TOWING MANUAL

“NAE SÃO PAULO”

JUNE / 2021

	Name	Date
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Revision	Description	Date
00	Inicial	15/06/2021

Sumário

1 INTRO

This manual aims to describe the procedure for inland and ocean towing of the ***"NAE SÃO PAULO"*** hull, from Ilha das Cobras – RJ, where it is moored, to the limit of Brazilian jurisdictional waters in the northeast of Brazil. The hull has as its finais destination the city of Aliaga in Turkey, where it will be dismantled for scrap.

From Ilha das Cobras - RJ to the exit of the Guanabara Bay - Rio de Janeiro – RJ, 02 (two) port azimuth tugs will be used, with at least 60 tons of bollard pull and 01 (one) main tug with at least 180 tons of bollard pull. The main tug will be responsible for the ocean tow. After leaving the Guanabara Bay – Rio de Janeiro – RJ, the port tugs will be disconnected, and the oceanic tow will be done by the main tug according to the settings described in this manual.

It should be noted that the ***"NAE SÃO PAULO"*** hull will be towed unmanned and without a source of electrical energy. Powering the navigation lights and flood alarms will be via batteries previously installed on board with sufficient capacity to carry out the entire voyage with a safety margin of at least 1.5 times. The navigation lights may have solar energy panels as their main power, with batteries as the second source of power.

All equipment used in the towing operation must be certified for the expected loads and be in good conditions and must be verified by the Marine Warranty Surveyor (MWS) in charge.

2 CLIENT DATA

- Name:	CORMACK MARITIMA LTDA.
- Company Register Number (BR):	01.956.427/0001-20
- Address:	AV VENEZUELA – Nº 03 SALA: 208, RJ - Brazil
- Zip Code:	20.081-311

3 HULL MAIN PARTICULARS

- Name:	**NAE *SÃO PAULO* (A-12)**
- Length Over All:	266,00 m
- Lenght Water Line:	238,00 m
- Max Width:	51,20 m
- Breadth (W.L)	31,70 m
- Towing Draft:	7,50 m

4 TUGS

4.1 PORT TUGS

The port tugs in charge on inland towage are not defined yet.

Must be 02 (two) azimuth type, with at least 60 tons of bollard pull (each) and suitable bow towing winches to manuevre.

4.2 MAIN TUG

The main tug in charge on inland and ocean towage is not defined yet.

Must be 01 (one) unrestricted ocean going tug, with at least 150 tons of bollard pull.

The tug must be fitted with certified towing winch with double drum. One certified main towing wire with at least 1200 meters long and other emergency towing wire with the same specifications of the main towing wire.

The tug must be fitted with suitable certified tow pin at stern.

The tug must be fittled with suitable stern roller.

The tug must be fitted with a motor sevice boat for at least 4 (four) people.

The tug must fitted with towing wire tension monitoring.

5 OPERATION SCHEDULE

INLAND TOWAGE

- Date and time of the beggining : To be Defined
- Inland Towage Distance: 8,0 NM
- Mean Inland Towage Speed: 3 knots
- Inland Towage time: 02:40 h

Notes:

1) For the inland towage is required 02(two) pilots onboard.
2) The length of towing wire of the the tugs can be adjusted on pilot criteria.

OCEAN TOWAGE

- Date and time of the beggining : To be Defined
- Ocean Towage Distance on Brazilian Waters: ~1400 MN
- Ocean Towage Distance on International Waters*: ~4612 MN
- Mean Ocean Towage Speed: 5 knots

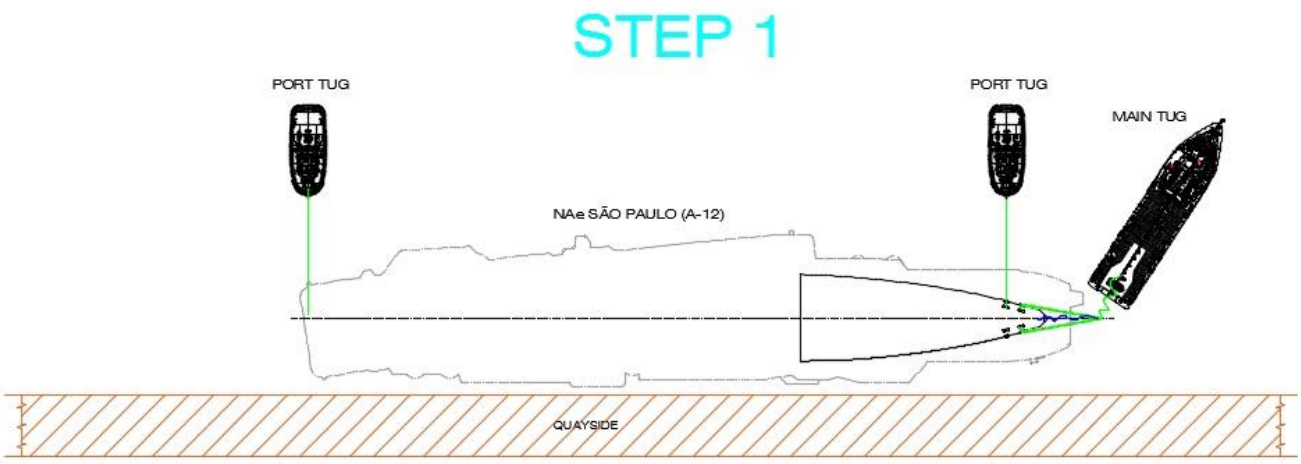
*Towage considering the route passing on strait of Gibraltar to Aliaga-Turkey.

