Pre-Portuguese Goa was an international port, frequented by the ships from Aden, Ormuz, Palestine, Cambay and other hinterland kingdoms. To build new ships and to provide repair facilities, the Pre-Portuguese rulers had maintained a well equipped shipyard at Old Goa. The easy availability of skilled manpower and appropriate material gave an impetus to shipbuilding in Goa. The Portuguese on annexation of Goa in 1510, got an absolute control over one of the key points, by which they could check the operation of the spice-trade. The already existing dockyard at Old Goa provided basic and important infrastructure to the Portuguese eastern maritime empire in the East.

When Adil Shah surrendered to the Portuguese, Alfonso de Albuquerque found in the dockyard about 40 large ships, 26 brigs and large number of fustas. He also found a large amount of artillery comprising of 40 heavy guns, 55 pieces of ordnance called falcons, 200 muskets and a large quantity of gun powder, pitch, naphta oil, copper, iron and other hardware.¹ This chapter aims at throwing light on various aspects of the Portuguese naval establishment at Goa.

The Portuguese initiated a series of measures to restructure its working and appointed Francisco Corvinel as its Suprintendent with the title of Feitor.² This Royal dockyard received successive names such as Rebeira, Rebeira Das Naus, Ribeira Das
The Royal dockyard at Goa was roughly equivalent to the Lisbon armazen, except that, it not only provided shipbuilding and repair facilities but also had a gun foundry and a mint. Pyrard de Laval, who visited Goa after its conquest by the Portuguese, gives the following account of its different wings and functioning. "Between the city of Goa and the river bank there were three large dockyards. The main dockyard which was on the western side of the city was the Rebeira de Grande or Ribeira das Naus. In this dockyard were important units, like the mint (Casa da Moeda) and gun foundry. It minted coins, manufactured artillery pieces and also other naval hardware. Next to this dockyard was the quay called 'Cais de Santa Catarina. This quay was busy whenever any armada lays anchored.' The Rebeira das Gales was another wing of the dockyard, which was well fortified. This unit was well structured and provided with all facilities to the Masters and the officials. Persons convicted for various offences were confined to gales and were not allowed to leave the cell except for carrying out of any urgent work. There was also a large building where the unloaded material was kept.

As soon as unloading operation was over, the ships had to leave the berth, thereby making a way for others. Cais da ortaleza do Viso-rey was located between the river and the palace of the Viceroy. It was of about 70 passos of length and 200 f breadth. This quay was generally used by all Indiamen merchantships which enter the port. From the window of his palace, the Viceroy could see all anchoring and departure that take place.
at this quay. In 1526, new rules for its administration were framed by Afonso Mexia, who was the Comptroller of Finance. Under these new regulations a provision was made for the maintenance of a register of all the material that was acquired and used in the dockyard. The Clerk of the warehouse (Almazen) had to maintain a clear record of all annual income and expenditure in the register which was required to be produced before the Fietor of the city.

Before recording any transaction in the register, the Clerk had to declare the total number of folios which the register contained on the very first folio. Every folio of the register was numbered and initialled. All material such as iron, lead, coir, gun-powder, oil, timber, sails, masts etc. received had to be recorded and signed with exact declaration of the day, month and the year. If any quantity of any material was given to any person, besides his name and designation and other details such as the name of the ship and the fleet in which he sailed from Lisbon to India, his nationality, parentage as entered on the register of birth had to be noted down. This was necessary because on many occasions the person had to be summoned in case of any problem relating to supply of the material.

All record books had to be disposed in one arqua. However, inspite of these regulations many administrative malpractices continued specially in matters of awarding the contracts, as the Finance Comptroller was given over all charge and there were no checks on the procedure of procuring the material for the dockyard. Stealing and smuggling became almost routine. This was
followed by financial constraints and the shortage of skilled manpower. In 1622 the Viceroy was informed about the loss of 1 artillery piece, some falcons and breços from the dockyard. An inquiry was ordered into this and the Chief Justice, Pedro Alvares Pereira was asked to investigate the matter. In 1624 again some artillery pieces were stolen and taken on the other side of the river. The same judge was asked to conduct an inquiry. As a remedy to this situation Nuno Vaz, a Portuguese office in Goa, suggested that the doors of the warehouse should have 2 keys, 1 of which should be in the custody of the Comptroller of Finance.

