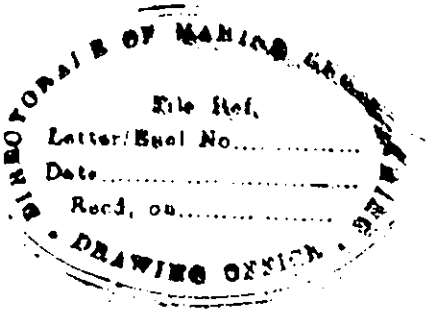
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DRAWING OFFICE

DOS(E) SPECIFICATION 423

ON

MARINE SEA WATER AND BILGE PUMPS

DOS(E) SPECIFICATION - 423

MARINE SEA WATER AND BILGE PUMPS

FOREWORD

1. General requirements of Rotodynamic Pumps are contained in the General Marine Engineering Specifications, the relevant Naval Engineering Standards and DME Specifications 402. The aim of this specification is to rationalise the range of Sea Water and Bilge pumps for Indian Naval Ships in order to standardise the variety of these pumps in service and to act as the guiding document to pump manufacturers and those dealing with the design and selection of pumps.

2. Though reference to other specifications have been made in some places, the text has been prepared to make it self sufficient for pump manufacturers to understand Naval requirements of design and manufacture of marine Sea Water and Bilge pumps.

3. Any user of this specification, within the Navy or in the outside industry may propose changes. Proposal for changes are to be forwarded to Director of Systems(Engineering), Naval Headquarters, New Delhi - 110011.

4. No alteration to this specifications is to be made, without formal approval of the Naval Headquarters.

(Pradeep Bahri)
Commander
Dy Director of System (Engineering)
25 Jun 96

II

Approved for issue as DOS(E) specification.

(AM Telang)
Commodore
Director of Systems (Engineering)
25 Jun 96

CONTENTS

STATEMENT OF REQUIREMENT
FOR
STANDARD RANGE OF
CENTRIFUGAL PUMPS
FOR
IN SHIPS AND SUBMARINES

1. SCOPE

0101 This document has been prepared with the aim of standardisation of centrifugal pumps, using sea water as fluid medium. It contains general guidelines for selection of sea water and bilge pumps for shipboard application.

0102 This document defines Naval duties and details pertaining to evaluations and testing of Pumps. Manufacturers may be guided by this document to ensure that their products meet the standards of installation on Naval Ships.

0103 Further Clarification/Details required are to be guided by NES 327 and DME Specification 402.

2. GENERAL REQUIREMENTS

0201. All offers are to be technically cleared prior to placement of order. The technical offer should include following :-

(a) GA drawings.

(b) General material specifications and part identification list(PIL).

(c) Technical parameters (as per Articles 0301 - 0302).

(d) Quality Assurance Plan.

Documentation

0202. **Spare/Tools** The following details/documents in respect of the spares are required to be submitted by the manufacturers/suppliers along with the techno-commercial offer:-

(a) On-board Spares. Manufacturers recommended list of spares for one year operation of one plant as has been explained at article 0319 of this document.

(b) Base and Depot Spares. Manufacturers recommended list of spares for long term exploitation (five years) as per article 0319.

(c) Itemised price list of all the components, sub-assemblies and complete units.

(d) Part Identification List.

(e) Tools required for maintenance.

0203. **Operation/Maintenance Documentation.** The technical documentation should clearly specify the operating procedures viz. starting, precautions during running, necessary checks for starting and after stopping. All maintenance necessary till the end of service life, including procedures to carry out such maintenance should be clearly specified. All mandatory replacement parts during maintenance are to be indicated.

0204. Complete Documentation should be supplied in 20 copies for the first order. Additional copies are required to be provided for each of the repeat orders. The documents should cover all aspects of operation and maintenance, catering from daily routines upto major overhaul and replacement of major assemblies/components.

Training

0205. The suppliers are required to indicate the course contents for training of Naval personnel in operation and maintenance of their equipment . The level and number of personnel recommended for training also need to be indicated. The training, as far as possible, should be conducted at the manufacturers premises.

Warranty

0206. The suppliers should guarantee, for efficient and trouble free operation of the equipment, for 24 months after commissioning or 30 months from the date of despatch or as agreed upon during the negotiations.

Guarantee/Maintenance Contract

0207. The supplier should confirm product support for next 20 years for the equipment offered by them. A maintenance contract may be offered for consideration and negotiations.

Inspection, Tests & Trials.

0208. The product offered by the manufacturer should conform to standard Engineering practices. The equipment will be subject to stage inspection and final test and trials by the Naval Inspection Agencies as per the Quality Assurance Plan accepted by the equipment ordering authority. By and large, the pumps should have all the components of indigenous make. In case design changes are made to any component subsequent to the order, the manufacturer shall inform the customer and the plant will have to be re-type tested.

3. TECHNICAL/DESIGN REQUIREMENTS

Duty

0301. The aspects while selecting the pumps are as follows:-

(a) Total Head

(b) Suction Head

(c) Requirement of self priming

(d) NPSH available

(e) System cleanliness

(f) Power requirements

0302. Additional Information. The following additional information may be included in procurement specification:

(a) Pump fluid and its temperature range.

(b) Pumps total Head and flow rate.

(c) Pump inlet pressure.

(d) Other duty flow rates, total heads, suction pressures, where applicable.

(e) Connecting flange sizes.

(f) Motor electrical supply including any limitation on starting current.

(g) Whether or not motor is to be submersible.

(h) Weight and dimensional limitations such as hatch size.

(j) Type of motor.

Environmental conditions

0303. The pumps offered for marine applications are required to operate under various environmental conditions as appended below:

(a) **Surface Ships.**

(i) Ambient temp. between 10 deg C and 50 deg C.

(ii) **Machinery space conditions**

	NORMAL	CLOSED DOWN
Temperature	10-55 deg C	70 deg C
Relative Humidity	100%	100%
Time	continuous	upto 48 hrs
Pressure	1.013 bar	1.013 bar

(iii) **Sea conditions**

	Design	Extreme
Roll	(+/-)20 deg period 10.5 secs	(+/-)25 deg period 10.5 secs

Pitch	(+/-)7deg period 5 secs	(+/-)8.5 deg period 5 secs.
Heel	----	20 deg
Trim	----	05 deg

(b) **Submarine**

(i) **Machinery space conditions**

	Normal	Abnormal
Temperature	2-40 deg.C	85 deg C
Relative Humidity	80%	100%
Time	Continuous	15 minutes
Pressure (Nuclear)	-0.1 to +0.1 bar	--
(Diesel)	-0.4 to +0.1 bar	--

(ii) **Sea conditions**

		Submerged	Surfaced
Heel	(aa)	40 deg for 5 secs	10 deg
	(ab)	20deg for 10 secs	cont
	(ac)	10 deg continuously	
Trim	(aa)	30 deg for 30 secs	5 deg
	(ab)	22 deg for 3 min	cont
	(ac)	15 deg continuously	

Combined Heel & Trim	(aa)	30 deg Trim and 10 deg Heel for 30 secs	----
	(ab)	15 deg Trim and 40 deg Heel for 5 secs	----
Emergency Bottomed	30 deg from vertical in any direction.		----
Roll	----		(+/-) 30 deg periodicity 6 secs
Pitch	----		(+/-) 25 deg periodicity 5 secs

Range of Sea water Pumps & Material Requirements

0304. The details of existing Sea water and Bilge pumps in the Indian Navy are at Appendix I. Standard Classification of these pumps is at Appendix II. The standard ranges of the Sea water and Bilge pumps is placed at Appendix III and the Statement of Technical Requirements of the standard ranges is at Appendix IV.

0305. **Materials**. The desired material requirements and limitations are specified in Appendix V. The basic and essential requirements are placed at Appendix VI.

Design Requirements

Vibrational environment

0306. The vibrational environment is specified in DGS 350. In general the standard test levels are as follows:

Type Of Ship	Test Levels Peak Values And Frequency Range
(a) Minesweeper and above	0.125mm, 5to 33 Hz
(b) Smaller than Mines -weeper	30 mm/sec or 0.2 mm whichever is less. Range 7 to 300 Hz
(c) Submarines	0.125 mm, 5 to 33 Hz

Noise

0307. Acceptable noise levels will depend upon the target noise level of the ship in which the pump is installed. In general, the attempt should be made to reduce it to the minimum.

Shock

0308. The pump should comply with Shock Grade B standards. However for submarines application the pump should meet Shock Grade A standards.

Cavitation and NPSH

0309. The pump may be required to be so designed to avoid cavitation by ensuring that NPSH available is greater than NPSH required. Pump manufacturer is to ensure that NPSH available is known and the pump offered meets its requirement.

Self priming

0310. The pump may be required to be of the self priming type, when machinery arrangement aspects dictate that the pump/impeller is above the water level. This requirement when applicable, will be included.

Submersibility

0311. Submersibility in terms of water head above seating levels and the period of submerged operation will be specified in the order, if required.

Starting/stopping arrangements

0312. The pumps should be suitable for remote starting/stopping.

Pump Drive Arrangements

0313. The pumps are to be of the direct drive type. The prime movers are to be electric motors, unless otherwise indicated for special applications.

0314. The power supply to the motor should be as follows :-

(a) For AC ships

(i) Power Supply

Voltage	Phase	Cycles
450 V	3 Ph	60 Hz
380 V	3 Ph	50 Hz
415 V	3 Ph	50 Hz

(ii) Motor must conform to EED-Q-071

(iii) Shock Grade B (except for submarines where Shock Grade A is required).

(iv) Starter must conform to NES 636.

(b) For DC ships and submarines:-

(i) Power supply - 220 V

(ii) Motor must conform to NES 632

(iii) Starter must conform to NES 636.

Controls/ Instrumentation

0315. Control and instrumentation systems required for the particular application will be included in the order specification. The system may include any or all of the following:

(a) Remote/automatic starting.

(b) Local/remote control.

(c) Protective devices.

(d) Instrumentation.

0316. The pump starter or a start stop facility, is to be located adjacent to the pump's local instrumentation/gauges so that the operator is immediately aware of whether or not the pump has started taking suction.

0317. Pumps are to be provided with pressure/vacuum gauges, each with an indicator and isolating valve, at the following points:

(a) Pump discharge

(b) Pump suction (where applicable)

0318. Bourdon tube pressure gauges are to be of the dial indicating

type to DEF STAN 66-2. Installation of pressure gauges is to conform to BS 1780. All pressure, flow and level sensing devices are to be fitted with isolating valves at source conforming to the working pressure of the system.

Spares

0319. Manufacturers should ascertain the upkeep policy, duty cycle, preventive maintenance schedule, probable modes of failure and their frequencies and recommended ranged and scaled list for each category of spares for the pumps. The categories are as follows:

(a) Onboard Spares. These are the spares which are required for routine servicing during any 12 month period, together with those spares which should be carried onboard for critical maintenance onboard.

(b) Base and Depot Spares. These are spares and assemblies to support a five year period. These are to include mandatory spares required to be changed during a maintenance routine and other spares depending on the condition of the equipment. This is to be based on consumption pattern.

0320. Spares recommended for procurement by the manufacturers will be ranged and scaled by Naval Headquarters. For this purpose, the following additional information is to be supplied by the manufacturers:

(a) Comprehensive Part List and Illustrated Part Identification List giving details of assemblies and sub-assemblies. Details of nomenclature and Part Numbers are also required.

(b) Price of each component and lead time for supply on receipt of order.

(c) Recommended list of Onboard and Base and Depot spares.

Documentation

0321. Drawings. The drawings are to be supplied in 20 sets along with Vellographs. The drawings are also to be micro filmed and two sets of microfilms are also be supplied. The drawings are to show the followings:

(a) General arrangement.

(b) Cross sectional Arrangement.

(c) Overall dimensions.

(d) Terminal points including output coupling.

(e) Mounting arrangements and jacking points.

(f) Maintenance envelope, lifting points, center of gravity.

(g) Assemblies.

(h) Sub-assemblies.

(j) Overall weights and weights of assemblies and sub-assemblies.

(k) List of special tools and outfit.

(l) Part list.

Documentation/Handbooks. The following documentation is to be supplied in 20 sets. The documentation is to be prepared in accordance with NES 722:

(a) Operators handbook.

(b) Maintainers handbook.

(c) Parts Identification list.

(d) Comprehensive Parts List.

Maintainability

0323. All maintenance and repair between major overhauls should be carried out in situ. The design is, therefore, to provide accessibility to all working parts.

4. TEST AND TRIALS

0401. All material such as plates, ingots, forgings, welds, castings, etc are to be inspected in accordance with Naval test methods either destructive or non-destructive. Components, sub assemblies and assemblies are to be inspected at various stages of manufacturing process.

0402. Pressure tests are to be carried out after completion of all welding/brazing operations for a duration of not less than 30 minutes. The test fluid is normally fresh water at 15 degrees C. The test pressure would be specified (generally 1 1/2 times the maximum working pressure).

Type Test

0403. The first production or prototype pump of each type and size is to be subjected to a type test. Type test shall comprise any or all of the following:

(a) Physical Data

(b) Wear

(c) Safety test

(d) Overspeed test

(e) Performance test

(f) Noise and Vibration measurement

(g) Shock test

(h) Submersion test

(j) Inclination test

(k) Endurance test

(l) Examination for wear

0404. Physical Data.

(a) Weight of complete unit, wet and dry.

(b) Overall dimensions.

(c) Determination of center of gravity.

(Above parameters needs to be cross-checked with the drawings submitted by the manufacturers, and the drawings be amended, if results are found differing).

0405. Wear. Before type testing, measurements of the wearing parts and clearances are made for comparison with dimensions on completion of endurance test.

0406. Safety tests. All protection devices are to be tested atleast five times to establish satisfactory operation.

0407. Overspeed test. When the primemovers are steam/gas turbines or diesel engines, the unit is to be run upto 20% above the specified speed to show that the equipment is free from unacceptable vibration.

0408. Performance test. Performance test should comprise the continuous running of the pump for atleast eight hours. The fluid to be used in case of sea water and bilge pumps may be fresh water. These tests are carried out to establish the performance of the pump over the full specified duty range. The important parameters

to be measured during performance test are as follows:

(a) Suction head

(b) Discharge head

(c) Capacity of flow rate

(d) RPM

(e) Current, voltage and power consumption

(f) Motor temperature

(g) Bearing temperature

(h) Cooling water inlet and outlet temperature

(j) Ambient pressure and temperature

(The suggested tolerance on the guarantee flow rate for the guarantee points specified for total head and RPM is + 0 - 4.75%.)

0409. Start/stop tests. A minimum of 30 start/stops are to be carried out. Once the pump has been started, it should run for atleast 15 minutes and then stopped.

0410. Noise and Vibration. Self induced noise and vibration levels at the specified duty will be measured.

0411. Environmental shock test. Pumps are to be shock graded to shock grade B for surface ships and to shock grade A for submarines unless otherwise specified. Performance of the pump before and after the shock test is to proved. The pump should be completely dismantled thereafter and examined for any damage. The test shock

(j) Inclination test

(k) Endurance test

(l) Examination for wear

0404. Physical Data.

(a) Weight of complete unit, wet and dry.

(b) Overall dimensions.

(c) Determination of center of gravity.

(Above parameters needs to be cross-checked with the drawings submitted by the manufacturers, and the drawings be amended, if results are found differing).

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(g) Bearing temperature

(h) Cooling water inlet and outlet temperature

(j) Ambient pressure and temperature

(The suggested tolerance on the guarantee flow rate for the guarantee points specified for total head and RPM is + 0 - 4.75%.)

0409. Start/stop tests. A minimum of 30 start/stops are to be carried out. Once the pump has been started, it should run for atleast 15 minutes and then stopped.

0410. Noise and Vibration. Self induced noise and vibration levels at the specified duty will be measured.

0411. Environmental shock test. Pumps are to be shock graded to shock grade B for surface ships and to shock grade A for submarines unless otherwise specified. Performance of the pump before and after the shock test is to proved. The pump should be completely dismantled thereafter and examined for any damage. The test shock

loadings of grade A and B are to be as per Appendix VII and VIII respectively.

0412. Submersible tests. When specified, tests are to be carried out to demonstrate the pumps capability to operate in submerged condition.

0413. Tilt test. Pumps are to be run for one hour with 40 deg tilt in each direction. All parameters are to be checked after 45 minutes with particular attention to the following:

(a) Suction

(b) Effect on discharge pressure

(c) Motor temperature

0414. Endurance Run. This test is to be conducted for 100 hours at maximum capacity at rated pressure. It is to include the following:

(a) Parameters recorded every two hours.