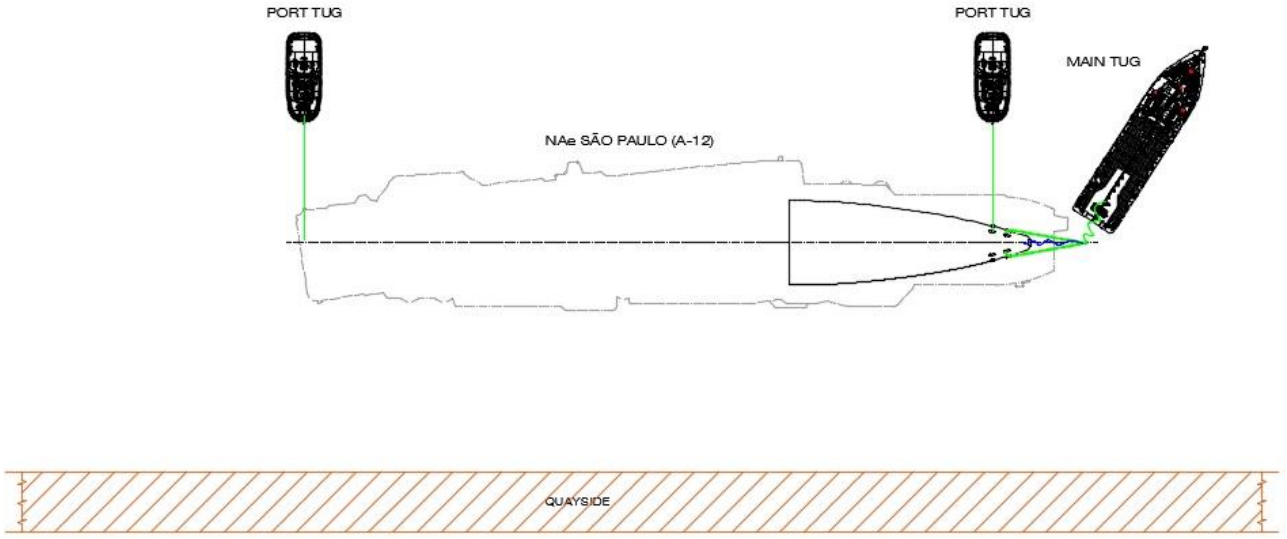
6 TOWING PROCEDURE

1. The "NAE SÃO PAULO" is already berthed at ilha das cobras – Rio de Janeiro – RJ by starboard side;
2. The main tug must approach by the stern to the "NAE SÃO PAULO" bow. The towing bridle will be connected to the towing wire of the main tug. The bridle connection at the "NAE SÃO PAULO" can be handle by the main tug deck equipments and mobile crane positioned at the quay;
3. After the connection, the position of the main tug must be in such a way that the towing wire must be stay slacked;
4. The both port tugs will be connected to the "NAE SÃO PAULO" bollards. One at fore mooring station and other at aft mooring station;
5. The pilots will come on board. For embarktion and disembarkation of the pilots and the peo-ple who will take care of the mooring lines a secured pilot ladder must be placed at starboard