Sub-standard quality material was supplied to the dockyard violating the basic terms of the contract. The authorities therefore, directed the dockyard officials, not to make any payment to the leases or to any other person for the wood or nails before actually purchasing the same. This order was issued when it was found, that some material supplied to the shipyard was of inferior quality than what was laid down in the contract.

When Conde de Linhares took over as the Viceroy of India, the shipbuilding at the dockyard came under the close watch of his office. He began to visit the dockyard regularly and personally supervised the fitting out of the fleets and monitored the equipping work of every Carrack, until they sailed to Europe in mid-February. All transactions were carefully recorded and maintained. All hardware material brought to the dockyard from outside Goa was examined with the help of the technical officials of this establishment. In 1682, 2 Charruas which sailed to Goa
carrying pitch, timber etc. in its holds were checked by the Guard-Mor of the dockyard in the presence of the custom officials.  

**Personnel At The Dockyard:**

The labour at the dockyard comprised of foreign, indigenous and Slave. Usually the Chief Technical officers such as Chief Masters and the Masters of various workshops were from Portugal. They were appointed by the King through Royal orders. The appointment letter stated the designation of the person, the year and the remuneration. The person appointed to head any workshop at the dockyard was prohibited from holding any other office in his private capacity. The appointee had to give a declaration of the same under oath.

Some of the prominent Portuguese naval experts who worked at this dockyard were Antonio Fernandes, Master Caulker in 1588. In 1606 Bras Vinciente, Caulker and Francisco de Santo, Master Carpenter also worked in this establishment. In 1614 Jorge Marinho was appointed as Master Caulker. In 1616 Jeromio Luis was appointed by the authorities as Master Caulker and Antonio Luis as Carpenter in 1624. The most excelled among them was Antonio Gonsalves, Master Caulker who worked for a period of 26 years in the Royal service. He evolved a method by which the cost of shipbuilding was reduced. In 1630 Diogo Luis was appointed as Master Carpenter and in 1642 he was nominated to substitute Vicente Rodriguese.
To meet the Dutch challenge, Antonio da Costa was appointed as a Master Caulker with a view to equipe the Galleons promptly. In 1650, Manuel Fernandes was nominated as the Master Carpenter of the dockyard to substitute Valetim Themudo, who returned to Lisbon. It is difficult to say if this Manuel Fernandes was the same person whom D. Joaö on 20th October 1656 appointed as Second Master of the Naus and Master of the Galleys. In the years between 1625 - 35, there was even a demand for the services of Chinese gun-founders to cast iron guns at Goa. The Chinese gun-founders from Macau were brought to Goa for imparting training to the Smithers in the art of casting iron. In 1626, the Council of Portugal at Lisbon wrote to the viceroy of India to procure from Macau salaried personnel who could teach the art of casting iron to the gun-founders of Goa. In the years that followed many people from Brazil have been recruited in the dockyard in different workshops.

Indigenous Labour:

The Indigenous manpower played a crucial role in the Portuguese naval dockyard at Goa. The use of Indian shipwrights in building both inshore and oceangoing vessels was urged since 1503. Like at Bassein, Cochin and Daman, large amount of local labour was employed in the dockyard in Goa. In Goa, large number of locals were employed from Panelim, Chimbel, Carambolim and from other neighbouring Villages. In 1613 the Justicas of the northern fortresses were directed to arrange carpenters and other
artisians to work in the Royal Dockyard under Chief-Carpenter Valetin Themudo. The work of bringing timber from the forests of Goa was also entrusted to the locals who were provided with all necessary implements. In 1774, one Rama Chandra Shetti from Chorao was provided with saw blades cutters and other material for cutting the trees in the Province of Bardez. In 1659, there is a reference to a provision, under which the Viceroy at the suggestion of the Master of the dockyard, granted a monthly allowance of 4 xerafins to one family from Ribandar, who rendered valuable service to dockyard.

Slave labour:

The shipwrights and the dockyard workers were recruited from free white (and also convicts). The slaves who were found guilty were sent to the galleys and were kept at Bhangasala. The slaves were even purchased sometimes by the officials of the dockyard. In 1683 the Fragata Nossa Senhora de Milagres sailed with number of slaves from Mocambique to Goa. The carpenter and the caulker of the dockyard purchased some of them. However, unauthorised use of slaves in any workshop of the dockyard was strictly prohibited. Although the Jews were not allowed to work in any of the Portuguese fortresses, yet they were caught and put to galley to do all sort of hard work. Usually the well bodied slave were employed to carry heavy material from the quay to the workshops, with hardly any regard for their safety.

