



# **AMET**

**ACADEMY OF MARITIME EDUCATION AND TRAINING**  
**DEEMED TO BE UNIVERSITY**  
(Under Section 3 of UGC Act 1956)

## **ACADEMY OF MARITIME EDUCATION AND TRAINING (AMET)**

(Declared as Deemed to be University u/s 3 of UGC Act 1956)

135, EAST COAST ROAD, KANATHUR, CHENNAI  
- 603 112.

TAMILNADU, INDIA

Internship Project –

**“TUTICORIN PORT”**

A Report On Internship In

Department of Nautical Science

By

<b>SL NO.</b>	<b>CADET NAME</b>	<b>ROLL NO.</b>	<b>REG.NO.</b>
<b>1.</b>	<b>ABINAV.K</b>	<b>2675A</b>	<b>ANS19001</b>

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled “**TUTICORINVPORT**” submitted by cadet . **ABINAV.A** Reg.No **ANS19001**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt. C.Krishna  
Associate Professor  
Department of Nautical Science

Capt. K.Karthik  
DEAN/ HOD  
Department of Nautical Science



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## INTERNSHIP ALLOCATION REPORT 2019-20

Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-17/ Group -6




Name of the Mentor : Capt. C.Krishna

Title of the assigned internship : **“TUTICORIN PORT”**

Nature of Internship : Individual/Group

Reg No of Student : ANS 19001

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



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Name of the Student	ABINANAV.K
Register No and Roll No	ANS 19001& 2675A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP-6
Semester	VI
Title of Internship	"TUTICORIN PORT"
Duration of Internship	1 MONTH
Mentor of the Student	Capt. C.Krishna

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	6
2	Adequacy & quality of information recorded	10	6
3	Drawings, sketches and data recorded	10	7
4	Thought process and recording techniques used	5	3
5	Organization of the information	5	3
6	Originality of the Internship Report	20	14
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	8
10	Presentation Skills	10	8
Total		<b>100</b>	<b>81</b>

Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
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**TUTI CORIN PORT**

**A Report on Internship**

**In**

**Department of BSc. Nautical Science**

**By**

**Student Name: Adersh S**

**Register Number: ANS19005**

**Month & Year**

**JUNE -2020**

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6. PORT SAFETY AND SECURITY
7. TRAFFIC HANDLES BY PORT
8. OTHER FACILITY

# **1.INTRODUCTION**

**V. O. Chidambaranar Port Trust** (formerly **Tuticorin Port Trust**) is one of the 13 major ports in India. It was declared to be a major port on 11 July 1974. It is second-largest port in Tamil Nadu and fourth-largest container terminal in India. After Sethusamudram Shipping Canal Project V. O. Chidambaranar Port Trust will be India's premier port and one of the major ports of Asia equal to Port of Singapore. V. O. Chidambaranar Port Trust is an artificial port. This is the third international port in Tamil Nadu and its second all-weather port.

## **2.VISION AND MISSION OF THE PORT**

## **Vision**

- To become a pioneer in providing quality and efficient cargo handling facility in South India and its Hinterland

## **Mission**

- To be the preferred distribution hub of India.
- To provide efficient seaport logistic for providing best value to our customers.
- To augment capacity by developing international standard Port infrastructure and installing State-of-the-Art handling equipments.
- To ensure quick turn-around of vessels by providing facilities, up gradation of equipments for efficient handling of cargo.

### 3. BERTHING FACILITIES

Sl No	Berth	Quay length (in m)	Parameters			Remarks
			Permissible LOA (in m)	Permissible Draught (in m)	DWT (in MT)	
1	VOC I	168	183	9.3	25000	
2	VOC II	168	183	9.3	40000	
3	VOC III	192	245*	11.5**	50000	Draught without tide = 11.0 m
4	VOC IV	192				
5	AB - I	168	183	8.6	40000	
6	AB - II	168	200*	9.3	40000	
7	VII	370	270	11.7	50000	for container vessels only
8	VIII	345	310	14.2***	93000	for container vessels only
9	IX	334.5	235	14.2***	93000	
10	Coal Jetty I	301	225	13.0	60000	Under upgradation
11	Coal Jetty II	318	225	13.0	65000	
12	Oil Jetty	150	150 - 228	13.0	40000	
13	North Cargo Berth I	306	245	14.0**	80000	
14	North Cargo Berth II	306	245	14.0**	80000	
15	Coastal Berth West (CBW)	185	160	9.0	15000	
16	Shallow Water Berth	140	120	5.85	6000	
17	Eastern Arm	140	100	7.4	-	

### 4. NAVIGATION FACILITY

Name of the Vessel	Type	Year of Commissioning	Length	Breadth	Moulded Depth (M)	Details of Main Engine – Power, Make & Model	Propulsion system	Capacity – Bollard pull speed
M.T.Tuticorin Gross Tonnage -425	Tractor Tug	2006	32	10.65	4.7	2 x 1880 KW @ 1000 rpm, Wartsila Italia – 6 L 26 A2	Voith Twin Screw	45 T ( 12 knots)
M.L.Tuticorin Gross Tonnage – 80	Pilot Launch	2005	21.5	6.7	2.6	2 x 477 KW @ 1800 rpm, Cummins KTA 19 M3	Schottel Twin Screw	(13 knots)
M.L.Nallathanni Gross Tonnage – 48	Pilot Launch	2010	16	5.2	2.5	2 x 450 KW @ 1800 rpm, Cummins KTA 19 M3 Engines	Conventional Twin Screw	(16 knots)
M.L.Musal	Pilot Launch	2014	17.15	5.2	1.2	2 x 450 KW, Cummins KTA 19 M3 Engines  Rs.6,660/ per Day + 10.3 % Service Tax + Fuel + Water + Electricity + Maintenance + Repairs Hired Directly by Marine Department	Conventional Twin Screw	16 Knots
M.L.Pothigai	Mooring Boat	2018	9.70	3.30	1.5	130 HP Ashok Leyland	Single Screw	7 Knots Speed

M.L.Alaimagal	Mooring Boat	2018	9.70	3.30	1.5	130 HP Ashok Leyland	Single Screw	7 Knots Speed
F.C. Bharathi Gross Tonnage -	Crane Pontoon	2003	34	12	0.9	Crane Make – TATA TFC 280-45 driven by Cummins Engine NT 743 C (Crane mte & rep by CHER Div Mech Deptt)	6 T @ 19.8 M opertaion radius with 21.24 M boom 32.66 T @ 4.57 M radius with 15.24 M boom	
<b>Details of Hired Crafts</b>								
M.T.Ocean Endurance (Hird from M/s.Ocean Sparkle)	Z Drive Tug	2012	30	9.54	4.70	2 x 1470 KW Niigata	Z Peller SRP Twin Screw	50 T (12 Knots)
M.T.Ocean Brave (Hird from M/s.Ocean Sparkle)	Z Drive Tug	2013	32.50	11.40	4.40	2 x 1470 KW Niigata	Z Peller 31 SRP Twin Screw	50 T (12 Knots)
YOJAKA DHATRI M/s SRMF Automobiles, (JV with M/s Yojaka (India) Pvt. Ltd.)	ISPS Patrol Boat	2012	15.5	4.6	2.67	Cummins Mer Cruiser Marine Engine Model QSC 8.3 500H PCB 2600RPM	Twin Screw (Contract Ends on 27.08.2023)	20 Knots

## **5.STORAGE FACILITY**

Open space for stacking bulk cargo and containers is available inside the security wall to the extent of 5, 53,000 sq. m. The open areas can accommodate around 30,000 tones of bulk cargo either for import or export and 2500 containers. In addition to containers, the open area inside the wharf is used for temporary stacking of bulk cargo such as coal and sulphur. V.O. Chidambaranar Port is having a vast open land of about 2,158 acres outside the main gate. Cargo go downs with a capacity of stacking 36,000 tones have been put up in this area by Tamil Nadu Warehousing Corporation. The Port has also permitted a number of other agencies to put up go downs and warehouses in order to augment the import and export trade through the Port. Open lands are also used for stacking of timber imported through the port as well as granite for export.



Type	Dry Storage Accommodation		Container								Remarks
	No	Area (Sq.mtrs)	Location Inside port	No	Location Inside Port/ Out Side Port	Capacity (Kls/Tonnes )	Type of Cargo	No	Location Inside Port/ Out Side Port	Capacity (TEUs)	
A. PORT OWNED											
a. Covered											
i. Transit shed / Overflow sheds	2	10,800	Inside								
ii. Warehouses	4	19,550	Inside								
iii. Container Freight Station											
b. Open		5,53,000	Inside						Inside	54,000	
B. OTHERS											
a. Covered											
i. Transit Shed / Overflow sheds				3	Inside	15,000 M3	Ph. Acid				
				1	Outside	10,000 MT	Liq. Ammo.				
ii. Warehouses (TNWHC) (CWC)	142	4,23,000	Outside	10	Outside	2000 M3	V.C.M.				
		36,000	Outside								
iii. Container Freight Station				1	Outside	5000 M3	V.C.M				
				3	Outside	3x8500 MT	F.Oil				
				2	Outside	2x70 KL	LSHF/H SD				
b. Open				3	Outside	1x13700 KL	Naptha				
						1x13800 KL	Naptha				
						1x14100 KL	Naptha				
				2	Outside	1x600 MT	L.D.O				
						1x938 MT	L.D.O				
				2	Outside	7790 KL	E.D.C				
				1	Outside	10000 KL	L.P.G.				

## **6.PORT SAFETY AND SECURITY**

### Port security

The central industrial security force of the govt. of India with adequate security personal headed by a commandant is deployed to man the vulnerable points in the port area. In addition, watch man of private agencies are deployed for watch keeping duties.

### Port safety

The office of the dock safety inspectorate, which is the regulatory authority to enforce safety, health and welfare of the dock workers, is functioning at this port.

## **7. TRAFFIC HANDLED BY THE PORT**

March 4, 2020: V O Chidambaranar Port, Tuticorin in southern Tamil Nadu achieved record container traffic of 7.41 lakh TEUs as on March 2, 2020, with a growth of 9.51 percent over traffic during the corresponding period of previous year (6.76 lakh TEUs) and has already surpassed previous financial year's container traffic of 7.39 lakh TEUs.

Cargo imports and exports hit an all-time high at the V.O. Chidambaranar Port, Tuticorin during this financial year up to March 2, 2020, with 33.11 million tones of cargo moving through the port. This represents 5.30 percent increase over last financial year's corresponding performance of 31.44 million tones.

INDICATORS	2014-15	2015-16	2016-17	2017-18	2018-19
CAPACITY(IN MILLION TONNES)	42.06	44.55	46.78	65.90	65.90
TARGET IN MILLION TONNES	32.00	36.80	39.50	38.00	38.00
TRAFFIC (IN MILLION TONNES)	32.41	36.85	38.46	36.58	34.34
Traffic in lakh tonnes	324.14	368.49	384.63	365.83	343.42
%of Traffic Growth	1.35	13.17	4.38	-4.89	-6.13
%OF Capacity Utilization	77.06	82.72	82.21	55.51	52.11
<b>1. AV. PRE-BERT DETN.</b>					
PORT A/C (IN DAYS)	0.16	0.27	0.37	0.39	0.12
NON-PORT A/C (IN DAYS)	0.97	1.14	1.61	0.88	0.63
OVERALL (in Days)	1.13	1.41	1.98	1.27	0.75
(in Hrs.)	27.12	33.84	47.52	30.48	18.00
<b>3.AV. TRT.</b>					
PORT A/C (IN DAYS)	2.54	2.28	2.47	2.37	1.69
NON-PORT A/C (IN DAYS)	1.01	1.45	1.93	0.32	0.27
OVERALL (in Days)	3.55	3.73	4.4	2.69	1.96
(in Hrs.)	85.20	89.52	105.60	64.56	47.04
<b>4. PERSHIP BERTHDAY OUTPUT (IN TONNES)</b>					
a. LIQUID BULK	3666	3829	3706	4062	4560
b. DRY BULK – MECH	11988	13187	15587	18453	19201
CONVENTIONAL	9879	10331	9362	9545	13687
c. CONTAINERS	21535	21018	24163	28301	36564
OUTPUT PER HOUR IN TEUS	46	43	50	58	75
d BREAK BULK	2364	2113	2147	2055	2129
OVERALL	10147	10239	10456	11961	15353
<b>5. NO. OF VESSELS HANDLED</b>					
a. LIQUID BULK	195	210	204	197	186
b. DRY BULK – MECH	134	162	170	167	182
CONVENTIONAL	321	354	346	292	153
c. CONTAINERS	496	573	534	469	550
d. BREAK BULK Zone A	171	216	307	222	173
e. BREAK BULK Zone B	63	73	101	135	126
f. PASSENGER VESSELS	-	-	-	-	-
OVERALL	1380	1588	1662	1482	1370
AV. PARCEL	24308	23834	24101	26658	27310
<b>6. TONNAGE HANDLED</b>					
a. LIQUID BULK	15.06	15.4	15.46	15.09	16.08
b. DRY BULK – MECH	63.83	78.9	99.77	109.36	97.99
CONVENTIONAL	119.79	131.25	115.64	78.29	65.08
c. CONTAINERS	110.34	123.88	129.91	141.92	149.56
d. BREAK BULK Zone A	12.48	15.35	17.8	13.31	8.87
e. BREAK BULK Zone B	2.64	3.71	6.05	7.86	5.84
<b>OVERALL</b>	<b>324.14</b>	<b>368.49</b>	<b>384.63</b>	<b>365.83</b>	<b>343.42</b>

## **8.OTHER FACILITIES**

- **Bunkering**
- **Supply of fresh water to the ships**
- **Vessel survey**
- **Cargo survey**
- **Salvage/diving**
- **Fire service**
- **Crew transport**

**THANK YOU**



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<b>1.</b>	<b>ALBIN ALEX</b>	<b>2719A</b>	<b>ANS19045</b>

April & 2020



## **BONAFIDE CERTIFICATE**

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Signature

(Guide )

Capt. C.Krishna

Associate Professor

Department of Nautical Science

DEAN/HOD

Capt. K.Karthik

DEAN/ HOD

Department of Nautical Science



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Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group -6




Name of the Mentor : Capt. C.Krishna

Title of the assigned internship : **“MUMBAI PORT”**

Nature of Internship : Individual/Group

Reg No of Student : ANS 19045

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		





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Register No and Roll No	ANS 19045& 2719A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP-5
Semester	VI
Title of Internship	"MUMBAI PORT"
Duration of Internship	1 MONTH
Mentor of the Student	Capt. C.Krishna

### Evaluation by the Department

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2	Adequacy & quality of information recorded	10	8
3	Drawings, sketches and data recorded	10	8
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5	Organization of the information	5	4
6	Originality of the Internship Report	20	14
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	8
10	Presentation Skills	10	8
Total		100	78

Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
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## INTRODUCTION

- ❖ The Mumbai Port lies in the midway west coast of India .
- ❖ The first of the present day docks was built in the 1870's. Its was established as Bombay Port Trust(BPT) on 26 June 1873.
- ❖ The Mumbai Port is in south Bombay, whereas one more port is built and established as Jawaharlal Nehru Port(JNPT) in Navi Mumbai.

## MUMBAI PORT TRUST



## GRNRAL INFORMATION

**Location-** Mumbai , Maharashtra

**Owned by-** Government of India

**Operated by-** Mumbai Port Trust

**Wharfs-**5

**Available berths -** 63

The Port of Mumbai is the largest port in India by size and traffic.

The harbor is spread across over 400 sq. kilometers (150 sq. miles).

The harbor open to the south of the Arabian Sea.

#### **MISSION STATEMENT**

- ❖ We the Mumbai Port Trust, are committed to provide customer friendly, reliable and cost efficient services,
- ❖ i ) By continually improving the processes and systems;
- ❖ ii) By maintaining transparency in the operation;
- ❖ iii) By meeting environmental norms;through teamwork, total employee involvement, training and effective review system

#### **FACILITIES AVAILABLE**

- ❖ Berthing facilities.
- ❖ Dry Dock facilities.
- ❖ Bunkering .
- ❖ Storage.
- ❖ Transport facilities.
- ❖ Stevedoring.
- ❖ Equipments
- ❖ Reefer points
- ❖ Reception facilities for ships generated waste.
- ❖ Cruise terminal.
- ❖ Operation system
- ❖ Navigational aids.



MUMBAI PORT TRUST LOGO

## DOCKS

- ❖ THE PRINCE'S DOCK; commissioned in 1880, has 8 berths of an available draft of 6.4 meters (21 feet).

- ❖ THE VICTORIA DOCK; commissioned in 1891, has 14 berths of an available draft of 6.7 meters (22 feet).

THE INDIRA DOCK; commissioned in 1914, has 21 berths with an available draft of 7 meters (23 feet)

- ❖ The Prince's Dock and The Victoria Dock are semi-tidal docks where vessels dock and depart at high tide.