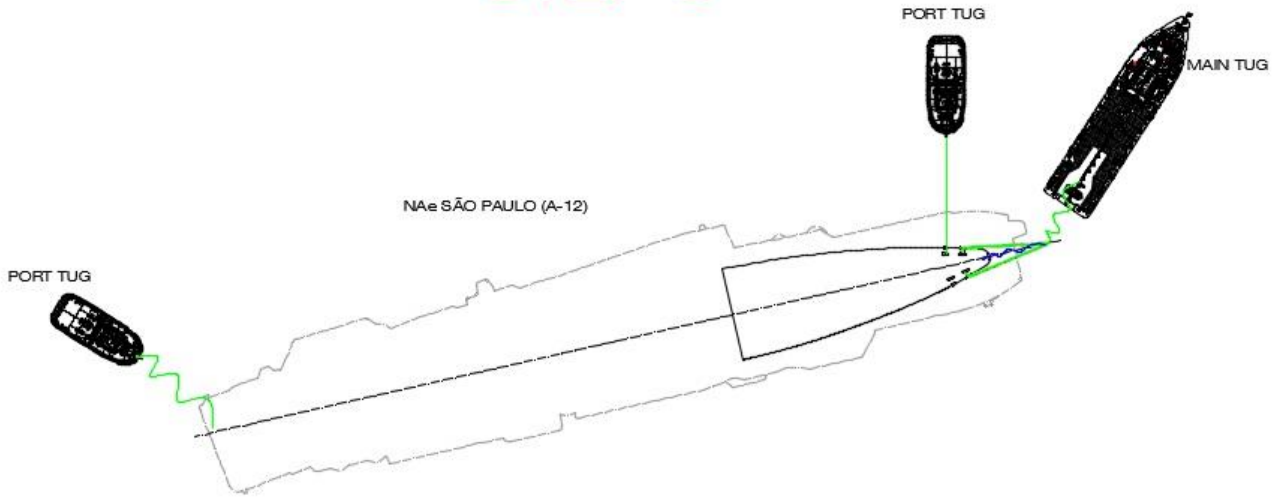
side of the Hull. At least one person who knows the “NAE SÃO PAULO” must accompany the pilots to the Upper deck;

6. The mooring and any connections of the “NAE SÃO PAULO” with land must be removed;
7. Port tugs must move the “NAE SÃO PAULO” away from the quay in order to allow the vessel to remain far away and angled to exit the navigation channel;
8. During the quay exit maneuver, the main tug must be with its system slacked and following the maneuver in accordance with the pilot's instructions. He may act in the maneuver at the discretion of the pilot;
9. After moving away and angling “NAE SÃO PAULO”, the main tug must tension its towing system so that it has approximately 60 meters of towing wire. The length of the cable can be adjusted at the pilot's discretion;
10. The bow port tug must be disconnected, which will follow the maneuver free and act on the side shell (push) according to the pilot's instructions;
11. The aft port tug must remain connected with the hull and position itself astern in such a way as to act as a rudder throughout the operation;
12. After leaving Guanabara Bay, the aft tug must be disconnected and pilots and other people on board disembark;
13. It is important that the access of pilots and other people on board must, after disembarkation, be made watertight and properly locked;
14. The main tug must paid out the towing wire to the ocean towage configuration.