All people, who were appointed to head any workshop of the dockyard had to take an oath on Holy Bible and the same had to be
recorded by the Clerk of the Matricula Geral. The most striking feature of this Royal dockyard is that, it had a permanent staff unlike at Daman.

Remuneration Of The Officials Of The Dockyard:

In 1565, the remuneration of the officials of the dockyard was fixed as under.

<table>
<thead>
<tr>
<th>Official</th>
<th>Remuneration</th>
</tr>
</thead>
<tbody>
<tr>
<td>High usher of the Dockyard</td>
<td>100/000</td>
</tr>
<tr>
<td>Warehouse keeper of the Dockyard</td>
<td>60/000</td>
</tr>
<tr>
<td>Clerk of the Warehouse</td>
<td>30/000</td>
</tr>
<tr>
<td>Muster keeper of the Dockyard</td>
<td>30/000</td>
</tr>
<tr>
<td>Pilot Major of India</td>
<td>80/000</td>
</tr>
<tr>
<td>Chief of the Dockyard</td>
<td>60/000</td>
</tr>
<tr>
<td>Master of the Dockyard</td>
<td>60/000</td>
</tr>
<tr>
<td>Master of the Smithy</td>
<td>60/000</td>
</tr>
<tr>
<td>Master of the Foundry of the Dockyard</td>
<td>40/000</td>
</tr>
<tr>
<td>Master of the cooper</td>
<td>24/000</td>
</tr>
<tr>
<td>Master of the Rope-yard</td>
<td>390/600</td>
</tr>
<tr>
<td>Master of the Caulkers</td>
<td>35/800</td>
</tr>
<tr>
<td>Master of the Oars</td>
<td>42/600</td>
</tr>
<tr>
<td>Master of the Turnery</td>
<td>21/600</td>
</tr>
<tr>
<td>Master of the Repairs</td>
<td>1 tanga per day.</td>
</tr>
<tr>
<td>Meirinho of the Dockyard</td>
<td>16/320</td>
</tr>
<tr>
<td>Door Keeper of the Main gate</td>
<td>15/120</td>
</tr>
<tr>
<td>Door Keeper of the Small gate</td>
<td>16/320</td>
</tr>
</tbody>
</table>
To avoid surplus labour at the dockyard, a work estimate was made. The Carpenters, Ironsmiths, Caulkers etc. were enlisted depending upon the workload. This estimate was made in the presence of the Captain-General, Chief of the Navy and other personels which formed the Tribunal da Junta. After making an estimate of the work and the manpower required in the dockyard, the Tribunal da Junta would work out a general balance of all material belonging to the warehouse.

**Infrastructure At The Dockyard:**

The Dockyard being located on the bank of the river small ships were used for carrying the material from the warehouse to the anchored ships in the water. The finance comptroller who was initially the head of the dockyard had 2 meirinhos and 1 Clerk. He also had at his disposal 1 well equipped Manchua which was used by him either for visiting the ships or to go in the river for any survey work. This Manchua could carry only 8 or 9 people. There were also other small oarships like Escaleres and Botes. For embarking on the ship anchored away from the main quay, one small ship was kept reserved out of fourteen. The remaining ships were meant for the general service of the dockyard. The sick workers were sent to the Royal Hospital for treatment, which was very close to the dockyard. On every Sunday, the missionary priest used to visit the dockyard to impart religious instructions and to administer the Holy Sacrements to the convicts working over there.
Maintenance Of The Ships:

As soon as the ships came from Lisbon to India, (Goa), they were required to be taken to the Royal dockyard to check the eixos de estrincas, calceses the cabrestante and the paleamo. When the ships were anchored they were to be covered with the sail cloth to protect all oily material on board from rain. A person was entrusted with the task of draining out water which was accumulated on the mizzen sails. During the moon light, the sailors were instructed not to cover the whole ship but had to fold the covering on the deck without removing it completely. But if it was raining, then the whole ship had to be properly covered.