The Indira Dock has a lock which enables vessels to enter a depart at any time

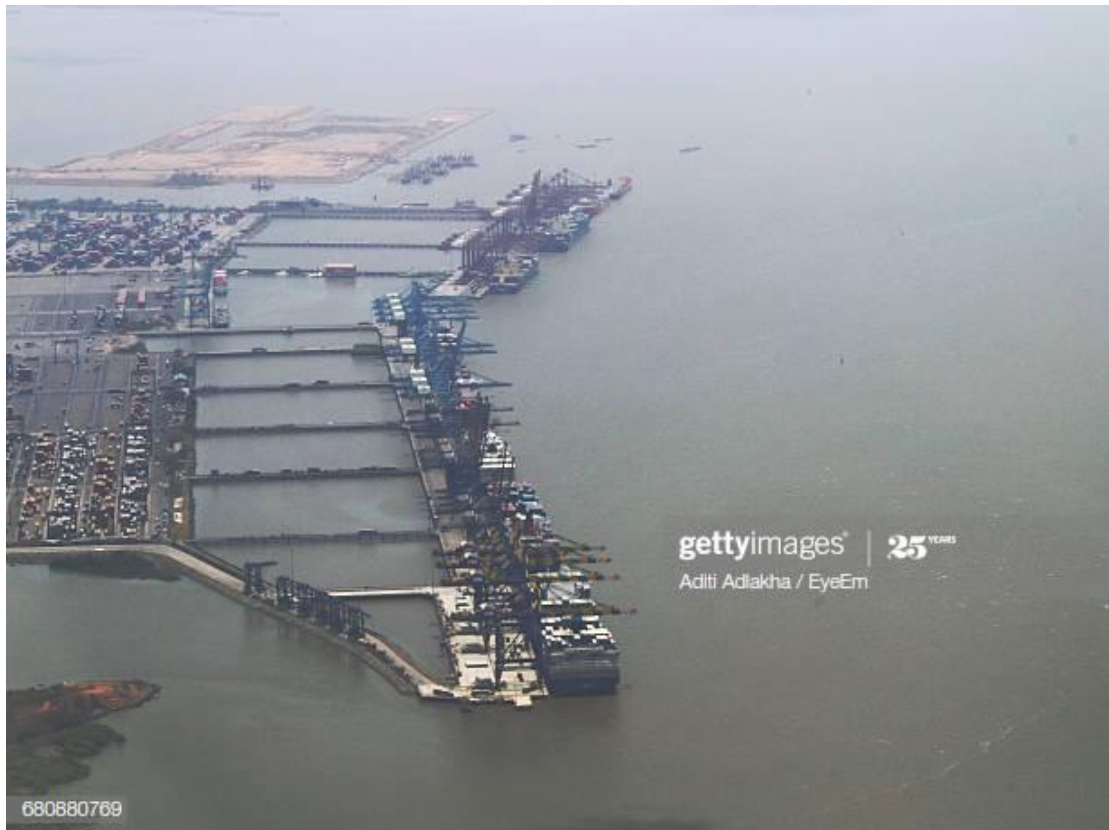


## JETTIES

- ❖ The Mumbai Port has 4 jetties on JAWAHAR DWEET , an island in the harbour for handling Crude Oil and Petroleum products.
- ❖ These Jetties have an available draft of 12.2 meters (40 feet).



- ❖ Liquid Chemicals are handled on a jetty on PIRPAU.



JETTIES

## BUOYS & BEACON

- ❖ There are three light buoys moored South-East of Prongs Lighthouse, one flashing a green light every five seconds, the other group (2) flashing red light every 10 seconds and the third flashing red every 5 seconds. Prongs reef buoy is fitted with a radar reflector.
- ❖ There are other important subsidiary light including the Dolphin Rock Light and
- ❖ Tucker Beacon Light. In addition the Elephanta patch beacon has been upgraded to improve its range.



BEACONS



BUOYS

## PASSENGER TERMINAL

- ❖ Ballard Pier Extension has a Passenger Terminal which includes immigration clearance facilities for crew and passengers of the cruise liners.



## CRUISE TERMINAL

### PILOTAGE

- ❖ A Pilot is mandatory for all vessels of over 100 tonnes net weightage.
- ❖ The port has a total of 63 Anchorage Points.



## JAWAHARLAL NEHRU PORT

### INTRODUCTION

- ❖ The port of Nhava Sheva which is widely known as the Jawaharlal Nehru Port, is located to the East of the Mumbai Port, about 6 nautical miles away across the Thane creek. It is the largest container port in India.

### GENERAL INFORMATION

- ❖ **Location :** Navi Mumbai, Maharashtra, India
- ❖ **Operated by :** Jawaharlal Nehru Port Trust
- ❖ **Owned by :** Government of India
- ❖ **Commissioned on :** May 26<sup>th</sup> 1989
- ❖ **Land area :** 2584 Hectares
- ❖ **Annual cargo tonnage :** Bulk 7.88 million tons
- ❖ **Container:** 56.43 million tons



Jawaharlal Nehru Port trust logo

### MISSION STATEMENT

- ❖ To be the port operator of choice in the world's gateway hubs, renowned for best-in-class services and successful partnerships.

### VALUES:

- ❖ Committed to excellence.
- ❖ Dedicated to customers.
- ❖ Focus on people and Integrated globally



### **Major exports**

- Textiles, sporting goods, carpets, textile machinery, boneless meat, chemicals and pharmaceuticals.

### **Major imports**

- Chemicals, machinery, plastics, electrical machinery, vegetable oils and aluminium and other non-ferrous metals.

### **TERMINALS**

- The Port of Nhava Sheva operates three container terminals: the Jawaharlal Nehru Port Container Terminal (JNPCT), the Nhava Sheva International Container Terminal(NSICT), and the Gateway Terminal India Pvt. Ltd. (GTIPL).



## **FACILITIES**

- The Port of Nhava Sheva operates a fleet of boats to facilitate the movement of cargo ships. These include four pilot launches, eight tugs.
- It has two mooring launches and one high-speed harbor patrol launch.
- The port has shallow water berth and port craft berth that can handle the feeder vessels.
- Transport facilities ( roads and rails).
- Storage facilities
- Equipments for loading and discharging are available.
- Reefer points
- Berthing facilities

**Thank you**



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April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled "**JAWAHARLAL NEHRU**PORT" submitted by Cadet.**ARJUN.K**Reg.No**ANS19127**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )  
Capt.P.Rajendran  
Associate Professor  
Department of Nautical Science

DEAN/HOD  
Capt. K.Karthik  
DEAN/ HOD  
Department of Nautical Science



# AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING  
DEEMED TO BE UNIVERSITY  
(Under Section 3 of UGC Act 1956)

## INTERNSHIP ALLOCATION REPORT 2019-20

Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group -6




Name of the Mentor : Capt.P.Rajendran

Title of the assigned internship : **“Jawaharlal Nehru Port”**

Nature of Internship : Individual/Group

Reg No of Student : ANS 19127

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



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## INTERNSHIP EVALUATION REPORT 2019-20




Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Student	ARJUN.K
Register No and Roll No	ANS 19127& 2801A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP-5
Semester	VI
Title of Internship	Jawaharlal Nehru Port
Duration of Internship	1 MONTH
Mentor of the Student	Capt.P.Rajendran

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	8
2	Adequacy & quality of information recorded	10	9
3	Drawings, sketches and data recorded	10	8
4	Thought process and recording techniques used	5	4
5	Organization of the information	5	3
6	Originality of the Internship Report	20	16
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	7
10	Presentation Skills	10	8
Total		100	79

Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
--	---	--



## INTRODUCTION

Mumbai Port has long been the principal gateway to India and has played a pivotal role in the development of the national economy, trade & commerce and prosperity of Mumbai city in particular. The port has achieved this position through continuous endeavor to serve the changing needs of maritime trade. Though traditionally designed to handle general cargo, over the years, the port has adapted to changing shipping trends and cargo packaging from break bulk to unitization/palletisation and containerization. Besides, it has also developed specialized berths for handling POL and chemicals. For decades, Mumbai Port was India's premier port. Even today, with the development of other ports, it caters to 10% of the country's sea-borne trade handled by Major Ports of the country in terms of volume. It caters about 19% of POL Traffic handled by Major Ports.

Having weathered and survived many a changes in maritime trade in its long history, Mumbai Port is today facing challenges posed by competition from adjoining ports and private ports, changing traffic patterns, inherent physical constraints and continuing labour intensive operations, *etc.* However, Mumbai Port is taking various measures to render cost effective and quality services to the trade.





## CONTENTS

- VISION AND MISSION
- BERTHING FACILITIES
- STORAGE FACILITIES
- PORT SAFETY AND SECURITY
- TRAFFIC HANDLED BY PORT
- NAVIGATIONAL  
FACILITIES
- OTHER FACILITIES

## **VISION \$ MISSION**

### **VISION**

To ensure zero corruption organizational atmosphere with positive impact on performance of individual employees . To become the premier container port in south Asia

### **MISSION**

To be equipped with state of the art and technology, efficiency and manpower which are at par with the international is conform to international standards and offer cost effective integrated logistics standards

- Ensure security with safety of life ,equipment and cargo
- Pressure the principles of eco –friendly
- Sustainable development

Coastally upgrade the competence, awareness, skills and motivational of port personal for continual improvements in all efficiency parameters. We, at the Mumbai Port Trust, provide integrated sea-port facilities for handling, storage and delivery of cargo/container to our customers' requirements. We are committed to:

- Strive excellence in port operations by improving infrastructure facilities;
- Improve our service processes and Quality systems continually;
- Establish quality objectives for improvement in our operations;
- Observe safety norms;

Through teamwork, total employee involvement, training and effective review system for continued sustainability.

Our aim is total customer satisfaction and continued happiness of all stakeholders



## **BERTHING FACILITIES**

The JNP TRUST Container Terminal is operated by JNPT .It has a quay length of 680 meters (2,230sq) with 3 berths.

The Nhava sheva international containers terminal (NSICT) is leased to a consortium led by p&o, now a port of DP world .commissioned in July 2000; it has a 600m (2000sq) quay length with two berths.

## **STORAGE FACILITIES**

Annual cargo tonnage of bulk is 7.88 million tons and containers are 56.43 million tons. Annual containers volume is 5.05 million. The Nhava sheva international containers Terminal (NSICT) is leased to a consortium led by p & o now a port of DP world. Commissioned in July 2000, it has a 600 meters (2000sq) quay length with two berths. Which can handle up to 62.15 million tons of cargo, i.e. totally 4.8 million TEUS (60 MTPA). There are three container terminals;

- A) JAWAHARLAL NEHRU PORT Containers terminal (JNPCT) , THE NHAVA SEVA
- B) INTERNATIONAL CONTAINERS Terminal (NSICT) and the gateway Terminals India pvt ltd. Shortly, NSICT can handle up to 62.15 million tons of cargo. Gateway Terminals India (GTI) can handle 1.3 million tons

## **PORT SAFETY AND SECURITY**

Mainly Focuses On 3 Important Principles: Safety Of Workplace, Working Conditions And The Minimal Impact On The Environment. Mainly Port Safety and Security System Includes

- Port Security Assessment And Awareness
- Security Towards Internals And Externals
- Identification And Classifying Infectious Substances For Transport
- Procedures For Legal And Safe Shipping
- Measures , Procedures And Requirements Of Health and Safety At Port
- Essentials Of Reporting And Investigations
- Contingency Planning , Maritime Law , Safety And Environment Protections
- Principles Of Quality Management and Quality Management Software

## S

## - Threat Instigation Strategies

Vigilance corner CVC plays a pivotal role in uprooting and eradicating corruption among the government machineries vigilance department in JNPT is serving as a central agency & striving for the integrity and efficiency in the organization. Vigilance work can be successful and productive with the help of all officers and employees

**TRAFFIC**

Inp Accounts for More Than Half of Total Containers Volumes Handled at India's 12 Public Ports And Around 40% Of the Nation's overall Containerized ocean trade. Major exports from Jawaharlal Nehru port are textiles , sporting goods ,carpets , textile maichery ,boneless meat , chemical , machinery ,plastics , electrical maichery, vegetable oils and aluminum and other non – ferrous metals the port handles cargo traffic mostly originating from destined for Maharashtra , Madhya Pradesh ,Gujarat ,Karnataka, as well as most of North India

This department is responsible for the smooth and safe movement of containers in-out of the port in a manner the ensures optimum benefit of time and cost for EXIM community and provides ease of doing business

**KEY FUNCTIONS OF THE DEPARTMENT:**

- To mange the container terminal operations (main containers berth) in its entirety ensuring speedy loading and unloading of containers, receipt , stacking and disposal of containers at the yard , maintaining
- Management of receipt and dispatch of exports and import containers respectively by road and its associated activities
- Operating contracts for hiring the services of TTs , reach stackers ,conservancy ,allotment of paved area inside CT,claims ,arbitration , auctions etc
- Compliance of dock safety regulation and all related correspondence
- Preparations of budget for the year
- Ensuring proper co-ordination with other terminal for effective implementation of ITRHO to improve turnaround time of mixed rakes
- Co-ordination with external agencies such as concur other rail operation , other terminal for smooth operations

## NHAVA SHEVA / JAWAHARLAL NEHRU PORT

### NAVIGATIONAL FACILITIES

#### **Anchorage**

There are 63 anchorage points                      Anchorage Points (Points K3 and V1)

#### **Buoys and Beacon**

1. There are three light buoys moored South-East of Prongs Lighthouse, one flashing a green light every five seconds, the other group (2) flashing red light every 10 seconds and the third flashing red every 5 seconds. Prongs reef buoy is fitted with a radar reflector.
2. There are other important subsidiary light including the Dolphin Rock Light and Tucker Beacon Light.
3. 4 nos. Lighted floating buoys to mark the approach channel, 2 jetty end beacons at mooring dolphins 1 and 4 and 2 leading lights have been provided for night navigation. In addition the Elephanta patch beacon has been upgraded to improve its range.

#### **Lighthouse**

1. Kennery Lighthouse, which marks the Southern Boundary of the Port limits, is a light of the first order dioptric, group-flashing white, and shows groups of two flashes with a visibility upto 25 kms in clear weather. The name of this lighthouse has now been changed as KANHOJI ANGRE LIGHT HOUSE.
2. Prongs Lighthouse marks a reef Southwards from Colaba Point and dangerous ground which extends for a distance of 1.6 km. from it. The light is of the first order dioptric and exhibits at night, every 10 seconds, a white flash light with a visibility up to 27 kms.
3. About 3.2 kms ENE off Prongs Lighthouse is the Sunk Rock Lighthouse. It is unattended and shows red light with white rays flashing every 6 seconds

## **Vessel Traffic System (VTS)**

A state-of-the-art VTS for control of ports operations, Surveillance and harbour navigation (Tracking and guidance of ships), having interface with Port MIS was earlier commissioned in September 1997 and the same has been replaced with new advanced state-of-the-art technology VTS and commissioned in September 2011. The fully computerised VTS employs three dual radars, 5 microwave links, two control stations (Mumbai Port Trust- BPX and JNPT control) one Radio Direction Finder, Differential Global positioning system, VHF & UHF communication system, CCTV system and Automatic Identification System (AIS). Major beneficiaries of VTS are Mumbai Port Trust, JNPT and Indian Navy.



## **OTHER FACILITIES**

### **Integrated Port Operating System Port Community System**

Port Community System (PCS) is a single window web application, which allows the port community and stakeholders to access the centralized repository to view transactions. The users of this system also can track and trace the cargo or container details. Through this application, they can also avail the real time vessel, finance, transport, cargo, and container status. It also covers online payment of bills and interface with Integrated Port Operating System (IPOS).

### **Sales and Cargo Sales System**

The Sales branch mainly deals with the auction of the import or export cargo lying uncleared/unclaimed in the Major Port Trust Act 1963. This forms an important part of the

The details of uncleared/unclaimed cargo is merged as un cleared cargo (u/c) list into sale cargo line a unique lot no. is given, notices are generated and sent to respective for Bill of Entry formalities. The lots with Bill of Entry formalities over are put into final auction list. The d generated as per Docks Scale Of Rates. Lots which are not sold are again put into auction sale as per cycle

### **Tender Management System**

**Tender Management System was developed to cater to the purchases/works of Civil, Mechanical and Planning and Research department. The Tender Management System**

Integrated Port Operating System (IPOS) covers all operational activities of the port. The system caters to Vessel, Port, Cargo, Container, Rail and Operation Resource activities in five modules. The activities comprises of all transactions at the Port including Vessel, Sheds, Gate activities, Import and Export processing, Container Stuffing and Stripping (de-stuffing), Cargo Receipt and delivery, Labour/Equipment Booking, Documentation, Resource Allocation, Rail documentation and operations and the terminal management. incorporates the complete tender cycle. It includes Estimate Preparation, Proposal, Sale, Receipt and opening of tender till award of contract. It also includes Bank Guarantee, Billing, Income Tax, VAT remittance, e-TDS. The system also generates various reports, certificates and e-TDS submission files.

