

Unit 5 - Purse seine design

Expected learning out-come

- Purse seine gears and their parts
- Classification of purse seine gears
- Deck equipments onboard purse seiners
- Operational methods of purse seines

5.1.Netting material

The choice of material plays an important part in designing a purse seine. The performance of the gear will depend upon the speed of sinking. It is proved that hard laid twines of continuous filament has less hydrodynamic resistance than soft laid twines of staple fibres.

5.2.Net size and depth

The length and depth must be determined by the size of vessel, the species behavior of fish species, fishing method and condition. Operation is easy when the depth is between 10-15% of the length. However, in deep water purse seines the depth goes up to 30-50% of the length.

5.3.Mesh and twin size

The mesh and twine size is directly related to the size of fish and the quantity of fish caught . If the mesh size is too small it increases the cost and slow sinking, but large mesh results in loss of catch and gilling which is not desirable.

5.4.Selvedge

These are large meshes made of tickler twines along the border of the main webbing. Selvedges are provide at on top, not on and side of fishing gear.

5.5.Main webbing

Vertical strips of uniform mesh size of different depths laid one after another with the central portion having the maximum depth from the main webbing. This tapers gradually to both wings.

5.5.Float line

There will be two lines, A double cord 5mm rope will be attached to the upper strip of the top selvedge along with a hanging coefficient its entire length giving of 0.3-0.35. The second rope is the actual float line, floats pass through it and is attached to the entire length of the former at regular intervals.

5.7.Lead line

Lead line is also a double cord of same specification. One of which is attached to the lower strip of the bottom selvedge along its entire length giving with a hanging coefficient of 0.25-0.30. The sinkers are passed through a second rope and is attached the first rope at regular intervals.

5.8.Breast lines

There are two breast lines one each at hauling and skiff ends. These are also of the same specification as float line and lead lines but of single cord attached to the head rope and foot rope and is stapled along the respective breast selvedge. This forms loop at either ends

5.9.Bridles

Bridles are attached at a gap of 5-10 meters depending upon the size of the net, along its foot rope. They can be either single as in case of Japanese purse seine or "V" form as in the American and Norwegian type purse seines. The length of the bridle is 2-4 m. The upper end of the bridle is attached to the foot rope and the purse ring attached to the lower end. Purse rings are generally made of 5-18mm dia galvanized rods with a ring diameter of 50-100 mm and an way for attaching bridle. In "V" shaped bridles there will be an additional single short bridle attached with a shackle to which the open type or closed purse rings are attached.

5.10.Purse line

Purse seines for sardine and mackerels for the type of net mentioned require 5-18 mm rope where as deep sea purse seine require 30-50 mm rope as purse line. The purse line passes

through the rings and is attached to the skiff end foot rope with an easy detaching arrangement on one end. The other end is attached to the pursuing winch through the gallow.

5.11.Deck Equipment

5.11.1.Gallows and Davit

Gallows are used in trawlers and purse seiners. Trawl gallows are “V” shaped heavy steel structure fixed on the either side of the stern part of a trawler. This is used in hitching up of otter boards as well as for passing of towing warps. The position of the gallows is very important in order to avoid fouling of warps during a sharp turn.

Purse seine gallows are used to lead the purse line and tow line to the winch in larger vessels and davit with blocks is fitted on bulwark for passing purse line.

5.11.Deck Equipment

5.11.2.Winches

Different types of winches are used. They may be placed fore and aft direction or athwart ship depending on the requirements. They are commonly used in trawlers, purse seiners and Danish seiner for releasing and hauling purpose.

Trawl winch can be single drum split type, two drum on one shaft or two or more drums on parallel shaft. The last type is most suitable for double rig trawling and purse seining. A winch may or many not have warping heads. Warping heads are used for auxiliary hauling requirements such as hauling of sweep lines, wings and split winches are common in large trawlers.

Winch can be driven either mechanically, electrically or hydraulically usually mechanical drive is preferred in smaller vessels. Power take – offs are used to take the power from the main engine to drive the winch. It is simple, easy to maintain and less expensive. Electrical drive is confined to large vessels. Hydraulic drive is popular in only larger vessels.

5.11.Deck Equipment

5.11.3.Others

Windlass:- This is a special type of winch used for handling anchor chain and rope.

Power blocks:- These are used in purse seining and gill netting. It is a labour saving device. The purse seine power block is so designed as to pass the bundles of webbing, corks, weights and rings through the sheaves during hauling operation. It is a self powered free swinging “V” shaped sheave made of cast aluminum along with zinc and it is hydraulically driven.

Triplex: - It is a net winch used in purse seiners instead of power blocks for hauling large nets without damage. It consists of three hydraulically driven rollers fixed parallel to each other on independent shaft and adjacent rollers rotate in the opposite direction.

Line hauler:- Line haulers are used for heaving lines. Capstan and line haulers are similar in many aspects. Line haulers or gurdies are used in hauling the trolling lines, long lines, jigging lines and tuna long lines.