(b) Outlet temperature.

(c) Operation of auto cutout system.

(d) Noise and Vibration levels.

(e) Motor starting test at full, rated and reduced voltage (for submarines).

(f) Thorough examination after 100 hours.

0415. Examination for wear. On completion of type test the unit is to be stripped and examined for wear.

Production Test

0416. Each unit is to be production tested to confirm that the performance characteristics conform to those established in the type test. The production tests are to include the following:

(a) Safety tests.

(b) Control equipment tests.

(c) Overspeed tests.

(d) Performance tests.

(e) Noise and Vibration test.

(f) Submersible test.

Onboard Trials

0418. On successful completion of the trials at manufacturers premises and the shock test trials, the pump is to be installed on board ship/ submarine, and tried as per Appendix IX.

Criteria for Selection of Pumps.

0419. Criteria for selection of pumps for certain duties is at Appendix X.

APPENDIX I

DETAILS OF EXISTING SW AND BILGE PUMPS

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT 1241 PE																		
SANITORY PUMP	AUEG-2/25-CMS	USSR	2.00	2.50	0.00	SELF		BOTTOM/SIDE			MOTOR			380	3	50	1	620X620
COOLING WATER PUMP -A/C	HUB 40/65 -50 MS	USSR	40.00	65.00	0.00	SELF				540X459X979	MOTOR			380	3	50	1	620X620
BULL & FIRE PUMP	HUB 63/80 -50 MS	USSR	63.00	80.00	0.00	SELF		BOTTOM/SIDE		690X533X990	MOTOR		VERTICAL	380	3	50	2	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/ SHIP	SHIPPING SPACE (LXW) IN MM
** PROJECT 1241RE																			
BILGE STRIPPING PUMP	PB-32 TM	USSR	2.70	20.00	5.00	NON-SELF		SIDE/SIDE		HAND	305X220X670	MOTOR		HORIZONTAL	380	3	50	2	620X620
DIRTY BILGE PUMP	EBN 5/5	USSR	5.00	56.00	5.00	SELF		TOP/TOP			1279X335X345	MOTOR		HORIZONTAL	380	3	50	1	620X620
HULL & FIRE PUMP (A/C COOLING)	BUB 63/80 6	USSR	63.00	80.00	80.00	SELF		BOTTOM/SIDE			690X533X990	MOTOR	22.7		380	3	50	0	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL RPM	DIMENSION (LXWX H) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOL TAGE	PHASE	HZ	QTY/ SHIP	SHIP PING SPACE (LXW) IN MM
** PROJECT 1258 E(IHS)																		
DOMESTIC PUMP	IB 1.6/5 -1.5/2	USSR	1.60	20.00	5.00	SELF			2790	525X180X425	MOTOR	0.8		380	3	50	2	620X620
COOLING FIRE & DRAINAGE PUMP -A/C	UBC 10/40 &UBC3/40	USSR	10.00	40.00	7.00	SELF	40X	CENTRE/TOP	3000	762X270X435	MOTOR		HORIZONTAL	380	3	50	2	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT 16 A HULL & FIRE PUMP	BV-65 -200- LI	B E PUMPS	100.00	77.00	0.00					3500	750X580X1560	MOTOR	50	VERTICAL	440	3	60	4	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWX G) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOL TAGE	PHASE	HZ	QTY/ SHIP	SHIPPING SPACE (LXW) IN MM
** PROJECT 205ER																			
SANI TORY PUMP	ECH/2 -II	USSR	3.00	35.00	4.00							MOTOR			380	3	50	2	620X 620
BULL AND FIRE PUMP	ESW-1	USSR	25.00	65.00	6.00	NON-SELF		BOTTOM/SIDE		2900	135X582X582	MOTOR	9.8	VERTICAL	380	3	50	1	620X 620
FIRE MAIN PUMP	NTSV 40/65	USSR	40.00	65.00	5.00	SELF	76X76	BOTTOM/SIDE		2850	300DX 1080B	MOTOR	14KW		380	3	50	2	620X 620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT 773 J/JM																		
HOT WATER COOLING & GYRO COMPASS W CIR. PUMP	MS	USSR	1.50	15.00	0.00					192X118X180				380	3	50	2	620X620
SEA WATER CIRCULATING PP. FOR REFRIGERATION	MS-23	USSR	3.00	20.00	0.00					405X200X226				380	3	50	2	620X620
SEWAGE PUMP	MS-21	USSR	3.24	25.00	0.00					405X200X226				380	3	50	1	620X620
BOILER CONDENSATE TANK COOLING PUMP	MS-31	USSR	4.00	20.00	0.00					405X200X226				380	3	50	0	620X620
SEA WATER PP-A/C	63 WSA-1 5HS54	POLAND	4.80	26.00	0.00				1390		MOTOR	1.1	HORIZONTAL	380	3	50	0	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL ***	RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPACE (LXW) IN MM
SEA WATER PP-REFRIGERATION	SE3-0 1-1 R	POLAND	12.00	35.70	20.00					1450	855X296X350	MOTOR	3	HORIZONTAL	380	3	50	0	620X620
EVAPORATOR SEA WATER PUMP	40 VOL	USSR	40.00	25.00	0.00						700X480/368				380	3	50	1	620X620
BILGE & BALLAST PP	63 WSA-2 OT54	POLAND	63.00	15.00	7.00					2920	430X350X1230	MOTOR	6.7	VERTICAL	380	3	50	0	620X620
BILGE & BALLAST PUMP	63 WBS 295-A /2	USSR	63.00	24.20	2.20						795X735/700				380	3	50	2	620X620
FOBS . A/C S W PUMP	63 WOC	USSR	63.00	25.00	0.00						860X700X444				380	3	50	1	620X620
FIRE PP	63 WSA80 M54	POLAND	63.00	80.00	7.00					2950	824X776X1335	MOTOR	31	VERTICAL	380	3	50	0	620X620
FIRE PUMP	63 WPS 254-A /2	USSR	63.00	87.00	7.00						928C620X800				380	3	50	2	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
SEA WATER PP-A /C	100WS 20-M5 4	POLAND	100.00	20.00	7.00					1460	382X686X1315	MOTOR	16.2	VERTICAL	380	3	50	0	620X620
AFT. A/C SEA WATER PUMP	100 WOL	USSR	100.00	25.00	0.00						903X700X444				380	3	50	1	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPACE (LXW) IN MM
** PROJECT 877 E&M																			
	NSB-5 /17	USSR	5.00	39.00	1.70	SELF				3000		MOTOR		HORIZONTAL	220	3	DC	1	800 DIA
MAIN SUCTION LINE	2PI-N R-2	USSR	20.00	350.00	6.00	SELF				3000	1075X700X2085	MOTOR		VERTICAL	220	3	DC	2	800 DIA
S W & BATTERY COOLING PUMP -A/C	NSB 40/15	USSR	40.00	380.00	5.00	SELF			BOTTOM/SIDE	3000	825X440X435	MOTOR		VERTICAL	220		DC	5	800 DIA
AUX COOLING PUMP	SN-23	USSR	43.00	380.00	5.00	SELF				2800	478X508X980	MOTOR		VERTICAL	220	3	DC	3	800 DIA
BALLAST PUMP	CENTRIFUGAL 6MBX2	USSR	180.00	125.00	5.00	SELF				3000	610X720X1610	MOTOR	31.5	VERTICAL	220		DC	1	800 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	FRAME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	PING SPACE (LXW) IN MM
** PROJECT 877EKM																		
BILG E DRYING PUMP	1B1.6 /5-1.	USSR 5/2	1.50	0.00	0.00	SELF			3000		MOTOR		VERTICAL	220	3	DC	7	800 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL ***	RPM	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOLTAGE ***	PHASE *****	HZ **	QTY/SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT AMBA																			
SANITORY PUMP	AO 3120 R-3	BEPUMPS	3.00	35.00	3.00					1700	1000X150X150	MOTOR			380	3			DIA
SANITORY PUMP	ESH-1 /I-II	USSR	10.00	30.00	3.00	SELF	74X40	CENTRE/TOP	3000			MOTOR	4.2	HORIZONTAL	380	3	50	9	1300 DIA
OG COOLING & A/C HOT WATER CIRCULATING PUMP	BEACON	BEST & CROMPTON	43.00	25.00	6.00			BOTTOM/SIDE			528X250X2760X540X810				380	3	50	6	1300 DIA
A/C COOLING PUMP	NTSV 100/30-2	USSR	100.00	30.00	6.00	NON-SELF		BOTTOM/SIDE	2900		424X500X827	MOTOR	11	VERTICAL	380	3	50	7	1300 DIA
FIRE PUMP	NTSV 160/80-II	USSR	160.00	10.00	5.00				1430			MOTOR	10		380	3	50	6	1300 DIA
SEA WATER EVAPORATOR PUMP	NTSV 160/20	USSR	160.00	20.00	6.00	NON-SELF		BOTTOM/SIDE	1430		514X650X912	MOTOR	14		380	3	50	2	1300 DIA
SEA WATER EVAPORATOR PUMP	NTSV 160/20	USSR	160.00	20.00	6.00	NON-SELF		BOTTOM/SIDE	1430		514X650X912	MOTOR	14		380	3	50	2	1300 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP FLNG SPACE (LXW) IN MM
FIRE PUMP	NTSV 160/80-II	USSR	160.00	80.00	3.00	NON-SELF		BOTTOM/SIDE	2910		MOTOR		VERTICAL	380	3	50	6	1300 DIA
SUBMERSIBLE PUMP (FIXED)	NTSV 315-10-II	USSR	315.00	10.00	5.00	NON-SEL F	200X264	BOTTO/SIDE	1440	565X770X1086	MOTOR			380	3	50	8	1300 DIA
A/C SEA WATER CIRCULATING PUMP	NTSV-400/20-II	USSR	400.00	20.00	6.00	NON-SEL F		BOTTOM/SIDE		633X810X1227	MOTOR	32		380	3	50	4	1300 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXB) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SHIP	SHIPPING SPACE (LXW) IN MM
** PROJECT ASTRAVAHINI																			
SEA WATER PUMP		FLORITE ENGG	20.00	4.00	0.00	SELF	184X184	TOP/TOP		1450	660X250X320	MOTOR	5.5KW					2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT CTS																			
EMERGENCY FIRE PUMP		BEACON	25.00	45.00	7.00					3000		DIESEL	6.6	HORIZONTAL	415	3	50	1	
NON-SUBMERCIBLE PUMP	CENTRIFUGAL	BEST & CROMPTON	35.00	17.00	0.00						980X440X545			HORIZONTAL	415	3	50	2	
COOLING WATER PUMP -A/C		VOLTAS SUPPLY	91.00	0.00	0.00										415	3	50	2	
FIRE PUMP	CENTR.SELF PRIM. 5X5 1225KBC	M/S BEST CROMPTON	100.00	75.00	4.60					1440		ENGINE	44		415	3	50	3	
SEA WATER PP -EVAPORATOR	S-54V R-20(BC)	B E PUMPS	125.00	20.00	4.60					1450			14.7	VERTICAL	415	3	50	2	
SEA WATER PP-A/C & REF.			133.00	0.00	0.00										415	3	50	2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT DEEPAK																		
AUX CONDENSATE PUMP-T/A	VBK 40-23/4	KSB	3.40	5.00	0.00				1750		MOTOR	2.5		440	3	60	2	620X1800
SEA WATER HYDRO-PHONE PP	4 STAGE	B E PUMPS	7.00	10.00	0.00	SELF	50X50	TOP/TOP	1720	600X200X300	MOTOR		HORIZONTAL	440	3	60	1	620X1800
AUX BILGE PP	EDS 100-75	GOTHIA SWEDEN	10.00	7.50	0.00				1750		MOTOR	2.9		440	3	60	1	620X1800
AUX CONDENSATE PUMP-CARGO & DRAIN TANK	VBK 40-23/4	KSB	12.00	4.00	0.00				1750		MOTOR			440	3	60	3	620X1800
COOLING WATER PP-HARBOUR DA	REX 9.5-130	KSB	15.50	20.00	0.00	SELF	50X50	SIDE/TOP	3440	500X266X310	MOTOR	1.58	VERTICAL	440	3	60	1	620X1800
AUX BILGE PP	REX-50-260	KSB	26.00	18.30	0.00				1730		MOTOR	2.6	VERTICAL	440	3	60	1	620X1800

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMEN SION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP ING SPAC E IN MM
EMER GENC Y FIRE PP	GSE-R	GIKK	40.00	40.00	0.00				2400		DIESE L	17.7		440	3	60	1	620X 1800
FIRE & SPRA Y PUMP	SZZM V350	M/S SULZ ER VEIS E	98.00	90.00	0.00				1750		MOTOR	49		440	3	60	3	620X 1800
CIRC ULAT ING PP-E VAPO RATO R	REX 125-2 7V	ESB	100.00	5.00	0.00	SELF	125X1 25	SIDE/SIDE	1750	600DX 560dX 1215	MOTOR	6.1	VERT ICAL	440	3	60	2	620X 1900
BILG E BALL AST & WATE R SERV ICE PP	REX-1 50-32	ESB	140.00	10.00	0.00	SELF	150X1 50	SIDEXSIDE	1750	600X5 60X15 30	MOTOR	23.5	VERT ICAL	440	3	60	2	620X 1800
BILG E & BALL AST & WATE R SERV ICE PUMP	REXSI 50 32V	M/S K.S. B.	140.00	43.00	0.00				1750		MOTOR	23.5	VERT	440	3	60	2	620X 1800

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	BZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
AUX BILGE PP	RSL 5150-320A	ESB	140.00	43.00	0.00					1750		MOTOR	66.5	VERTICAL	440	3	60	1	620X1800
COOLING WATER PP-M/C COMPARTMENT VENTILATION	REX 175-2 8V	ESB	270.00	12.00	0.00					1750		MOTOR	15	VERTICAL	440	3	60	1	620X1800
AUX SEA WATER PUMP	REX-3 00-27 E	ESB	450.00	10.00	0.00					1150		MOTOR	16		440	3	60	2	620X1800

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOLTAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT DP-25																		
BILGE PUMP	AB II N	KAVERI ENGG.	2.50	20.00	6.00	SELF		TOP/SIDE	720	700X200X300	MOTOR	3 KW	HORIZONTAL	415	3	50	2	760X900
SEA WATER PP-FOR DISTILLING PLANT	BV 65-16 OL	BEST & CROMPTON	80.00	35.00	0.00	SELF		SIDE/SIDE	2900	650X640X1610	MOTOR	15KW	VERTICAL	415	3	50	2	760X900
BULL & FIRE PP	SINGLE STAGE MONSELF PRIMING	BEST & CROMPTON	100.00	77.50	0.00	NON-SELF		SIDE/SIDE	2900	750X660X1642	MOTOR	37.5KW	VERT ICAL	415	3	50	3	760X900
SEA WATER PUMP FOR	BV-80 H 160 B S	BE PUMP	125.00	20.00	0.00	SELF		SIDE/SIDE	2900	650X640X1610	MOTOR	15KW	VERT ICAL	415	3	50	2	760X900

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP SPARE (LXW) IN MM
** PROJECT GAJ																			
BILGE PUMP	REVF-S 80-250 VERTICAL NON-AUX	M/S ESB PUMP	44.00	60.00	0.00					2920		MOTOR	17		415	3	50	1	
FIRE PUMP	NDL HORIZONTAL SELF PRIMING	M/S WEIR PUMP	150.00	50.00	0.00					2950		MOTOR	85		415	3	50	1	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X DEL ENTRY *****	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOLTAGE ***	PHASE *****	BZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT GODAVARI																		
BILGE PUMP	TEF53 HELICAL ROTOR	M/S BOWALD STWEBEE BEUSCHWERETAG	5.00	3.00	0.00						MOTOR	2.2		440	3	60	2	760X920
SEA WATER PP-EVAPORATOR	VGC 25-125ABN		17.50	42.00	0.00	NON-SELF	127X127		1760		MOTOR	4.2	VERTICAL	440	3	60	2	760X920
BRINE PP-EVAPORATOR	VGC 25-12.5 ABN		64.00	16.00	0.00				1760		MOTOR	4.1		440	3	60	2	760X920
SEA WATER PP-A/C	43VR17	B E PUMPS	92.00	30.00	0.00				3500		MOTOR	7.5	VERTICAL	440	3	60	3	760X920
HULL & FIRE PUMP	5" X 5" VMX3	M/S BEST & CROMPTON	100.00	77.00	0.00	SELF			3500		MOTOR	33.5		440	3	60	4	760X920
FIRE PUMP	SINGLE STAGE VERT. 6X6 MBSB	M/S TRIVENI ENGG. WORKS	100.00	78.00	0.00				3500		STEAM TURBINE	29		440	3	60	1	760X920