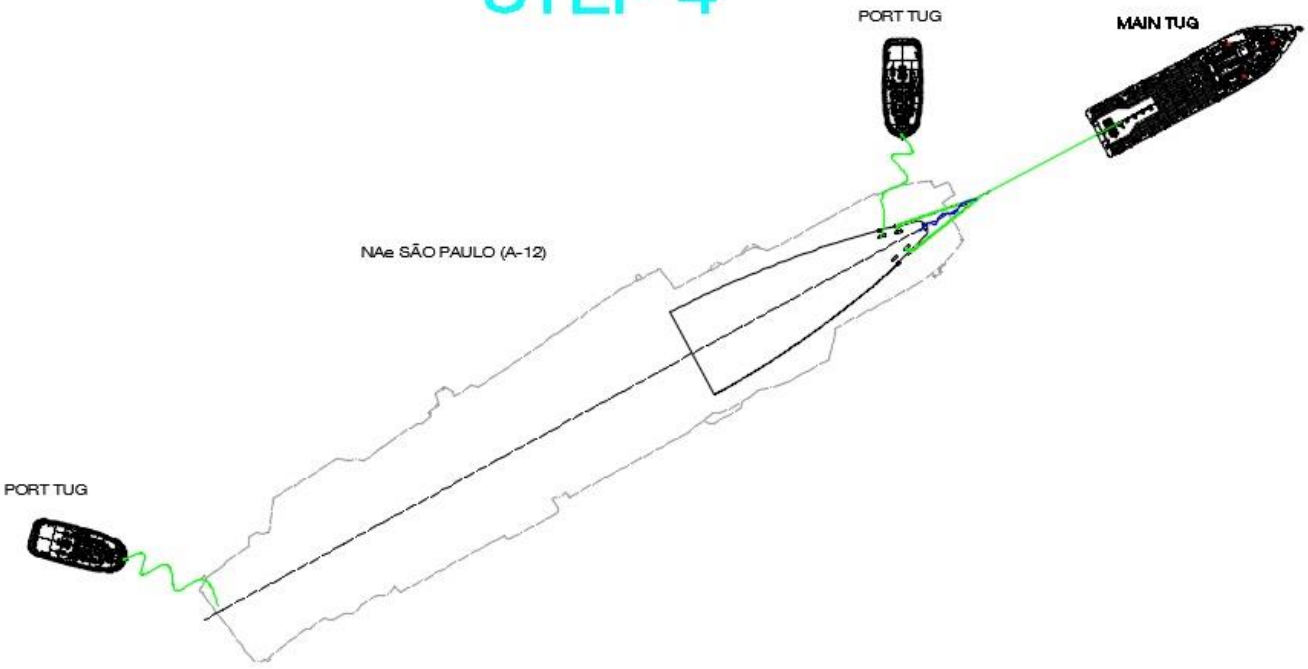

STEP 1
PORT TUG
PORT TUG
MAIN TUG
NAe SÃO PAULO (A-12)
QUAYSIDE

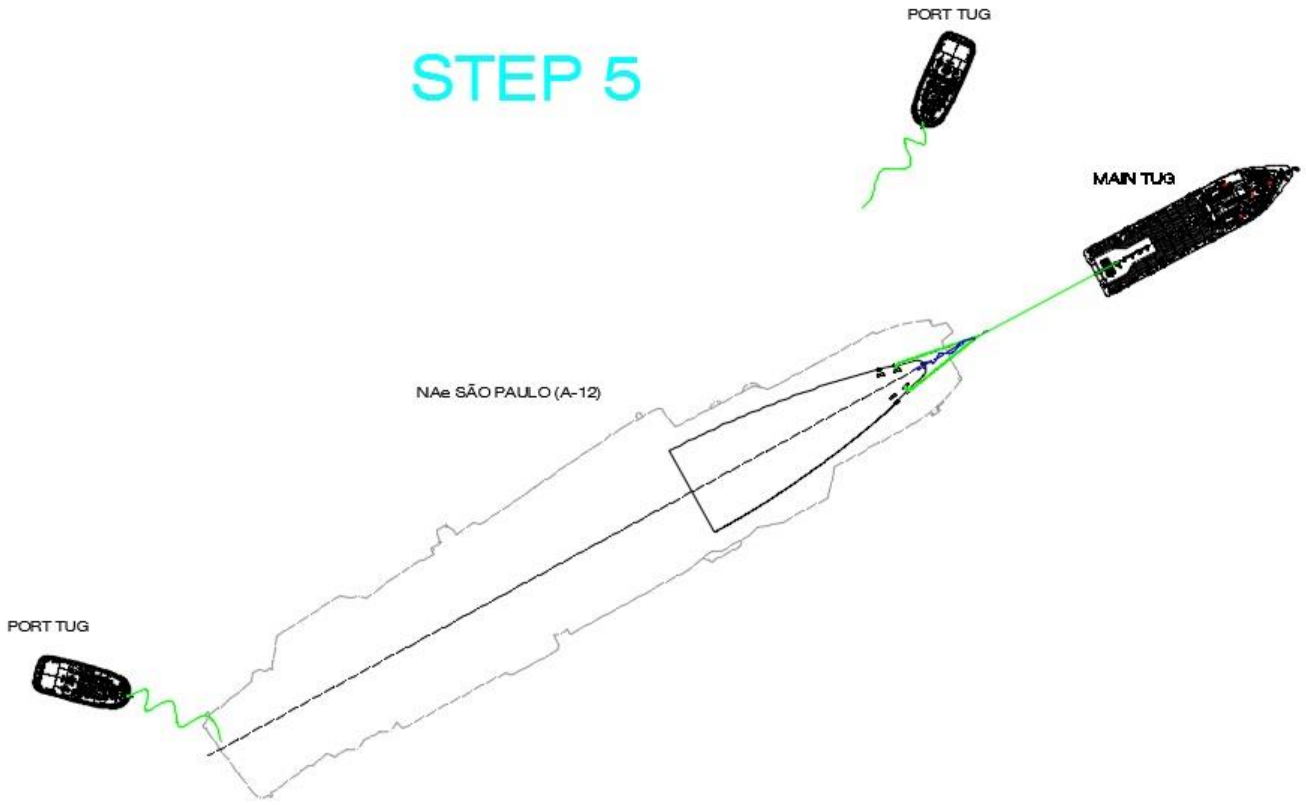

STEP 2
PORT TUG
PORT TUG
MAIN TUG
NAe SÃO PAULO (A-12)
QUAYSIDE

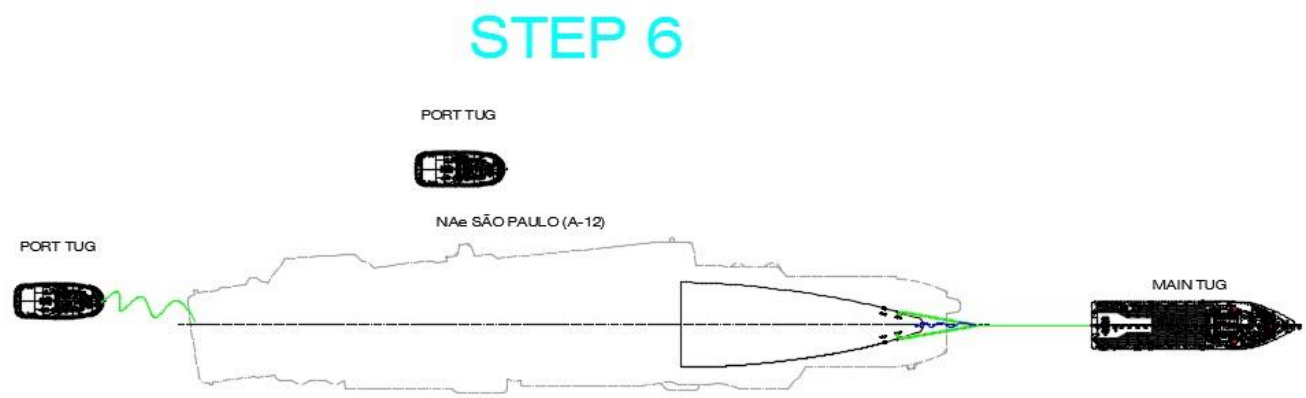
STEP 3


PORT TUG
MAIN TUG
NAe SÃO PAULO (A-12)
PORT TUG

STEP 4


PORT TUG
MAIN TUG
NAe SÃO PAULO (A-12)
PORT TUG


STEP 5
PORT TUG
MAIN TUG
NAe SÃO PAULO (A-12)
PORT TUG

