Route negotiation / Text Chat*

*Communication Router with VTS (select AIS/VDES/VSAT)  
 Route Optimization / Flow Management  
 Handling VDES messages (e.g. MSP, etc)*



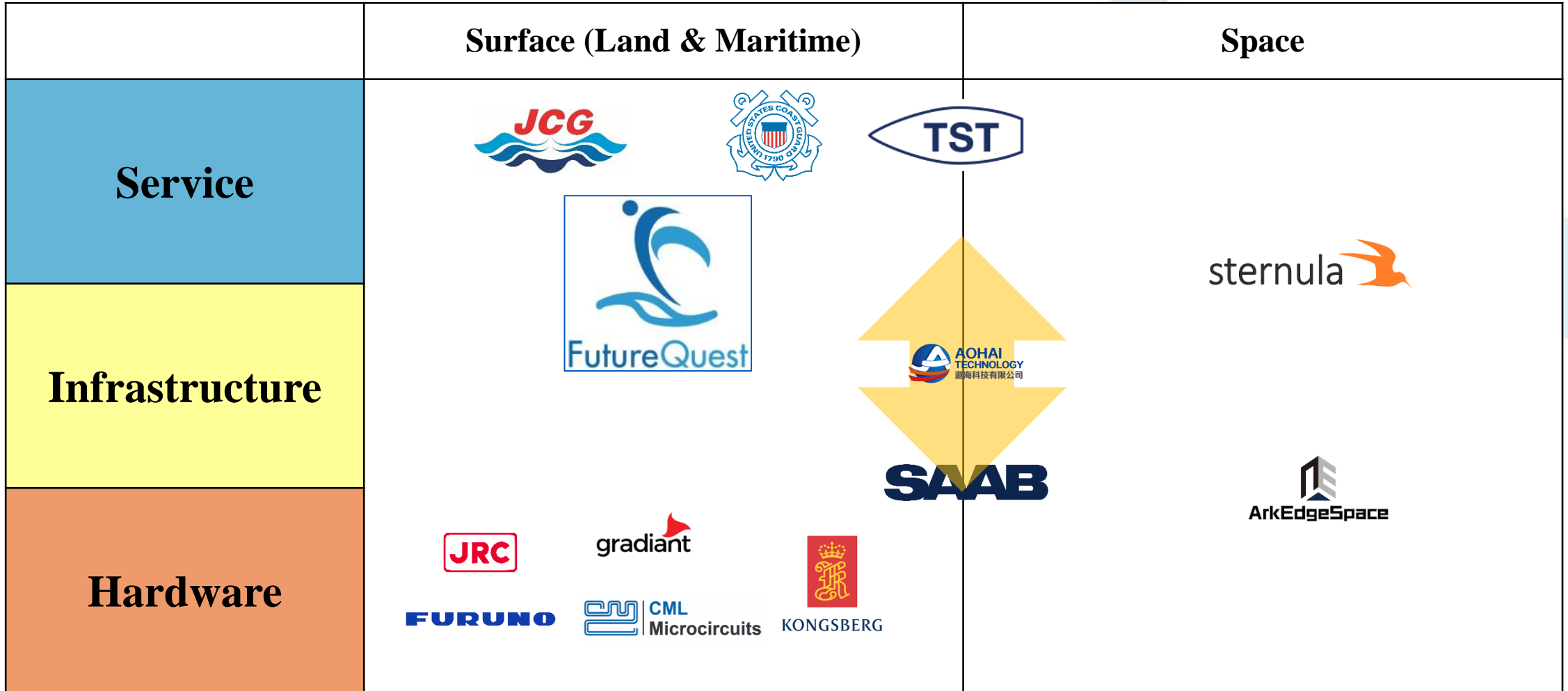