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMEN SION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPAC E (LXW) IN MM
MAIN CIRC ULAT ING PUMP			3780.00	7.00	0.00				775								2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT LCU ME I																		
CIRCULATING PUMP -A/C	A4120 EE	B E PUMPS	10.50	15.00	0.00						MOTOR			415	3	50	1	600X600
BALLAST PUMP & GENERAL SERVICE PUMP	A 7120K RTE	B E PUMPS	33.00	18.00	0.00						MOTOR			415	3	50	3	600X600
BILGE/FIRE PUMP	A 7120 EETE	M/S B E PUMPS	35.00	18.00	8.00				1450		MOTOR	1.1		415	3	50	2	600X600

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXG) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/ SHIP	SHIP PING SPACE (LXW) IN MM
** PROJECT LCU MK II																			
SEA WATER PUMP -A/C	AO 5110-BE/BC	B E PUMPS	15.00	20.00	0.00	SELF	160X160			1450		MOTOR	3.7		415	3	50	1	600X600
FIRE PUMP	SP-62 -1	FLORITE ENGG	24.00	20.00	0.00					1410		DIESEL	4.4		415	3	50	1	600X600
FIRE & BILGE PUMP	CENTRIFUGAL VERTICAL FCB100/75	M/S FLRITE ENGG. CORP.	55.00	10.00	1.60	SELF	220X220			1450		MOTOR	7.5		415	3	50	3	600X600
FIRE BILGE & BALLAST PUMP	FCB/100-SP/75	FLORITE ENGG	55.00	20.00	0.00					1450		MOTOR			415	3	50	3	600X600

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT LCU MK III																			
BILGE PUMP	JM-6	FLORITE PUNE	4.70	15.00	0.00	SELF	120X120	TOP		1450	412X227X210	MOTOR	2BP		415	3	50	1	600X600
SEA WATER PUMP (A/C)		B E PUMPS	10.00	20.00	0.00	SELF	150	TOP		1450	554X180X283	MOTOR	2.3HP					2	
FIRE MAIN BILGE AND BALLAST PUMP	VERTICAL SELF PRIMING	SEBRA INDUSTRIES BOMBAY	55.00	30.00	7.00	SELF	225X225	BOTTOM		1450	600X600X1325	MOTOR	15BP	VERTICAL	415	3	50	3	600X600

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT LEANDERS																			
BILGE PUMP	10UHL	BRITISH LABOUR	5.00	10.00	0.00	NON-SELF		TOP/SIDE		1725	1276X 1085X 35	MOTOR 3HP			440	3	60	2	760X 920
BILGE PUMP	5T54B	M/S B E PUMP	7.50	8.00	0.00					1725		MOTOR 2.2			440	3	60	2	760X 920
AUX SW CIRCULATING PUMP		DRYSDALE	12.00	12.00	0.00	SELF		SIDE/SIDE		1730	560X343X622	MOTOR 3HP			440	3	60	1	760X 920
SONAR COOLING PUMP	1 1/2DV X8	WORTHINGTON SIMPSON	15.00	8.00	0.00	SELF						MOTOR			440	3	60	1	760X 920
BULL & FIRE PUMP	6" X 6"	M/S WEIR PUMP	100.00	7.50	0.00					3600		STEAM TURBINE	35		440	3	60	1	760X 920
T/D FIRE PUMP	TLH 20 D	DRYSDALE CO. LTD	100.00	76.00	0.00	SELF		SIDE/SIDE		3500		STEAM TURBINE	47.5H P		440	3	60	1	760X 920
BULL & FIRE PUMP	5" X 5"	M/S BEST & CROMPTON ,M/S WORTHINGTON	100.00	77.00	0.00	NON-SELF		SIDE/SIDE		3500	1490X 770X795	MOTOR 33.5			440	3	60	3	760X 920

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP SPACE (LXW) IN MM
BILGE PUMP	10 UBL	M/S BRITISH LABOUR	105.00	12.00	9.50					1725		MOTOR			440	3	60	2	760X920
MAIN CIRCULATING PUMP		DRYSDALE	3780.00	7.00	0.00					775		TURBINE		HORIZONTAL				2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SHIP	SHIPPING SPACE (LXW) IN MM
FIRE PUMP	BEACON-100 TPB	M/S BEST CROMPTON	100.00	60.00	7.00					1750		MOTOR	37.3		440	3	60	3	920X770
BULL & FIRE PUMP	BEACON	BEST & CROMPTON	100.00	60.00	0.00										440	3	60	3	920X770
SEA WATER PUMP FOR DISTILLING PLANT	GIRDLE STONE	GIRDLE STONE/ CAIRD & RAINER	115.00	0.00	0.00										440	3	60	2	920X770
S W CIRCULATING PP-M/E(STAND BY)	C5X4V	HANWORTH BY	140.00	46.00	0.00					1170				VERTICAL	440	3	60	1	920X770
BALLAST PUMPS	586-V R/4C	B E PUMPS	200.00	20.00	0.00										440	3	60	4	920X770
BALLAST PUMP	VERTICAL 586 VRBC	M/S B E PUMPS	200.00	20.00	5.00					1750		MOTOR	18		440	3	60	1	920X770

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPACE (LXW) IN MM
** PROJECT MATANGA(OGT)-II																		
SEA WATER PUMP -REF	A0 3610E	B E PUMPS	50.00	12.00	0.00	SELF					MOTOR	1.1		415	3	50	2	630X780
BILGE PUMP	B5X4 MID MOUNTED CENTRIFUGAL	M/S HAMWORTHY	50.00	60.00	0.00	SELF	127X101	SIDE/SIDE	2900	900X700X690	MOTOR	21	VERTICAL	415	3	50	2	630X780
GENERAL SERVICE PUMP	B5X4VP	HAMWORTHY UK	50.00	60.00	0.00						MOTOR		VERTICAL	415	3	50	2	630X780
FIRE PUMP	6"X6"	WEIRS	150.00	120.00	0.00	SELF		SIDE/SIDE	2940	990X770X600	MOTOR	91	HORIZONTAL	415	3	50	1	630X780
FIRE PUMP	4" MDL	M/S DRYSALE	150.00	120.00	0.00	SELF			2950		MOTOR	91	HORIZONTAL	415	3	50	1	630X780

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X DEL ENTRY *****	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOLTAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPACE (LXW) IN MM
** PROJECT NIREEKSHAK																		
M/E S/W COOLING PUMP	4 V	FRANKE MOBRA/S	1.50	46.00	0.00	NON-SELF	116X120	SIDE/SIDE	3545	520X450X410	MOTOR	15.7KW	VERTICAL	440	3	60	2	135X135
COOLING PUMP FOR DIVING	5110 EE/BC	B E PUMPS	10.00	0.00	0.00	NON-SEL F	65X60	TOP/TOP	1710	570X210X290	MOTOR	55 KW	HORIZONTAL	440	3	60	1	135X135
FIRE PUMP	MA 844EE /BC	B E PUMPS	30.00	60.00	0.00	SELF	89X89	TOP/TOP	1760	1070X300X380	MOTOR	22KW	HORIZONTAL	440	3	60	1	135X135
BILGE PUMP	MA 842 EE/BC	B E PUMPS	60.00	6.00	0.00	SELF	116X90	TOP/TOP	1730	930X360X380	MOTOR	11KW	HORIZONTAL	440	3	60	1	135X135
BALLAST PUMP	CENTRIFUGAL	FRANKE MOBRA/S	150.00	60.00	0.00	NON-SELF	165X167	SIDE/TOP	3565	560X450X540	MOTOR	56.5KW	HORIZONTAL	440	3	60	2	135X135

DATA ON EXISTING SEA WATER AND BILGE PUMPS

****

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT OPV																		
STERN TUBE COOLING PUMP	VLI-6 5-50-250	WEIR PP UK	17.00	20.00	0.00	SELF	65X50	SIDE/SIDE	1450	600X800X1013	MOTOR	2.5KW	VERTICAL	415	3	50	2	640X1360
NON-SUBMERCIBLE PUMP	BC-65-40-200	WEIR UK	35.00	40.00	0.00	SELF	65X40	SIDE/TOP	2900	685X285X741	MOTOR	7.5 KW	HORIZONTAL	415	3	50	2	640X1360
FIRE MAIN & SPRINKLING PUMP	VLI-8 0-65-250	WEIR UK	60.00	20.00	0.00	SELF	80X65	SIDE/SIDE	2900	600X500X120	MOTOR	27 KW	VERTICAL	415	3	50	6	640X1360
BILGE PUMP	VLI-8 0-65-250	WEIR UK	60.00	70.00	0.00				1450	600X800X1185		8 KW		415	3	50	2	640X1360
BILGE & BALLAST PUMP	VLI-8 0-65-250	WEIR UK	60.00	70.00	0.00				2900	600X800X1440		127 KW	VERTICAL	415	3	50	2	640X1360

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD ******	SUCTION HEAD *****	SELF PRIMING	SUC X DEL	SUC X ENTRY (MTRS)	DEL (MTRS)	RPM ***	DIMEN SION **** (L) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / ****	VOL TAG ***	PHASE *****	HZ **	QTY/ SHIP *****	SHIP PING ***** (LXW X H) IN MM	HORZ E
** PROJECT P-15																				
FEED PUMP		M/S BEST & CROM PTON	2.50	20.00	0.00										415	3	50	0		
BILGE PUMP		SUYA SB ENGG	5.00	20.00	8.00										415	3	50	3		
BILGE PUMP		M/S SUYA SB ENGG	5.00	28.00	8.00										415	3	50	3		
SW COOLING PUMP		B E PUMPS	125.00	30.00	0.00							MOTOR			415	3	50	3		
SEA WATER COOLING PUMP		M/S BEST & CROM PTON	125.00	30.00	0.00										415	3	50	0		
FIRE PUMP		B E PUMPS	150.00	100.00	0.00							MOTOR			415	3	50	3		
FIRE PUMP		M/S B E PUMPS	150.00	100.00	0.00										415	3	50	3		
FIRE PUMP		M/S BEST & CROM PTON	200.00	100.00	7.00										415	3	50	3		

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SHIP	[illegible] SPACE (LXW) IN MM
FIRE PUMP		BEST & CROMPTON	200.00	100.00	7.00							DIESEL			415	3	50	2	
SEA WATER COOLING PUMP		M/S BEST & CROMPTON	250.00	30.00	0.00										415	3	50	4	
S W COOLING PUMP		BEST & CROMPTON	250.00	30.00	0.00							MOTOR			415	3	50	4	
SALVAGE PUMP -SUBMERCIBLE		S U MOTORS	310.00	10.00	0.00							MOTOR			415	3	50	12	
SALVAGE PUMP (SUBMERCIBLE)		M/S S U MOTORS	310.00	10.00	0.00										415	3	50	12	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL NAME ***** ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL ***	RPM ***	DIMENSION (LXWX B) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SPARE (LXW) IN MM
** PROJECT PETYA																		
SANI TORY PUMP	ESN -2/II	USSR	3.00	35.00	3.00					621.5 X602.5	MOTOR			380	3	50	1	620X620
SANI TORY PUMP	ESN1/ I-II	USSR	10.00	30.00	3.00									380	3	50	2	620X620
BRIN E PUMP FOR A/C PLANT & CIRCULATING PUMP	ESN-1 8/I	USSR	18.00	13.00	0.00	SELF	130X140	BOTTOM/TOP	1435	530X510X980	MOTOR	5.0KW		380	3	50	4	620X620
WATER CIRCULATING PUMP	TSN 5 BM-18	USSR	42.00	12.00	0.00									380	3	50	2	620X620
FIRE PUMP	NTSU 63/90	USSR	63.00	80.00	5.00	SELF	185X185		2900	772X496X866	MOTOR	25KW		380	3	50	4	620X620
BULL AND FIRE PUMP	NTSV 160/I 0-I	USSR	160.00	10.00	5.00	SELF	270X210		1430	520X660X967	MOTOR	7.5KW		380	3	50	3	620X620
FIRE PUMP	NTSV 160/8 0-II	USSR	160.00	80.00	3.00	SELF					MOTOR		VERTICAL	380	3	50	3	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOLTAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT SDB MKII																		
BILGE PUMP	JM-6	KIRLOSKAR BROTHERS	4.62	15.00	0.00						MOTOR	1.5		415	3	50	1	730X730
SEA WATER PUMP -A/C	A411Q EE	B E PUMPS	9.00	0.00	0.00				1500		MOTOR	1.5		415	3	50	1	730X730
FIRE & BILGE PUMP	SELF PRIMING TYPE	B E PUMPS	10.00	30.00	7.00				1450		MOTOR	7.5	VERTICAL	415	3	50	2	730X730
BULL & FIRE ,BILGE PUMP	313-VDPX2	WORTHINGTON-SIMPSON	10.00	30.00	7.00				1450		MOTOR	5.6	VERTICAL	415	3	50	2	730X730
BILGE PUMP	SP/37/1	M/S FLOWRITE	84.00	15.00	5.00	SELF	103X100	TOP/TOP	1450	523X250X155	MOTOR	1.5		415	3	50	1	730X730

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPACE (LXW) IN MM
** PROJECT SDB MKIII																		
BILGE PUMP	SP-37/1	FLORITE ENGG.	4.62	15.00	5.00				1450			1.5		415	3	50	0	730X
FIRE & BILGE PUMP	SVAM 332	B E PUMP	10.00	37.00	7.00				1450			5.6		415	3	50	0	730X 730
FIRE & BILGE PUMP	SVAM 332	M/S B E PUMP	10.00	37.00	7.00				1450		MOTOR	5.6		415	3	50	2	730X 730