During the night time, there had to be a small light which had to be properly fixed. One marinheiro was entrusted with the task of maintaining a strict vigil over the same and was not allowed to leave his place. In the same manner, the Officers responsible for guarding the ships were not allowed to smoke onboard, except at a place where a water tin was kept. No fire was allowed on the ship while it was anchored.

The prow of the ship had to be covered with the cloth till the curvatoens and sufficient weight was to be kept on in to prevent the same from flying at the impact of the wind. During rains, much care had to be taken to prevent any damage to the ship out of water, as the salinity of the river decreases during this period. The mast and the calçês had to be properly covered. All the Navios, Fragatas or the Pallas which were anchored at the
beginning of the summer for any work, had to finish the same before the commencement of the winter.\textsuperscript{56} The dockyard officials had to be present on the anchored ships when it rains to see if there was any leakage of the pitch at the costura and had to identify the portion immediately if any leakage was found. The concerned official had to bring the leakage to the notice of the commander of that ship, who would inform the Intendent General. The Intendent would summon the Caulker or Carpenter to carry out repairs without any delay.\textsuperscript{57}

The covers of the mast and of the gurupes had to be preserved well so as to be in proper shape. If any material was found damaged, it had to be either replaced or repaired promptly.\textsuperscript{58} The drainning pumps had to be maintained well for any emergency. The holds of the ship had to be cleaned regularly and the whole ship had to be dried up both internally and externally. Special care had to be taken not to spill any water on the deck. After the sunset the costado, conves and the castleos had to be closed down. During winter all the hatch ways had to be exposed for fresh air.\textsuperscript{59} The person incharge of maintaining night watch was provided with two lanterns to see the amarrações, during night. The gurupes had to be checked and those old and damaged had to be either replaced or repaired accordingly.\textsuperscript{60} Ships anchored either at Mormugão or at Old Goa had to be inspected by the Master of the dockyard to ascertain the condition of the caverna, apostura etc. of the ship.\textsuperscript{61} No ship was allowed to make a return voyage without obtaining permission from the authorities of the dockyard.\textsuperscript{62}
Technical fitness certificates had to be issued to the ship after carrying out inspection by the officials of the dockyard. The main job was to ascertain whether the ship fulfilled all the technical norms specially in regards to the dimension of the parts of the ship. On March 5th 1737 the Clerk of the Treasurer and the Feitor along with the Chief Master of the shipyard inspected the Nau Nossa Senhora de Aparecida and declared that the said Nau was neither in a position to make a voyage nor it could be repaired. Similarly in 1740, the Nau Nossa Senhora de Nazareth was examined both, internally and externally and declared that, the cadaste and the enchimentos required immediate repairs.

Quality Control Of The Material:

Care was taken to maintain high quality of the material that was procured for different workshops of the dockyard. No wood of any defect was to be purchased. A strict check was carried out of the same and if any defective material was found, then the defaulting person was punished. The paos of the masts had to be selected in the presence of the Intendent and the Master of the mast. If the paos were found defective with any cracks or infested with wood worms, or if the same was lying unused for considerable time since felling, the officials had to be acquainted with different qualities of wood. After the fixing of the mast, the Commander of the Fragata had to make verification of the same and if he noticed any defect, the defaulting person was punished. The wood meant for construction and repair had to be piled up
separately according to the quality, price and the proportion. The piling was done in such a manner that even if a small piece was removed secretly it could be identified. All precautions had to be taken against fire and no fire was allowed anywhere close to the wood. Coir which was acquired for the dockyard had to be weighed first and cleaned after shaking well. If any quantity was found wet, the same had to be dried up. The quality of this material had to be identified by competent people.

Supply Of food Provision To The Shipyard:

The Portuguese got most supply of the food provisions to the dockyard from Kanara. In 1525, Simao de Menezes was sent to Basrur and Bhatkal for obtaining rice. In the list of items delivered to the dockyard by Nagana Camotim in 1759, included 913 fardos of rice, coconut, etc. The dockyard had a store-house where all provisions were deposited under the charge of the Treasurer and the Record Keeper. The Treasurer of the store maintained all records of the provisions received and used and the same had to be placed before Revenue Council. Perishable items like wine, vinegar etc. were checked regularly. If any casks or barrel was found damaged, the same had to be replaced. There was no separate budget allocation for the maintainance of the dockyard. Proceeds obtained out of fines imposed for the violation of various rules were credited for the expenditure of the dockyard. For instance, an order was issued by which a fine amounting to 15,000 xerarfines was imposed upon any official encroaching upon the estate rights of the orphans in Bengal. The same was used to meet the expenses.
On 9th of June, 1753, a major fire broke out in the main quay of the Arsenal which destroyed the Manchuas and the Pallas. This mishap was a result of the negligence and inadequate safety measures. In 1753, Marques de Tavora issued an order to Captain General, prohibiting the display of fire-works on the feast of São João Baptista or on any other festive day. The area from Ribandar Custom till the Royal dockyard was declared as protective zone. This order was issued to ensure the safety of the ships anchored at the dockyard as well as the gunfoundry.

The whole administrative and technical set-up of the Royal dockyard was restructured by Marques de Pombal by virtue of his decree of 1773. The office of the Finance Comptroller (Vedor de Fazenda), head of the dockyard was abolished and was replaced with that of the Intendent General of Navy along with the board known as Meza da Regista da Martrica presided over by him. The shipyard was divided into five sections namely,

(i) The Intendent General of Navy
(ii) The Almoxarife
(iii) The Arsenal with 11 workshops such as Caulking workshop (Oficina da Calafates); Cooper workshop (Oficina de Tonoaria); sails workshop (Oficina de Velas); winding workshop (Oficina de cordoaria); painting workshop (Oficina de pintores); smith workshop (Oficina de funileiros); casting workshop (Oficina de fundicao); saddler workshop (Oficina de Correirs); blacksmith workshop (Oficina de Serral haria); and Mansion & Potter workshop (Officina de Redreiros e Oleirose). (iv) the dockyard, entrusted
with the work of shipbuilding and repair. It comprised of the Chief-Master. (Patrão-Mor), One under Chief-Master; Master of the shipyard and under Master of the shipyard; Master Caulker and under Master Caulker; Master Rope maker and under Master Rope Maker; Master Blacksmith; Master Locksmith; Master of Sails; Master of Mast and Master of Rudder. (V) The gun-foundry, entrusted with the work of casting guns, cannon balls etc. 79

**Intendent general Of Navy:**

The Intendent General of Navy was the chief of the whole establishment and had to furnish a detailed report of the day to day functioning of the Arsenal to the Governor of Goa. 80 Periodical checks of the warehouse of the dockyard were carried out to ascertain the quality and quantity of the material stored therein. An exact time limit was fixed for this purpose. From the beginning of October till the end of March the inspection was to be between 7.00 a.m. to 10.00 a.m. in the morning and from April to September, between 8.00 a.m. to 11.00 a.m. in the morning and from 2.00 p.m. to 5.00 p.m. in the evening. 81 All expenditure books had to be submitted to the Intendent General every Saturday by the Treasurer of the warehouse. 82 The Intendent General, would visit the ware-house of the food stuff (Armazens do mantimentos) twice every month to see the condition in which the food provision had been stored. No material was to be delivered to the ware-house without proper scrutiny of it by the Intendent in the presence of the concerned officials. 83

Quality control was another important task entrusted to him.
Before making an entry of any material in the register, he would summon, the Chief-Master to check the quality and to declare the same under oath. Timber or any other material which comes to the dockyard had to be in conformity with the thickness and the length as laid down in the requirement order of the master of the dockyard.\textsuperscript{84}

On the eve of the departure of the ship, he along with the Chief Master and Clerk of the warehouse would visit the ship so as to ascertain whether the ship was provided with all necessary equipments.\textsuperscript{85} Whenever any work was done, the Intendent General would ask the masters of the workshops to make the valuation of the work and the amount of material that has been used. He would also order the attestation of all the weights and balances.\textsuperscript{86} The Intendent General was also empowered to conduct a test to Pilots of the homebound ships, which were not holding a certificate issued by the Chief-Cosmographer at Lisbon. The Masters of the ship were also examined for their knowledge of the navigational charts, needles and nautical instruments. If they were found fit, a certificate was awarded to them signed by the \textit{Mestre de Aula} and the Intendent General.\textsuperscript{87}