### **Integrated Material Management System**

This system caters to the purchase requirements of stock and non stock items. The system allows online indenting of material, Annual Contract Management, Tender Management, Purchase Order Management, Goods Receipt Management, Material Inspection Management, Material Issue Management, online stock maintenance. The tender value, purchase order value etc. are calculated automatically in the system. All the items are codified in the system irrespective of its type i.e. stock or non stock item. System generates various reports like indent, recoupment memo, purchase order, acceptance letter, tender etc.

### **Stevedoring**

Mumbai Port Trust is providing Stevedoring / Gear services for loading and unloading of various categories of cargo on board the vessel and Container loading, unloading, stuffing destuffing in the port. The operations are carried out efficiently by the skilled On Board Labour under the instruction of experienced On Board Supervisory staff in coordination with vessel agents and under the supervision of the master of the Vessel. Mb. P. T. is committed to offer time bound and prompt quality service to the Vessel Agents in accordance with the ISO quality policy

·  
ADVANCE PAYMENT



On the basis of manifested quantity and commodity of cargo mentioned in IGM, advance payment is received on self assessment basis (Format of PDR – Annexure A). the Demand Draft and Pay Order is to be drawn in favour of “The Chairman, Mb. P. T.” and must be deposited in account number 10996681184 in the State Bank of India – Extension Counter, Operation Service Center, Indira Docks.

#### GEAR CHARGES

The agents who use their own gears need not pay Gear Charges. In case, the Vessel Agent desires to use Port Gears for Stevedoring operation, they are required to pay Gear Charges as prescribed – Annexure B , in addition to stevedoring charges.

#### Dry Docks (Ship Repairing)



the existing facilities provide all major services for repairs to the ship. The impounding water to an extra height of 1.20m so that the depth of water.



During fair weather seasons the depth of water level can be increased even up a capacity and 8 Oxy-Acetylene outlets have been provided.

#### DETAILS OF FACILITIES AVAILABLE AT DRY DOCKS

##### Hughes Dock

	Dimensions of ship which can be accommodated		Electric Supply	Compressed Air	Cranes
	Length	Beam			
	Outer Comp. 380 V Phase 250 Amplifier	Inner Comp. 30.48 m	415V 3 phase 60 cycles 230 V Single phase 130 V Three phase 32 V 50 cycles 24V A.C. * 110 V and 220 V DC supply	100 lbs. per sq. inch 500 C.F.M.	One no. electric crane of 5 tonnes capacity  One no. electric crane of 20 - ton capacity
Outer Grove	123.44 m	170.84 m			
Middle Grove	146.30 m	125.12 m			
Inner Groove	169.16 m	125.12 m			
Without Caisson	304.04 m				

#### Additional Facilities:

The following additional facilities have been provided under “Modernisation of ship repair”

1. Workshop building
2. One sub-station on each side(i.e, two per dry dock).
3. Lightning mast to improve the visibility
4. Automatic fire fighting system.
5. Supply of salt water on one side of the dry docks.
6. Supply of fresh water on the side of the dry docks.
7. Supply of dry compressed air on one side of the dry docks.
8. Capstans at suitable location
9. 6Nos. water jet pumps
10. 6 Nos. grid blasting machines.
11. 10 Nos. spray painting machines.
12. 12 Nos. scaffolding sets.
13. Office building at MDD east only.
14. Sub-station with frequency convertor and various supply voltage.
15. Yard lighting.

#### Bunkering

Oil for bunkering can be obtained practically at all berths.

## Cruise Terminal



The terminal is situated at Ballard Pier (BPX) within 5-10 minutes driving distance from the Taj Mahal Hotel, Museum, Art galleries, CBD of Fort, Colaba Causeway, Nariman Point and Marine Drive.

The Cruise Terminal has check- in baggage handling facilities, a lounge, duty free shop, curios and handicraft stalls and toilets etc.

### Features :

- Dedicated Cruise Terminal at BPX
- Domestic Cruise at Ferry Wharf Shed no. 3

Details of the cruise passengers handled at Mumbai Port – both international and domestic – during the last six years is given in the following table:

	International Cruise		Domestic Cruise		Total	
	No. of calls	Passengers *	No. of calls	Passengers	No. of calls	Passengers

2007-08	25	14212	59	54917	84	69129
2008-09	30	17375	45	26247	75	43622
2009-10	33	27482	90	62032	123	89514
2010-11	42	27529	21	12063	63	39592
2011-12	40	36803	---	---	40	36803
2012-13	41	27827	---	---	41	27827

## CONCLUSION:

Thus these are all the major specification of the busiest container port in India . Having set for itself a long term goal of achieving 10 million Tons by the year 2020=22 through addition of two terminals and the increasing the amount of facilities so it can reach a level one of best and biggest port of India and south





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## **ACADEMY OF MARITIME EDUCATION AND TRAINING (AMET)**

(Declared as Deemed to be University u/s 3 of UGC Act 1956)

135, EAST COAST ROAD, KANATHUR, CHENNAI  
- 603 112.

TAMILNADU, INDIA

Internship Project –

**“KANDLA PORT”**

A Report On Internship In

Department of Nautical Science

By

<b>SL NO.</b>	<b>CADET NAME</b>	<b>ROLL NO.</b>	<b>REG.NO.</b>
<b>1.</b>	<b>HARSHITH.R</b>	<b>2801AA</b>	<b>ANS19175</b>

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled “**KANDLAPORT**”

submitted by Cadet.**HARSHITH.R**Reg.No**ANS19175**...Batch

**18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt.P.Rajendran  
Associate Professor

Department of Nautical Science

DEAN/HOD  
Capt. K.Karthik  
DEAN/ HOD

Department of Nautical Science





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Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group -6




Name of the Mentor : Capt.P.Rajendran

Title of the assigned internship : **“KANDLA PORT”**

Nature of Internship : Individual/Group

Reg No of Student : ANS 19175

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



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Name of the Student	<b>HARSHITH.R</b>
Register No and Roll No	ANS 19175& 2849A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP-5
Semester	<b>VI</b>
Title of Internship	<b>KANDLA PORT</b>
Duration of Internship	1 MONTH
Mentor of the Student	<b>Capt.P.Rajendran</b>

### Evaluation by the Department

S1 No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	8
2	Adequacy & quality of information recorded	10	9
3	Drawings, sketches and data recorded	10	8
4	Thought process and recording techniques used	5	4
5	Organization of the information	5	3
6	Originality of the Internship Report	20	17
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	9
10	Presentation Skills	10	9
Total		<b>100</b>	<b>83</b>

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		

# **HOME BASED INTERNSHIP**

## **DEENDAYAL PORT (KANDLA PORT)**

### **VISION**

To be the one of the most economical modern port rendering cost of service to customers.



### **MISSION**

Deendayal port will emerge as a vibrant, world class, multi cargo port offering services at different location and having dominant share of regional cargo by virtue of its ability to effectively leverage its location and land resources for facilitation of growth of economic activities and investments with objective of developing mutually beneficial and substantial linkage with port based industries and users thereby making kandla the driver of economic growth in the region.

## BERTHING FACILITIES

Kandla port handles dry cargo at its 14 general berths, 6 oil jetties for handling POL products and other liquid cargo traffic and 3 single buoy mooring at Vadinar for handling crude oil.

## NAVIGATION FACILITIES

The port channel is marked with 22 lighted navigational buoys and a light house also assists.

The port offers 12 dry cargo berths with total quay length of 2532 meters. It also operates six oil jetties, one deep draught mooring and four cargo mooring in the inner harbor.



## TRAFFIC HANDLED BY PORT

In year 2019-2020 the cargo handling has marginally increased. The port handled 453.98 lakh MT dry cargo in current financial year by February which was 427.61 lakh MT in the corresponding last year. Vadinar facility, where the port handles crude oil and petroleum, oil and lubricants the port

handles 529.24 lakh MT in FY till February as against 511.18 lakh MT in FY. The transshipment traffic at the port increased current fiscal.

## STORAGE FACILITIES

It offers and excellent and vast dry cargo storage facilities inside the custom bonded area on a competitive rate

Storage area for dry cargo

Inside custom area

Godown: 2.01 - 6.33 lakh (sq.mtr) Open area: 20.58 – 48.28 lakh (sq.mtr)

Outside custom bonded area

Godown: 1.33 lakh (sq.mtr)

Storage for liquid

Private sector storage: 12.53 lakh (in kl)

Public sector and co-operative: 11.22 lakh (in kl)

## PORT SAFETY AND SECURITY

Kandla has international security for protection.

They have 500”SAINIK” unit.

Air defense regiment, line defense regiment and court guard.

They also do satellite monitoring.

They have been awarded “MANAGEMENT EFFICINECY”

ISO-9001-2001

award.

## OTHER FACILITIES BY PORT

Ship repair.

Dry dock

Railway service

Garbage disposal

Dirty ballast cleaning



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TAMILNADU, INDIA

Internship Project –

### **“INFORMATION ABOUT JNPT PORT”**

A Report On Internship In  
Department of Nautical Science

By

<b>SL NO.</b>	<b>CADET NAME</b>	<b>ROLL NO.</b>	<b>REG.NO.</b>
<b>1.</b>	VICHU.BL	<b>2959A</b>	<b>ANS19285</b>

April & 2020





## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled "INFORMATION ABOUT JNPT PORT" submitted by Cadet. **VICHU.BL** Reg.No **ANS1285**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt.K.Ravindranath  
Associate Professor

Department of Nautical Science

DEAN/HOD  
Capt. K.Karthik  
DEAN/ HOD

Department of Nautical Science





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Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group -9




Name of the Mentor : Capt.K.Ravindranath

Title of the assigned internship : INFORMATION ABOUT JNPTPORT

Nature of Internship : Individual/Group

Reg No of Student : ANS 19285

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



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Name of the Student	VICHU.BL
Register No and Roll No	ANS 19285& 2959A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP-8
Semester	VI
Title of Internship	<b>INFORMATION ABOUT JNPTPORT"</b>
Duration of Internship	1 MONTH
Mentor of the Student	Capt.K.Ravindranath

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	9
2	Adequacy & quality of information recorded	10	8
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Total		<b>100</b>	<b>82</b>

Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
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## INTRODUCTION

Mumbai Port has long been the principal gateway to India and has played a pivotal role in the development of the national economy, trade & commerce and prosperity of Mumbai city in particular. The port has achieved this position through continuous endeavor to serve the changing needs of maritime trade. Though traditionally designed to handle general cargo, over the years, the port has adapted to changing shipping trends and cargo packaging from break bulk to unitization/palletisation and containerization. Besides, it has also developed specialized berths for handling POL and chemicals. For decades, Mumbai Port was India's premier port. Even today, with the development of other ports, it caters to 10% of the country's sea-borne trade handled by Major Ports of the country in terms of volume. It caters about 19% of POL Traffic handled by Major Ports.

Having weathered and survived many a changes in maritime trade in its long history, Mumbai Port is today facing challenges posed by competition from adjoining ports and private ports, changing traffic patterns, inherent physical constraints and continuing labour intensive operations, *etc.* However, Mumbai Port is taking various measures to render cost effective and quality services to the trade.



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- OTHER FACILITIES

## **VISION \$ MISSION**

### **VISION**

To ensure zero corruption organizational atmosphere with positive impact on performance of individual employees . To become the premier container port in south Asia

### **MISSION**

To be equipped with state of the art and technology, efficiency and manpower which are at par with the international is conform to international standards and offer cost effective integrated logistics standards

- Ensure security with safety of life ,equipment and cargo
- Pressure the principles of eco –friendly
- Sustainable development

Coastally upgrade the competence, awareness, skills and motivational of port personal for continual improvements in all efficiency parameters. We, at the Mumbai Port Trust, provide integrated sea-port facilities for handling, storage and delivery of cargo/container to our customers' requirements. We are committed to:

- Strive excellence in port operations by improving infrastructure facilities;
- Improve our service processes and Quality systems continually;
- Establish quality objectives for improvement in our operations;
- Observe safety norms;

Through teamwork, total employee involvement, training and effective review system for continued sustainability.

Our aim is total customer satisfaction and continued happiness of all stakeholders



## **BERTHING FACILITIES**

The JNP TRUST Container Terminal is operated by JNPT .It has a quay length of 680 meters (2,230sq) with 3 berths.

The Nhava sheva international containers terminal (NSICT) is leased to a consortium led by p&o, now a port of DP world .commissioned in July 2000; it has a 600m (2000sq) quay length with two berths.

## **STORAGE FACILITIES**

Annual cargo tonnage of bulk is 7.88 million tons and containers are 56.43 million tons. Annual containers volume is 5.05 million. The Nhava sheva international containers Terminal (NSICT) is leased to a consortium led by p & o now a port of DP world. Commissioned in July 2000, it has a 600 meters (2000sq) quay length with two berths. Which can handle up to 62.15 million tons of cargo, i.e. totally 4.8 million TEUS (60 MTPA). There are three container terminals;

- A) JAWAHARLAL NEHRU PORT Containers terminal (JNPCT) , THE NHAVA SEVA
- B) INTERNATIONAL CONTAINERS Terminal (NSICT) and the gateway Terminals India pvt ltd. Shortly, NSICT can handle up to 62.15 million tons of cargo. Gateway Terminals India (GTI) can handle 1.3 million tons

## **PORT SAFETY AND SECURITY**

Mainly Focuses On 3 Important Principles: Safety Of Workplace, Working Conditions And The Minimal Impact On The Environment. Mainly Port Safety and Security System Includes

- Port Security Assessment And Awareness
- Security Towards Internals And Externals
- Identification And Classifying Infectious Substances For Transport
- Procedures For Legal And Safe Shipping
- Measures , Procedures And Requirements Of Health and Safety At Port
- Essentials Of Reporting And Investigations
- Contingency Planning , Maritime Law , Safety And Environment Protections
- Principles Of Quality Management and Quality Management Software



## S

## - Threat Instigation Strategies

Vigilance corner CVC plays a pivotal role in uprooting and eradicating corruption among the government machineries vigilance department in JNPT is serving as a central agency & striving for the integrity and efficiency in the organization. Vigilance work can be successful and productive with the help of all officers and employees

**TRAFFIC**

Inp Accounts for More Than Half of Total Containers Volumes Handled at India's 12 Public Ports And Around 40% Of the Nation's overall Containerized ocean trade. Major exports from Jawaharlal Nehru port are textiles , sporting goods ,carpets , textile maichery ,boneless meat , chemical , machinery ,plastics , electrical maichery, vegetable oils and aluminum and other non – ferrous metals the port handles cargo traffic mostly originating from destined for Maharashtra , Madhya Pradesh ,Gujarat ,Karnataka, as well as most of North India

This department is responsible for the smooth and safe movement of containers in-out of the port in a manner the ensures optimum benefit of time and cost for EXIM community and provides ease of doing business

**KEY FUNCTIONS OF THE DEPARTMENT:**

- To mange the container terminal operations (main containers berth) in its entirety ensuring speedy loading and unloading of containers, receipt , stacking and disposal of containers at the yard , maintaining
- Management of receipt and dispatch of exports and import containers respectively by road and its associated activities
- Operating contracts for hiring the services of TTs , reach stackers ,conservancy ,allotment of paved area inside CT,claims ,arbitration , auctions etc
- Compliance of dock safety regulation and all related correspondence
- Preparations of budget for the year
- Ensuring proper co-ordination with other terminal for effective implementation of ITRHO to improve turnaround time of mixed rakes
- Co-ordination with external agencies such as concur other rail operation , other terminal for smooth operations

## NHAVA SHEVA / JAWAHARLAL NEHRU PORT

### NAVIGATIONAL FACILITIES

#### **Anchorage**

There are 63 anchorage points                      Anchorage Points (Points K3 and V1)

#### **Buoys and Beacon**

1. There are three light buoys moored South-East of Prongs Lighthouse, one flashing a green light every five seconds, the other group (2) flashing red light every 10 seconds and the third flashing red every 5 seconds. Prongs reef buoy is fitted with a radar reflector.
2. There are other important subsidiary light including the Dolphin Rock Light and Tucker Beacon Light.
3. 4 nos. Lighted floating buoys to mark the approach channel, 2 jetty end beacons at mooring dolphins 1 and 4 and 2 leading lights have been provided for night navigation. In addition the Elephanta patch beacon has been upgraded to improve its range.