DATA ON EXISTING SEA WATER AND BILGE PUMPS

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USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMEN SION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPAC E (LXW) IN MM
** PROJECT SHAKTI																		
AUX BILG E PUMP	40120 IAN	SIHI SUPP LOE BREM EN WEIM STAD T	2.40	14.00	0.00	SELF	40X32	TOP/TOP	1700		MOTOR	0.29	HORI ZONT AL	440	3	60	1	320 DIA
CIR. WATE RPP- CARG O REF PLAN T	NT-32 -200(180)	ALLW EYLE R	7.00	15.00	0.00	SELF	50X40	SIDE/TOP	1750		MOTOR	0.88	HORI ZONT AL	440	3	60	1	320 DIA
S W HYDR OPHO NE PUMP	A 03634 KRTP' 1'	KSB	9.00	28.00	0.00	SELF	50X50	TOP/TOP	1720		MOTOR	3.2	HORI ZONT AL	440	3	60	1	320 DIA
AUX PUMP	*EDSIO*	GOTB .. SWED EN	10.00	25.00	0.00	SELF	65X65	SIDE/SIDE	1750		MOTOR	2.9	HORI ZONT AL	440	3	60	1	320 DIA
COOL ING WATE R PP D/G	ETA 50/20 0	KSB	20.00	20.00	0.00	SELF	65X65	SIDE/TOP	1750		MOTOR	1.5	HORI ZONT AL	440	3	60	2	320 DIA
COOL ING WATE R PP-A /C	NT-40 -200(180)	ALLW EYLE R	25.00	14.00	0.00	SELF	80X65	SIDE/TOP	1750		MOTOR	1.7	HORI ZONT AL	440	3	60	1	320 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOLTAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
AUX BILGE PUMP	REX-S 5-200	ESB	26.00	20.00	0.00	SELF	65X65	SIDE/SIDE	1750			3.9	VERTICAL	440	3	60	1	320 DIA
EMERGENCY FIRE PUMP	4B-02 6 RW	BERG & SIBERT BRENEN	43.00	60.00	0.00	SELF		SIDE/TOP	2900		DIESEL ENGINE		HORIZONTAL	440	3	60	1	320 DIA
CIR WATER FP-AFT & STAND BY A/C	NT-65 -200(205)	ALLWEYLER	77.00	15.00	0.00	SELF	125X100	SIDE/SIDE	1750		MOTOR	5	HORIZONTAL	440	3	60	2	320 DIA
FIRE & SPRAY PUMP	SZZM V350	M/S SULZER WEISE	98.00	90.00	0.00	SELF	125X100	SIDE/SIDE	1750		MOTOR	49	VERTICAL	440	3	60	3	320 DIA
FIRE & SPRAY PP	SZZMV 350	WEIZE	100.00	90.00	0.00				1750			49.5	VERTICAL	440	3	60	2	320 DIA
BILGE & BUTTERWORTH PUMP	REX-S 100 320-3	M/ E.S. B.	100.00	140.00	0.00	SELF	125X100	BOTTOM/TOP	1750	700X600X2091	MOTOR	69	VERTICAL	440	3	60	1	320 DIA
COOLING WATER PP EVAPORATOR	RSL 150-250/A	ESB	180.00	15.00	0.00	SELF	200X175	SIDE/SIDE	1750		MOTOR	11.5	VERTICAL	440	3	60	2	320 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
BILGE BALLAST & WATER SERVICE PUMP	RSL-S-150-320-A	M/S. K.S.B.	220.00	43.00	0.00					1750		MOTOR	29.84	VERTICAL	440	3	60	2	320 DIA
COOLING WATER PP T/G	RSL 350-280B	KSB	800.00	11.00	0.00	SELF	350X300	SIDE/SIDE	1160			MOTOR	22.2	VERTICAL	440	3	60	2	320 DIA
MAIN CIRCULATING PUMP II	SDY 400-350	KSB	1200.00	7.00	0.00	SELF	500X400	SIDE/SIDE	875			MOTOR	30.2	VERTICAL	440	3	60	1	320 DIA
MAIN CIRCULATING PUMP I	SDY 600-520	KSB	3600.00	7.00	7.00	SELF	700X700	SIDE/SIDE	700			MOTOR	18	VERTICAL	440	3	60	1	320 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL NAME ***** ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT SNF																	
SEA WATER PUMP	E84-1 O/O USSR	2.00	21.00	0.00				1700	508X366X330	MOTOR	1.7		380	3	50	5	620X620
DG COOLING & A/C HOT WATER CIRCULATING PUMP	NTSV 63/30 USSR	63.00	30.00	6.00	NON-SELF			2880	760X540X810		8	VERTICAL	380	3	50	6	620X620
FIRE PUMP	BUB 63/80 USSR	63.00	80.00	5.00	NON-SELF				690X533X998	MOTOR		VERTICAL	380	3	50	0	620X620
AUX COOLING PUMP	BUB 100/30A-II USSR	100.00	30.00	6.00	NON-SELF	635X635	BOTTOM/SIDE	2900	650X394X828	MOTOR	11	VERTICAL	380	3	50	3	620X620
FIRE PUMP	BUB 100/80-R-III USSR	100.00	80.00	5.00	NON-SELF	650X604	BOTTOM/SIDE	2900	760X620X1235	MOTOR	11	VERTICAL	380	3	50	7	620X620
SALVAGE PUMP	BUB 160/10-III USSR	160.00	10.00	5.00		650X604	BOTTOM/SIDE	1430	520X660X969	MOTOR		VERTICAL	380	3	50	1	620X620
FIRE PUMP	AYB-1 60/80 A II USSR	160.00	80.00	5.00	NON-SELF	650X604	BOTTOM/SIDE	2910	750X620X1233	MOTOR		VERTICAL	380	3	50	1	620X620
AUX. COOLING PUMP	BUB 250/30(D)-III USSR	250.00	30.00	0.00		640X610	BOTTOM/SIDE	1440	860X560X1100	MOTOR	11	VERTICAL	380	3	50	0	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX B) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
SUBMERSIBLE PUMP (FIXED)	NTSV 315-I O-II	USSR	315.00	10.00	3.00	NON-SELF	200X264	BOTTM/SIDE	1440	565X770X1080	MOTOR		VERTICAL	380	3	50	10	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOL TAGE	PHASE	HZ	QTY/ SHIP	SHIP SPARE (LXW) IN MM
** PROJECT SHN																			
SEA WATER /IR PUMP -REF	YB-18	USSR	1.00	20.00	0.00					2800	441X161X200	MOTOR	0.35	HORIZONTAL	380	3	50	0	620X620
BILGE PUMP	EBN 3/5	USSR	2.80	5.00	0.00	SELF	40X32	TOP/TOP		1000	1309X335X345	MOTOR	1.6	HORIZONTAL	380	3	50	1	620X620
FIRE PUMP	HUB 63/80	USSR	63.00	80.00	5.00	NON-SELF		BOTTOM/SIDE			630X533X990	MOTOR	20	VERTICAL	380	3	50	1	620X620
BULL AND FIRE PUMP	NTSV 160/10-i	USSR	160.00	10.00	5.00	SELF		BOTTOM/SIDE		1430	520X660X967	MOTOR	7.5		380	3	50	4	620X620
FIRE PUMP	NTSV 160/80 II	USSR	160.00	10.00	5.00	NON-SELF		BOTTOM/SIDE		1430	630X700X1000	MOTOR		VERTICAL	380	3	50	0	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMEN SION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL. TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT SNR																		
HOT WATER CIRCULATING PUMP	ETSN-18/I-II	USSR	1.00	100.00	0.00					425X161X200				380	3	50	1	620X620
FRESH WATER AND SANITORY PUMP (PORTABLE)	ENPS-1.5/20	USSR	1.50	20.00	5.00					472X266X330				380	3	50	2	620X620
SANITORY PUMP	ESN-2/II	USSR	3.00	35.00	3.00					621.5X302.5	MOTOR			380	3	50	4	620X620
BILGE PUMP	3 BB 5/5	USSR	5.00	0.00	0.00				1420		MOTOR			380	3	50	2	620X620
BILGE PUMP	3 BB 5/5		5.00	0.00	0.00				1420		MOTOR			380	3	50	2	620X620
DIRTY BILGE PUMP	EBN 5/5	USSR	5.00	56.00	6.00									380	3	50	2	620X620
FIRE PUMP	BUBC-40/65 MT	USSR	40.00	65.00	5.00				2850		MOTOR			380	3	50	3	620X620

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SET	SHIPPING SPACE (LXW) IN MM
FIRE MAIN PUMP	NTSV 40/65	USSR	40.00	65.00	5.00										380	3	50	2	620X 820
FIRE PUMP	RUBC 40/65 MT		40.00	65.00	5.00					2850		MOTOR			380	3	50	2	620X 820
DG COOLING & A/C HOT WATER CIRCULATING PUMP	NTSV 63/30	USSR	63.00	30.00	6.00						760X540X810				380	3	50	1	620X 820

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X DEL ENTRY	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SHIP	SHIPPING SPACE (LXWXH) IN MM
** PROJECT SSK																		
SEA WATER PP-A/C PLANT	REW 65-250 BLOC	KLEIN BECKER AG	5.00	20.00	0.00	SELF		BOTTOM/TOP	1450		MOTOR	1.7	HORIZONTAL	365		DC	3	760 DIA
SEA WATER PP-DISTILLER	REW 40-260	KSB. BREMEN	10.50	89.00	0.00	SELF			3000		MOTOR	13.5	HORIZONTAL	365		DC	1	760 DIA
BILGE PUMP 2 FOR FREEZING	TT 120K	FA. ABEL	20.00	250.00	7.00	SELF	100X50	BOTTOM/TOP	1500		MOTOR	18.5	HORIZONTAL	365		DC	1	760 DIA
COOLING WATER FOR DISTILLER	REW-65-200 BLOC	KLEIN	28.00	25.00	0.00				2000		MOTOR		HORIZONTAL	365		DC	2	760 DIA
SEA WATER PP-DA	ALFA 7102B N102.31.2/1	SIEMEN&HENSCH	40.00	20.00	0.00	SELF		TOP/TOP	1500		D/D		HORIZONTAL	365		DC	4	760 DIA
BILGE PP FOR COMPENSATING	FF 150K	FA. ABEL	55.00	250.00	6.00	SELF	50X100	BOTTOM/TOP	1500		MOTOR	51	HORIZONTAL	365		DC	1	760 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMEN SION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	EZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
MAIN SEA WATER COOLING PUMP	REW-STOCK 125/125	KLEIN BECKER AG	74.00	25.00	0.00	SELF		SIDE/SIDE	1900		MOTOR	7.8	VERTICAL	365	DC		1	760 DIA
MAIN SEA WATER COOLING PUMP	REW-STOCK 125/125	KLEIN BECKER AG	74.00	25.00	0.00	SELF		SIDE/SIDE	1900		MOTOR	7.8	VERTICAL	365	DC		1	760 DIA

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOL TAGE	PHASE	HZ	QTY/ SHIP	SHIPPING SPACE (LXW) IN MM
** PROJECT SURVEY CRAFT																			
FIRE PUMP	2 STAGE CENTRIFUGAL	M/S BEST & CROMPTON	27.00	37.00	7.00					1450		MOTOR	7.5		415	3	50	2	
FIRE & BILGE PUMP		BEST & CROMPTON	27.00	40.00	0.00							MOTOR			415	3	50	2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT SURVEY CRAFT(NITBUN)																		
SEA WATER PUMP	A S110K	B E PUMPS	10.00	0.00	0.00	SELF	30X30	TOP/TOP	1420	490X1 70X18 0	MOTOR	5 HP					1	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT SURVEY CRAFT(OLD)																			
BILGE PUMP	GB-7	BAMW ORTHY UE	6.50	25.00	0.00							MOTOR	20		415	3	50	2	
FIRE PUMP	M-922 EE	B E PUMPS	70.00	70.00	0.00					2850		MOTOR	30		415	3	50	3	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/ SHIP	SHIPPING SPACE (LXW) IN MM
** PROJECT SURVEY VESSEL																		
SEA WATER PUMP FOR REF.		BAMW ORTH Y PUMPS	4.00	25.00	0.00	SELF	100X100	TOP/TOP	1400	360X200X400	MOTOR	1.1KW		415	3	50	2	630X780
BILGE PUMP	GB7	M/S BAMW ORTH Y	6.50	25.00	0.00				2900		MOTOR	2		415	3	50	2	630X780
BILGE PUMP	SB32-BC	B E PUMPS	6.50	25.00	0.00	SELF	100X100	TOP/TOP	1400	360X200X400	MOTOR	1.1KW		415	3	50	2	630X780
G. S. PUMP	SBV-50-160 L	M/ BE PUMPS	25.00	30.00	0.00						MOTOR			415	3	50	2	630X780
SEA WATER PUMP FOR AC PLANT	MA-10 2258-BC	M/S B E PUMPS	64.00	20.00	0.00	SELF	215X215	TOP/TOP	1450	900X340X460	MOTOR	9.3		415	3	50	2	630X780
FIRE PUMP	M-922 &	M/S B E PUMP	70.00	70.00	4.60	SELF	215X215	SIDE/TOP	2950	700X300X400	MOTOR	30		415	3	50	3	630X780
FIRE PUMP	M 922 &	M/S BE PUMPS	70.00	70.00	0.00				2850		MOTOR	30		415	3	50	3	630X780
FIRE PUMP	M922&	BE PUMP	70.00	70.00	0.00				2850	ELEC				415	3	50	3	630X780

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL. TAGE *****	PHASE **	HZ	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT SURVEY VESSEL(NEW)																		
D/D PUMP		BEST & CROMPTON	27.00	35.00	0.00				3000		DIESEL	6.7		415	3	50	1	630X780
FIRE PUMP	BV-65	B E PUMPS	100.00	76.00	0.00						MOTOR			415	3	50	3	630X780

DATA ON EXISTING SEA WATER AND BILGE PUMPS

****

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT THIRD FLEET TANKER ADITYA																		
BILGE PUMP	ME 40 A	NEPZ -SCB -MOB NO PUMP EN	5.00	2.00	0.00				360				HORIZONTAL	440	3	60	1	
SEA WATER COOLING PUMP	RSV65 -300 A	ESB	18.00	25.00	1.00				1450				VERTICAL	440	3	60	1	
BILGE PUMP	SBV-65-120 L	B E PUMPS	60.00	20.00	5.00				2900	625X600X1635	MOTOR 10		VERTICAL	440	3	60	1	
AUX. BARBOUR COOLING-S W PUMP	BV-65 -160L	B E PUMPS	70.00	2.50	6.00				2900	600X500X1635	MOTOR 12.5		VERTICAL	440	3	60	1	
BILGE/BALLAST TANK CLEANING PUMP	SBV-100-315L	B E PUMPS	100.00	14.00	5.00				2900	900X700X2363	MOTOR 125		VERTICAL	440	3	60	1	
BILGE/FIRE FIGHTING PUMP	SBV-80-200 L	B E PUMPS	110.00	70.00	5.00				2900	730X700X2085	MOTOR 75		VERTICAL	440	3	60	2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

****

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
BILGE BALLAST DK SERVICE PUMP	SBV-100-20 L	B E PUMPS	140.00	40.00	5.00				2900	760X600X250	MOTOR	50	VERTICAL	440	3	50	1	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP FING SPACE (LXW) IN MM
** PROJECT TRV																		
FIRE PUMP	SP G2/I	M/S FLORITE ENGG.	22.00	20.00	7.00				1450		MOTOR	5.6		415	3	50	1	600X 630
FIRE & BILGE PUMP	SP-62 /I	FLORITE ENGG	22.00	20.00	0.00	SELF	178X178	TOP/TOP	1450	649X254X325	MOTOR	7.5HP		415	3	50	2	600X 630

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
** PROJECT VIKRANT																		
EXTR ACTION PUMP -A/C PLANT	2"X3" CENTRIFUGAL	WORTHINGTON SIMPSON	1.08	43.00	0.00				2025		MOTOR 3			220	DC		2	1300 X790
BILGE PUMP -SHAFT SPACE	POSITIVE ROTARY TYPE M8-MK II	MEGATOR PUMP	2.25	45.00	6.00									220	DC		2	1300 X790
SUMP PUMP	M8-MK II	MEGATOR PUMP	3.00	10.00	0.00				950					220	DC		6	1300 X790
BILGE PUMP -MAIN M/C ROOM	POSITIVE DISPLACEMENT	MEGATOR PUMP	3.00	30.00	6.00									220	DC		6	1300 X790
COIL DRAIN PUMP -EVAPORATOR	21/2" X2"	DRYSDALE	4.00	25.00	0.00				1750					220	DC		1	1300 X790
SEA WATER PUMP -CATAPULT	MEGATOR TYPE BL-2 1/2	MEGATOR	10.00	100.00	0.00				1200		MOTOR			280	DC		1	1300 X790

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SHIP	SHIP PLNG SPACE (LXW) IN MM
CIRCULATING WATER PUMP -REF	1 1/2"X 2"	WORTHINGTON SIMPSON	12.00	13.80	0.00					755-865		TURBINE			220		DC	2	1300 X790
SUMP PUMP	M-50-B ME-II	MEGATOR PUMP	15.00	10.00	0.00					720					220		DC	4	1300 X790
CIRCULATING PUMP -D G	6 1/4"X 5" VERTICAL	J B CARUTHERS	36.00	1.20	0.75									VERTICAL	220		DC	3	1300 X790
COOLING WATER PUMP -A/C PLANT	5 1/7" VERTICAL 2 STAGE	WORTHINGTON SIMPSON	75.00	41.00	0.00					1750		MOTOR		VERTICAL	220		DC	2	1300 X790
FIRE MAIN & BANGER SPRAY PUMP -FLT GBT DECK	6"X6" CENTRIFUGAL	HARLAND ENGG CO.	100.00	0.00	0.00					1800			46		220		DC	3	1300 X790
BOLL & FIRE PUMP	VDSPT	M/S WORTHINGTON	114.00	60.00	7.60					1790 TO 1850		MOTOR	20		220		DC	4	1300 X790

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL	RPM ***	DIMENSION (LXWXH) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAGE ***	PHASE *****	BZ **	QTY/ SHIP ****	SHIPPING SPACE (LXW) IN MM
SEA WATER PUMP -A/C 1/2 MILLION	5/6 UI	WORTHYNGTON SIMPSON	124.00	12.00	0.00					1550					220		DC	1	1300 X790
FIRE & BILGE PUMP	6" X 6" ROTARY CENTREX	M/S DRYSDALE	148.00	60.00	7.60					1400 TO 1800		STEAM TURBINE	30		220		DC	2	1300 X790
FIRE & BILGE PUMP	6"X6" ROTARY CENTREXY	M/S DRYSDALE	148.00	60.00	7.60					1400 TO 1800		MOTOR	31		220		DC	2	1300 X790
FIRE & BILGE PUMP	6"X6" SOS	DRYSDALE	150.00	0.00	0.00						900X1 100X2 350	TURBINE		VERTICAL				2	
SEA WATER PUMP -A/C 1 MILLION	8/10 U-P-I	WORTHYNGTON SIMPSON	235.00	25.00	0.00					1160			8.3		220		DC	1	1300 X790
CIRCULATING &BILGE PP FOR EVAPORATOR	10"X10"	DRYSDALE	405.00	0.00	0.00					1440	750X7 25X21 00	TURBINE		VERTICAL				2	