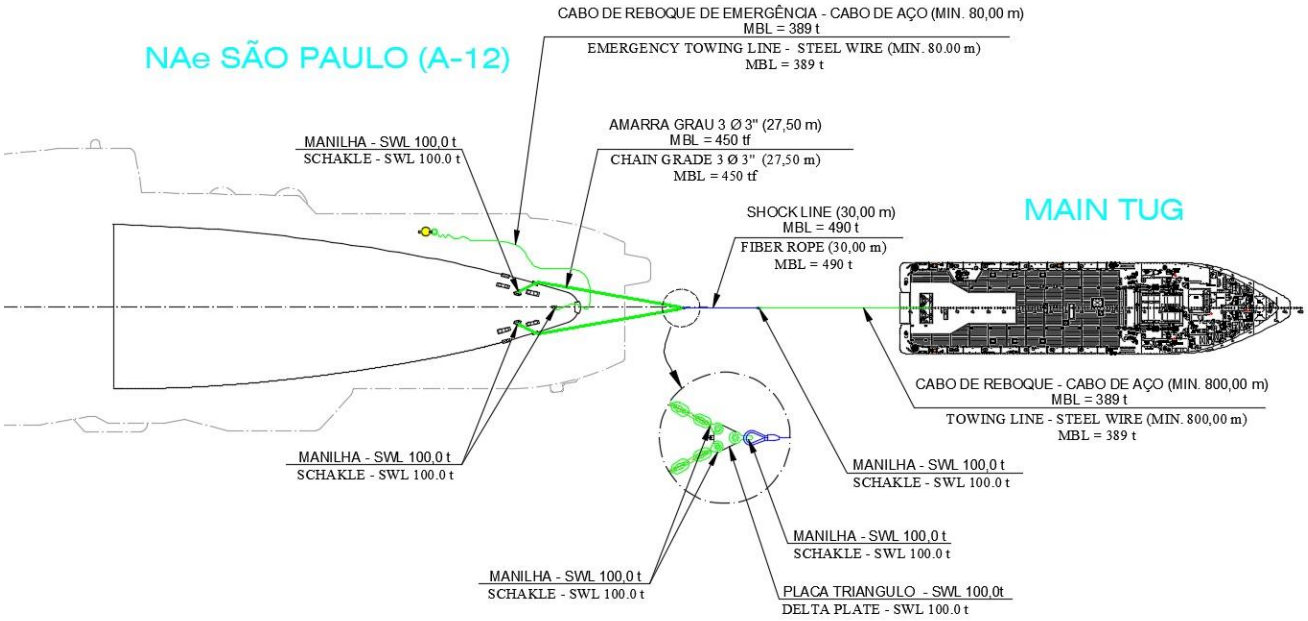

STEP 6
PORT TUG
NAe SÃO PAULO (A-12)
PORT TUG
MAIN TUG

7 TOWING EQUIPMENTS

7.1 INLAND TOWAGE

The configuration of the inland towage follows the same configuration as the ocean towage. The change is the adjustment of the length of the towing wire of the main tug. For inland towage, the length of the wire will be approximately 60 meters and can be adjusted at the pilot's discretion.

