

IUMI Conference – Sevilla 2003

Quality and Safety in the Chain of Tuna Fishing and Transport

The tuna fish family is a highly migratory species that is caught mainly in international tropical waters.

The total amount of tuna catch in the world amounts to 4.000.000 tons. That total amount is shared as follows:

- 2.500.000 tons, in the Pacific Ocean
- 600.000 tons, in the Indian Ocean
- 450.000 tons, in the Atlantic Ocean
- 450.000 tons, in the Mediterranean Sea and other waters

There are some 50 families with a commercial interest all over the world, but the industrial fishing activity is mainly concentrated in five families that, by order of importance, are:

- **Skippyack** (*Katsuwonus Pelamis*), weighting up to 12 kg per piece. The total world captures amounts to 2.000.000 tons.
- **Yellowfin** (*Thunnus Albacaris*), weighting up to 80 kg per piece, and 1.200.000 tons of captures
- **Bigeye** (*Thunnus Obesus*), weighting up to 130 kg per piece, with an amount of captures of 400.000 tons.
- **Albacora** (*Thunnus Alalunga*), weighting up to 25 kg per piece, with 250.000 tons of captures, and finally
- **Bluefin** (*Thunnus Thynnus*) the largest ones, that can weight up to 550 kg per piece, with 50.000 tons of captures.

This last family, the Bluefin, is the one with the highest commercial value. Known as “Red Tuna”, the Bluefin can rise prices up to US\$ 200 per kilogram in the Tokyo market.

The cheapest one is the Skippyack, which is sold for industrial uses at the price of US\$ 1,00 per kg.

The tuna fishing is carried out in three different ways, that is:

- 1) Artisanal fishing (coastal fishing), by pole fishing vessels up to 200 GT,
- 2) Blue water fishing, by tuna longliner fishing vessels up to 1.000 GT, and
- 3) Oceanic fishing, by tuna purse seiners, that works with nets, and can get up to 4.400 GT.

In this last type of fishing, there are registered in the world about 540 units, out of which the Spanish tuna fishing fleet deserves a special qualification, specially because of its effectiveness and modernity.

It is interesting to remark that most of the masters (captains) of these vessels, even flagged out of Spain and also working for foreign owners, are born in Bermeo, a small

Town in the north coast of Spain, close to Bilbao, where this industry is practically a single harvest.

And now, let's concentrate in this type of activity.

Without any doubt, the modern tuna fishing vessels, also called super tuna purse seiners, should be included among the most sophisticated vessels that are built nowadays in the whole world.

Taking into account the equipment and building cost of 24 million Euros and their tonnage of 4.400 GT, the value per ton practically doubles the value of a modern reefer ship which can also be considered as a specialized ship.

While the ship is being constructed, and due to the complexity of its equipment, the highly quality required is strictly supervised by the classification society and the country of flag. Moreover, the ship has to comply with several additional requirements in order to obtain the necessary sanitary certificates, since without them she would not be allowed to sell her catch in almost any of the world markets.

In this activity, the crew is a key factor. Due to the complexity of this type of fishing regarding both the electronic equipment and the fishing machinery, a highly technical "know-how" at all levels is required, which is compensated by generous wages and rest periods.

These compensations guarantee a high loyalty in the crews, in fact it is quite normal that fishermen stay during their whole working life at the same company. The performance of the duties in the tuna purse seiners is really a team work, since everyone of the production processes are enchainned, demanding a deep involvement of the crewmembers.

Thanks of the crewmembers qualification and the advanced and safe equipments, there are only few industrial accidents to account for, with the lowest loss - ratio of the fishing industry.

Another important fact of this business, is the handling cost of the tuna fishing vessels.

We should take into account that in this type of vessels the whole equipment must have a level of sharpness hardly achievable in any other activity, in order to be really effective. As soon as there is any doubt about the performance or resistance of any element, it has to be immediately replaced by a new one.

For this reason, while the handling cost of a modern reefer or chemical carrier amounts to approximately US\$ 4.000 per day, the cost of a tuna fishing ship amounts to US\$ 12.000 per day, that means three times the cost of those commercial vessels.

Remarkable is the power installed in these vessels in relation to their length overall (116 m): 8.500 HP at the main engine, and another 7.800 HP at the auxiliary engines, generating enough power to supply the freezing installations, and the hydraulic power station that supplies the energy for the entire fishing operation.