#### **Lighthouse**

1. Kennery Lighthouse, which marks the Southern Boundary of the Port limits, is a light of the first order dioptric, group-flashing white, and shows groups of two flashes with a visibility upto 25 kms in clear weather. The name of this lighthouse has now been changed as KANHOJI ANGRE LIGHT HOUSE.
2. Prongs Lighthouse marks a reef Southwards from Colaba Point and dangerous ground which extends for a distance of 1.6 km. from it. The light is of the first order dioptric and exhibits at night, every 10 seconds, a white flash light with a visibility up to 27 kms.
3. About 3.2 kms ENE off Prongs Lighthouse is the Sunk Rock Lighthouse. It is unattended and shows red light with white rays flashing every 6 seconds

## **Vessel Traffic System (VTS)**

A state-of-the-art VTS for control of ports operations, Surveillance and harbour navigation (Tracking and guidance of ships), having interface with Port MIS was earlier commissioned in September 1997 and the same has been replaced with new advanced state-of-the-art technology VTS and commissioned in September 2011. The fully computerised VTS employs three dual radars, 5 microwave links, two control stations (Mumbai Port Trust- BPX and JNPT control) one Radio Direction Finder, Differential Global positioning system, VHF & UHF communication system, CCTV system and Automatic Identification System (AIS). Major beneficiaries of VTS are Mumbai Port Trust, JNPT and Indian Navy.



## **OTHER FACILITIES**

### **Integrated Port Operating System Port Community System**

Port Community System (PCS) is a single window web application, which allows the port community and stakeholders to access the centralized repository to view transactions. The users of this system also can track and trace the cargo or container details. Through this application, they can also avail the real time vessel, finance, transport, cargo, and container status. It also covers online payment of bills and interface with Integrated Port Operating System (IPOS).

### **Sales and Cargo Sales System**

The Sales branch mainly deals with the auction of the import or export cargo lying uncleared/unclaimed in the Major Port Trust Act 1963. This forms an important part of the

The details of uncleared/unclaimed cargo is merged as un cleared cargo (u/c) list into sale cargo line a unique lot no. is given, notices are generated and sent to respective for Bill of Entry formalities. The lots with Bill of Entry formalities over are put into final auction list. The d generated as per Docks Scale Of Rates. Lots which are not sold are again put into auction sale as per cycle

### **Tender Management System**

**Tender Management System was developed to cater to the purchases/works of Civil, Mechanical and Planning and Research department. The Tender Management System**

Integrated Port Operating System (IPOS) covers all operational activities of the port. The system caters to Vessel, Port, Cargo, Container, Rail and Operation Resource activities in five modules. The activities comprises of all transactions at the Port including Vessel, Sheds, Gate activities, Import and Export processing, Container Stuffing and Stripping (de-stuffing), Cargo Receipt and delivery, Labour/Equipment Booking, Documentation, Resource Allocation, Rail documentation and operations and the terminal management. incorporates the complete tender cycle. It includes Estimate Preparation, Proposal, Sale, Receipt and opening of tender till award of contract. It also includes Bank Guarantee, Billing, Income Tax, VAT remittance, e-TDS. The system also generates various reports, certificates and e-TDS submission files.

### **Integrated Material Management System**

This system caters to the purchase requirements of stock and non stock items. The system allows online indenting of material, Annual Contract Management, Tender Management, Purchase Order Management, Goods Receipt Management, Material Inspection Management, Material Issue Management, online stock maintenance. The tender value, purchase order value etc. are calculated automatically in the system. All the items are codified in the system irrespective of its type i.e. stock or non stock item. System generates various reports like indent, recoupment memo, purchase order, acceptance letter, tender etc.

### **Stevedoring**

Mumbai Port Trust is providing Stevedoring / Gear services for loading and unloading of various categories of cargo on board the vessel and Container loading, unloading, stuffing destuffing in the port. The operations are carried out efficiently by the skilled On Board Labour under the instruction of experienced On Board Supervisory staff in coordination with vessel agents and under the supervision of the master of the Vessel. Mb. P. T. is committed to offer time bound and prompt quality service to the Vessel Agents in accordance with the ISO quality policy

·  
ADVANCE PAYMENT

On the basis of manifested quantity and commodity of cargo mentioned in IGM, advance payment is received on self assessment basis (Format of PDR – Annexure A). the Demand Draft and Pay Order is to be drawn in favour of “The Chairman, Mb. P. T.” and must be deposited in account number 10996681184 in the State Bank of India – Extension Counter, Operation Service Center, Indira Docks.

#### GEAR CHARGES

The agents who use their own gears need not pay Gear Charges. In case, the Vessel Agent desires to use Port Gears for Stevedoring operation, they are required to pay Gear Charges as prescribed – Annexure B , in addition to stevedoring charges.

#### Dry Docks (Ship Repairing)



the existing facilities provide all major services for repairs to the ship. The impounding water to an extra height of 1.20m so that the depth of water.



During fair weather seasons the depth of water level can be increased even up a capacity and 8 Oxy-Acetylene outlets have been provided.

#### DETAILS OF FACILITIES AVAILABLE AT DRY DOCKS

##### Hughes Dock

	Dimensions of ship which can be accommodated		Electric Supply	Compressed Air	Cranes
	Length	Beam			
	Outer Comp. 380 V Phase 250 Amplifier	Inner Comp. 30.48 m	415V 3 phase 60 cycles 230 V Single phase 130 V Three phase 32 V 50 cycles 24V A.C. * 110 V and 220 V DC supply	100 lbs. per sq. inch 500 C.F.M.	One no. electric crane of 5 tonnes capacity  One no. electric crane of 20 - ton capacity
Outer Grove	123.44 m	170.84 m			
Middle Grove	146.30 m	125.12 m			
Inner Groove	169.16 m	125.12 m			
Without Caisson	304.04 m				

#### Additional Facilities:

The following additional facilities have been provided under “Modernisation of ship repair”

1. Workshop building
2. One sub-station on each side(i.e, two per dry dock).
3. Lightning mast to improve the visibility
4. Automatic fire fighting system.
5. Supply of salt water on one side of the dry docks.
6. Supply of fresh water on the side of the dry docks.
7. Supply of dry compressed air on one side of the dry docks.
8. Capstans at suitable location
9. 6Nos. water jet pumps
10. 6 Nos. grid blasting machines.
11. 10 Nos. spray painting machines.
12. 12 Nos. scaffolding sets.
13. Office building at MDD east only.
14. Sub-station with frequency convertor and various supply voltage.
15. Yard lighting.

#### Bunkering

Oil for bunkering can be obtained practically at all berths.

## Cruise Terminal



The terminal is situated at Ballard Pier (BPX) within 5-10 minutes driving distance from the Taj Mahal Hotel, Museum, Art galleries, CBD of Fort, Colaba Causeway, Nariman Point and Marine Drive.

The Cruise Terminal has check- in baggage handling facilities, a lounge, duty free shop, curios and handicraft stalls and toilets etc.

### Features :

- Dedicated Cruise Terminal at BPX
- Domestic Cruise at Ferry Wharf Shed no. 3

Details of the cruise passengers handled at Mumbai Port – both international and domestic – during the last six years is given in the following table:

	International Cruise		Domestic Cruise		Total	
	No. of calls	Passengers *	No. of calls	Passengers	No. of calls	Passengers

2007-08	25	14212	59	54917	84	69129
2008-09	30	17375	45	26247	75	43622
2009-10	33	27482	90	62032	123	89514
2010-11	42	27529	21	12063	63	39592
2011-12	40	36803	---	---	40	36803
2012-13	41	27827	---	---	41	27827

## CONCLUSION:

Thus these are all the major specification of the busiest container port in India . Having set for itself a long term goal of achieving 10 million Tons by the year 2020=22 through addition of two terminals and the increasing the amount of facilities so it can reach a level one of best and biggest port of India and south







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- 603 112.

TAMILNADU, INDIA

Internship Project –

**“SIMPLE HYDRAULIC STEERING  
GEAR SYSTEM”**

A Report on Internship In

Department of Nautical Science

By

SL NO.	CADET NAME	ROLL NO.	REG.NO.
1.	NAMAN RASTOGI	2689A	ANS19026

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled “**SIMPLE HYDRALIC STEARING GEAR SYSTEM**” ”submitted by cadet. **NAMAN RASTOGI** Reg.No**ANS19026**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt. C.Krishna  
Associate Professor

Department of Nautical Science

Capt. K.Karthik  
DEAN/ HOD

Department of Nautical Science



# AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING  
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## INTERNSHIP ALLOCATION REPORT 2019-20

Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group 6




Name of the Mentor : Capt. Rajandran.

Title of the assigned internship : "SIMPLE HYDRALIC STEARING GEAR SYSTEM"

Nature of Internship : Individual/Group

Reg No of Student : ANS 19026

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



# AMET

**ACADEMY OF MARITIME EDUCATION AND TRAINING**  
**DEEMED TO BE UNIVERSITY**  
 (Under Section 3 of UGC Act 1956)

## INTERNSHIP EVALUATION REPORT 2019-20




Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Student	<b>NAMAN RASTOGI</b>
Register No and Roll No	<b>ANS 19026&amp; 2689A</b>
Programme of study	<b>B.Sc</b>
Year and Batch/Group	<b>III YEAR 18<sup>TH</sup> BATCH/ GROUP -6</b>
Semester	<b>VI</b>
Title of Internship	<b>“SIMPLE STEERING GEAR SYSTEM”</b>
Duration of Internship	<b>1 MONTH</b>
Mentor of the Student	<b>Capt. Rajendran</b>

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	6
2	Adequacy & quality of information recorded	10	6
3	Drawings, sketches and data recorded	10	7
4	Thought process and recording techniques used	5	3
5	Organization of the information	5	3
6	Originality of the Internship Report	20	14
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	8
10	Presentation Skills	10	8
Total		<b>100</b>	<b>81</b>

Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
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## **CONTENTS**

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**ABSTRACT –**

This report describes my internship experience at the AMET University in Chennai, and it is divided into four parts.

PART ONE summarizes the projects that I have completed. It also includes the introduction of a steering gear system, what are its parts, what are the different types and what are its function.

PART TWO provides the background and purpose of the steering gear system. It describes the methodology on which it works. It is organized by the notes that I received in the classroom from our Captains.

PART THREE takes you to the conclusion of this report.

PART FOUR comprises of the various figures, flowcharts and diagrams that helps one to understand how a simple hydraulic steering gear system works.

I got help from my partner and I have used my class notes given by my faculty and the knowledge I gained in the classroom. I have also used the internet to clarify my doubts and insert images related to my internship.

## **INTRODUCTION –**

A hydraulic steering gear consists of a bridge control which applies helm, an engine control which is operated jointly by the helm and hunting gear (when fitted) and a power pump and rudder actuator which constitutes the steering engine.

The steering gear provides a movement of the rudder in response to a signal from the bridge. It is in constant use when the ship is underway, and any failure or malfunction may result in disaster.

The main control of the steering operations is given from the helm of any ship, similar to an automobile where the entire control of the vehicle's "steer-ability" rests on the steering wheel of the driver. The 'control force' for turning is triggered off from the wheel at the helm, which reaches the steering gear system.

The steering gear system generates a torsional force at a certain scale which is then, in turn, is transmitted to the rudder stock that turns the rudder. The intermediate steering systems of a modern-day ship can be multifarious with each small component having its own unique function.

Telemotor control is a hydraulic control system employing a transmitter on the bridge, and a receiving unit consisting of a variable delivery pump, pipes, valves and an oil recharging unit) situated in the steering flat.

On turning the wheel, liquid displaced in the transmitter causes a corresponding displacement in the receiver through the movement of the pump control lever of the variable direction pump. Hydraulic oil is pumped down one pipe line to the telemotor cylinder and sucked through the opposite pipe line forcing the telemotor cylinder to move and turn the rudder in the required direction. A Hunting Gear is incorporated as a feedback mechanism of steering gear which repositions the pump control lever of hydraulic pump to neutral as the tiller moves its required position.

The steering gear system consists of these parts –



- **Control unit** – Helm, transmitter to steering gear compartment and the receiver/feedback in the form of rudder angle indicator.
- **Power unit** – Receiver to receive signal from helm and move the lever to control pumps.
- **Actuating unit** – RAMS connected to tiller & Tiller connected to rudder stock.
- **Rudder.**

There are other types of telemotor system too. These include electric telemotor system, in which the transmitter is a small unit on the bridge and is simple and reliable in operation. Electrical control is commonly used in modern vessels.

Movement of the bridge transmitter results in electrical imbalance and current flow to a control motor. This control motor drives the hydraulic pump lever/control rod to actuate the rudder movement.

Moreover, there are RAM type steering system also called as ELECTRO-HYDRAULIC STEERING SYSTEM. They are –

- Two RAM steering system.
- Four RAM steering system.

This consists of a set of hydraulic rams, one on the port side and the other on the starboard. These rams are linked to the tiller arm of the rudder by a crosshead and swivel block. Pipes with hydraulic oil connect the ram cylinders to a hydraulic pump with a by-pass relief valve incorporated in the circuit. The hydraulic pump is of rotary displacement type driven by an electric motor. It runs continuously in the same direction and a movable plate inside the pump controls the suction and discharge flow directions of the oil. When the plate is in mid position, no oil is drawn from one cylinder to the other. When moved, the suction and discharge process

begin and turns the rudder stock/rudder to the required position. A relief valve is incorporated in the circuit to accommodate any sudden increase in oil pressure in a hydraulic cylinder due to heavy seas striking the rudder. The valve allows the tiller to give way slightly by by-passing oil into the other cylinder. Through the hunting lever, the rudder is then automatically brought back to the proper position.

These RAM-type steering systems are widely used nowadays. Four RAM system are used on large ships to generate higher steering power. It is similar in working as Two-RAM system. It just has two sets of RAMs and motors.

These systems are connected to rudder, which allows the ship to turn.

**(The diagrams for the above telemotor system are shown below from page 13-17)**

## **METHODOLOGY –**

When command is given from control unit or helm, it is transmitted to power unit through transmitter. Power unit consist of hydraulically driven RAMs and Tillers. These multiply force applied to the steering wheel. The hydraulic pressure typically comes from a generator or rotary vane pump driven by engine. The steering wheel operates valves to control flow to the cylinder. The more torque applied, the more fluid the valve allows through the cylinder.

As per standard requirement, the steering gear should be capable of steering 35 degrees each side. With one of the power unit in operative mode, the rudder shall be capable of turning 15 degrees each side within 1 min with the vessel moving at half its rated maximum speed.

The rudder system consists of the following:

- Rudder actuators
- Power units
- Other auxiliary equipment needed to apply turn the rudder by applying torque
- Hydraulic pumps and valves

In hydraulic and electro-hydraulic system, hydraulic pressure is developed by pumps which are mainly driven by electric motors or sometimes through purely mechanical means.

However, mainly advanced electro-hydraulic system are predominant in ship nowadays.

Actuators mediate the coordination between the generated hydraulic pressure from pumps and the rudder stock by converting it into a mechanical force creating a turning moment of the rudder. The types of actuator system depict the types of steering gears present of steering gear present on ship, which are also segregated as RAM type.

## **CONCLUSION –**

The steering gear system is most vital for a ship's operation. Without this, the movement of ship is not possible so it needs to be maintained at all the times. There are certain checks and tests that are done prior departure to test the steering gear system.

Testing of Steering Gear is done as per the regulations of SOLAS Chapter V Regulation 26 and the United States of America 33 CFR Chapter 1 164.25

“Tests before entering or getting underway” have to be complied with. During stays in port between voyages or passages a test is to be carried out within 12 hours of the estimated time of "stand by departure".

Pre-departure testing include – 1. The main steering gear 2. The auxiliary steering gear 3. The remote steering gear control systems 4. The steering positions located on the navigation bridge 5. The emergency power supply 6. The rudder angle indicators in relation to the actual position of the rudder 7. The remote steering gear control system power failure alarms 8. The steering gear power unit failure alarms 9. The automatic isolating arrangements and other automatic equipment.

Steering gear system has been an indispensable part of the ship machinery since the advent of the very early ship, which were operated by hand.

With the passage of time, the technological developments have led to the discovery of various new types of steering system (from hand driven to hydraulic and electro-hydraulic) and with the advancements in technology, there is a great chance that the future maritime industry will come up with a new and efficient way of steering ships.

**LIST OF FIGURES –**

1) FLOWCHART OF COMPONENTS OF A STEERING GEAR SYSTEM.

2) SKETCH OF A HYDRAULIC STEERING GEAR SYSTEM.

3) SKETCH OF AN ELECTRICAL MOTOR STEERING GEAR SYSTEM.

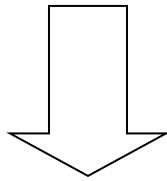
4) DIAGRAMS OF ELECTRO-HYDRAULIC STEERING GEAR SYSTEM (RAM type) –

- Two RAM.
- Four RAM.

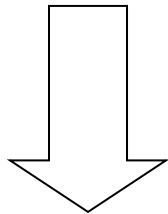
5) IMAGE OF A STEERING CONTROL AT HELM.