7.2 OCEAN TOWAGE



MATERIAL LIST

02 - STEEL CHAIN LINES, GRADE 3, Ø 3" / (27.50 m) / MBL 450 t
07 - SHACKLE W/ SCREW PIN, SWL:100.0 t (MBL = 5 x SWL)
01 - DELTA PLATE / SWL 100.0 t
01 - MAIN TOWING LINE - STEEL WIRE / (MIN. 800.00M) / MBL 389 t
01 - SHOCK LINE - FIBER ROPE / (30.00M) / MBL 490 t
01 - EMERGENCY TOWING LINE - STEEL WIRE / (MIN. 80.00M) / MBL 389 t

NOTES:

1) Where the tow wire may rub against the tow stern structures, there must be no sharp corners or corners that could damage the wire. The friction locations must be lubricated and protected with rubber strips;

2) Shocklines must be new or in like-new condition;

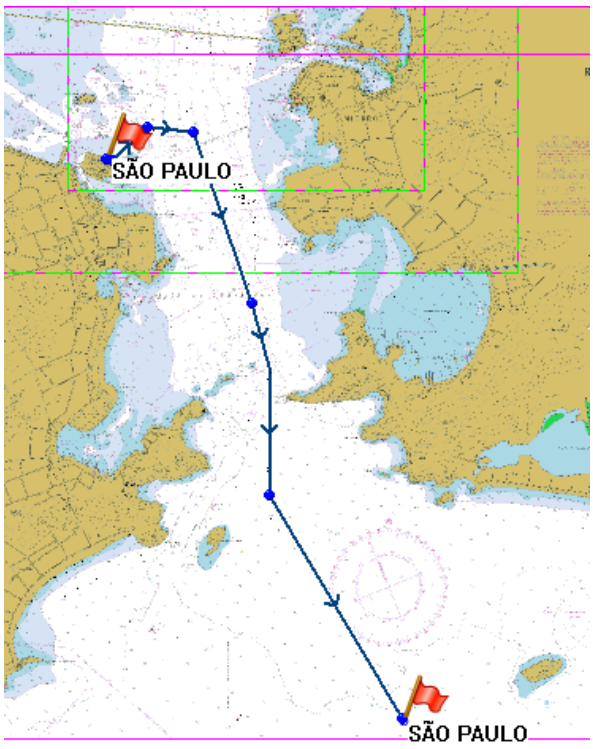
3) The main tug must have 1 (one) spare shockline with same specifications;

4) The main tug must have 2 (two) 100 t spare shackles.

8 TOWING ROUTE

INLAND TOWAGE (GUANABARA BAY)

WAYPOINTS	*LATITUDE*	*LONGITUDE*	*AZIMUTH*	*DISTANCE (MN)*
Ilha das Cobras - RJ	22°53'39.1" S	43°10'15.2"W	-	-
01	22°53'40.2"S,	43°10'11.2"W	046º	0.526
02	22°53'18.3"S	43°9'46.5"W	096º	0.509
03	22°53'21.9"S	43°9'13.7"W	161º	1.97
04	22°55'14.3"S	43°8'32.0"W	165º	0.789
05	22°56'00.3"S	43°8'19.1"W	180º	1.32
06	22°57'19.7"S	43°8'19.5"W	149º	2.84
Guanabara Bay Exit - RJ	22°59'46.9" S	43°06'45.1"W	-	-