The purse seiners fishing operation is carried out by dropping from the ship stern, at full speed, a 50 tons tug boat, called “ panga “, that is used for completing the encircling of the net.

The net of approximately 100 tons, is 1.700 metres long and about 280 metres deep, being made of multi-filament nylon and without knots, in order to prevent damages to the fish by rubbing against the net.

Once the encircling is finished, the operation of closing the bottom of the net and hauling up (tacking) on board, is carried out by a high powered winch on the upper deck and a power block at the end of the main derrick in order to finish the operation in the shortest possible period of time. By these means, the catch won't get any stress and won't generate histamines, which could give rise to some undesirable biochemical phenomena.

Once finished the shifting, the tuna is stowed on board through the “**salabardo**”, a kind of scoop made of a small and special net used to pick up directly the catch in small quantities.

That method avoids the crushing of the catch, which would happen if the whole net were hauled up on board, as it is usual on other fishing vessels. As it is shown, the whole fishing system is focused to ensure that the catch arrives on board in perfect conditions.

Through a hopper, the catch is brought into the fishing tweendeck. Therefore, its exposure to sun and air is zero.

From the hopper, and through a conveyor belt provided with several doors that can be opened or closed, the catch is classified according to its length and brought into the corresponding freezing tank. Thus the freezing period can be made uniform in a better way. Since the weight of the fish can vary generally from 2 kilograms to 100 kilograms, freezing tanks will have different treatment times. It should be avoided that small fishes fill the gaps remaining among the big ones, because it would generate very compact fish bags, which would hinder the refrigerating fluids from circulating freely and comply with their task of being cooled quickly.

The freezing is carried out in three phases. Firstly, the catch is submerged in a freezing tank with seawater, previously refrigerated up to 0 °C. There, the fish is cooled down up to that temperature, getting a strong consistency by isolating in a certain way the tunas' skin. Some of the blood that might have been lost in their agony will also be cleaned, preparing the fish for the following phase.

In the second phase, the freezing tank is flooded with brine that has been cooled up to -18° C. During this immersion, the fish reach their conservation temperature. The low temperature itself avoids salt to penetrate in the fish's tissues.

Once the temperature of the bones reaches -18 °C, the brine is removed from the freezing tank, while the cold is maintaining through its serpentines just as any other reefer. So tuna fishes have obtained sufficient hardness to support their own weight, and the air can circulate easily among them. At this stage the freezing effect is produced mainly by radiation.

As soon as the fishing campaign is finished (two months as much), the vessels return to port where they perform the unloading operations directly to the plant or reefer store, or they make the transshipment to the reefers.

The unloading and transshipments are carried out following strict guidelines in order to protect the catch by means of no aggressive manipulations.

To carry out the unloading, the freezing tanks are flooded once more with brine at -18°C , meaning that the tuna fish floats at the top of the tanks. The stevedores only have to push it towards the stowage nets hauling them directly into the previously cooled holds of the reefers.

These reefers are cautiously selected, being required the experience in this type of cargo traffics, as the defrosting of the reefer machinery has to be constant due to the humidity of the catch. It is quite common that the tuna fishing owners have their own fleet of reefers.

The owners of the tuna fishing vessels do not obtain usually profits, as an ordinary commercial shipowner. The profit they obtain running those vessels refers to the strategic advantages and the assurances of the quality transport without the ordinary transport problems, thanks to the experience of their crews, together with the fully dedication of these vessels for that specific traffic.

Being located the transfer ports in tropical regions, the operations are usually carried out during the night, when the outside temperature, wind and sun will have smaller incidence in the catch.

Once the cargo is loaded, the reefer leaves for its port of destination, which is usually a tuna fishing port; what means, that it is a port dedicated to the handling of this kind of cargo, since in its surrounding area there are reefer stores and tuna fish processing plants. In Spain, the Bay of Arosa (Galicia) is where 80 % of the traffic of this product is handled.

After having passed severe and strict customs and sanitary controls, the unloading is carried out by means of specialized stevedore teams with modern port equipment, which allow the consignments to transfer to reefer stores and processing plants in very short periods of time, avoiding to break the cooling chain.