# VDES Business Entities



Source: Sternula, AOHAI Technology, USCG



# VDES Business Entities



# IT Perspective

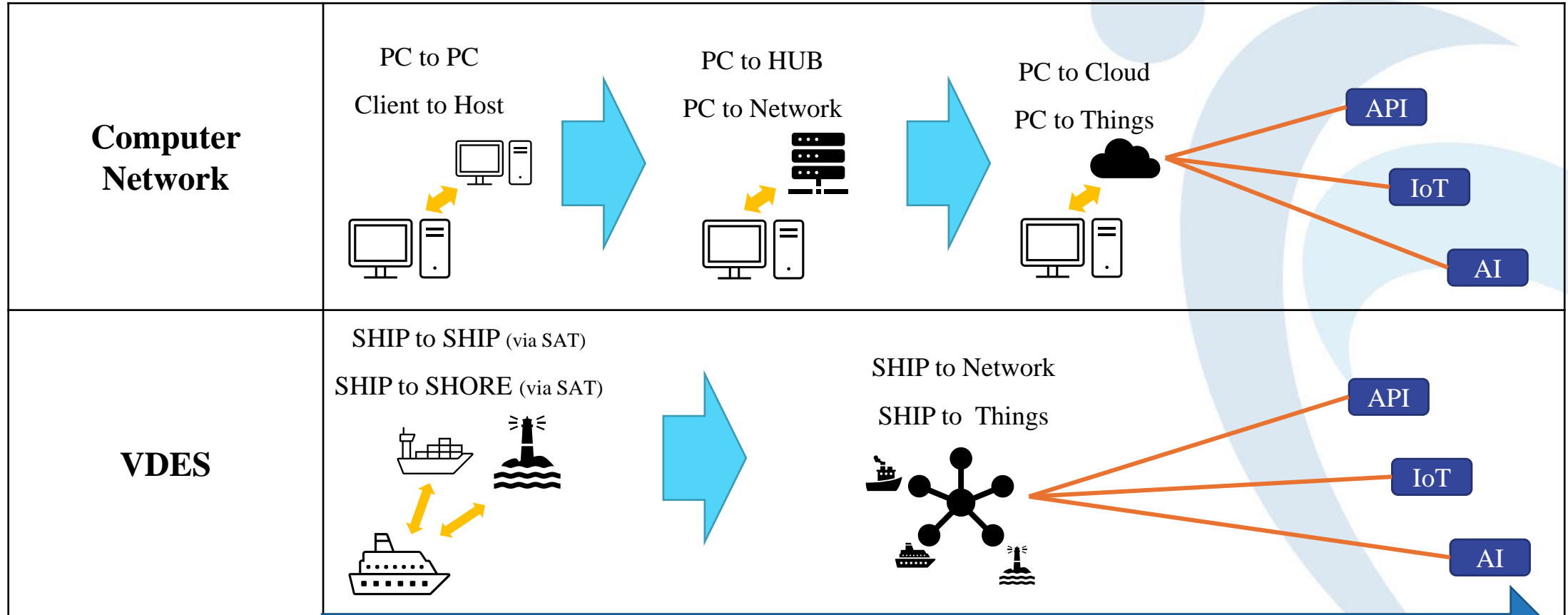