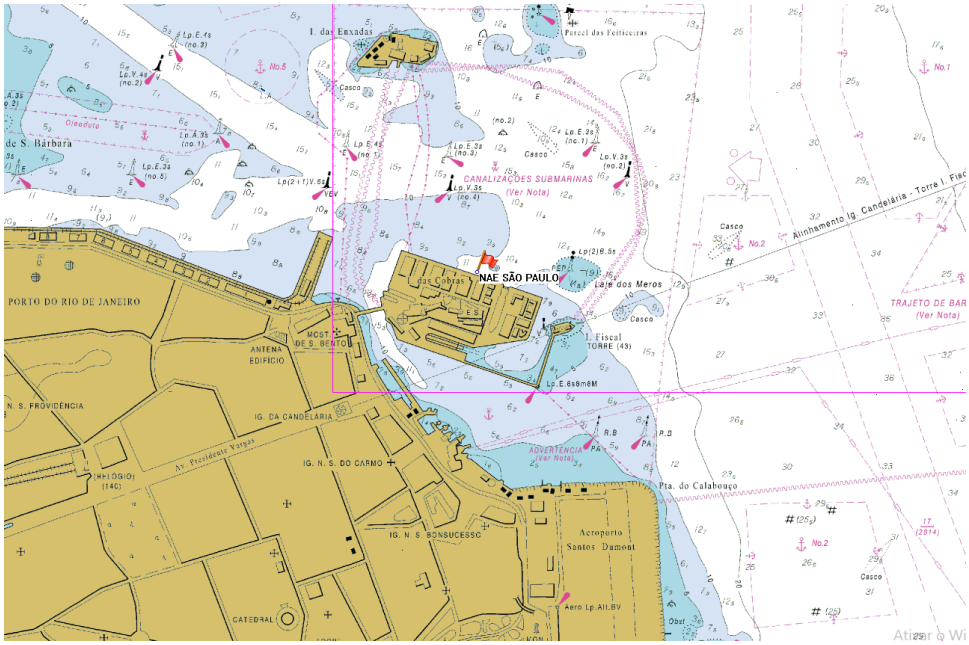


OCEAN TOWAGE

Predicted Route on Brazilian jurisdictional waters

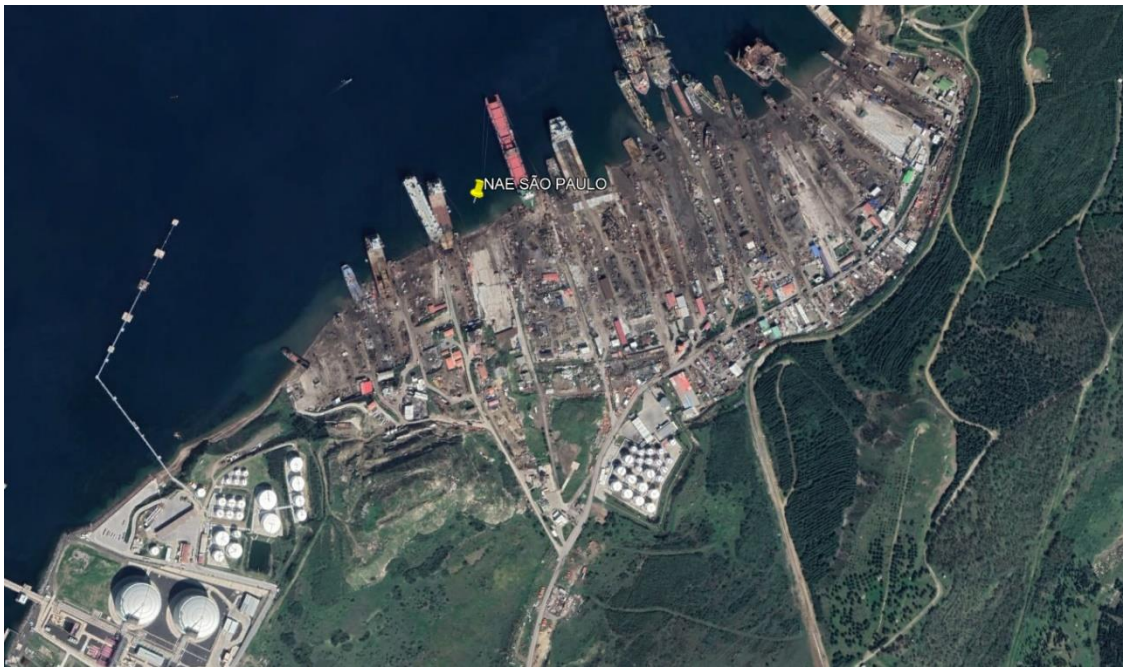
Route with coastal navigation in Brazilian jurisdictional waters, heading north, navigating the Atlantic Ocean, ending in the Strait of Gibraltar. After passing the strait, the convoy will sail across the Mediterranean Sea to Aliaga-Turkey, the final destination.

START – RIO DE JANEIRO - BRAZIL



END – ALIAGA - TURKEY

LATITUDE: 38°49'44.65"N
LONGITUDE: 26°55'36.21"E



9 TIGHTNESS AND BUOYANCY

Proof of the tightness and buoyancy of the hull will be required for a towing operation. All sea chests and/or openings in the hull that may allow the entry of water causing a flooding of relevant compartments or may cause progressive flooding must be externally sealed and made watertight.

All watertight doors in the hull must be closed. Their closing and sealing system must be in good condition. Access doors on the sides must have closing systems in good condition with rubber gasket.

All Openings in the hangar deck must be closed. Adequate drains must be ensured on the hangar deck, led to shell to ensure that possible embarked waters do not accumulate.

Underwater survey must be carried out by an accredited company to ensure that all sea chests were properly closed and the integrity of the hull underwater. A tightness and buoyancy certificate to be approved by the MWS must be issued.