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	QTY/SHIP	SHIPPING SPACE (LXW) IN MM
** PROJECT VIRAAT																			
MAKE UP FEED PUMP	MA-159	GIRDLESTONE	5.00	0.00	0.00										440	3	60	9	1300 X790
ELEMANT DRAIN PUMP	MA-160	GIRDLESTONE	6.00	0.00	0.00										440	3	60	4	1300 X790
BILGE SUMP PUMP	M 50	MEGATER	10.00	0.00	0.00										440	3	60	8	1300 X790
SALWAGE PUMP	SIZE E TYPE V IN/BD 6"/6"	PLENTY	40.00	85.00	0.00	SELF		SIDE/SIDE	208			MOTOR 40 BP		VERTICAL	440	3	60	2	1300 X790
DRAIN COOLER PUMP	DRYSDALE PARALEL	DRYSDALE	75.00	59.00	0.00	SELF		/BOTTOM	1800			MOTOR 15BP		VERTICAL	440	3	50	2	1300 X790
FIRE MAIN F/D	15"X4 1/2" ROTARY CENTREX	DRYSDALE			90.00	78.00	0.00	SELF			TOP/BOTTO	3500		MOTOR 50BP	VERTICAL	440	3		1300 X790
BRINE PUMP	MA-158	GIRDLESTONE	112.00	0.00	0.00										440	3	60	4	1300 X790

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE ***	MODEL *****	MAKE ****	CAPACITY (CU MT/HR) *******	TOTAL HEAD (MTRS) ******	SUCTION HEAD (MTRS) *****	SELF PRIMING ****	SUC X DEL *****	SUC X ENTRY *****	DEL RPM ***	DIMEN SION (LXWX H) IN MM *****	PRIME MOVER *****	POWER KW *****	VERT / HORZ ****	VOL TAG E ***	PHASE *****	HZ **	QTY/ SHIP ****	SHIP PING SPAC E (LXW) IN MM
SEA WATER PUMP -MAN GER	6"/6" DXL	DRYS DALE	150.00	275.00	0.00	SELF		TOP/BOTTO M	3500			75BP	VERT ICAL	440	3	60	4	1300 X790
CIRC ULAT ING PUMP	MA-15 7	GIRD LE STON E	210.00	0.00	0.00									440	3	60	4	1300 X790
BALL AST PUMP	8X10 VSPI	WORT HING TON SIMP SON	350.00	15.00	9.00	SELF		SIDE/SIDE	1750			50BP	VERT ICAL	440	3	60	2	1300 X790

DATA ON EXISTING SEA WATER AND BILGE PUMPS

USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTRS)	SUCTION HEAD (MTRS)	SELF PRIMING	SUC X DEL	SUC X ENTRY	DEL	RPM	DIMENSION (LXWXH) IN MM	PRIME MOVER	POWER KW	VERT / HORZ	VOLTAGE	PHASE	HZ	Qtr/ SHIP	SHIP PING SPACE (LXW) IN MM
** PROJECT 1641																			
WATER PUMP (TURBULENT SELF PRIMING)	IVSH-3M	USSR	3.00	0.00	3.00						325X220				220	DC		1	800 DIA
PISTON PUMP /BILGE PUMP	2 P-1	USSR	20.00	2.50	6.00	NON-SELF	180X160				1075X700X2085	MOTOR	31.5KW		220	DC		3	800 DIA
CONDENSER PUMP	NTSV 40/15	USSR	40.00	15.00	0.00	SELF	180X160			3000	780X450X455	MOTOR	3.7KW		220	DC		1	800 DIA
BATTERY COOLING& SHAFT COOLING PUMPS	VTSH-902	USSR	90.00	29.00	5.00	SELF	200X200			2700	489X432X856	MOTOR	12.5KW		220	DC		3	800 DIA
CENTRIFUGAL PUMP	6HBX2	USSR	180.00	120.00	5.00	SELF	270X200			3000	610X720X1610	MOTOR	31.5KW	VERTICAL	220	DC		3	800 DIA

APPENDIX II

STANDARD RANGES OF SW AND BILGE PUMPS

STANDARD RANGES OF SEA WATER AND BILGE PUMPS

SOTR	STANDARD CAPACITY (CU MT/HR)	STANDARD TOTAL HEAD (MTS)
1	05	35 - 50
2	10	35 - 50
3	20 - 40	35 - 50
4	60 - 80	40 - 80
5	100	80 - 100
6	150 - 200	80 - 100
7	250	30 - 40
8	300 - 350	10 - 15
9	450 - 1000	10 - 15
10	1500 - 4000	7 - 10

APPENDIX III

STANDARD CLASSIFICATION OF SW AND BILGE PUMPS

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 5									
* STANDARD PUMP TOTAL HEAD(MTRS): 35 TO 50				0.00	0.00	0.00			
LST		MS 25G	POLAND	1.00	0.00	0.00			MOTOR
SNM	SEA WATER PUMP-REF.	YH-18/II	USSR	1.00	20.00	0.00		441X161X200	MOTOR
SNR	HOT WATER CIRCULATING PUMP	EISN-18/I-II	USSR	1.00	100.00	0.00		125X161X200	
VIKRANT	EXTRACTION PUMP-A/C PLANT	2"X3" CENTRIFUGAL	WORTHYNGTON SIMPSON	1.08	43.00	0.00			MOTOR
877EKM	BILGE DRYING PUMP	IBI.6/5-1.5/2	USSR	1.50	0.00	0.00			MOTOR
773 J/JM	HOT WATER COOLING & GYRO COMPASS SW CIR. PUMP	MS 11G	USSR	1.50	15.00	0.00		192X118X180	
SNR	FRESH WATER AND SANITORY PUMP (PORTABLE)	ENPS-1.5/20	USSR	1.50	20.00	5.00		472X266X330	
NIREEKSHAK	M/E S/W COOLING PUMP	4 V	FRANK MOHN A/S	1.50	46.00	0.00	116X120	520X450X410	MOTOR
1258 E(IMS)	DOMESTIC PUMP	IB 1.6/5-1.5/2	USSR	1.60	20.00	5.00		525X180X425	MOTOR
1241 PE	SANITORY	AUKG-2/	USSR	2.00	2.50	0.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
SNF	SEA WATER PUMP	EK4--10/0	USSR	2.00	21.00	0.00		508X96 6X330	MOTOR
VIKRANT	BILGE PUMP-SHAFT SPACE	POSITIVE ROTARY TYPE M8-MKII	MEGATOR PUMP	2.25	45.00	6.00			
SHAKTI	AUX BILGE PUMP	AO1201AN	SIHI SUPPLOE BREMEN NEINSTADT	2.40	14.00	0.00	40X32		MOTOR
P--15	FEED PUMP		M/S BEST & CROMPTON	2.50	20.00	0.00			
DP-25	BILGE PUMP	AB II M	KAVERI ENGG.	2.50	20.00	6.00		700X200X300	MOTOR
1241RE	BILGE STRIPPING PUMP	PH-32TM	USSR	2.70	20.00	5.00		305X220X670	MOTOR
SNM	BILGE PUMP	EBN 3/5	USSR	2.80	5.00	0.00	40X32	1309X335X345	MOTOR
1641	WATER PUMP(TURBULENT SELF PRIMING)	IVSM-3M	USSR	3.00	0.00	3.00		325X220	
VIKRANT	SUMP PUMP	M8-MK11	MEGATOR PUMP	3.00	10.00	0.00			
773 J/JM	SEA WATER CIRCULATING PP. FOR REFRIGERATION	MS-23	USSR	3.00	20.00	0.00		405X200X226	
				3.00	30.00	3.00			
VIKRANT	BILGE PUMP-MAIN M/C ROOM	POSITIVE DISPLACEMENT	MEGATOR PUMP	3.00	30.00	6.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
SNR	SANITORY PUMP	ESN -2/II	USSR	3.00	35.00	3.00		621.5X 302.5	MOTOR
PETYA	SANITORY PUMP	ESN -2/II	USSR	3.00	35.00	3.00		621.5X 602.5	MOTOR
205ER	SANITORY PUMP	ECH/2-II	USSR	3.00	35.00	4.00			MOTOR
AMBA	SANITORY PUMP	AO 3120 K-3	BE PUMPS	3.00	35.00	3.00		1000X150X150	MOTOR
LST	REF. PLANT S/W PUMP	SK 3-03-4-2	POLAND	3.00	55.00	0.00	100X100	428X157X237	MOTOR
773 J/JM	SEWAGE PUMP	MS-21	USSR	3.24	25.00	0.00		405X200X226	
DEEPAK	AUX CONDENSATE PUMP-T/A	VBK 40-23/4	KSB	3.40	5.00	0.00			MOTOR
773 J/JM	BOILER CONDENSATE TANK COOLING PUMP	MS-31	USSR	4.00	20.00	0.00		405X200X226	
VIKRANT	COIL DRAIN PUMP-EVAPORATOR	21/2"X2"	DRYSDALE	4.00	25.00	0.00			
SURVEY VESSEL	SEA WATER PUMP FOR REF.		HAMWORTHY PUMPS	4.00	25.00	0.00	100X100	360X200X400	MOTOR
SDB MKII	BILGE PUMP	JM-6	KIRLOSKAR BROTHERS	4.62	15.00	0.00			MOTOR
SDB MKIII	BILGE PUMP	SP-37/1	FLORITE ENGG.	4.62	15.00	5.00			
LCU MK III	BILGE PUMP	JM-6	FLORITE PUNE	4.70	15.00	0.00	120X120	412X227X210	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
773 J/JM	SEA WATER PP-A/C	63 WSA-15M S54	POLAND	4.80	26.00	0.00			MOTOR
VIRAAT	MAKE UP FEED PUMP	MA-159	GIRDLE STONE	5.00	0.00	0.00			
SNR	BILGE PUMP	3 BH 5/5	USSR	5.00	0.00	0.00			MOTOR
SNR	BILGE PUMP	3 BH 5/5		5.00	0.00	0.00			MOTOR
THIRD FLEET TANKER	BILGE PUMP	NE 40 A	NEP2-SCH -MOHNO PUMPEN	5.00	2.00	0.00			
GODAVARI	BILGE PUMP	TEF53 HELICAL ROTOR	M/S HOWALD STWERKE BEUSCHWE RETAG	5.00	3.00	0.00			MOTOR
LEANDER S	BILGE PUMP	10UHL	BRITISH LABOUR	5.00	10.00	0.00		1276X1 085X35	MOTOR
LST(L)	BILGE PUMP	STC-4BC	B E PUMPS	5.00	18.00	0.00			
P-15	BILGE PUMP		SUYASH ENGG	5.00	20.00	8.00			
SSK	SEA WATER PP -A/C PLANT	REW 65-250 B10C	KLEIN BECKER AG	5.00	20.00	0.00			MOTOR
P-15	BILGE PUMP		M/S SUYASH ENGG	5.00	28.00	8.00			
877 EKM		NSB-5/17	USSR	5.00	39.00	1.70			MOTOR
SNR	DIRTY BILGE PUMP	EBN 5/5	USSR	5.00	56.00	6.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
1241RE	DIRTY BILGE PUMP	EBN 5/5	USSR	5.00	50.00	5.00		1279X335X345	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 10									
* STANDARD PUMP TOTAL HEAD(MTRS): 35 TO 50									
VIRAAT	ELEMANT DRAIN PUMP	MA-160	GIRDLE STONE	6.00	0.00	0.00			
SURVEY VESSEL	BILGE PUMP	GB7	M/S HAMWORTHY	6.50	25.00	0.00			MOTOR
SURVEY VESSEL	BILGE PUMP	SH32-BC	B E PUMPS	6.50	25.00	0.00	100X100	360X200X400	MOTOR
SURVEY CRAFT(OLD)	BILGE PUMP	GB-7	HAMWORTHY UK	6.50	25.00	0.00			MOTOR
DEEPAK	SEA WATER HYDRO-PHONE PP	4 STAGE	B E PUMPS	7.00	10.00	0.00	50X50	600X200X300	MOTOR
SHAKTI	CIR. WATERPP-CARGO REF PLANT	NT-32-200(180)	ALLWEYLER	7.00	15.00	0.00	50X40		MOTOR
LEANDERS	BILGE PUMP	5T54B	M/S B E PUMP	7.50	8.00	0.00			MOTOR
LST(L)	SELF PRIMING BILGE PUMP	STS 4B (BC)	BE PUMP	8.00	18.00	5.00			ELEC
LST(L)	BILGE PUMP	STS-4B(BC)	M/S B E PUMP	8.00	18.00	5.00			MOTOR
SDB MKII	SEA WATER PUMP-A/C	A411Q KK	B E PUMPS	9.00	0.00	0.00			MOTOR
SHAKTI	S W HYDROPHONE PUMP	A 03634 KKTP'1'	KSB	9.00	28.00	0.00	50X50		MOTOR
VIRAAT	BILGE SUMP PUMP	M 50	MEGATER	10.00	0.00	0.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
NIREEKSHAK	COOLING PUMP FOR DIVING	5110 KK/BC	B E PUMPS	10.00	0.00	0.00	65X60	570X210X290	MOTOR
SURVEY CRAFT(MITHUN)	SEA WATER PUMP	A 5110KK	B E PUMPS	10.00	0.00	0.00	30X30	490X170X180	MOTOR
DEEPAK	AUX BILGE PP	EDS 100-75	GOTHIA SWEDEN	10.00	7.50	0.00			MOTOR
LCU MK III	SEA WATER PUMP(A/C)		B E PUMPS	10.00	20.00	0.00	150	554X180X283	MOTOR
LST		PA 10A-6VC 22X0.51	POLAND	10.00	21.00	0.00			MOTOR
SHAKTI	AUX BILGE PUMP	EDS100-75	GOTHIAHOOD SWEDEN	10.00	25.00	0.00	65X65		MOTOR
				10.00	25.00	5.00			
SDB MKII	FIRE & BILGE PUMP	SELF PRIMING TYPE	B E PUMPS	10.00	30.00	7.00			MOTOR
AMBA	SANITORY PUMP	ESN-1/I-II	USSR	10.00	30.00	3.00	74X40		MOTOR
SDB MKII	HULL & FIRE ,BILGE PUMP	313-VDP X2	WORTHYINGTON-SIMPSON	10.00	30.00	7.00			MOTOR
PETYA	SANITORY PUMP	ESN1/I-II	USSR	10.00	30.00	3.00			
SDB MKIII	FIRE & BILGE PUMP	SVAM 332	B E PUMP	10.00	37.00	7.00			
SDB MKIII	FIRE & BILGE PUMP	SVAM 332	M/S B E PUMP	10.00	37.00	7.00			MOTOR
1258 E(IMS)	COOLING FIRE & DRAINAGE PUMP-A/C	UBC 10/40&UBC3/40	USSR	10.00	40.00	7.00	40X	762X270X435	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
LST	SANITORY PUMP	SK6-02-4-1	POLAND	10.00	45.00	0.00	110X110	474X185X272	MOTOR
VIKRANT	SEA WATER PUMP-CATAPULT	MEGATOR TYPE BL-2 1/2	MEGATOR	10.00	100.00	0.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 20 TO 40									
* STANDARD PUMP TOTAL HEAD(MTRS): 35 TO 50									
LCU MK I	CIRCULATING PUMP-A/C	A4120KK	B E PUMPS	10.50	15.00	0.00			MOTOR
SSK	SEA WATER PP-DISTILLER	REW 40-260	KSB. BREMEN	10.50	89.00	0.00			MOTOR
DEEPAK	AUX CONDENSATE PP-CARGO & DRAIN TANK	VBK 40-23/4	KSB	12.00	4.00	0.00			MOTOR
LEANDERS	AUX SW CIRCULATING PUMP		DRYSDALE	12.00	12.00	0.00		560X343X622	MOTOR
VIKRANT	CIRCULATING WATER PUMP-REF	1 1/2"X2"	WORTHYNGTON SIMPSON	12.00	13.80	0.00			TURBINE
773 J/JM	SEA WATER PP-REFRIGERATION	SK3-01-1	POLAND	12.00	35.70	20.00		855X296X3050	MOTOR
LEANDERS	SONAR COOLING PUMP	1 1/2DVX8 MONOBLOCK	WORTHYINGTON SIMPSON	15.00	8.00	0.00			MOTOR
VIKRANT	SUMP PUMP	M-50-B MK-II	MEGATOR PUMP	15.00	10.00	0.00			
LCU MK II	SEA WATER PUMP-A/C	AO 5110-KK /BC	B E PUMPS	15.00	20.00	0.00	160X160		MOTOR
DEEPAK	COOLING WATER PP-HARBOURDA	REX [illegible]	KSB	15.50	20.00	0.00	50X50	500X266X310	MOTOR
OPV	STERN TUBE COOLING PUMP	VLI-65-50-250	WEIR PP UK	17.00	20.00	0.00	65X50	600X800X1013	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
GODAVARI	SEA WATER PP-EVAPORATOR	VGC 25-125A BN		17.50	42.00	0.00	127X127		MOTOR
PETYA	BRINE PUMP FOR A/C PLANT& CIACULATING PUMP	EKN-18/I	USSR	18.00	13.00	0.00	190X140	530X510X980	MOTOR
THIRD FLEET TANKER	SEA WATER COOLING PUMP	RSV65-300 A	KSB	18.00	25.00	1.00			
1641	PISTON PUMP/BILGE PUMP	2 P-1	USSR	20.00	2.50	6.00	180X160	1075X700X2085	MOTOR
ASTRAVAHINI	SEA WATER PUMP		FLORITE ENGG	20.00	4.00	0.00	184X184	660X250X320	MOTOR
SHAKTI	COOLING WATER PP D/G	ETA 50/200	KSB	20.00	20.00	0.00	65X65		MOTOR
SSK	BILGE PUMP 2 FOR FREEZING	TT 120K	FA. ABEL	20.00	250.00	7.00	100X50		MOTOR
877 EKM	MAIN SUCTION LINE	2P1-MR-2	USSR	20.00	350.00	6.00		1075X700X2085	MOTOR
TRV	FIRE PUMP	SP G2/1	M/S FLORITE ENGG.	22.00	20.00	7.00			MOTOR
TRV	FIRE & BILGE PUMP	SP-62/1	FLORITE ENGG	22.00	20.00	0.00	178X178	649X254X325	MOTOR
LCU MK II	FIRE PUMP	SP-62-1	FLORITE ENGG	24.00	20.00	0.00			DIESEL
SHAKTI	COOLING WATER PP-A/C	NT-40-200(180)	ALLWEYLER	25.00	14.00	0.00	80X65		MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
				25.00	20.00	6.00			
SURVEY VESSEL	G. S. PUMP	SBV-50-160L	M/ BE PUMPS	25.00	30.00	0.00			MOTOR
CTS	EMERGENCY FIRE PUMP		BEACON	25.00	45.00	7.00			DIESEL
205ER	HULL AND FIRE PUMP	ESN-11	USSR	25.00	65.00	6.00		195X582X582	MOTOR
DEEPAK	AUX BILGE PP	REX-50-26W	KSB	26.00	18.30	0.00			MOTOR
SHAKTI	AUX BILGE PUMP	REW-S5-200	KSB	26.00	20.00	0.00	65X65		
SURVEY VESSEL(NEW)	D/D PUMP		BEST & CROMPTON	27.00	35.00	0.00			DIESEL
SURVEY CRAFT	FIRE PUMP	2 STAGE CENTRIFUGAL	M/S BEST & CROMPTON	27.00	37.00	7.00			MOTOR
SURVEY CRAFT	FIRE & BILGE PUMP		BEST & CROMPTON	27.00	40.00	0.00			MOTOR
SSK	COOLING WATER FOR DISTILLER	REW-65-200 BLOC	KLEIN	28.00	25.00	0.00			MOTOR
NIREEKSHAK	FIRE PUMP	MA 844KK /BC	B E PUMPS	30.00	60.00	0.00	89X89	1070X300X380	MOTOR
LCU MK I	BALLAST PUMP& GENERAL SERVICE PUMP	A 7120KKTE	B E PUMPS	33.00	18.00	0.00			MOTOR
CTS	NON-SUBMERCIBLE PUMP	CENTRIFUGAL	BEST & CROMPTON	35.00	17.00	0.00		980X440X545	
LCU MK I	BILGE/FIRE PUMP	A 7120 KKTE	M/S B E PUMPS	35.00	18.00	8.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
OPV	NON-SUBMERCIBLE PUMP	HC-65-40-200	WEIR UK	35.00	40.00	0.00	65X40	685X286X741	MOTOR
VIKRANT	CIRCULATING PUMP-D G	6 1/4"X5" VERTICAL	J H CARUTHERS	36.00	1.20	0.75			
1641	CONDENSER PUMP	NTSV 40/15	USSR	40.00	15.00	0.00	180X160	780X450X455	MOTOR
SSK	SEA WATER PP-D A	ALFA 7102BN1 02.31.2 /1	SIEMEN&HINSCH	40.00	20.00	0.00			D/D
LST(L)	CENTRIFUGAL MARINE PUMP NON SUBMERSIBLE	HORIZANTAL SELF PRIMING	BEST & CROMPTON	40.00	20.00	7.60			ENGINE DRIVEN
773 J/JM	EVAPORATOR SEA WATER PUMP	40 WOL	USSR	40.00	25.00	0.00		700X480/368	
DEEPAK	EMERGENCY FIRE PP	GSK-RGI KK		40.00	40.00	0.00			DIESEL
				40.00	48.00	6.00			
205ER	FIRE MAIN PUMP	NTSV 40/65	USSR	40.00	65.00	5.00	76X76	300DX1080H	MOTOR
1241 PE	COOLING WATER PUMP-A/C	HUB 40/65-50 MS	USSR	40.00	65.00	0.00		540X459X979	MOTOR
SNR	FIRE PUMP	HUBC-40/65 MT	USSR	40.00	65.00	5.00			MOTOR
SNR	FIRE MAIN PUMP	NTSV 40/65	USSR	40.00	65.00	5.00			
SNR	FIRE PUMP	HUBC 40/65 MT		40.00	65.00	5.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
VIRAAT	SALWAGE PUMP	SIZE E TYPE V IN/HD6" /6"	PLENTY	40.00	85.00	0.00			MOTOR
877 EKM	S W & BATTERY COOLING PUMP-A/C	NSB 40/15	USSR	40.00	380.00	5.00		825X440X435	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 60 TO 80									
* STANDARD PUMP TOTAL HEAD(MTRS): 40 TO 80									
PETYA	WATER CIRCULATING PUMP	TSN 5 HM-18A	USSR	42.00	12.00	0.00			
AMBA	DG COOLING & A/C HOT WATER CIRCULATING PUMP	BEACON	BEST & CROMPTON	43.00	25.00	6.00		528X250X2927 60X540X810	
SHAKTI	EMERGENCY FIRE PUMP	4B-026 RW	BERG & SIBERT BREMEN	43.00	60.00	0.00			DIESEL ENGINE
877 EKM	AUX COOLING PUMP	SN-23	USSR	43.00	380.00	5.00		478X508X980	MOTOR
GAJ	BILGE PUMP	REWF-S 80-250 VERTICAL NON-AUX	M/S KSB PUMP	44.00	60.00	0.00			MOTOR
MATANGA (OGT)-III	SEA WATER PUMP-REF	AO 3610K	B E PUMPS	50.00	12.00	0.00			MOTOR
MATANGA (OGT)-III	BILGE PUMP	B5X4 MID MOUNTED CENTRIFUGAL	M/S HAMWORTHY	50.00	60.00	0.00	127X101	900X700X690	MOTOR
MATANGA (OGT)-III	GENERAL SERVICE PUMP	B5X4VP	HAMWORTHY UK	50.00	60.00	0.00			MOTOR
LCU MK II	FIRE & BILGE PUMP	CENTRIFUGAL VERTICAL FCH100/75	M/S FIRITE ENGG. CORP.	55.00	10.00	1.60	220X220		MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
LCU MK II	FIRE BILGE & BALLAST PUMP	FCH/100 -SP/75	FLORITE ENGG	55.00	20.00	0.00			MOTOR
LCU MK III	FIRE MAIN BILGE AND BALLAST PUMP	VERTICAL SELF PRIMING	SEHRA INDUSTRIES BOMBAY	55.00	30.00	7.00	225X225	600X600X1325	MOTOR
SSK	BILGE PP FOR COMPENSATING	FF 150K	FA. ABEL	55.00	250.00	6.00	50X100		MOTOR
NIREEKSHAK	BILGE PUMP	MA 842 KK/BC	B E PUMPS	60.00	8.00	0.00	116X90	930X360X380	MOTOR
THIRD FLEET TANKER	BILGE PUMP	SBV-65-120L	B E PUMPS	60.00	20.00	5.00		625X600X1635	MOTOR
OPV	FIRE MAIN & SPRINKLING PUMP	VLI-80-65-250	WEIR UK	60.00	20.00	0.00	80X65	600X500X120	MOTOR
OPV	BILGE PUMP	VLI-80-65-250	WEIR UK	60.00	70.00	0.00		600X800X1185	
OPV	BILGE & BALLAST PUMP	VLI-80-65-250	WEIR UK	60.00	70.00	0.00		600X800X1440	
				60.00	450.00	0.00			
773 J/JM	BILGE & BALLAST PP	63 WSA-20T54	POLAND	63.00	15.00	7.00		430X350X1230	MOTOR
	HOLD A/C SW PUMP	63 WSA 15M-54	POLAND	63.00	15.00	0.00	180X160		
LST	BILGE BALLAST PUMP	63 WSA 20T54	POLAND	63.00	20.00	0.00	180X160	722X577X709	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
773 J/JM	BILGE & BALLAST PUMP	63 WBS 295-A/2	USSR	63.00	24.20	2.20		795X735/700	
773 J/JM	FORS. A/C S W PUMP	63 WOC	USSR	63.00	25.00	0.00		860X700X444	
SNF	DG COOLING & A/C HOT WATER CIRCULATING PUMP	NTSV 63/30	USSR	63.00	30.00	6.00		760X540X810	
SNR	DG COOLING & A/C HOT WATER CIRCULATING PUMP	NTSV 63/30	USSR	63.00	30.00	6.00		760X540X810	
1241 PE	HULL & FIRE PUMP	HUB 63/80-50 MS	USSR	63.00	80.00	0.00		690X533X990	MOTOR
773 J/JM	FIRE PP	63 WSA80M54	POLAND	63.00	80.00	7.00		824X777X1335	MOTOR
LST	FIRE MAIN PUMP	63 WSA 80M54	POLAND	63.00	80.00	0.00	180X160	822X637X685	MOTOR
1241RE	HULL & FIRE PUMP(A/C COOLING)	HUB 63/806	USSR	63.00	80.00	80.00		690X533X990	MOTOR
SNF	FIRE PUMP	HUB 63/80	USSR	63.00	80.00	5.00		690X533X998	MOTOR
SNM	FIRE PUMP	HUB 63/80	USSR	63.00	80.00	5.00		690X533X990	MOTOR
PETYA	FIRE PUMP	NTSU 63/80	USSR	63.00	80.00	5.00	185X185	172X499X1186	MOTOR
773 J/JM	FIRE PUMP	63 WPS 254-A/2	USSR	63.00	97.00	7.00		926X652X800	