# Evolution Case of VDES

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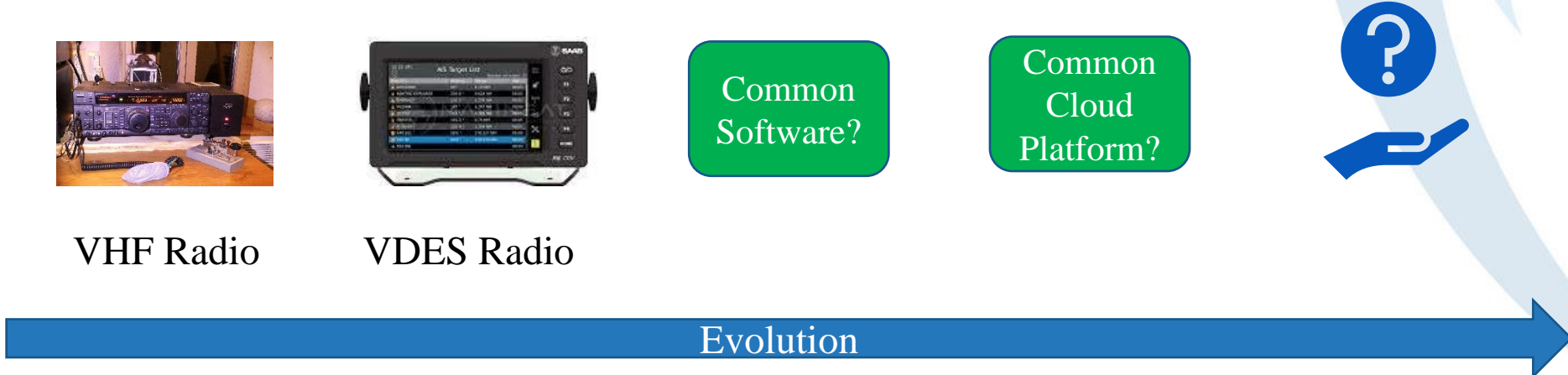
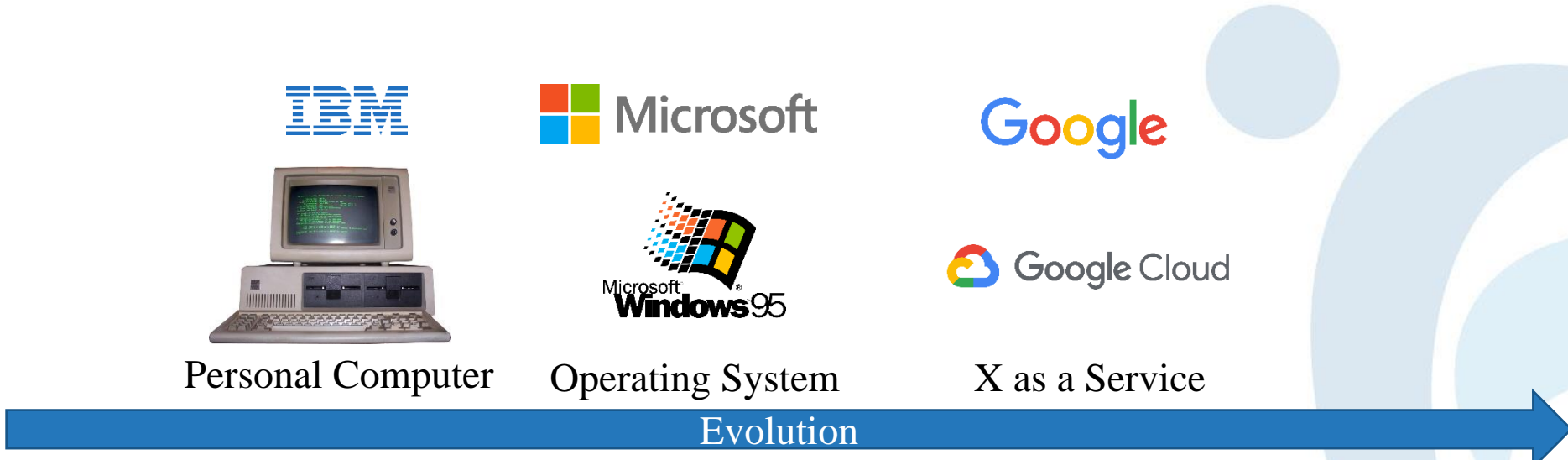
VDES evolves in pace with IT technologies  
or even faster.