10 LOADING CONDITION AND STABILITY

The "NAE SÃO PAULO" hull must be without any cargo on entire operation. All major items on board that can move and generate an unexpected change on load condition (Center of Gravity) during the voyage (bad weather) must be secured and fastened. Liquids on board that can generate a dangerous free surface effect must be drained.

The tanks must be loaded according to the attached capacity plan.

The loading condition must be such that it is foreseen in the existing stability study of the vessel and available on board "Renseigments pour la Stabilite" – Ex: Nº 2/3 SECU 1 – Porte-Avions "FOCH".

The predicted midship draft is 7.5 meters, Zero Heel, Max Trim of 0.5% LWL.

11 WEATHER CRITERIA

Regarding the IMO resolution "MSC/Circ. 884 – Guidelines for safe ocean towing" the weather condition required for an irrestricted ocean towing is:

- Wind: 20 m/s
- Significant wave height: 5 m
- Current: 0.5 m/s

12 REQUIRED BOLLARD PULL

The total force required to hold the "NAE SÃO PAULO" under the sea conditions presented in item 11, is 122 tons considering 65% of tug efficiency.

13 TOW MASTER

The tow master in charge of operation is not defined yet. His curriculum must be approved by MWS.

14 EMERGENCY PLAN

1) Bad Weather

During towing, in the event of a bad weather condition:

- Always heading to the wind and wave Direction;
- Monitoring the tension on the towline and adjust as necessary;
- Use all applicable navigation lights and warnings to inform the position of the towage;
- Search for shelter area if possible.

2) Towing equipments failure

- In case of failure on towing equipments, the emergency system must be released.
- In case of main towline failure, the spare towline must be used.
- In case of failure in any towing equipments, the tug master must report for the responsible of the operation and replace the damage equipment as soon as possible.

3) Shelter Area

During towing, if the master deems it necessary, for any reason, aiming at the safety of the operation and of the people on board, it must seek shelter area:

Brazilian shelter ports

ILHA DAS COBRAS – RIO DE JANEIRO	LAT: 22°53'39.1" S / LONG.: 43°10'14.9"W	145 M.N.
IMBETIBA PORT – MACAÉ	LAT.: 22°23'07.4"S / LONG.: 41°46'03.8"W	
IMBETIBA PORT – MACAÉ	LAT.: 22°23'07.4"S / LONG.: 41°46'03.8"W	72 M.N.
AÇU PORT – SÃO JOÃO DA BARRA	LAT.: 21°50'47.3"S / LONG.: 40°59'21.1"W	
AÇU PORT – SÃO JOÃO DA BARRA	LAT.: 21°50'47.3"S / LONG.: 40°59'21.1"W	162 M.N.
BARRA DO RIACHO TERMINAL	LAT.: 19°50'33.2"S / LONG.: 40°03'36.7"W	
BARRA DO RIACHO TERMINAL	LAT.: 19°50'33.2"S / LONG.: 40°03'36.7"W	402 M.N
ILHEUS PORT	LAT.: 14°46'41.5"S / LONG.: 39°1'38.8"W	
ILHEUS PORT	LAT.: 14°46'41.5"S / LONG.: 39°1'38.8"W	138 M.N.
SALVADOR PORT	LAT.: 12°58'12.9"S / LONG.: 38°30'50.5"W	
SALVADOR PORT	LAT.: 12°58'12.9"S / LONG.: 38°30'50.5"W	200 M.N.
SERGIPE PORT	LAT.: 10°50'39.1"S / LONG.: 36°55'10.5"W	
SERGIPE PORT	LAT.: 10°50'39.1"S / LONG.: 36°55'10.5"W	120 M.N.
MACEIÓ PORT	LAT.: 9°40'55.4"S / LONG.: 35°43'38.6"W	
MACEIÓ PORT	LAT.: 9°40'55.4"S / LONG.: 35°43'38.6"W	140 M.N.
SUAPE TERMINAL	LAT.: 8°3'24.5"S / LONG.: 34°52'06.5"W	
SUAPE TERMINAL	LAT.: 8°3'24.5"S / LONG.: 34°52'06.5"W	175 M.N.
NATAL PORT	LAT: 5°45'16.43"S / LONG: 35°11'58.76"W	

15 FINAL NOTES

1) Meet the safety requirements required by the Port Authorities;
2) The procedure must be approved by Harbor Master, Port Authority, MWS and Pilotage.

2) This document should not be considered as a Certificate of Seaworthiness and does not release the captains from their responsibilities during towing;

3) All conditions of buoyancy and tightness must be observed by the crew of tugs during the entire towage.

Niterói – RJ, 15 de Junho de 2021.

Eng.º Lucas Caldas Ferraz
CREA – 2019113828
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AWS Service