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
GODAVARI	BRINE PP-EVAPORATOR	VGC 25-12.5 ABN		64.00	16.00	0.00			MOTOR
SURVEY VESSEL	SEA WATER PUMP FOR AC PLANT	MA-1022 KK-BC	M/S B E PUMPS	64.00	20.00	0.00	215X215	900X340X460	MOTOR
LST(L)	SEA WATER PUMP FOR A/C PLANT	MA-1022 KK-BC	M/S B E PUMPS	64.00	25.00	0.00			MOTOR
THIRD FLEET TANKER	AUX. HARBOUR COOLING- S W PUMP	BV-65-1 60L	B E PUMPS	70.00	2.50	6.00		600X500X1635	MOTOR
SURVEY VESSEL	FIRE PUMP	M-922K	M/S B E PUMP	70.00	70.00	4.60	215X215	700X300X400	MOTOR
SURVEY VESSEL	FIRE PUMP	M 922 K	M/S BE PUMPS	70.00	70.00	0.00			MOTOR
SURVEY CRAFT(OLD)	FIRE PUMP	M-922KK	B E PUMPS	70.00	70.00	0.00			MOTOR
SURVEY VESSEL	FIRE PUMP	M922K	BE PUMP	70.00	70.00	0.00		ELEC	
				0.00	0.00	0.00			
SSK	MAIN SEA WATER COOLING PUMP	REW-S BLOCK 125/125	KLEIN BECKER AG	74.00	25.00	0.00			MOTOR
SSK	MAIN SEA WATER COOLING PUMP	REW-S BLOCK 125/125	KLEIN BECKER AG	74.00	25.00	0.00			MOTOR
VIKRANT	COOLING WATER PUMP-A/C PLANT	51/7" VERTICAL 2 STAGE	WORTHYNGTON SIMPSON	75.00	41.00	0.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
VIRAAT	DRAIN COOLER PUMP	DRYSDALE PARALEL	DRYSDALE	75.00	59.00	0.00			MOTOR
SHAKTI	CIR WATER PP-AFT & STANDBY A/C	NT-65-200(205)	ALLWEYLER	77.00	15.00	0.00	125X100		MOTOR
DP-25	SEA WATER PP-FOR DISTILLING PLANT	BV 65-160L	BEST & CROMPTON	80.00	35.00	0.00		650X640X1610	MOTOR
				80.00	40.00	5.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
VIRAAT	DRAIN COOLER PUMP	DRYSDALE PARALEL	DRYSDALE	75.00	59.00	0.00			MOTOR
SHAKTI	CIR WATER PP-AFT & STANDBY A/C	NT-65-200(20S)	ALLWEYLER	77.00	15.00	0.00	125X100		MOTOR
DP-25	SEA WATER PP-FOR DISTILLING PLANT	BV 65-160L	BEST & CROMPTON	80.00	35.00	0.00		650X640X1610	MOTOR
				80.00	40.00	5.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 100									
* STANDARD PUMP TOTAL HEAD(MTRS): 80 TO 100									
SDB MKII	BILGE PUMP	SP/37/1	M/S FLOWRITE	84.00	15.00	5.00	103X103	523X250X155	MOTOR
LST(L)	SW PUMP-A/C	MA1022-KK-BC	B E PUMPS	85.00	18.00	0.00			
1641	BATTERY COOLING&SHAFT COOLING PUMPS	VTSN-90 2	USSR	90.00	25.00	5.00	200X200	489X432X856	MOTOR
VIRAAT	FIRE MAIN F/D	15"X4 1/2" ROTARY CENTREX	DRYSDALE	90.00	78.00	0.00			MOTOR
CTS	COOLING WATER PUMP-A/C		VOLTAS SUPPLY	91.00	0.00	0.00			
GODAVARI	SEA WATER PP-A/C	43VR17	B E PUMPS	92.00	30.00	0.00			MOTOR
DEEPAK	FIRE & SPRAY PUMP	SZ2M V350	M/S SULZER WEISE	98.00	90.00	0.00			MOTOR
SHAKTI	FIRE & SPRAY PUMP	SZ2M V350	M/S SULZER WEISE	98.00	90.00	0.00	125X100		MOTOR
VIKRANT	FIRE MAIN & HANGER SPRAY PUMP-FLIGHT DECK	6"X6" CENTRIFUGAL	HARLAND ENGG CO.	100.00	0.00	0.00			
DEEPAK	CIRCULATING PP-EVAPORATOR	REX 125-27V	KSB	100.00	5.00	0.00	125X125	600DX560dX1215	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
LEANDERS	HULL & FIRE PUMP	6" X 6" WHS 4	M/S WEIR PUMP	100.00	7.50	0.00			STEAM TURBINE
THIRD FLEET TANKER	BILGE/BALLAST TANK CLEANING PUMP	SBV--100-315L	B E PUMPS	100.00	14.00	5.00		800X700X2360	MOTOR
LST	MAIN A/C PUMP	100 WSA 20M--511	POLAND	100.00	20.00	0.00	240X210	982X722X807	MOTOR
773 J/JM	SEA WATER PP-A/C	100WS20-M54	POLAND	100.00	20.00	7.00		982X686X1315	MOTOR
773 J/JM	AFT. A/C SEA WATER PUMP	100 WOL	USSR	100.00	25.00	0.00		903X700X444	
AMBA	A/C COOLING PUMP	NTSV 100/30-2	USSR	100.00	30.00	6.00		424X500X827	MOTOR
SNF	AUX COOLING PUMP	HUB 100/30A-II	USSR	100.00	30.00	6.00	635X635	650X394X828	MOTOR
LST(L)	HULL AND FIRE PUMP	BEACON	BEST & CROMPTON	100.00	60.00	0.00			ELEC
LST(L)	FIRE PUMP	BEACON-100TPH	M/S BEST CROMPTON	100.00	60.00	7.00			MOTOR
LST(L)	HULL& FIRE PUMP	BEACON	BEST & CROMPTON	100.00	60.00	0.00			
CTS	FIRE PUMP	CENTR.SELF PRIM.5X5 1225KKBC	M/S BEST CROMPTON	100.00	75.00	4.60			ENGINE
LEANDERS	T/D FIRE PUMP	TLH 20D	DRYSDALE CO. LTD	100.00	76.00	0.00			STEAM TURBINE