**1) STEERING GEAR SYSTEM -****CONTROL UNIT –**

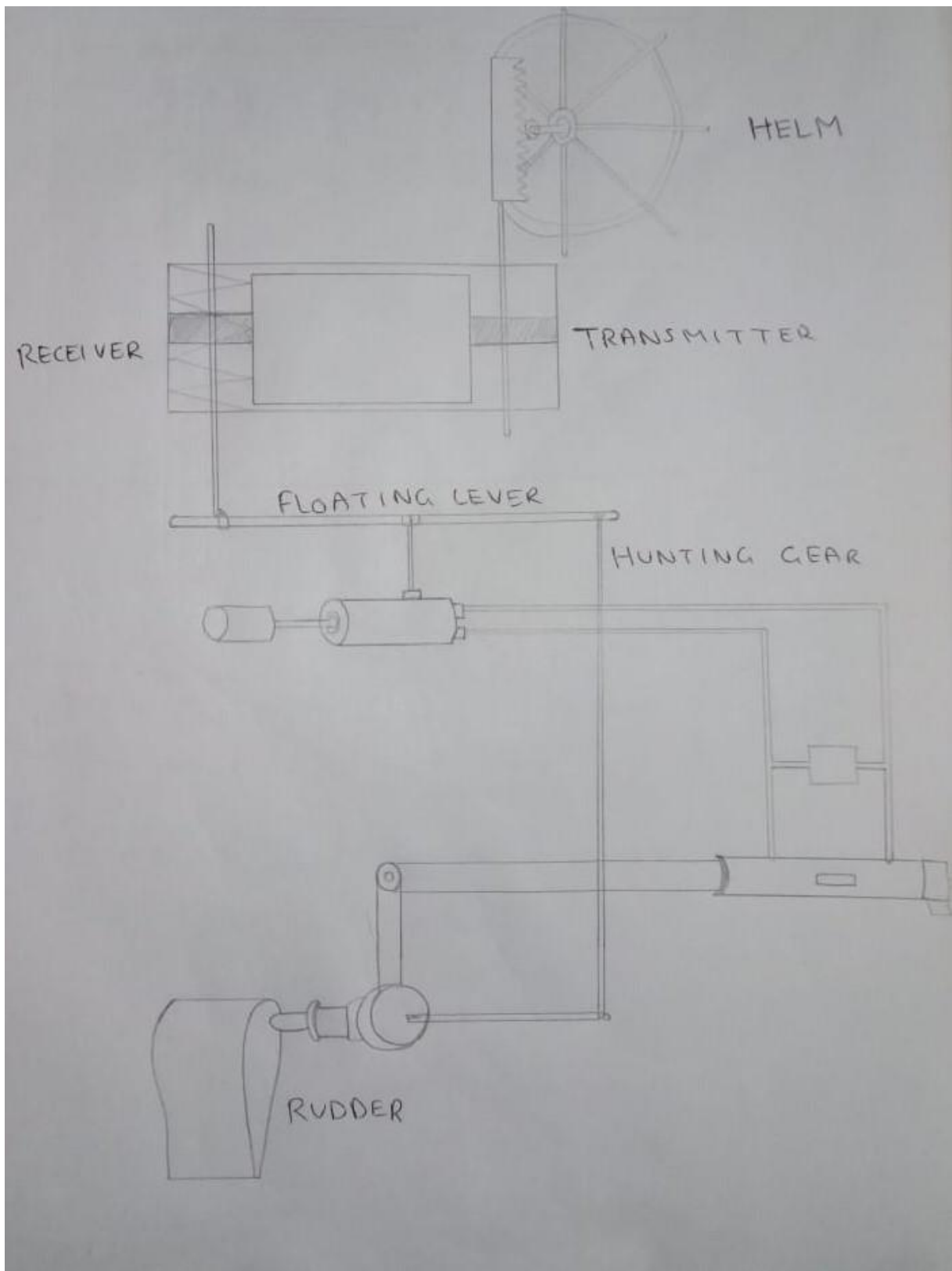
- \* Helm – Steering Wheel
- \* Transmitter to Steering Gear Compartment  
– Hydraulic or Electrical/Electronic
- \* Receiver/Feedback – Rudder Angle  
Indicator Actuating Unit

**POWER UNIT -**

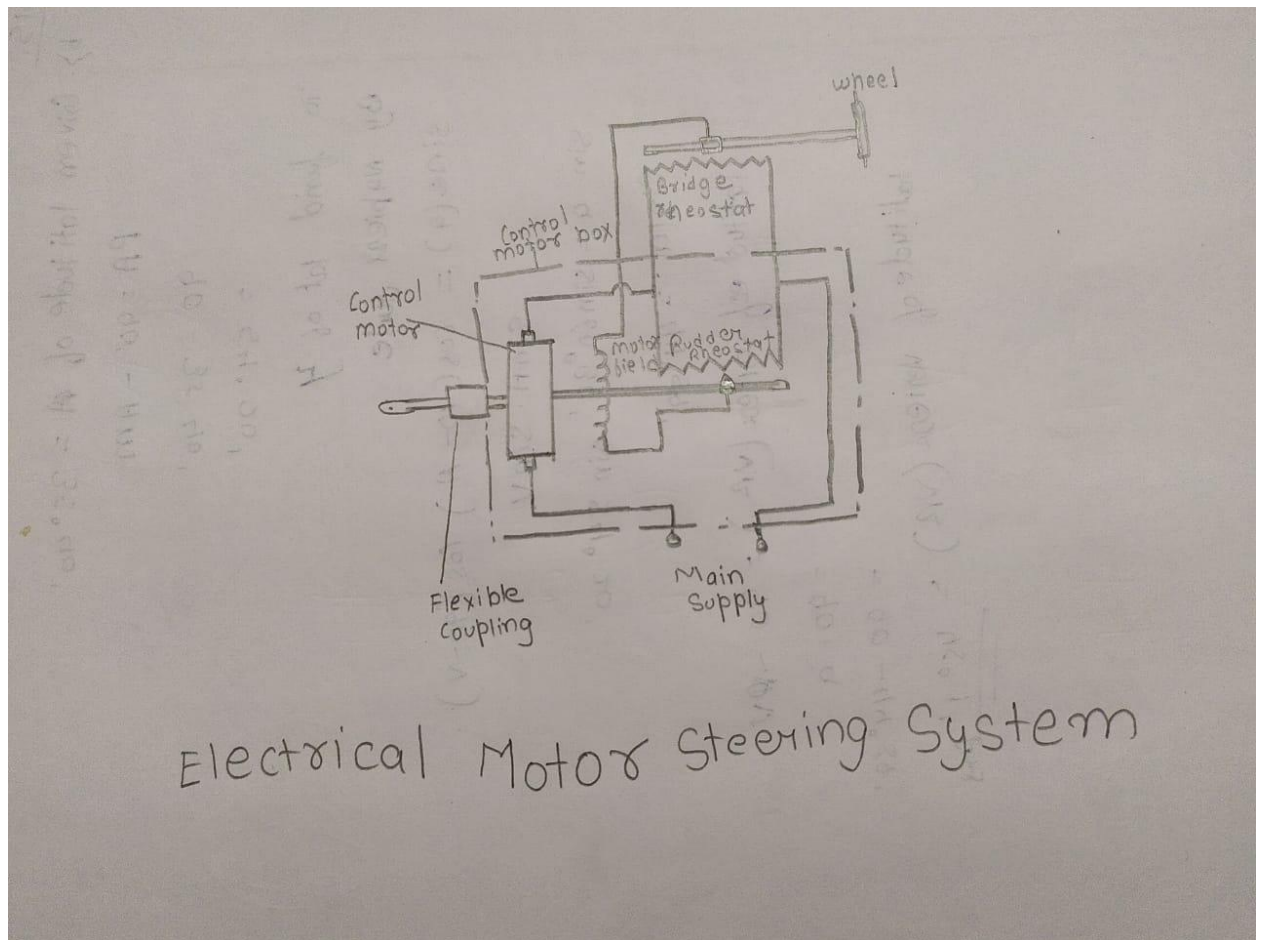
- Rams – Connected to the tiller
- Tiller – Connected to rudder stock Power Unit

**RECEIVER -**

- \* Receives signal from the helm
- \* Moves the lever to control the power pumps

**2) HYDRAULIC TELEMOTOR STEERING GEAR SYSTEM –**

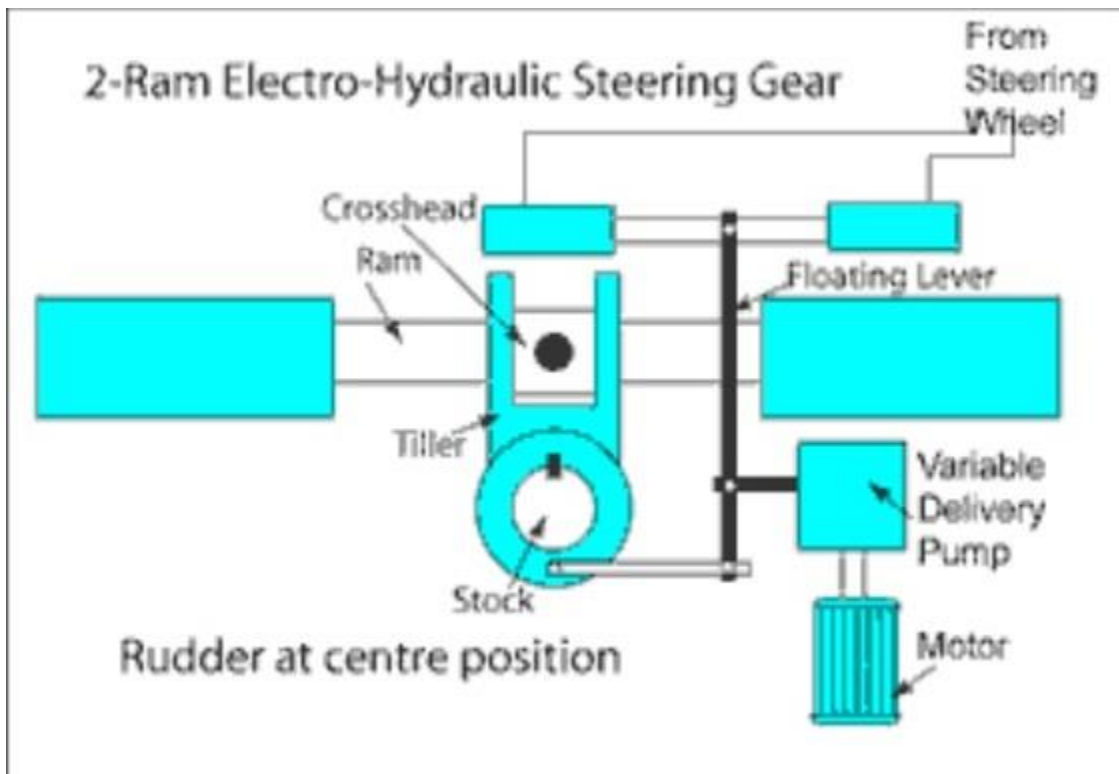
### 3) Electrical Motor Steering Gear System -



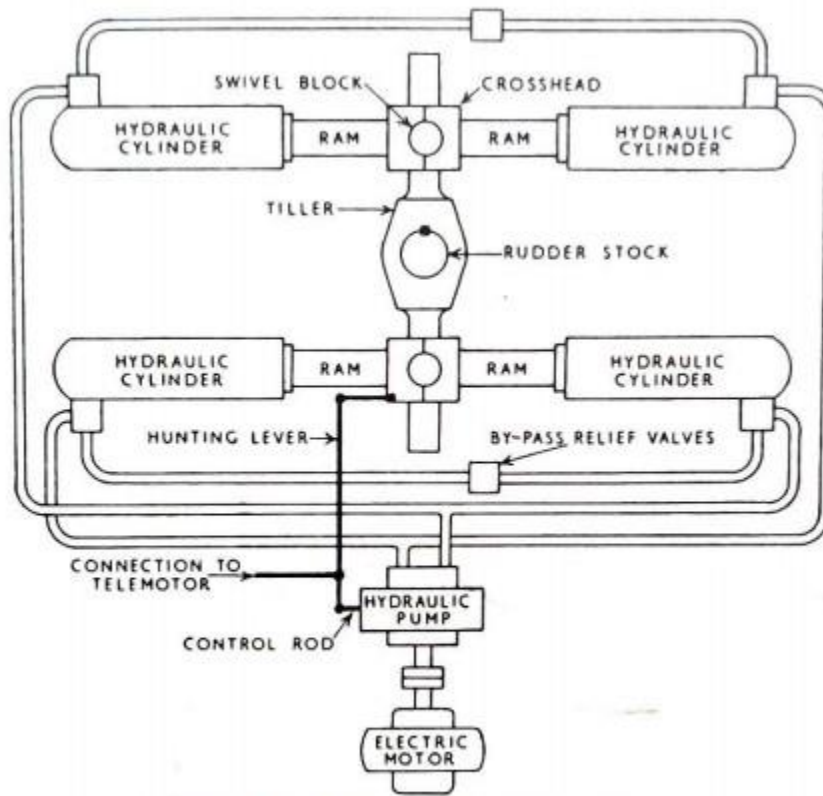


4) Electro-hydraulic steering gear system (RAM TYPE) –

- TWO RAM



- **FOUR RAM**



Four-Ram Electro Hydraulic System

5) **Steering control at helm**



**----\*THE END\*----**



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- 603 112.

TAMILNADU, INDIA

Internship Project –

**“NEW MANGALORE PORT”**

A Report on Internship In

Department of Nautical Science

By

SL NO.	CADET NAME	ROLL NO.	REG.NO.
1.	BIBIN BIJJU	2725A	ANS19051

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled “NEW MANGALORE PORT  
”submitted by cadet. **BIBIN BIJU** Reg.No**ANS19051**...Batch **18**.....in  
the Department of Nautical Science, AMET, Deemed to be University  
Chennai is a bonafide record of Technical work carried out by him / her  
under my supervision.

Signature  
(Guide )

Capt. C.Krishna  
Associate Professor  
Department of Nautical Science

Capt. K.Karthik  
DEAN/ HOD  
Department of Nautical Science



# AMET

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Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group 6




Name of the Mentor : Capt. Rajandran.

Title of the assigned internship : "NEW MANGALORE PORT"

Nature of Internship : Individual/Group

Reg No of Student : ANS19051

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		

INTERNSHIP EVALUATION REPORT 2019-20  
Name of the Department: **NAUTICAL SCIENCE**



# AMET




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Name of the Student	<b>BIBIN BIJJU</b>
Register No and Roll No	ANS 19051& 2725A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP -6
Semester	<b>VI</b>
Title of Internship	<b>"NEW MANGALORE PORT"</b>
Duration of Internship	1 MONTH
Mentor of the Student	<b>Capt. Rajendran</b>

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	6
2	Adequacy & quality of information recorded	10	6
3	Drawings, sketches and data recorded	10	7
4	Thought process and recording techniques used	5	3
5	Organization of the information	5	3
6	Originality of the Internship Report	20	14
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	8
10	Presentation Skills	10	8
Total		<b>100</b>	<b>81</b>

Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
--	---	--

# INTERNSHIP

**Members : SANJAY P(2744A)**

**KRITHIK KRISHNATK(2734A)**

**BIBIN BIJU(2725A)**

**Department: BSc Nautical Science**

**Batch: 1<sup>st</sup> year Group 2**

# NEW MANGALORE PORT



## LOGO





## **INTRODUCTION**

In this internship we are going to describe about NEW MANGALORE PORT in KARNATAKA. New Mangalore Port is a deep-water, all-weather port at Panambur, Mangalore in Karnataka state in India, which is the deepest inner harbour on the west coast. It is the only major port of Karnataka and is the seventh largest port in India. This port is operated by New Mangalore Port Trust. It was opened on 4 May 1974. The annual container volume of Mangalore port is 62,808TEU (according to 2014-2015 censess). The port is controlled under chairman Shri P.C. Parida with 17berths. It is owned by Ministry of Shipping, Government of India .

## **MISSION**

"We strive to provide state of the art technology and infrastructure, reliable services and competitive port charges in a seamless manner,

while surpassing environmental, social, safety and security standards."

## **VISION**

"To be the world's most customer centric and environmentally sustainable port that transforms communities through regional and national economic growth."

## **PORT FACILITIES**

Rail network :

The port provides a railway siding to Mangalore. Besides it spreads to kerala, Tamilnadu and bangalore

The hassan-mangalore rail has been converted to a broad guage capable of carrying more tonnage of cargo by rail

And now the port is fully accessible to its

Hinterland.

## **ROAD NETWORK**

The port is connected with 3 National highways.

NH 66 stretching from kochi to Mumbai

NH 77 connects mangalore to bangalore

NH 50 mangalore to sholapur

Commercial advantages

Customer satisfaction is the cornerstone  
around services are devised.

The congestion free all weather port helps

Vessels to berth all through the year.

## **PORT SAFETY**

A secured container yard prevents theft and  
prilferage

A single window clearance and simplified  
document system cargoes moves in and out at  
speeds unmatched by any other ports

The port follows safety committee

management system

The safety at the dock area is per the guide lines laid by the dock safety regulations.

The safety management system is monitored, reviewed, benchmarked and audited on the periodic basis.