\textbf{Treasurer:}

The Treasurer of the Arsenal was the most important officer, only next to the Intendent General in the whole set-up. He joined the service for a period of 3 years after furnishing a surety.\textsuperscript{88} The Treasurer had to maintain a record of timber, hardwares, foodstuff and the petrechos of war. All foodstuff received and used
had to be recorded with utmost care. At the beginning of the folio of the register the name of the Treasurer and other details were to be noted down with all details. A register of daily petty expenses of the week, starting from Monday to Saturday had to be maintained. At the end of the week, the Intendent would check the same with his Accountant. No entry could be made in the register by the Treasurer, without the consent of the Junta da Fazenda or the Navy. All money receipts had to be deposited in the coffer placed in the casa da armazen having 2 keys, with the Treasurer and other with the Clerk. The Treasurer could not give timber or any material to any workshop without the consent of the Intendent. Whenever any material was given either to the Chief-Master or the Master of the dockyard, it had to be noted down by the Clerk of the treasurer in the Register of Income and expenditure. (Livro de Receita e Despeza).

At the time of construction or repair of a ship, the treasurer would open an account in a separate book in the name of that ship, so as to know the exact amount of the material used for that particular ship. On the return voyage of the ship all surplus foodstuff had to be handed over to the authorities at Royal dockyard.

The Chief Master, the Clerk of the ship, the Treasurer and his Clerk would examine all surplus stock, before depositing the same in the warehouse. If any amount of meat or fish was found in good condition, it had to be salted immediately. Every Master of the ship on his return voyage to Goa, had to deliver all the
anxarcias etc. to the Treasurer of the dockyard. The Treasurer was also required to maintain a record of all armaments and would order the cleaning of the same.

Executor Of The Arsenal:

As soon as the ships of the Armada Crown sailed out, he would note down all the material which had been delivered to the Masters, Surgeons and other officials, of the ship. The Executor of the Arsenal had to take into possession the keys of the store holds of the ship no sooner the ship entered in the dockyard area.

Writers (Escriturarios):

The Writers had to do all transcription work regularly. At the time of the payment of the wages to the sailors, they had to assist the Clerk of the Treasurer. One of the Writers was entrusted with the work of looking after the records which were kept in the coffer of the Arsenal. An index book of all other books deposited in the safe had to be prepared by the writer.

Auditor (Contador):

The office of the Auditor was highly esteemed one and the person had to be of high intergrity and good experience. He prepared the salary bills of all employees and also assisted the Meza de Intendentencia to make corrections in the expenditure books of the respective Treasurer.
The Clerks (Escrivaos):

The Clerks were required to be present in the Arsenal from morning till evening as laid down in the Regimento. All official transactions had to be recorded by them which included the sureties furnished by the Treasurer, Masters, Carpenters and Caulkers. A separate register was maintained by him, wherein, all the despatches and the passports issued by the Intendent had to be maintained with utmost care.98

Chief-Master (Patrão-Mor):

The Chief-Master was the Chief technical officer of the dockyard, under whom there were Masters of different workshops. He was directly responsible to the Intendent of the Navy. He was appointed by the authorities at Lisbon. Ships under construction at the dockyard were regularly inspected by him to get himself acquainted with the work. During the wintering of the ships at Goa, he ordered for mooring of the ships with chains and anchors. He would visit the dockyard regularly, check the equipments and allot the work to the people in correct proportions. A strict watch was kept over the Masters, who worked in the different workshops. The Chief-Master was the main technical officer whenever an inspection of any ship was ordered by the Viceroy.99

Whenever any ships of the Armada or of the Crown sailed from Goa, he would accompany the same till the bar of Goa. Whenever a ship was to be equipped it was his duty to check the weight of enxarcia right from small cable to the big one as every inch of
the same depended upon the tonnage of the ship. The Chief-Master would not order the opening of any camarote of any ship without the presence of the Intendent of the Navy. He was also required to undertake search operations, for mooring and anchors in the river of Goa, twice a year, and was entitled to 1/3rd of the value of the material found. Whenever any ship anchor, at the yard, he along with other officers would visit the same and lockup the hatchways and the store room of the gun-powder.

Whenever any ship was to be repaired, the Chief-Master had to inform the Apontador to prepare a list of the people required for the execution of the work. Timely completion of the ship work and the safety of the hull were his prime responsibilities.

Masters (Mestres):

The Masters of the dockyard had to be present in their respective workshops before their sub-ordinates reached. All the Masters of the dockyard resided within the premises for their easy availability. Each Master had to allot work to each person in correct proportion.