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
SURVEY VESSEL(NEW)	FIRE PUMP	BV-65	B E PUMPS	100.00	76.00	0.00			MOTOR
GODAVARI	HULL & FIRE PUMP	5" X 5" VMX3	M/S BEST & CROMPTON	100.00	77.00	0.00			MOTOR
16 A	HULL & FIRE PUMP	BV-65-200-LI	B E PUMPS	100.00	77.00	0.00		750X580X1560	MOTOR
LEANDERS	HULL & FIRE PUMP	5" X 5" VMX3	M/S BEST & CROMPTON ,M/S WORTHIGTON	100.00	77.00	0.00		1490X770X795	MOTOR
DP-25	HULL & FIRE PP	SINGLE STAGE NONSELF PRIMING	BEST & CROMPTON	100.00	77.50	0.00		750X660X1642	MOTOR
GODAVARI	FIRE PUMP	SINGLE STAGE VERT. 6X6 MHSH	M/S TRIVENI ENGG. WORKS	100.00	78.00	0.00			STEAM TURBINE
				100.00	80.00	7.00			
SNF	FIRE PUMP	HUB 100/80-R-11T	USSR	100.00	80.00	5.00	650X604	760X620X1235	MOTOR
SHAKTI	FIRE & SPRAY PP	S2ZMV350	WEIZE	100.00	90.00	0.00			
SHAKTI	BILGE & BUTTERWORTH PUMP	REX-S10 0 320-3	M/ K.S.B.	100.00	140.00	0.00	125X100	700X600X2091	MOTOR
LEANDERS	BILGE PUMP	10 UHL	M/S BRITISH LABOUR	105.00	12.00	4.50			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CUBIC MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
THIRD FLEET TANKER	BILGE/FIRE FIGHTING PUMP	SBV-80-200L	B E PUMPS	110.00	70.00	5.00		730X700X2085	MOTOR
VIRAAT	BRINE PUMP	MA-158	GIRDLE STONE	112.00	0.00	0.00			
VIKRANT	HULL & FIRE PUMP	VDSPT	M/S WORTHINGTON	114.00	60.00	7.60			MOTOR
LST(L)	SEA WATER PUMP FOR DISTILLING PLANT	GIRDLE STONE	GIRDLE STONE/ CAIRD & RAINER	115.00	0.00	0.00			
VIKRANT	SEA WATER PUMP-A/C 1/2 MILLION	5/6 UI	WORTHYNGTON SIMPSON	124.00	12.60	0.00			
DP-25	SEA WATER PUMP FOR A/C & REF.	BY-80M 160	BE PUMPS	125.00	20.00	0.00		650X640X1610	MOTOR
CTS	SEA WATER PP -EVAPORATOR	S-54VR-20(BC)	B E PUMPS	125.00	20.00	4.60			
P-15	SW COOLING PUMP		B E PUMPS	125.00	30.00	0.00			MOTOR
P-15	SEA WATER COOLING PUMP		M/S BEST & CROMPTON	125.00	30.00	0.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 150 TO 200									
* STANDARD PUMP TOTAL HEAD(MTRS): 80 TO 100									
CTS	SEA WATER PP-A/C & REF.			133.00	0.00	0.00			
SNF	FIRE PUMP	HYB-160 /80A II	USSR	160.00	80.00	5.00	650X604	750X670X1233	MOTOR
PETYA	FIRE PUMP	NTSV 160/80-II	USSR	160.00	80.00	3.00			MOTOR
AMBA	FIRE PUMP	NTSV 160/80-II	USSR	160.00	80.00	3.00			MOTOR
SNM	HULL AND FIRE PUMP	NTSV 160/10-I	USSR	160.00	10.00	5.00		520X660X967	MOTOR
DEEPAK	BILGE BALLAST & WATER SERVICE PP	REX-150 -32	KSB	140.00	10.00	0.00	150X150	600X560X1530	MOTOR
				160.00	10.00	3.00			
SNM	FIRE PUMP	NTSV 160/80 II	USSR	160.00	10.00	5.00		690X700X1000	MOTOR
AMBA	SEA WATER EVAPORATOR PUMP	NTSV 160/20	USSR	160.00	20.00	6.00		514X650X912	MOTOR
AMBA	SEA WATER EVAPORATOR PUMP	NTSV 160/20	USSR	160.00	20.00	6.00		514X650X912	MOTOR
				160.00	60.00	6.00			
GAJ	FIRE PUMP	NDL HORIZONTAL SELF PRIMING	M/S WEIR PUMP	150.00	50.00	0.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
NIREEKSHAK	BALLAST PUMP	CENTRIFUGAL	FRANK MOHN A/S	150.00	60.00	0.00	165X167	560X450X540	MOTOR
P-15	FIRE PUMP		B E PUMPS	150.00	100.00	0.00			MOTOR
P-15	FIRE PUMP		M/S B E PUMPS	150.00	100.00	0.00			
MATANGA (OGT)-II	FIRE PUMP	6"X6"	WEIRS	150.00	120.00	0.00		990X770X600	MOTOR
MATANGA (OGT)-II	FIRE PUMP	4" NDL	M/S DRYSALE	150.00	120.00	0.00			MOTOR
VIRAAT	SEA WATER PUMP -HANGER	6"/6" DXL	DRYSDALE	150.00	275.00	0.00			
SNF	SALVAGE PUMP	HUB 160/10-III	USSR	160.00	10.00	5.00	650X604	520X660X969	MOTOR
AMBA	FIRE PUMP	NTSV 160/80-II	USSR	160.00	10.00	5.00			MOTOR
PETYA	HULL AND FIRE PUMP	NTSV 160/10-I	USSR	160.00	10.00	5.00	270X210	520X660X967	MOTOR
				140.00	40.00	6.00			
THIRD FLEET TANKER	BILGE BALLAST DK SERVICE PUMP	SBV-100 -200 L	B E PUMPS	140.00	40.00	5.00		760X600X2050	MOTOR
DEEPAK	BILGE & BALLAST & WATER SERVICE PUMP	REXS150 32V	M/S K.S.B.	140.00	43.00	0.00			MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
DEEPAK	AUX BILGE PP	RSL 5150-320A	KSB	140.00	43.00	0.00			MOTOR
LST(L)	S W CIRCULATING PP-M/E(STANDBY)	C5X4V	HAMWORTHY	140.00	46.00	0.00			
VIKRANT	FIRE & BILGE PUMP	6 " X 6" ROTARY CENTREX	M/S DRYSALE	148.00	60.00	7.60			STEAM TURBINE
VIKRANT	FIRE & BILGE PUMP	6"X6" ROTARY CENTREXY	M/S DRYSALE	148.00	60.00	7.60			MOTOR
VIKRANT	FIRE & BILGE PUMP	6"X6" SOS	DRYSDALE	150.00	0.00	0.00		900X1100X2350	TURBINE

STANDARD

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
SHAKTI	COOLING WATER PP EVAPORATOR	RSL 150-250 /A	KSB	180.00	15.00	0.00	200X175		MOTOR
LST(L)	BALLAST PUMPS	586-VR/ 4C	B E PUMPS	200.00	20.00	0.00			
LST(L)	BALLAST PUMP	VERTICAL 586 VRBC	M/S B E PUMPS	200.00	20.00	5.00			MOTOR
				200.00	60.00	7.00			
P-15	FIRE PUMP		M/S BEST & CROMPTON	200.00	100.00	7.00			
P-15	FIRE PUMP		BEST & CROMPTON	200.00	100.00	7.00			DIESEL
1641	CENTRIFUGAL PUMP	6MBX2	USSR	180.00	120.00	5.00	270X200	610X720X1610	MOTOR
877 EKM	BALLAST PUMP	CENTRIFUGAL 6MBX2	USSR	180.00	125.00	5.00		610X720X1610	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 250									
* STANDARD PUMP TOTAL HEAD(MTRS): 30 TO 40									
VIRAAT	CIRCULATING PUMP	MA-157	GIRDLE STONE	210.00	0.00	0.00			
SHAKTI	BILGE BALLAST & WATER SERVICE PUMP	RSL-S--1 50-320-A	M/ K.S.B.	220.00	43.00	0.00			MOTOR
VIKRANT	SEA WATER PUMP-A/C 1 MILLION	8/10 U-P-I	WORTHYNGTON SIMPSON	235.00	25.00	0.00			
P-15	SEA WATER COOLING PUMP		M/S BEST & CROMPTON	250.00	30.00	0.00			
P-15	S W COOLING PUMP		BEST & CROMPTON	250.00	30.00	0.00			MOTOR
SNF	AUX. COOLING PUMP	HUB 250/300 D)-III	USSR	250.00	30.00	0.00	640X610	860X560X1100	MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 300 TO 350									
* STANDARD PUMP TOTAL HEAD(MTRS): 10 TO 15									
DEEPAK	COOLING WATER PP-M/C COMPARTMENT VENTILATION	REX 175-28V	KSB	270.00	12.00	0.00			MOTOR
P-15	SALVAGE PUMP-SUBMERCIBLE		S U MOTORS	310.00	10.00	0.00			MOTOR
P-15	SALVAGE PUMP(SUBMERCIBLE)		M/S S U MOTORS	310.00	10.00	0.00			
AMBA	SUBMERSIBLE PUMP (FIXED)	NTSV 315-10-II	USSR	315.00	10.00	5.00	200X264	565X770X1086	MOTOR
SNF	SUBMERSIBLE PUMP (FIXED)	NTSV 315-10-II	USSR	315.00	10.00	3.00	200X264	565X770X1080	MOTOR
VIRAAT	BALLAST PUMP	8X10 VSPI	WORTHINGTON SIMPSON	350.00	15.00	9.00			

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 450 TO 1000									
* STANDARD PUMP TOTAL HEAD(MTRS): 15 TO 10									
AMBA	A/C SEA WATER CIRCULATING PUMP	NTSV-40 0/20-II	USSR	400.00	20.00	6.00		633X81 0X1227	MOTOR
VIKRANT	CIRCULATING &BILGE PP FOR EVAPORATOR	10"X10"	DRYSDALE	405.00	0.00	0.00		750X725X2100	TURBINE
DEEPAK	AUX SEA WATER PUMP	REX-300 -27E	KSB	450.00	10.00	0.00			MOTOR
SHAKTI	COOLING WATER PP T/G	RSL 350-280 B	KSB	800.00	11.00	0.00	350X300		MOTOR

STANDARD CLASSIFICATION OF SEA WATER AND BILGE PUMPS

PROJECT	USE	MODEL	MAKE	CAPACITY (CU MT/HR)	TOTAL HEAD (MTR)	SUCTION HEAD (MTR)	SUCTION DISC FLANGES	DIMENSIONS	PRIME MOVER
** STANDARD PUMP CAPACITY(CU M/HR): 1500 TO 4000									
* STANDARD PUMP TOTAL HEAD(MTRS): 7 TO 10									
SHAKTI	MAIN CIRCULATING PUMP II	SDY 400-350	KSB	1200.0	7.00	0.00	500X400		MOTOR
SHAKTI	MAIN CIRCULATING PUMPI	SDY 600-520	KSB	3600.0	7.00	7.00	700X700		MOTOR
LEANDERS	MAIN CIRCULATING PUMP		DRYSDALE	3780.0	7.00	0.00			TURBINE
GODAVARI	MAIN CIRCULATING PUMP			3780.0	7.00	0.00			

APPENDIX IV

SOTRS OF STANDARD RANGES OF SW AND BILGE PUMPS

STATEMENT OF TECHNICAL REQUIREMENTS

SW AND BILGE PUMPS

REQUIREMENTS	SOTR 1	SOTR 2	SOTR 3	SOTR 4	SOTR 5
CAPACITY IN CU MTRS/HR	5	10	20-40	60-80	100
TOTAL HEAD IN METERS	35-50	35-50	35-50	40-80	80-100
WORKING MEDIUM		SEA	AND	BILGE	WATER
SELF PRIMING REQUIREMENT	REFER NOTE 1				
OVER ALL DIMENSIONS	WOULD BE	SPECIFIED	FOR	RETROFITS	
SHOCK GRADE	GRADE A / B	GRADE A / B	GRADE A / B	GRADE A / B	GRADE A / B
PRIME MOVER	MOTOR	UNLESS	OTHERWISE	SPECIFIED	
POWER REQUIREMENT	AS	PER	ARTICLE	0312	
DIESEL ENGINE SPECIFICATIONS	AS	PER	STANDARD	RANGE	PROMULGATED
NEAREST ACCEPTABLE INDIGENOUS EQUIVALENT					
WORTHINGTON PUMPS	50-32-200	50-32-200	65-40-250	100-65-200	100-65-200
STORK PUMPS	CV 32-200	CV 32-200	CV/CF 50-200	CF/CV 65-200	CF/CV 80-250
KIRLOSKAR BROTHERS LTD	KPD 32/20	KPD 32/20	KPD 50/20	KPD 65/26	KPD 65/32
BEACON WEIR		10 TPH	27 TPH		100 BPO
BE PUMPS	AO 3630 KDGS3	A5120KK DGS3	BV 50-200L	BV 80-250L	BV 65-315
SU MOTORS	CPV: 0 : 40X25 - 180	CPV2: 100X80 - 400	CPV2: 100X80 -400	CPV1: 100X80 - 250	CPV1: 100X80 - 250

NOTE 1: SELF PRIMING REQUIREMENTS TO BE INDICATED AT THE TIME OF PLACEMENT OF ORDERS.

NOTE 2: SUBMERSIBILITY FOR SALVAGE TO BE SPECIFIED AT THE TIME OF PLACEMENT OF ORDERS.

STATEMENT OF TECHNICAL REQUIREMENTS

REQUIREMENTS	SOTR 6	SOTR 7	SOTR 8	SOTR 9	SOTR 10
CAPACITY IN CU MTRS/HR	150-200	250	300-350	450-1000	1500-4000
TOTAL HEAD IN METERS	80-100	30-40	10-15	10-15	7-10
WORKING MEDIUM		SEA	AND	BILGE	WATER
SELF PRIMING REQUIREMENT	REFER NOTE 1				
OVER ALL DIMENSIONS	WOULD BE	SPECIFIED FOR	RETROFITS		
SHOCK GRADE	GRADE A / B	GRADE A / B	GRADE A / B	GRADE A / B	GRADE A / B
PRIME MOVER	MOTOR	OTHERWISE	STATED		
POWER REQUIREMENT	AS	ARTICLE	0312		
DIESEL ENGINE SPECIFICATIONS	AS	STANDARD	RANGE	PROMULGATED	
NEAREST ACCEPTABLE INDIGENOUS EQUIVALENT					
WORTHINGTON PUMPS	6U18	6U18	200-150-250	200-150-250	
STORK PUMPS	CF/CV 80-250	CF/CV 100-200	CF/CV 100-200		
KIRLOSKAR BROTHERS LTD	KPD 80/32	KPD 150/32			
BEACON WEIR	250 TPH	250 BPO			
BE PUMPS	BV 80-315L	BV 150-315L	BV 150-250L		
SU MOTORS	CPV1: 100X80, -315	CPV1:150X100, -250	CPV2:200X150, -315	CPV2:250X200, -400	

NOTE 1: SELF PRIMING REQUIREMENTS TO BE INDICATED AT THE TIME OF PLACEMENT OF ORDERS.

NOTE 2:SUBMERSIBILI- TY FOR SALVAGE TO BE SPECIFIED AT THE TIME OF PLACEMENT OF ORDERS.

