

STATEMENT OF TECHNICAL REQUIREMENTS FOR BATTERY LOADING TROLLEYS

- 1. Functionality.** The submarine batteries are handled by means of a Battery loading trolley consisting of travelling crane, transverse carriage and an extendable arm. The travelling crane runs the battery rooms longitudinally. The travelling crane takes all batteries and places them on the room's centre line, under the access hatch. From there, they are lifted by means of an external crane. The Battery loading trolley will have a transverse carriage with an incorporated lifting system that allows placing the lift wire rope over the batteries vertical axis. The batteries are thus lifted some centimeters above the room floor in order to facilitate its movement. Furthermore, it will have a swing arm which will be assembled in the transverse carriage, if it is necessary to reach the furthest batteries in the centre line. The longitudinal displacement of the travelling crane will be manually controlled; the travelling crane will run all over the submarine structural stiffeners, which will work as rails.
- 2. Number of Travelling Crane/Trolley.** Requirement exists for two types of Battery loading trolleys:-

 - (a) Battery loading trolley, aft side.
 - (b) Battery loading trolley, forward side.
- 3. Required Function.** The travelling crane must be dimensioned to resist the weight of the whole assembly comprising the transverse carriage, the swing arm and a battery (800 kg). A number of rollers will be arranged on the travelling crane's stops in order to facilitate an easy longitudinal slide. The whole assembly must be **removable** for onboard installation if required. The limited space available inside the room, that it is full of batteries, must be taken into consideration. The travelling crane's removable section must be designed so that both the total weight of the transverse carriage (and all the stress due to the load it carries) are not only resisted by the fixing bolts. To that purpose, the assembly will be arranged so that the removable section of the travelling crane is supported by the fixed one. It must be guaranteed that the assembly is able to reach the batteries located on both ends of the rooms without any interference. The carriage will be designed so that a fixed arm is adapted to it in order to reach the central batteries. Both travelling cranes (aft and forward) will have their own rolling surface.
- 4. Running Tests.** A running test guaranteeing the fulfillment of the required performances will be carried out in the factory. The carriage will undergo the following trials:-

 - (a) **Static Trial.** A load of 900 daN (Deca Newton) will be suspended from the carriage during one hour without moving, after the trial check that the carriage does not show permanent distortion.
 - (b) **Dynamic Trial.** A load of 700 daN (Deca Newton) will be suspended from the carriage so as to bring this one in all possible positions. It will be verified that

the displacement of the carriage is correctly performed and that it one does not show permanent distortion.

(c) In addition, a running test will be carried out on board. It will have the same aim and will be developed in the same conditions as those of the factory test. Inside the battery room, it will be checked that it is possible to take apart the equipment.