In the case of the carpentery workshop, the carpenters had to sign on the register stating the amount of wood which they take. The Masters would assist the Treasurer at the time of paying the wages to his people, specially when any deduction was to be made from the salary of any person inorder to compensate the loss of the state Treasury incurred on account of his (person)
negligence. The Masters were forbidden from taking any private contracts or utilising the services of the carpenter or Caulker for his personal work. 102

**Master Of The Masts (Mestre de Masto):**

The Master of the Mast would have sufficient knowledge and technical expertise. He along with the Chief-Master and the Master-Builder would check the quality and the utility of the mast at the time of purchasing. The mast had to be thoroughly checked to see if there were any cracks and the condition of the same had to be declared in writing. 103

**Sail Master: (Mestre de Vela)**

Smooth sailing of the ship depended upon the correct cutting and fixing of the sails. When any new fittings were to be made, the Sail Master would ask the Master of the Mast to provide him necessary measurements. On the return voyage he would check all the sails of the ship and carry out repairs wherever necessary. 104

**Apontador:**

The Apontador' was a person incharge of maintaining a muster-roll of all people working in the dockyard. He was required to be present in the yard with the muster-roll half an hour before other people entered for work. All the pages of the master-roll were numbered and initialed by the Intendent. The names of all the Carpenters, Caulkers and other officials working in the dockyard were recorded. Whenever the Chief-Master takes any person for
mooring the ship, the Apontador always accompanies him. 105

The Guards Of The Dockyard And The Guards Of The Nails:

The new order made a provision for 3 guards, who were entrusted with the task of maintaining a close watch over all the material within the premises of the dockyard. During night these Guards were posted at different sites. The Guards would not allow any ship to anchor during the night time at the dockyard quay except, those carrying timber for shipbuilding. If anything was found missing, the Guards were punished as per the rules framed by the authorities. 106

The Doorkeeper (Porteiro):

The Door - Keeper had to be present every day in the dockyard half an hour before the official time, to open the gate and had to remain there till all people leave the dockyard. After the entry of all people in the yard, he would close the gate and would not allow any person to enter inside. The Door - keeper would not allow anybody to carry any material from the dockyard without the permission of the Intendent or the Treasurer. 107

The Royal dockyard at Goa contributed immensely to the Portuguese colonial expansion. It not only met their defence and naval requirements, but also civil requirements. The 1773 restructured system continued till 1841, when it was once again reorganised by the order of the Governor-General Lopes de Lima, with new title as Regulamento Para o Arsenal da Marinha Exercito e Ribeira das Naos da Cidade de Goa. 108
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32. Obrigações de Feitoria de Goa (OFG), HAF, Mss.no.1603, f1.43.

33. CPAA, HAG, Mss.no.7536, f1.50v.

35. Bhangasala was a store house, but it was also used as a prison house for the galley slaves.

36. CAF, HAG, Mss.no.2316, fl.117.

37. *Instruções Para Service Q Marinha (ISM)*, HAG, Mss.no.816 fl.13.


41. Rego Op.Cit., p.567. This remuneration was however changed following the decree of 1773, issued by Marques de Pombal.


43. Ibid., fl.10.


50. Ibid., f1.23.

51. Ibid., f1.21.

52. Ibid., f1s. 21v-22.

53. Ibid., f1.22v.

54. Ibid., f1.20.

55. Ibid., f1.22.

56. Ibid., f1.23v.

57. Ibid., f1s. 24v-25.

58. Ibid., f1.26.

59. Ibid., f1s. 33v-35.

60. Ibid., f1s. 36-38.

61. CRP, HAG, Mss.no.7544, f1.63.

62. Correspondencia de Arsenal de Goa (CAGO), HAG, Mss.no.2663, f1.10.
63. Assentos de Conselho de fazenda (ACF), HAG, Mss.no.1128, f1.86.

64. ACF, HAG, Mss.no.1180, f1.13v.

65. Ibid., f1.10v.


67. Ibid., f1.35v.

68. Ibid., f1.38v.

69. Ibid., f1.36v.


71. CPA, HAG, Mss.no.476, fL.71.


73. Rivara Cunha, APO, Fas.6, p.278.


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106. Ibid., p. 105.

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