All marine operations are comply with port safety code and the international safety standards.

A safe working environment is provided in the port so far is responsibly practical and adequate

as regards facilities and arrangements of staff welfare

## **STORAGE FACILITIES**

a) Transit sheds:2 areas(3192sq. M)

b) Overflow sheds:2areas (3600 square. M)

c) Openstackyard:8areas (18164sq.m) o

D) covered warehouse; work shop godown =1

other godown=4

## **NAVIGATIONAL FACILITIES**

1,lighting for night berthing is available

2,weather monitoring, VTS,

3,weather monitoring ,three tugs presently

Available for maneuvering

4, adequate worksheet hour for situational

Awareness

5,MPS,VTS

## **TRAFFIC HANDLED BY PORT**

During the fiscal 2017-18, New Mangalore Port has handled a record traffic of 42.05 million tones of cargo surpassing the earlier record of 39.94 million tones handled in 2016-17

### **RECORDS AND ACHIEVEMENTS-2017-18**

-Record traffic throughput of 42.05 million tones as against 39.94 million tones in 2016-17(5.28% growth)

-Record container traffic of 1.15 lakh TEUs(17.43 lakh tones) as against 94,929 TEUs (14.10 lakh tones) in previous year(21.67% growth)

-Highest coffee export of 2.41 lakh tones(12,249 TEUs)handled as against 2.36 lakh tones(12,200 TEUs) in 2016-17

-Record quantity of 22.09 lakh tones of LPG handled as against 20.74 lakh tones handled in 2011-12

-Record qty of 7.92 lakh tones of edible oil handled as against 7.30 lakh tones handled in 2015-16

-Record handling of 10.17 Million tonnes of coastal cargo as against 8.33 Million tonnes handled in 2016-17(22.08% growth)

## **BERTHING FACILITIES**

<b>N o</b>	<b>Name of Berth</b>	<b>Type of Berth</b>	<b>Draught (in MTS.)</b>	<b>Length (in MTS.)</b>	<b>DWT</b>
1	Berth No:1	General Cargo	7	125	4000
2	Berth No:2	General Cargo	10.5	198	30000
3	Berth No:3	General Cargo	10.3	198	30000
4	Berth No:4	General Cargo/ Liquid Amonia /Phosp horic acid	9.5	198	30000
5	Berth	General	9.5	198	30000

	No:5	Cargo/ Bulk Cement / Edible oil			
6	Berth No:6	General Cargo	9.5	198	30000
7	Berth No:7	General Cargo	9.5	198	30000
8	Berth No:8	General Cargo/ Iron ore	13	300	60000
9	Berth No:9	POL/ LPG	10.5	330	45000
10	Berth No:10	POL/ Crude oil	14	320	12000 0
11	Berth No:11	POL/ Crude oil	14	320	12000 0



12	Berth No:12	POL and Chemic als	12.5	320	50000
13	Berth No:13	Under constru ction	12	275	35000
14	Berth No:14	General Cargo/ Iron ore /Coal	14	350	50000
15	Berth No:15	Coal	14	350	60000

## **CONCLUSION**

In the whole, the internship report was a great experience. We have gained many Knowledge about ports in India ,especially New Mangalore Port in Karnataka state.We achieved several of

our learning goals.

This internship has given opportunities to learn about ourself . We get to know our team strength. It motivate us to do many of the researches later . And we would be happy to do an another internship also.

We are very thankful to our Dean Captain K Karthik for giving us the opportunity to prove ourselves .



# AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING  
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## ACADEMY OF MARITIME EDUCATION AND TRAINING (AMET)

(Declared as Deemed to be University u/s 3 of UGC Act 1956)

135, EAST COAST ROAD, KANATHUR, CHENNAI  
- 603 112.

TAMILNADU, INDIA

Internship Project –

### “VESSEL PROPELLED BY RENEWABLE ENERGY”

A Report on Internship In

Department of Nautical Science

By

SL NO.	CADET NAME	ROLL NO.	REG.NO.
1.	AMAL.C.V	2760A	ANS19086

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled "VESSEL PROPELLED BY RENEWABLE ENERGY" submitted by cadet. **AMAL.C.V** Reg.No**ANS19051**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt. P.Rajendran  
Associate Professor

Department of Nautical Science

Capt. K.Karthik  
DEAN/ HOD

Department of Nautical Science



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## INTERNSHIP ALLOCATION REPORT 2019-20

Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group 3




Name of the Mentor : Capt. Rajandran.

Title of the assigned internship : VESSAL PROPPELLED BY  
RENEWABLE ENARGY

Nature of Internship : Individual/Group

Reg No of Student : ANS19086

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



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*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Student	AMAL.C.V
Register No and Roll No	ANS19086 & 2760A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP -6
Semester	VI
Title of Internship	VESSEL PROPELLED BY RENEWABLE ENARGY
Duration of Internship	1 MONTH
Mentor of the Student	Capt. Rajendran

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	6
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8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	7
10	Presentation Skills	10	7
Total		100	79

 Signature of the Mentor	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
--	---	--

# **VESSEL PROPELLED BY RENEWABLE ENERGY**

SUBMITTED BY: AMAL C V

Roll No: 2760A

Reg No: ANS 19086

GROUP-3 BSc 18

## **TEAM MEMBERS**

- AMAL C.V
- ALAN P BINIRAPHAEL
- PRATHAPJITH
- ABHIRAM M
- NAMSHAD T
- MOHAMMAD RINFAS ROSHAN
- MOHAMMAD KADABI

**Topic: Biogas is used as fuel for the propulsion of vessel**

### **BIO GAS**

Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen (anaerobically), primarily consisting of methane and carbon dioxide. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste.

### **BIO GAS PRODUCTION**

Biogas is a type of biofuel that is naturally produced from the decomposition of organic waste. When organic matter, such as food scraps and animal waste, break down in an anaerobic environment (an environment absent of oxygen) they release a blend of gases, primarily methane and carbon dioxide

## ENGINE PROPELLED BY BIO GAS FUEL

Because of its properties, biogas is mostly used as fuel for spark-ignition engines. This way of using biogas is most often applied in sewage treatment plants and rubbish dumps, where biogas forms spontaneously as a result of chemical processes occurring there. These engines mostly power electricity generators or cogeneration units [6, 9].

The relatively high self-ignition temperature of methane (the main combustible component of biogas) of ca. 640 °C, limits the use of this fuel as a power feed source for diesel engines.

Nevertheless, because of diesel engines' higher efficiency and lower sensitivity to fuel quality, research is carried out on the use of biogas or methane as a fuel for these engines [7, 9-11].

To ensure the proper operation of diesel engines using gas fuel, it is necessary to modify the engine or its supply system. Three methods of adapting a diesel engine to gas fuel supply are currently being used [5, 7, 9, 11]:

reducing the diesel engine's compression ratio and replacing the fuel injection system with an ignition system, which requires modification of the diesel engine into a spark-ignition engine, application of a dual-fuel supply system, thanks to which gas fuel is supplied to a suction manifold, in which a air-gas mixture is formed and is then sucked into the engine combustion chamber. During the compression stroke, a small dose of liquid fuel initiating gas fuel self ignition is injected into the combustion chamber.

In such a system, gas is supplied under small overpressure to the suction manifold. Such an engine supply method is a solution which is relatively simple in design, does not require significant interference in a standard installation and allows simultaneous engine operation in both single- and dual-fuel systems, application of special two-way injectors enabling independent injection into the combustion chamber of both gas and the liquid fuel dose initiating self-ignition. In such a case, it is necessary to apply more complex gas installations because of the need to inject gas fuel under a



pressure in the order.

This paper examines the possibility of using biogas as fuel for spontaneous ignition engines.

Despite work on third- and fourth-generation fuels, the important role, which second-generation fuels will play, must not be ignored. These fuels, as earlier mentioned, form as a result of waste product processing and it is difficult to imagine any agricultural or food production not resulting in the formation of waste, which can be used for biogas production.

Work on the use of methane for supplying large marine engines is the most advanced. This is connected with the fact that currently large ships have been built (so-called "LG carriers") for the transport of liquid methane (LNG). During the transport of this fuel, up to 0.3% of the carried fuel volume evaporates in the course of one day. Therefore, substantial quantities of methane are released naturally on these ships and it should naturally be managed. Because of the size of these engines, special two-way injectors are typically used in them, injecting both methane and liquid fuel into the combustion chamber.

Currently, intensive research is being carried out in many research facilities in Poland and abroad on the use of gas fuels, particularly methane, as fuel for diesel engines applied to power vehicles and machines as well as to power cogeneration units.

The results of this research indicate that the operation of these engines with a dual-fuel supply is possible, yet because of the different methane properties, the course of the combustion process in this engine changes. The course of gas fuel combustion in a self-ignition engine depends, above all, on the following parameters [7, 9-11]: the proportion between gas and liquid fuel in the overall supply dose,

the pilot dose injection parameters, particularly injection pressure, pilot dose injection start angle.

It presents example pressure courses obtained for an HATZ 1B40 engine at 40% of a nominal load and different diesel oil and methane percentages.

Figure 2 presents the effect of the injection lead angle for the dose initiating self-ignition for a diesel oil dose equivalent to 22% of the dose for diesel oil supply alone. The next Fig. 3 shows the effect of the injection lead angle for the initiating dose for different proportions between individual fuels on changes of maximum pressure in the combustion chamber.

The effect of the methane share in the dose supplying the engine on its efficiency is presented in Fig. 4. It is clear from the data presented in this graph that an increase in the methane share in the dose supplying the engine causes much higher consumption of this fuel than its calorific value would indicate. This shows a decrease in the overall engine efficiency with the growing methane share in the supply dose. It should be noted that the presented results refer to a constant diesel oil injection lead angle.

#### **THE BENEFIT OF USING BIO GAS IN SHIPPING**

The main environmental advantage of biogas in shipping industry as a fuel is that it can substantially reduce greenhouse gas (GHG) emissions in the transport sector (typically between 60% and 80% compared to gasoline). There is a great potential for biogas production from organic wastes as well as from energy crops. Moreover, we are setting a biogas plant in each port, obviously a port is located in a city. So the bio wastes needed for the production of biogas will be collected from the nearby apartments and from dead fishes with the help of local government. So this project helps the shipping industry by providing a low cost, more efficient, pollution less fuel and also finds a solution for the trouble of proper waste disposal in a city.

\_ Thank you \_





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Internship Project –

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By

<b>SL NO.</b>	<b>CADET NAME</b>	<b>ROLL NO.</b>	<b>REG.NO.</b>
<b>1.</b>	<b>ANAND KRISHNA.P</b>	<b>2684A</b>	<b>ANS190101</b>

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled **MAJOR SEA PORT IN INDIA** "submitted by cadet. BIBIN BIJJU Reg.No**ANS19051**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt. C.Krishna  
Associate Professor  
Department of Nautical Science

Capt. K.Karthik  
DEAN/ HOD  
Department of Nautical Science



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Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group 6




Name of the Mentor : Capt. C.Krishna

Title of the assigned internship : "MAJOR SEA PORT IN INDIA"

Nature of Internship : Individual/Group

Reg No of Student : ANS190101

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



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Name of the Student	ANANDA KRISHNA.P
Register No and Roll No	ANS 190101& 2684A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP -6
Semester	VI
Title of Internship	“MAJOR SEA PORT IN INDIA”
Duration of Internship	1 MONTH
Mentor of the Student	Capt.C.Krishna

### Evaluation by the Department

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1	Regularity in maintenance of the diary.	10	6
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Signature of the Mentor 	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
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**TAMILNADU, INDIA**

**MAJOR SEA PORT IN INDIA**

**A Report on Internship**

**In**

**Department of Nautical Science**

**By**

**Ananda Krishna. R- ANS19010 (2684)**

**Sarod Siva-ANS19030 (2704)**

**Sreeyukth-ANS19036 (2710)**

*July/2020*



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Berthing facilities	5
Navigation and other Facilities	6
Traffic handling	8
Port Safety and Security	9



## **Visakhapatnam Port- An Introduction**

**Visakhapatnam Port is one of 12 major ports in India and the only major port of Andhra Pradesh. It is India's second largest port by volume of cargo handled. It is located on the east coast of India and is located midway between the Chennai and Kolkata Ports**

**Although the need for building a port on the east coast to access Central Provinces was felt by the British in the 19th century, the proposal of Col. H.Cartwright Reid of British Admiralty for constructing a harbour at Visakhapatnam was approved by the Government only after the First World War. The Inner Harbour was built by the Bengal Nagpur Railway between 1927 and 1933 to facilitate the export of manganese ore from the Central Provinces. The port, built at a cost of ₹378 lakhs was inaugurated by Lord Willingdon on 19 December 1933.**

**During the Second World War, the military significance of the port increased. After India's independence, the port witnessed growth under the various Five Year Plans. Over time, the port has grown from one with 3 berths handling 1.3 lakh tonnes per annum to one with 24 berths and annual traffic of 65 million tonnes. The port was notified as a major port in 1964 under the Major Port Trusts Act, 1963. Under the Act, the Visakhapatnam Port Trust is in charge of running the port**



## **Vision and Mission of Vishakhapatnam Port**

### **Our Vision**

**To be the most preferred port in South Asia offering services of global standards.**

### **Our Mission**

**To be a major partner in meeting the logistics requirements of the importers and exporters of the region**



**As it turned 86 Sunday, the Visakhapatnam Port Trust (VPT), which is acclaimed as the Eastern Gateway of India has drawn up a vision to become the most-preferred port in south Asia offering services of global standards and world-class logistics solutions.**

**Massive capacity expansion and modernisation plans are being implemented in a mission-mode in line with Visakhapatnam Port's growing strategic importance to trade with China, Australia, Indonesia, Singapore, Malaysia, South Africa, Nigeria and countries in the Persian Gulf.**

## **Berthing**

**Visakhapatnam Port has three harbours - the outer harbour, inner harbour and the fishing harbour. The outer harbour has 6 berths capable of handling vessels with a draft up to 17 meters while the smaller inner harbour has 18 berths that are Panamax compatible. Vizag Seaport owns two berths in the inner harbour; berth EQ-8 is fully mechanised and berth EQ-9 berth is not.**

**The Dolphin's Nose Hill to the north of the entrance channel protects the harbour from cyclones that strike the east coast. The port is located on the area of a creek through which the coastal river Narava gedda joins the sea.**





### Facilities

#### Iron Ore & Pellets



#### Coking Coal & Steam Coal facilities





## Alumina



## POL



## Containers



## Cargo handling equipments



**VIZAG PORT' HARBOUR FACILITIES AND BERTHING  
FACILITIES**

**Toggle navigation**

**HARBOUR & BERTHING FACILITIES**

**Home / Facilities / Harbour & Berthing Facilities**

**last update on : 30-MAR-2019**

**Harbour Facilities**

<b><u>Feature</u></b>	<b><u>Inner Harbour</u></b>	<b><u>Outer Harbour</u></b>
<b><u>Water Spread (Hectares)</u></b>	<b><u>100</u></b>	<b><u>200</u></b>
<b><u>Berths</u></b>	<b><u>18</u></b>	<b><u>6 +1 (SPM)</u></b>
<b><u>Max.Draft(Mtrs.)</u></b>	<b><u>14.5</u></b>	<b><u>18.10</u></b>
<b><u>Max. length (Mtrs.)</u></b>	<b><u>PANAMAX</u></b>	<b><u>Cape Size</u></b>

**Berthing Facility****All dimensions are in meters**

<b><u>INNER HARBOR NORTHERN ARM – EAST SIDE</u></b>				<b><u>INNER HARBOR NORTH</u></b>
<b><u>DAY TIME ( BERTHING / SAILING )</u></b>				<b><u>NIGHT TIME ( BERTHING )</u></b>
<b><u>DRAFT (with dock water density)</u></b>				<b><u>DRAFT (with dock water density)</u></b>
<b><u>BERHTS</u></b>	<b><u>Length</u></b>	<b><u>Panamax</u></b>	<b><u>Others</u></b>	<b><u>Panamax</u></b>