**WHY? and HOW?**

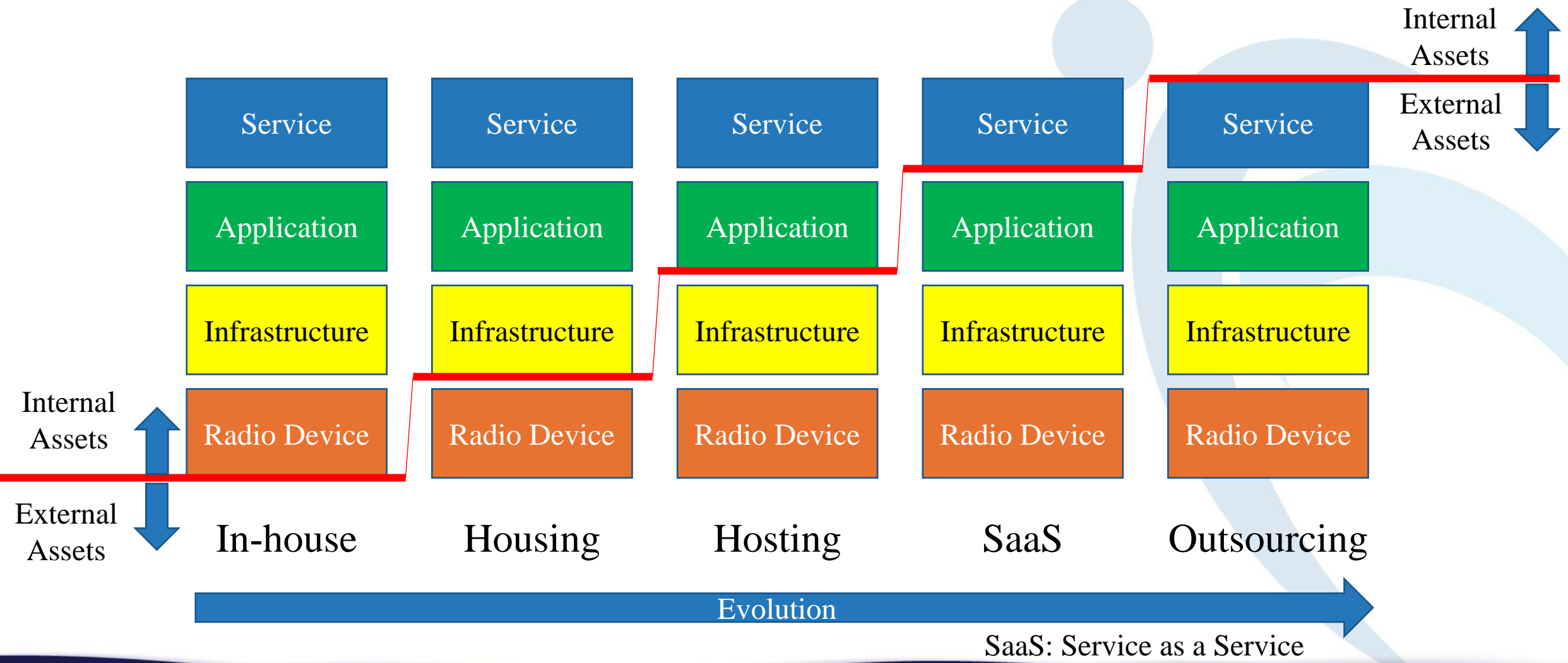
# Evolutions: VDES vs PC



# Radio to IP Network



# Outsourcing and SaaS





# Integration with New Technologies



AI



Sensing Devices



Terminal Devices



MASS (\*1), USV (\*2), Robot



# Benefits and Requirements

# Benefits

- Accommodation of diverse work styles
- Improvement of work efficiency
- Leading to cost reduction
- Being a measure for business continuity planning (BCP)
- Storage and utilization of data

# Costs and Requirements

- Incurrence of implementation and running costs
- Necessity of security measures
- Obtaining understanding from government and industry required
- Securing IT experts/personnel required
- Ensuring international quality required