When the shipment reaches the plant, it will be divided once more, by automatic machines, by sizes and allocated in stainless steel cages of 1 ton capacity, which will allow the stowing and selective handling of the catch in the future. At the same time, it avoids that the catch could be crushed during the defrosting.

At the canning plants, the fish is boiled as soon as it enters in the production chain, destroying any germ or bacterium and keeping the whole area of the plant aseptic.

Afterwards, the fish is hand cleaned by specialized workers who remove skin, bones, spines and others disposable parts, reserving the clean meat for the canning procedure.

The waste is led on a conveyor belt to a production centre of fish flour.

Analytical and sanitary controls are continuous during the whole process and supervised very strictly by the officers of the EC. As it is known, the food companies have to comply with very strict working measures.

From that point, the fish meat enters in an automatic chain of the most recent generation where the product is canned, sterilised and packed, to be transported to their selling points.

Canned tuna has the same behaviour than quality wine, and it is curious how it improves inside of the can, reaching its best **organoleptic** level during the first year of its canning.

Of course, all this process, as described, is covered by the corresponding insurance policies, for both, Cargo and Hull risks, since tuna is fished, during the process of preparation on board of tuna fishing vessel, transportation itself in the fishing vessel, transshipment to the reefer, unloading and storing and processing, and finally transport to the final point of destination.

That coverage is provided basically by two policies (Cargo and Hull) based on the turnover of the Company (Cargo) and the agreed values for the hulls, according to the International Institute Clauses for Cargo and Hull, as listed here below:

Firstly, they are shown some figures we are sharing with the Insurance Industry.

Our Company's fleet is made of 25 vessels: 13 tuna fishing purse seiners, 2 tuna fishing line vessels, 5 auxiliary vessels and 5 reefers. Such fleet has got an insured value of 245 million euros while the value of the insured catch amounts to 90 millions euros annually.

The highest exposure, 35 million euros (vessel + catch), is given at the "Salica Frigo", one of the reefers of the Company, which is used mainly in the transport of our own fish.

The exposure at the largest tuna fishing vessels amounts to 24 million euros.

The premiums paid per year, amounts to 3 million euros in Hull, 300.000 euros in Cargo and 350.000 euros for the rest of the insurable industrial risks.

At this stage, my Company and me would like to share with you, dear underwriters, what we have seen, and how much we have suffered, let's say from the 11th of September 2001, a magic date on which the Insurance Industry discovered their own weaknesses, forcing itself since then to look ahead with other perspectives.

In the nineties, all of us have been able to see how most of the commercial and fishing shipowners were pushing the insurance industry looking for rates and conditions that no one was able to predict where the bottom was, but it was not our case.

While others were fighting for huge reductions, we were only asking prudently for reasonable reductions, according to our own merits, because our philosophy is built on a long-term commitment with our underwriters.

Under this situation, and until the 2002 renewal season, we were showing a loss ratio over the previous 15 years of 35% on gross premiums.

Regretfully, the 2002 year awarded us with a sad surprise: a huge increase of rates despite of our own results and besides important increases of the deductibles that nobody was able to justify, even more knowing our own results and history.

These significant increases of premiums and deductibles are not appropriate. If it is really necessary to get a bigger premium volume for the insurance market, the problem should be solved in a stable way and fully accepting the "bonus malus" condition of each client.

We are starting to think that the shipowners' problem for finding out experienced crews is also showing up in respect to the "crews" of the insurance market. Where are the traditional experienced underwriters? Those which built their reputation on their experience, their skill and their "sixth sense" instead of just on "figures".

We notice that decisions regarding the Marine Insurance Market are taken in some offices far away from the seaside, far away from the vessels, and the risk inspections are conspicuous by their absence, despite of our requirements. So Ladies and Gentlemen take in mind just one thing: Not all the shipowners are the same, neither they are working within the same management standards.

It is necessary for us that the Marine Insurance Companies pay visits to the risks, such as it is done in the Industrial Insurance. Without any doubt, it would be very useful for all of us to change our minds and to try to know each other much better.

We hope that this little speech could show you the great human and economical effort being carried out by our sector in the interest of quality and security at the fishing operations.

For me, there is nothing more left than invite you to visit us at our facilities ashore or at our vessels, where all of you will be gladly attended by me or by any of our crewmembers.

By. **Iván Fernández**
Technical Mgr.
Albacora Group

Sevilla 17th of September 2003