<b><u>*East Quay-1</u></b> <b><u>(ADANI)</u></b>	<b><u>280.00</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>
<b><u>East Quay-5</u></b>	<b><u>167.64</u></b>	<b><u>11.00</u></b>	<b><u>11.00</u></b>	<b><u>11.00</u></b>
<b><u>East Quay-6</u></b>	<b><u>182.90</u></b>	<b><u>11.00</u></b>	<b><u>11.00</u></b>	<b><u>11.00</u></b>
<b><u>East Quay-7</u></b>	<b><u>255.00</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>
<b><u>** East Quay-8</u></b> <b><u>(VSPL)</u></b>	<b><u>255.00</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>
<b><u>** East Quay-9</u></b> <b><u>(VSPL)</u></b>	<b><u>255.00</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>
<b><u>*** East Quay-10</u></b> <b><u>(IMC)</u></b>	<b><u>181.00</u></b>	<b><u>=</u></b>	<b><u>11.00</u></b>	<b><u>=</u></b>
<b><u>* Awarded to M/s Adani Vizag Coal Terminal Pvt., Ltd.,</u></b> <b><u>** Awarded to B.O.T. Operator M/s. Vizag Seaport Pvt. Ltd.</u></b> <b><u>*** Awarded to IMC</u></b>				<b><u>-</u></b>
<b><u>INNER HARBOR NORTHERN ARM –</u></b> <b><u>WEST SIDE</u></b> <b><u>DAY TIME ( BERTHING / SAILING )</u></b> <b><u>DRAFT (with dock water density)</u></b>	<b><u>INNER HARBOR</u></b> <b><u>NORTHERN ARM</u></b> <b><u>– WEST SIDE</u></b> <b><u>NIGHT TIME (</u></b> <b><u>BERTHING /</u></b> <b><u>SAILING )</u></b> <b><u>DRAFT (with</u></b>	<b><u>TIDE</u></b>		

				dock density) water		
<u>BERHTS</u>	<u>Length</u>	<u>Panamax</u>	<u>Others</u>	<u>Panamax</u>	<u>Others</u>	-
<u>West Quay-1</u>	<u>212.00</u>	<u>13.50</u>	<u>13.50</u>	<u>13.50</u>	<u>13.50</u>	<u>0.5</u>
<u>West Quay-2</u>	<u>226.70</u>	<u>13.50</u>	<u>13.50</u>	<u>13.50</u>	<u>13.50</u>	<u>0.5</u>
<u>West Quay-3</u>	<u>201.12</u>	<u>13.50</u>	<u>13.50</u>	<u>13.50</u>	<u>13.50</u>	<u>0.5</u>
<u>West Quay-4</u>	<u>243.00</u>	<u>11.00</u>	<u>11.00</u>	<u>11.00</u>	<u>11.00</u>	-
<u>West Quay-5</u>	<u>241.70</u>	<u>11.00</u>	<u>11.00</u>	<u>11.00</u>	<u>11.00</u>	-
<u>West Quay-6(WQ-MPL)</u>	<u>255.00</u>	<u>14.00</u>	<u>14.00</u>	<u>14.00</u>	<u>14.00</u>	<u>1.0</u>
<u>RE West Quay1</u>	<u>170.00</u>	=	=	=	<u>11.00</u>	-

<b><u>West Quay-7</u></b>	<b><u>280.00</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>1.0</u></b>
<b><u>West Quay-8</u></b>	<b><u>280.00</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>14.50</u></b>	<b><u>1.0</u></b>

#### INNER HARBOR WESTERN ARM

<u>Quay Berths</u>	<u>Berth length (Mtrs)</u>	<u>Permissible draft # (Mtrs)</u>
<b><u>Fertiliser berth</u></b>	<b><u>173.13</u></b>	<b><u>10.06</u></b>
<b><u>Oil Refinery Berth-1@</u></b>	<b><u>183.00</u></b>	<b><u>10.06</u></b>
<b><u>Oil Refinery Berth-2@</u></b>	<b><u>183.00</u></b>	<b><u>9.75</u></b>

#### INNER HARBOR NORTH WESTERN ARM

<b><u>Green Channel Berth</u></b>	<b><u>150.00</u></b>	<b><u>8.20</u></b>
<p><b><u>* Vessels with more than 160.0m LOA can be allowed at EQ-10, subject to availability of sufficient space at the adjacent berth i.e. EQ-9.</u></b></p> <p><b><u># Permissible draft of vessels is subject to availability of tide – details given under harbour facilities</u></b></p>		

**\*\* For berthing 230.0m LOA vessel at WO-6, 45.0m room to be left vacant on North side of West Quay-5.**

**Night Restrictions: 1) For vessels > 200m LOA, maximum permissible draught in dark hours is 13.5m**

**2) Vessels above 195.0m or Beam more than 32.0m are handled by two pilots in dark hours**

-

**@ Subject to a max. 225 Mts. at one of the two berths**

-

#### **OUTER HARBOUR**

<b><u>Berth</u></b>	<b><u>LOA (Mtrs)</u></b>	<b><u>Permissible draft # (M)</u></b>
<b><u>Ore Berth-1</u></b> <b><u>(ESSAR)</u></b>	<b><u>300.00</u></b>	<b><u>16.50</u></b>
<b><u>Ore Berth-2</u></b> <b><u>(ESSAR)</u></b>	<b><u>300.00</u></b>	<b><u>16.50</u></b>
<b><u>Vizag General Cargo Berth (VGCBL) FOR</u></b> <b><u>2,00,000DWT</u></b>	<b><u>300.00</u></b>	<b><u>18.10</u></b>
<b><u>Offshore Tanker Terminal</u></b>	<b><u>280.00</u></b>	<b><u>17.00</u></b>
<b><u>L.P.G.</u></b>	<b><u>230.92</u></b>	<b><u>14.00</u></b>

<b><u>CONTAINER TERMINAL (VCTPL)</u></b>	<b><u>320.00</u></b>	<b><u>14.50</u></b>
<b><u>Chennel Berth FOR 10,000DWT</u></b>	<b><u>150.00</u></b>	<b><u>8.50</u></b>
<b><u>Fishing Harbour</u></b>	<b><u>70.00</u></b>	<b><u>5.50</u></b>

-

## **HANDLING FACILITIES OF VIZAG PORT**

### **Iron Ore & Pellets**

Functioning of the Mechanical ore handling plant known as ore handling complex comprises of the receiving system and the shipping system operated by M/s EVTL. The ore received through wagons is tippled and conveyed to the stacker for stacking in the receiving system. The receiving system consists of three wagons tippers (one twin wagon tippler of 2700 TPH cap. and another tippler of 3000 TPH capacity) to tipple the wagons

The shipping system reclaims the cargo from the stacks and conveys through the conveyors to the shiploader for loading into the ships' hatches. The system consists of 3 bucket wheel reclaimers 4000 tonnes per hour capacity, a long overhead conveyor system (4.8 kms – one way), a surgebin of 2000 tonnes capacity and a ship loader with a assigned capacity to load iron ore at 8000 tonnes per hour. This shiploader which moves on rails can negotiate a 2100 turn and can dip deep into the hatch of a ship.

The loading conveyors (7 nos.) are all overhead conveyors running at about 10 to 12 metres above ground level. The conveyors are supported by means of a pre-cast RCC frames founded on piles. The pre-cast frames are spaced at about 20.0 m c/c, a walkway

of 1.0 m wide is also provided alongside of the conveyor for attending to maintenance.

The conveyor is designed to run at a speed of 210 mtrs/minimum

### **Coking Coal & Steam Coal facilities**

A deep draft berth at outer harbour (Vizag General Cargo Berth(VGCB) with a Quay

Length of 356 meters to handle vessels of draft upto 18.10 meters is available for handling import Coking coal and Steam coal. The berth is capable of handling 2,00,000 DWT vessels and equipped with 3 ship loaders 2500 TPH (70,000 TPD), Conveyor systems, Stacker cum reclaimers rapid wagon loading systems.

Another Mechanised Terminal (EQ1) for handling of Steam coal vessels operated by M/s Adani Vizag Coal Terminal to handle vessels upto draft 14.50 mts with 2 Harbour mobile cranes to unload 27,000 TPD.

In addition, 7 Multipurpose berths in inner harbour which can accommodate vessels upto 14.50 mts draft and 2 Multipurpose B.O.T berths operated by Vizag Seaport Pvt. Ltd., equipped with Mechanized handling facilities are available. The other 2 B.O.T berths Viz., EQ10 operated by M/s AVR Infra Pvt. Ltd. for Liquid Cargo and WQ6 operated by M/s West Quay Multi Port Pvt. Ltd. for Multi Cargos. Other facilities include 3 nos. Harbour Mobile cranes at WQ berths and 1 Harbour Mobile Crane at EQ Berths are equipped in Inner Harbour.

### **Alumina**

A fully mechanized facility for loading Alumina is available at the dedicated berth (WQ-5) with 242 meters length and permissible draft upto 11 meters. The facilities available at the berth include: 3 silos of 25,000 tonnes capacity each Mechanical wagon unloading system (1100 TPH) Conveyor system for loading(2200 TPH)

## **POL**

**A deep draft Oil Tanker Terminal (OSTT) for berthing tankers of size up to 150,000 DWT and draft upto 17 meters is available. the facility is equipped with three unloading arms at the terminal direct discharge from berth to the refinery tanks @ 5500 tonnes per hour through pipe lines.**

**Facility available for STS transshipment of crude from VLCC to smaller tankers.**

**An exclusive jetty with draft upto 14 meters is available to discharge LPG. A Cavern facility for LPG first of its kind in South Asia – a mined rock Cavern at a depth of 200 mtrs. below sea level (capacity: 60,000 T) is available. Two berths (OR1 & OR2) in the inner harbour are available for handling petroleum products**

## **Containers**

**Container Terminal (VCTPL) is being operated by Visakha Container Terminal Pvt. Ltd. The terminal is the deepest terminal of the country with a facility to accommodate main line vessels up to 14.50 Mts draft. The terminal has a dedicated rail facility to handle full rake of 45 wagons. The terminal has a potential to handle 6 lakh TEU's in future years. The terminal is equipped with 4 Post Panamax RMQC's, 6 RTGC's and 6 Reach Stackers, and is ideally situated to serve as "Container Hub Port" on the East Coast of India.**

## **Cargo handling equipment**

<b>Description</b>	<b>Capacity</b>	<b>Availability in Nos.</b>
<b>Electric Wharf Cranes</b>	<b>20 T</b>	<b>04</b>

<b>Harbour Mobile Cranes</b>	<b>100 T</b>	<b>04</b>
<b>Locos ( General Traffic)</b>	<b>1350 HP</b>	<b>04</b>
<b>Locos (General Traffic)</b>	<b>3100 HP</b>	<b>03</b>

### **Traffic**

**The Port of Visakhapatnam handled 56.39 million tones of traffic of which maximum proportion 49.53 % are imports followed by exports (42.25 %) and transshipment cargo(58.21%).Similarly,quantum of cargo about 38.53 million tonnes handled to overseas and remaining quantum handled to coastal (17.86 million tonnes). In respect of nature of the cargo, maximum quantum of cargo about 34.89 million tonnes (61.87 %) is dry bulk followed by liquid bulk (33.76%) and break bulk containers (4.37 %).**

**Regarding commodity wise traffic ,out of 558.01 lakh tonnes, maximum quantum of cargo about 168.42 million tonnes handled by Port is POL products (30.36 %) followed by iron-ore and pellets (26.65%) cocking coal and Lam coke (13.4 %) and others (13.94%) thermal coal (4.83 %) and fertilizers (4.11 %)137.**





## **Port Safety and Security**

The discussions in the earlier chapter envisages that Ports play' a key role in the economic development particularly in the liberalization and globalization scenarios in short and long term perspectives. Besides this, the review of evolution of port studies and case

studies of ports are indicating origin, growth and development of port plays vital role particularly in the impact of port developments on cities, infrastructure developments in catchment areas of port. The main aim of the study is to determine the origin and growth of Visakhapatnam port as well as to assess its impact on city development in existing and future scenario.



## **Conclusion**

As one of the leading ports in India, Visakhapatnam still continues to build its infrastructure for the future making sure that India's gates are open to all types of trade. With increasing safety standards and a efficiently working crew the port is set for accepting any ship into her berths



# **AMET**

**ACADEMY OF MARITIME EDUCATION AND TRAINING**  
**DEEMED TO BE UNIVERSITY**  
(Under Section 3 of UGC Act 1956)

## **ACADEMY OF MARITIME EDUCATION AND TRAINING (AMET)**

(Declared as Deemed to be University u/s 3 of UGC Act 1956)

135, EAST COAST ROAD, KANATHUR, CHENNAI  
- 603 112.

TAMILNADU, INDIA

Internship Project –

**“COCHIN PORT”**

A Report on Internship In

Department of Nautical Science

By

<b>SL NO.</b>	<b>CADET NAME</b>	<b>ROLL NO.</b>	<b>REG.NO.</b>
<b>1.</b>	<b>ASHWIN NAIR</b>	<b>2686A</b>	<b>ANS19012</b>

April & 2020



## **BONAFIDE CERTIFICATE**

This is to certify that the project entitled “**COCHIN PORT**” submitted by cadet. **ASHWIN NAIR** Reg.No**ANS19012**...Batch **18**.....in the Department of Nautical Science, AMET, Deemed to be University Chennai is a bonafide record of Technical work carried out by him / her under my supervision.

Signature  
(Guide )

Capt. P.Rajendran  
Associate Professor  
Department of Nautical Science

Capt. K.Karthik  
DEAN/ HOD  
Department of Nautical Science



# AMET

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## INTERNSHIP ALLOCATION REPORT 2019-20

Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Programme : B.Sc

Year of study and Batch/Group : Batch-18/ Group 3




Name of the Mentor : Capt. Rajendran.

Title of the assigned internship : COCHIN PORT

Nature of Internship : Individual/Group

Reg No of Student : ANS19012

Total No. of Hours Required to complete the Internship: 30 DAYS

Signature of the Mentor	Signature of the Internal Examiner	Signature of HoD/Programme Head
		



# AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING  
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## INTERNSHIP EVALUATION REPORT 2019-20




Name of the Department: **NAUTICAL SCIENCE**

*(In view of advisory from the AICTE, internships for the year 2019-20 are offered by the Department itself to facilitate the students to take up required work from their home itself during the lock down period due to COVID-19 outbreak)*

Name of the Student	ASHWIN NAIR
Register No and Roll No	ANS19012 & 2686A
Programme of study	B.Sc
Year and Batch/Group	III YEAR 18 <sup>TH</sup> BATCH/ GROUP -6
Semester	VI
Title of Internship	COCHIN PORT
Duration of Internship	1 MONTH
Mentor of the Student	Capt. Rajendran

### Evaluation by the Department

Sl No.	Criterion	Max. Marks	Marks Allotted
1	Regularity in maintenance of the diary.	10	6
2	Adequacy & quality of information recorded	10	6
3	Drawings, sketches and data recorded	10	7
4	Thought process and recording techniques used	5	3
5	Organization of the information	5	3
6	Originality of the Internship Report	20	15
7	Adequacy and purposeful write-up of the Internship Report	10	8
8	Organization, format, drawings, sketches, style, language etc. of the Internship Report	10	8
9	Practical applications, relationships with basic theory and concepts	10	9
10	Presentation Skills	10	7
Total		100	82

 Signature of the Mentor	Signature of the Internal Examiner 	Signature of HoD/Programme Head 
--	---	--

# ***INTERNSHIP***

## **About Cochin port**



Submitted by,

SHINS DAVIS(2706A,ANS19032)

ASWIN NAIR (2686A,ANS19012)

PRANAV.K.G (2702A,ANS19028)





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TAMILNADU, INDIA

## COCHIN PORT

SIGNATURE OF HOD

DATE:    /    /



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3	VISION AND MISSION	6
4	BERTHING FACILITIES	7
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# ABSTRACT

Cochin Port is a major port on the Arabian Sea - Laccadive Sea – Indian Ocean sea-route and is one of the largest ports in India. The port lies on two islands in the Lake of Kochi. Willington and Vallarpadam, towards the Fort Kochi river mouth opening onto the Laccadive Sea. The International Container Transshipment Terminal (ICTT), part of the Cochin Port, is the largest container transshipment facility in India's. The port is governed by the Cochin Port Trust (CPT), a government of India establishment. The modern port was established in 1926 and has completed 86 years of active service. The Kochi Port is one of a line of maritime related facilities based in the port-city of Kochi.

We have included the following topics in our project and we have given a brief description of vision and mission of Cochin Port which includes dependable, cost-effective Port services through modern and efficient infrastructure coupled with high quality, customer friendly services. Total information of the berthing facilities of Cochin Port have been discussed in this project which includes the maximum draft of SPM and container berthing terminal etc. Navigation facilities include pilotage, depth etc. Pilotage we know for all the merchant ships it is advisable to have a pilot on the time of berthing so the pilotage position. Storage facilities, include the number of container boxes or how much cargo it can store. Traffic separation scheme is also briefed in this project.

# INTRODUCTION

Cochin Port is a major port on the Arabian Sea - Laccadive Sea – Indian Ocean sea-route and is one of the largest ports in India. the port lies on two islands in the Lake of Kochi.

Willington and Vallarpadam, towards the Fort Kochi River mouth opening onto the Laccadive Sea. The International Container Transshipment Terminal (ICTT), part of the Cochin Port, is the largest container transshipment facility in India's he port is governed by the Cochin Port Trust (CPT), a government of India establishment. The modern port was established in 1926 and has completed 86 years of active service. the Kochi Port is one of a line of maritime related facilities based in the port-city of Kochi. The others are the Cochin Shipyard, the largest shipbuilding as well as maintenance facility in India. the SPM (single point mooring) facility of the Kochi Refineries, an offshore crude carrier mooring facility; and the Kochi Marina .The littoral drift phenomenon, which is associated with the movement of substantial quantity of sand, predominantly from the north, has been widely held to be responsible for the coastal erosion off the coast of Cochin. This phenomenon is also thought to be principally responsible for the fact that 95% of the siltation to the south of Cochin Port is from the outer sea. At 21 million cubic meters per year Cochin Port has the highest siltation among Indian ports, necessitating year-round maintenance dredging.