# The Future is Now

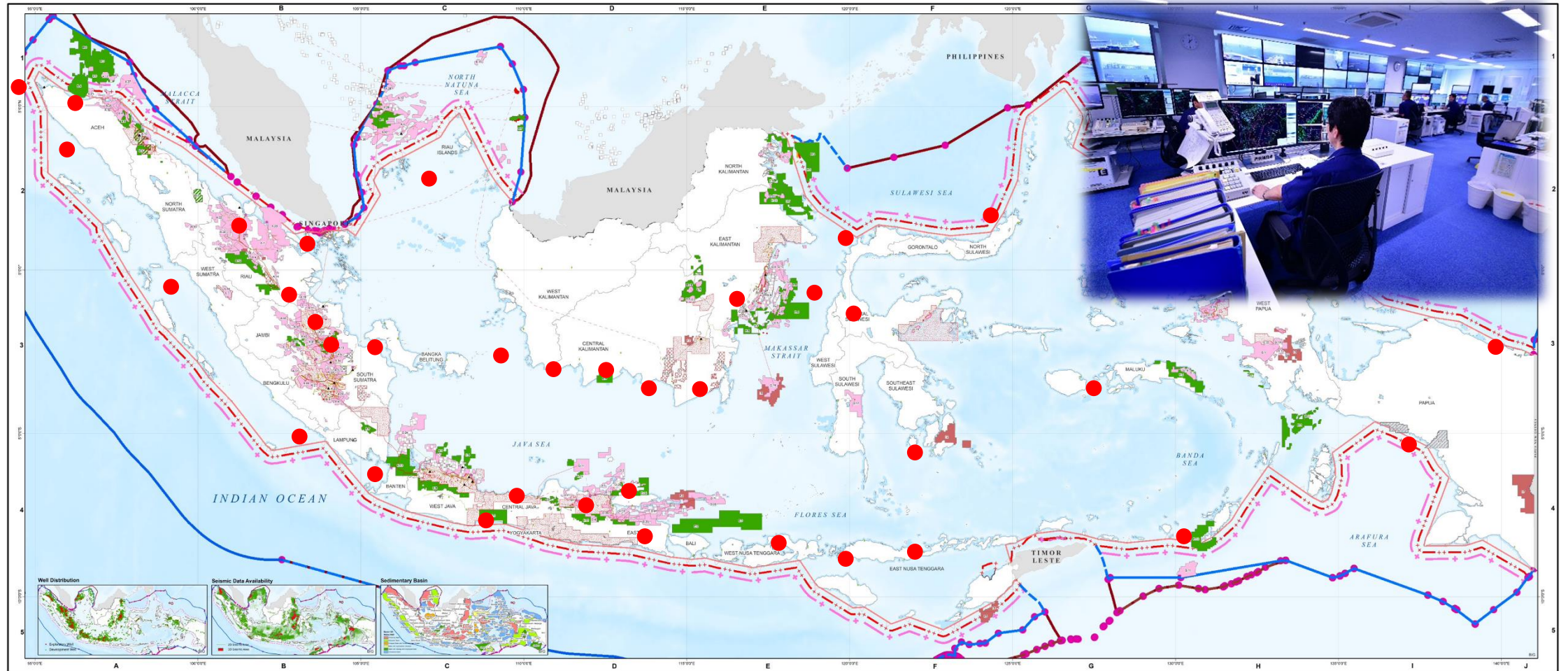
# Opportunities





# Cloud Radio System: The Smart Ocean Governance

## Central Management Center



Source: skmigas website, JRC website



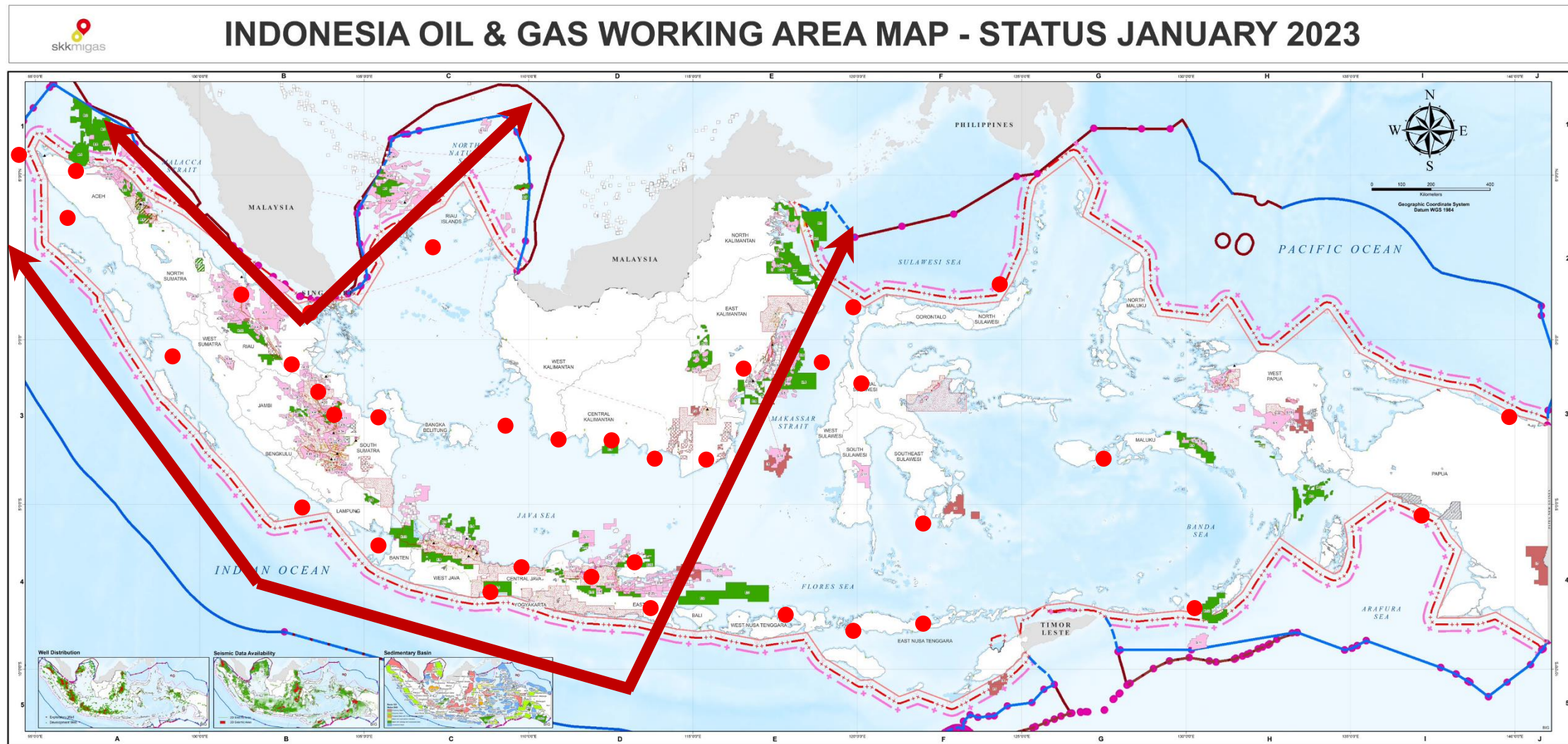
# Augmented Reality in Navigation: The Smart Lighthouse



Source: Malacca Strait Council



# Automation in Transportation: The Smart Sea Lane



Source: skkmigas website, JRC website

# Conclusion

# VDES and the Role of IT and Maritime Administrative Experts

- Port stations (operated by DGST) required to respond to VDES as part of the international trend
- VDES expected to undergo similar evolution and usage to IT

## <RECOMMENDATION>

- Installing VDES Equipment for International Compliance at Port Stations
- Optimizing VDES Benefits in Maritime Services through Software and Automation
- Necessity of IT/Maritime Adm. Experts for Efficient System Design and Development





# Terima kasih banyak