APPENDIX V

MATERIAL REQUIREMENTS

Appendix V

DETAILED MATERIAL SPECIFICATION FOR PUMPS - MAJOR COMPONENTS

Item No	Description	Material Specifications	
		Surface Ships	Submarines
1.	Impeller	Gun-Metal DGS 203 or Nickle Aluminium Bronze DGS 348	Nickle Aluminium Bronze DGS 348
2.	Casing	-do-	do
3.	Gland	-do-	-do-
4.	Shaft Sleeve	-do-	-do-
5.	Stuffing Box	-do-	do-
6.	Water Thrower	-do-	-do-
7.	Spacers	-do-	-do-
8.	Shaft	Nickle Aluminium Bronze DGS PS 1043 or Aluminium Silicon Bronze DGS PS 1044 or SS AISI 431 /EN 57	Nickle Aluminium DGS PS 1043 or Aluminium Silicon Bronze DGS PS 1044 or SS AISI 431/EN 57

9.	Wearing Rings (Casing)	Leaded Bronze BS 1400 LpB1 or Phenolic Resin Asbestos or Nickel Aluminium Bronze DGS 348.
10.	Couplings & Spacer	EN 8
11.	Casing cover	Nickel Al Bronze DGS 348
12.	Bearings(Roller)	Steel
13.	Lock nut	HT Carbon steel Gr 8.8
14.	Bearings (if lubricated by fluid pumped)	Phenolic Resin Asbestos.
15.	Packing	NS Cat No 0414/923-0902 (cold fluid) or NS Cat No 0414/923- 0718 to 0723 (hot fluid) or Resin/cotton impregnated.
16.	Bush Lantern and Neck Rings	Leaded Bronze BS 1400 - LPB1
17.	Mechanical Seals	Monel Metal Parts, Resin Loaded Carbon Rings, Solid Ceramic Seat
18.	'O' Ring Seals	Synthetic Rubber (Acrylonitrite) NS Cat No 0413/923-7730 to 7821 BS 2751 (Compound BA5)
19.	Plugs	Aluminium Bronze DGS 348
20.	Fasteners	Aluminium Bronze DGS 348
21.	Couplings	Cast Steel EN 8

22.	Coupling Spacers	Cast Steel EN 8
23.	Gaskets	PTFE
24.	Grease Cup	Gun Metal DGS 203
25.	Expanders(Suc & Del)	Gun Metal DGS 203
26.	Internal Circlip	Spring Steel

APPENDIX VI

BASIC & ESSENTIAL REQUIREMENTS

BASIC AND ESSENTIAL MATERIAL REQUIREMENTS

Basic Requirements

(a) Pumps required are for handling sea water.

(b) Shock grading should be Grade B unless specified.

(c) Pumps are to be light and compact.

(d) The use of split mechanical seals is to be made when specified.

(e) Firm should specify the vibration limits.

(g) Recommendations of onboard and B & D spares.

(g) Testing and trials of the prototype will be carried out.

Essential Material Requirements

(a) Desired material specifications are as per Appendix II.

(b) Wherever material specifications are not as per Appendix II, following properties of material are to be intimated:

(i) % elongation.

(ii) Elasticity.

(iii) UTS.

(iv) Corrosive/erosive resistance.

(v) Impingement resistance.

(c) The following materials are not to be used. This list is not exhaustive as other materials may be found unable to meet the requirements. It covers materials in common commercial use or which have in the past been approved for Naval use, but which are now considered not suitable:

(i) High tensile brass

(ii) Naval brass

(iii) Aluminium bronze(DCS 1043)

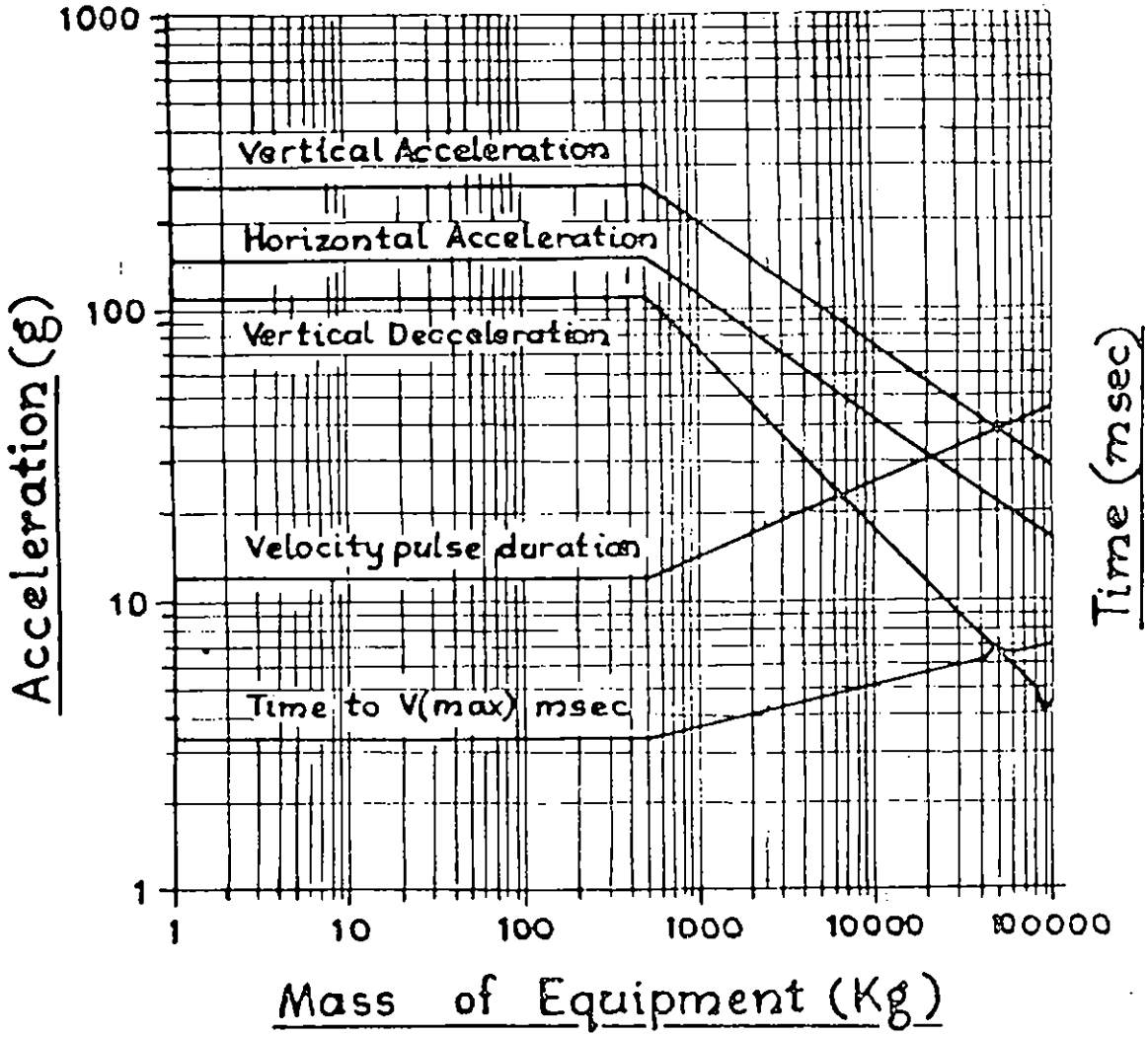
(iv) Gunmetal is not to be used in Submarine application.

(v) Wrought Aluminium Silicon Brass to NES 749 may only be used where the design stress does not exceed.

APPENDIX VII

SHOCK GRADE A CURVES

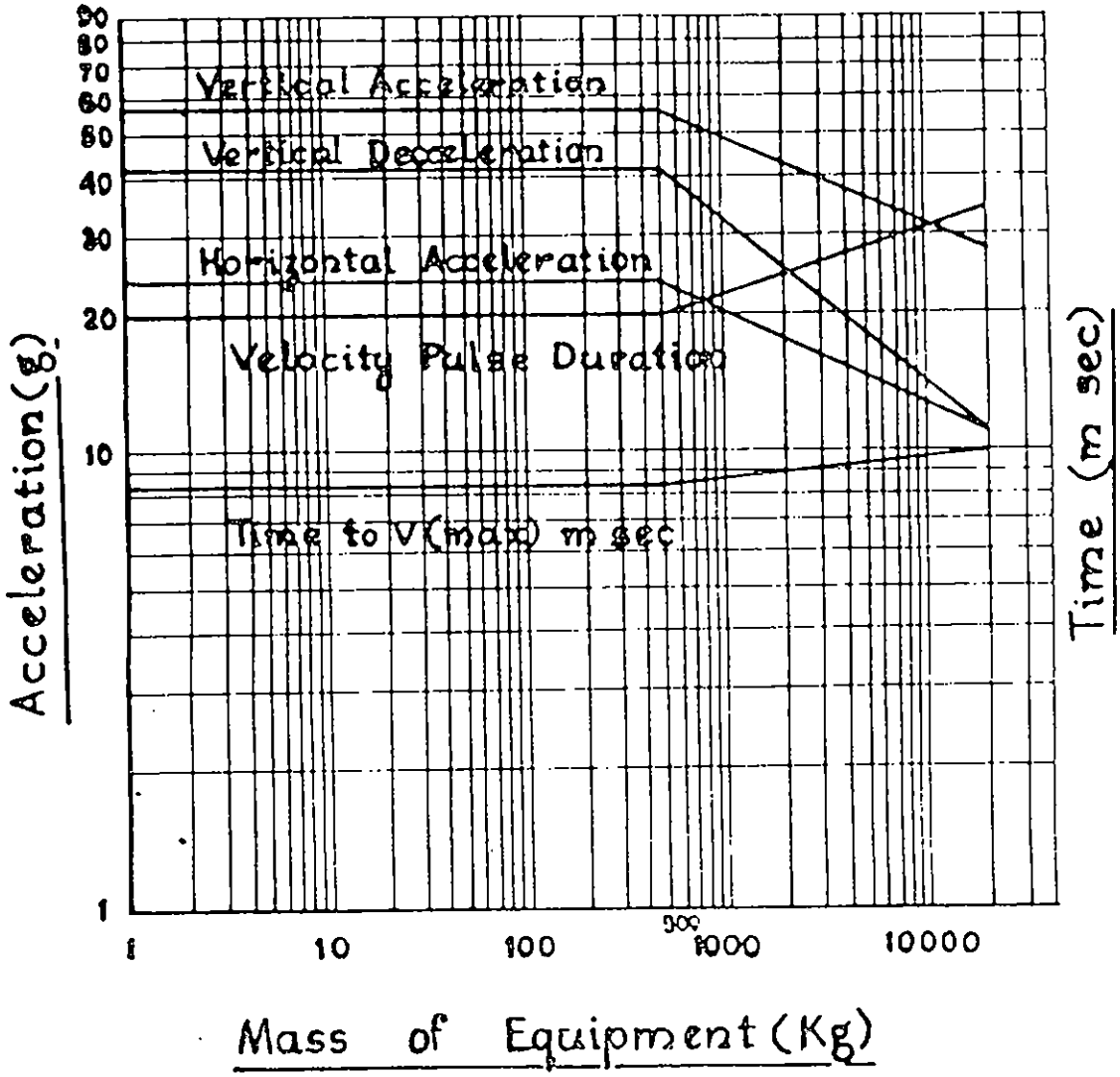
SHOCK GRADE 'A'



APPENDIX VIII

SHOCK GRADE B CURVES

SHOCK GRADE - 'B'



APPENDIX IX

DIRECTIVES FOR USER TRIALS OF PUMPS ON BOARD SHIPS

Appendix IX

DIRECTIVES FOR USER TRIAL OF PUMPS ONBOARD SHIPS AND SUBMARINES

1. Installation Checks

(a) Visual Inspection . The following is to be checked during the visual inspection :

(i) Installation is complete in accordance with the drawings and specifications.

(ii) Equipment is undamaged.

(iii) Instrumentation is complete, properly sited and calibrated. Arrangements for recording of readings as per the enclosed format are complete .

(b) SV Mountings and Securing Arrangement. SV mountings and securing arrangements for all equipments are complete.

2. Safety Controls: All safety cut outs, trips, alarm indications and associated control systems are to be set, checked and proved before the actual commencement of trials.

3. The setting to work trials are to be conducted in two phases:

Phase I : 6 hours 100% capacity Trials

Phase II: 48 hours Endurance Trials

4. In addition to the normal preparations for trials, the following may be ensured that all strainers/filters in the air delivery system are cleaned/renewed as necessary.

5. Duration of Trials : During the trial period of six months the pump is expected to be optimally exploited to realise its suitability for further replacement on other ships/submarines. During the User's trials, strict adherence to exploitation/instruction manuals is mandatory. Abnormalities, if any, are to be reported to Command Headquarters and local CAO organisations with copies endorsed to NHQ(DOS(E)) and DQA organisation.

6. The running hours clocked by the pump during the trial period are to be logged and all relevant parameters are to be recorded at hourly intervals.

Annexure to Appendix IX

Sl.	PARAMETER DESCRIPTION	UNIT
1	Time	hours
2	Pumps in use	-
3	Compartment Temperature	deg C
4	Pump delivery pressure	Kg/sq cm
5	Pump delivery temperature	deg C
6	Suction pressure(where applicable)	Kg/sq cm
7	Suction temperature(--"---)	deg C
8	RPM	RPM
9	Ambient temperature	
10	Barometric pressure	
11	Maximum depth of operation (in case of submarines)	

APPENDIX X

CRITERIA FOR SELECTION OF PUMPS FOR CERTAIN DUTIES

CRITERIA FOR SELECTION OF PUMPS FOR CERTAIN DUTIES

1. Fire pumps

(a) The total requirement of sea water pumps for fire fighting purposes calculated as per guidelines in NES 719, is to be achieved by selecting pumps with a capacity of 100 to 150 TPH at 7 to 10 bar discharge pressure.

(b) The total complement of the pumps is to include a redundancy factor of two pumps (one for small ships) to cater for routine maintenance and breakdowns.

(c) In addition, the total number of pumps so evolved, at least two pumps for ships above 3500 tons displacement, are to be autonomous diesel engine driven.

(d) The diesel engines for these pumps are to be air cooled.

(e) Wherever the pumps are installed onboard ships, vertical mounting is to be done. If horizontal mounting is unavoidable, the axis of rotation is to be arranged along the fore and aft direction of the ship.

2. SALVAGE PUMPING ARRANGEMENTS

(a) Total Capacity: The total capacity of dewatering (salvage) pumping out arrangements (shown as a percentage of the ships displacement) is to be as follows:

(i) Air Craft Carriers ...40%

(ii) Ships above 1800 Tons displacement ...75%

(iii) Ships above 500 Tons and below 1800 tons displacement ...100%

(iv) Ships below 500 tons displacement ...250%

(b) The above requirements have been worked out to cater for survivability of the ships with a number of simultaneous underwater hits as follows:

- Aircraft carriers - 4 hits
- Ships with displacement of 1800 tons and above - 2 hits
- Ships with displacement below 1800 tons - 1 hit

(c) PROPORTION OF FIXED AND PORTABLE PUMPS:

The total pumping capacity as defined above for various classes of ships is to be further sub-divided in a ratio of 60% fixed capacity and 40% portable capacity.

(d) In addition to the considerations given above, the number of fixed salvage pumps required is also to be calculated based on the following guidelines:

(i) Each Watertight section of the ship is to have an independent fixed submersible salvage pump.

(ii) Capacity of each of the above pumps is to be as follows:

Class/Type of Ship	Main MCY Sections	Other W/T Sections
Aircraft carriers and	1000 TPH (or 3x300 TPH)	300 TPH
Ships with displacement	300 TPH *	300 TPH
500 - 1800 tons	300 TPH	150 TPH
Ships upto 500 tons displacement	150 TPH	150 TPH

(*For a W/T Section having U/W permeable volume of more than 600 cu mtr, an additional 300 TPH pump is to be provided).

(iii) The total number and capacity of fixed submersible pumps is to be the greater of the capacity as computed in conformity with the above guidelines.

3. DE - WATERING ARRANGEMENTS:

In respect of the fixed sea water (fire) pumps and fixed submersible salvage pumps, guidelines have been given above. If due to space constrains it is found totally unviable to incorporate separate fixed submersible salvage pumps, then the guide lines given below are to be followed:

(a) The fitted sea water (fire) pumps selected should be of the submersible type capable of continuous duty.

(b) These submersible sea-water pumps are to be designed as Fire and Bilge(or hull and Fire) pumps with a provision being made for these to take suction from the sea as well as the W/T

Section where they are located.

(c) The total complement of these pumps is to be one per water tight section of the ship, with their capacities being selected so as to maintain the total salvage capacity of the ship which would have otherwise accrued by fitting the independent salvage pumps in addition to fire pumps.