It has been operated by Cochin Port Trust and Dubai ports world. And it is owned by Ministry of Shipping (Government of India), they are two Wharfs in the Cochin Port Trust one is Ernakulum Wharf and other one is Mattancherry Wharf. There are totally Nine Berths available in Ernakulum Wharfs and four Berths in MattancherryWarf's. The total Statistical Measures value of cargo is 17.43 million tonnes.

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# VISION AND MISSION OF COCHIN PORT

## **MISSION:**

- The Mission of the Cochin Port Trust is to provide dependable, cost-effective Port services through modern and efficient infrastructure coupled with high quality, customer friendly services.
- The Port shall manage its assets and resources for optimal economic use to the Nation and the community.
- The Port shall strive to be the main catalyst for the economic development of the region, with a strong commitment to environmentally sound policies and safe practices.
- The Board of Trustees, the employees and all stakeholders of the Port shall work as a team in an open, positive, collaborative and cooperative manner.
- In pursuit of this Mission, the Port Trust shall be guided by the principles of integrity, ethical behavior, professional excellence, service to the community and respect for every individual.

## **VISION:**

- A public service provider
- An economic development facilitator
- A business enterprise
- Education and training of all the employees
- Implementation of ISO 9001:2015 Quality Management System
- Attending to customer complaints and take corrective actions to avoid recurrences.
- Carrying out internal audits and take corrective actions
- Continual Improvement in all the areas of services.
- Complying

## **BERTHING FACILITIES AT COCHIN PORT**

The berthing facilities of the Cochin Port are provided along Ernakulam Channel and the mattanchery and Mattancherry Channel on either side of the Willingdon Island. The various facilities are briefly described in the following sections.

### **Cochin Oil Terminal (COT)**

The COT is located in the Ernakulum Channel, opposite to Q8 berth. Tankers up to a draft of 12.5 m with parcel size of about 82,000 t are loaded at this terminal. The COT comprises of 4 breasting dolphins, one central platform and four mooring dolphins, two on either side of the platform. The structure has been located on vertical as well as raker piles. The mooring dolphins and central portion consisting of platform and breasting dolphins have been interconnected through walkways, 4 nos. marine unloading arms, each of 300 mm diameters with a rated discharge of 1500 tph has been provided at the central platform. The COT is being used for handling of crude oil and products. One 762 mm diameter (for crude oil) and two 406 mm diameter (for products) including the submarine portion have been provided for connecting the COT to the refinery pipelines at shore. The crude pipeline has a capacity limiting to maximum discharge of 2500 tph and an average discharge of 2000 tph.

### **South Tanker Berth (STB)**

This jetty situated adjacent to NTB is mainly used to service product tankers of size up to 18,000 DWT with an LOA of 170 m and 9.14m draft. This jetty is connected to the

Ernakulum shore through a 270 m long approach trestle and oil transfer takes place through marine loading arms and flexible hoses. The jetty is provided with oil pipelines for handling products like Naphtha, MS, FO and SKO/HSD. The average discharge rate is 800 tph in case of Naphtha/MS/SKO/Kerosene and 500 tph in case of FO. One 320 mm diameter bunker pipeline is also provided.

### **North Tanker Berth (NTB)**

This jetty was constructed in the Ernakulam Channel and commissioned in 1955. The jetty was upgraded in 1966 to receive crude tankers of size 30,000 DWT with LOA of 213 m with a loaded draft of 9.14 m. The Jetty is connected to Ernakulam shore by a 270 m long approach trestle. To handle crude and products, pipeline system comprising of various sizes has been provided. Marine loading arms and hoses are provided for transferring oil between the berth and the tanker using tanker's own derrick.

### **Fertilizer Berth (Q10)**

It is an open piled jetty 278 m long, located at the south east of Q9 wharf. Two mooring dolphins, one on either side of the berth and an approach trestle of 36.3m length and 7.5 m width, at the south eastern end, have been provided. This berth is allotted for handling the FACT traffic exclusively, which consists of fertilizer raw material i.e. rock phosphate and sulphur. In addition to this a 300mm diameter pipeline has been provided to handle phosphoric acid. A barge jetty is provided adjacent to the Q10 berth, for transportation of the fertilizer raw material for FACT, by barges.

### **Multi Purpose Berth (Boat Train Pier & North Coal Berth Combined)**

This Boat Train Pier (BTP) berth has been constructed as multi-purpose jetty. The berth structure consists of a central platform connected to land through three no. of gangways. The total length of the platform is 200 m. The North Coal Berth (NCB) is located on the Mattancherry Channel. This was constructed for handling coal vessels. North Coal Berth was

commissioned in 1959 and its length is 182.88 m. The permissible draft at these berths is 9.14 m. The berth is constructed using pre-cast concrete piles and the main berth consists of a 105 m long RCC platform supported over 500 mm square pre-cast piles. This platform is connected to the shore by three gangways, one at the centre and two on either sides. The North Coal Berth is used for handling POL products for Indian oil. This berth is also being used for general cargo vessels with a maximum capacity of 35,000 DWT, passenger vessels and for maintenance of dredgers.

## **Mattancherry Wharf (Q1 to Q4)**

The Mattancherry Wharf consisting of four berths namely Q1, Q2, Q3 and Q4 is the first Wharf constructed during 1930s, using the steel sheet piles. The length of the original steel pile quay was 457.60 m. During 1940s the wharf was extended on both sides, using monoliths, increasing the quay length to 670 m. Subsequently, a structure using reinforced cement concrete supported over concrete screw piles was constructed in 1951 for berthing of vessel. The length of this structure is 577 m. It was subsequently extended on both sides by 33.15 m to provide a total wharf frontage of 643.30 m for berthing of the vessels. The quay structure has been designed for a dredged depth of -9.75 m in front. The 19 berths Q1 to Q3 are being used for handling of general cargo whereas the Q4 has been converted to handle liquid cargo in bulk.

## **South Coal Berth**

The South Coal Berth located on the Mattancherry Wharf. It was constructed for handling coal vessels. South Coal Berth was commissioned in 1953. The length of the South Coal Berth is 192.02 m. The permissible draft at the berth is 9.14 m. The berth is constructed using pre-cast concrete piles. The main berth consists of a 105 m long RCC platform supported over 500 mm square pre-cast piles. This platform is connected to the shore by three gangways one at the Centre and two on either sides. The South Coal Berth is being used for handling liquid ammonia, for which a 200 mm diameter marine unloading arm and a 300 mm diameter pipeline is provided connecting the storage tank.

## **Liquid Ammonia Jetty**

This is a barge loading jetty located south of the South Coal Berth. This jetty is an open piled construction using 500 mm square RCC piles. This jetty is 59 m long by 4.5 m wide. It is

connected to the shore by a 39 m long and 4 m wide approach on pre-cast piles. This jetty was being used for transportation of liquid ammonia for FACT by barges.

BERTH/MOORING	MAXIMUM LENGTH OVERALL	MAXIMUM DRAFT	PRODUCTS HANDLED
SPM	370	22.50	CRUDE
COT	250	12.50	CRUDE/POL
NTB	213	9.14	POL
STB	170	3.14	POL
ERNAKULAM WHARF(Q5-Q6)	250	10.00	DRY CARGO/CBS
ERNAKULAM WHARF(Q7)	250	10.50	DRY CARGO
ERNAKULAM WHARF(Q8-Q9)	250	11.00	DRY CARGO
FERTILIZERBERTH(Q10)	207	10.70	FERTILISERS/PHOS.ACID
SCB	170	9.14	LIQUID BULK
NCB	170	9.14	DRY/LIQUID
BTP	190	10.0	DRY/LIQUID
MATTANCHERY WHARF	180	9.14	DRY BULK

## STORAGE FACILITIES OF COCHIN PORT

For the storage of the cargo, extensive facilities have been provided at the Cochin Port.



1. Mattancherry Wharf is served by a covered area of 30,925 sqm consisting of four warehouses.
2. Ernakulam Wharf excluding Q10 berth, has a covered area of 23,321 sqM including a Container Freight Station of 10732 sq. m.
3. In Willingdon Island, 14 tank farms in an area of 206360 sqm with a total capacity of 362212 KL are located

### MATTANCHERY WHARF

S.NO	Location	Quantity (No. / KL)	Total Storage Area (Sq.M)
1	Warehouses	4	11,755
	OVER FLOW SHED	3	6060
	TRANSIT SHED	3	13,110
			35,463

### Traffic handled at the port

The cargo traffic handled at Cochin Port increased from 13.02 million tonnes in 2002-03 to 21.60 million tonnes in 2014-15, registering an average annual growth rate of 5.43%. The year-wise growth in the cargo traffic handled at Cochin Port vis-à-vis that handled at all the major ports of the country together with the percentage share of traffic handled at Cochin Port from 2002-03 to 2014-15 is given in Table

YEAR	TRAFFIC HANDLED BY COCHIN PORT	% OF SHARE OF TRAFFIC HANDLED BY COCHIN PORT
2002-03	13.02	4.15
2003-04	13.57	3.94
2004-05	14.10	3.67
2005-06	13.89	3.28
2006-07	15.26	3.29
2007-08	15.75	3.03
2008-09	15.49	2.92
2009-10	17.43	3.11
2010-11	17.87	3.14

2011-12	20.09	3.59
2012-13	19.85	3.64
2013-14	20.89	3.76
2014-15	21.60	3.72



## OTHER FACILITIES

### MAINTENANCE FACILITIES

For repairs and maintenance of the port structure and equipment, Port 24 Maintenance Workshop (PMW) have been provided in addition to electrical repair shops.

### **Proposed Facilities at Willingdon Island**

- International Ship Repair Facility at port workshop
- International Cruise Terminal at extended BTP
- Desalination plant
- Waste to energy treatment plant
- Mechanized Coal Terminal
- Bridge between W/Island and EdaKochi.

### **NAVIGATION FACILITIES**

The entrance to the Port of Cochin is through the Cochin Gut between the peninsular headland Vypeen and Fort Kochi. The port limits extend up to the entire backwaters and the connecting creeks and channels. The approach channel to the Cochin Gut is about 1000-metre long with a designed width of 200 meters and maintained dredged depth of 13.8 meters (now dredging for 16 meters for ICTT).

From the gut, the channel divides into Mattancherry and Ernakulam channels, leading west and east of Willingdon Island respectively. Berthing facilities for ships have been provided in the form of wharves, berths, jetties and stream moorings alongside these channels.



## **SAFETY AND SECURITY IN PORTS**

There are three levels of port security

- security number 1
- security number 2
- security number 3

cochin port is in security number 1

The maritime safety and security , as was already mentioned, is the safety of people and property at sea from all kinds of hazards existing at sea, and safety of the marine environment from pollution. The maritime security is the security of ships and port facilities from terrorist activities, as well as prevention of ships and trans- ported goods from being used by terrorists for spreading the terrorist assets (means and tools for terrorist activities).

The main objective of the maritime safety and security management is maintaining the acceptable level of risk at sea.

The term 'risk' means the value of the level of hazard at sea. The value of the Risk is given by the following expression

$$\text{Risk} = (\text{probability of accident}) \times (\text{losses per an accident})$$

The process of the maritime safety and security management comprises the following steps:

- monitoring and evaluating the level of risk;
- determining the options of risk control measures;
- implementing the proper risk control measures;
- coordinating the process of implementation of risk control measures;
- controlling the efficiency of implemented risk control measures

However, it should be remembered that maritime safety and security has the international character. It means that the maritime safety and security must be ensured and maintained in the following way:

- in the world-ocean scale;
- at all levels of the management of the maritime safety and security.
- Navigation and Port Management purposes
- Seaport Security

Automatic scanning and observation of all land and maritime zones for unauthorized activities. Surveillance of docks and storage areas. If intruders are observed, the systems continue with identification and tracking of the intruders and direction of security forces. This solution provides

- A "virtual fence" over the water - detection of intruders (small ships, boats and swimmers) from the sea before they reach the port or harbor area boundary.
- A "virtual fence" on the land near the port/ harbor detecting land intruders before they reach the fence.

## **Seaport Safety & Naval Vessel Control**

- Observe and track naval vessels at sea and at the port or harbor 24/7 with continuous zoom-in capabilities.
- Scan naval vessels at sea and at the harbor or port for technical issues - with large magnification.
- Support Vessel Traffic Control activities.
  - Provide situational awareness support for Port Traffic Control responsibilities.



The need for surveillance against sabotage is far greater than pilferage in case of Cochin since; it has tanker terminals handling LNG/Chemicals/ POL products. Within the limits of Cochin Port exists the Head Quarters of Southern Naval Command, a defence installation of great strategic importance. It is therefore extremely important to have continuous surveillance in the area for both the maritime purposes as well as the anti-sabotage point of view.

Surveillance for Cochin could be considered under the following sections:

- Closed circuit television (CCTV) cameras
- Patrolling
- Watch towers and Search lights



## METHDOLOGY

The Cochin port was formed naturally due to the flooding of the Periyar River in 1341 AD, and, over time, has become a major flashpoint for trade. The port in its initial history attracted European merchants- predominantly Dutch and Portuguese- and was later expanded by the British with the establishment of Willingdon Island. The traditional port was near Mattancherry (which still continues as Mattancherry Wharf).

### **Cochin Port Trust in 1948**

The idea of establishing a modern port in Cochin was first posited by Lord Willingdon during his governorship of the Madras Province. The opening of the Suez Canal allowed several ships to pass near the west coast and he felt it was necessary to build a modern port in the southern part as well. He selected the newly joined Sir Robert Bristow,[5] a leading British harbor engineer, to head the project, and Bristow became chief engineer of Kochi Kingdom's Port Department in 1920. From that point forward until the port's completion in 1939, he and his team were actively involved in making a Greenfield port. With extensive research spanning over a decade toward securing a permanent manmade port that could withstand monsoon erosion, he was convinced that it would be both feasible and largely beneficial to develop Kochi through its port. He believed that Kochi could become the safest harbour in India if the ships could enter the inner channel.

The challenge before engineers was a rock-like sandbar that stood across the opening of Kochi backwaters into the sea. Its density prevented the entry of all large ships (requiring more than eight or nine feet of water). It was thought that the removal of the sandbar was a technical impossibility, and the potential consequence on the environment was beyond estimation. Efforts that had been previously

undertaken on this scale had led to ecological atrocities such as destruction of the Vypeen foreshore.

However, Bristow, after a detailed study of wind and sea current conditions, concluded that such issues could easily be avoided. He addressed the immediate problem of Vypeen foreshore's erosion by building granite groynes that were nearly parallel with the shore and overlapped each other. The groynes enabled a system of automatic reclamation which naturally protected the shore from monsoon seas. Spurred on by this success, Bristow planned out a detailed proposal of reclaiming part of the backwaters at a cost of ₹25 million (US\$350,000). An ad-hoc committee appointed by the Madras government examined and approved the plans submitted by Bristow.

During World War II, the port was taken over by the Royal Navy to accommodate military cruisers and warships. The strategic importance of Cochin during the World Wars was one immediate reason for the construction of the harbour. It aided the British in resisting the Japanese threat, but it also proved crucial domestically in the shaping of Cochin as a modern urban space, reorganizing local caste and labour relations. According to a recent study, "[t]he 20-year long project appropriated, modified, or undermined existing social institutions of labour recruitment, work processes, skills and local technologies. The large-scale appropriation and modification of local skills and labour recruitment and work process in this colonial project produced a space of disparity by reinforcing the pre-capitalist caste-based coercive labour relations. The project also involved a massive destruction and appropriation of the social spaces of the urban poor." [7]

In 1932, the Maritime Board of British India declared the Port of Cochin as a major port and was opened to all vessels up to 30 feet draught. It was returned to civil authorities on 19 May 1945. After the Independence, the port was taken over by the government of India, and in 1964, the administration of the port was vested to a Board of Trustees

under the Major Port Trusts Act. The port is currently listed as one of the 12 major ports of India.



## CONCLUSION

Strategic location in the International shipping Highway and also near to the main waterways to Singapore and West Asia puts Kochi Port in a very commanding Position to serve the massive East West Ocean trade. Total exports at Kochi Port have experienced a gradual rise and the future projections are also showing a positive growth. Imports from the major share of goods handled at the port. POL product imports are registered the highest comprising 80% imports. Exports from the port are increasing but total exports comprise of only 17.22% traffic handled. The port has to insist on the faster completion of modernization plans to increase its capacity, so as to efficiently handle the growing traffic. The port has to concentrate more on container handling, as container traffic is being growing rapidly across the world.

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