

ERGOSPACE

**RESEARCH ON THE INTERACTION BETWEEN
WORKING SPACES, ERGONOMICS
AND PREVENTION OF OCCUPATIONAL ACCIDENTS
ON BOARD FISHING VESSELS**

**SETTING UP NEW SOLUTIONS
TO THE EFFECT OF REDUCING
THE SEVERITY AND NUMBER
OF SUCH ACCIDENTS**

SUMMARY AND CONCLUSIONS

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The “ErgoSpace” study investigates in the problematics of safety and working or living conditions on board fishing vessels, in compliance with the IMP missions in the maritime sector. Within this overall context, its specific objective is to discuss the relationship between these problematics and the space available on board vessels, with the view to set up recommendations aimed at improvement of comfort, health and safety aspects, in this sector of activity where occupational accident rates are high, and manpower recruitment is difficult.

To reach its objective, the “ErgoSpace” study endeavoured to answer four interrogations :

- Can we, on a statistical basis, assess the link between the “space factor”, defined so as to include both the mere notion of dimensions and some fitting out parameters, and accident risk (accidentability) or actual accidents (accidentality) ?
- Having in mind that enhancing safety and working or living conditions is more difficult and costly on board existing vessels, because potential transformations or upgrades are limited by the existing features, is the number of new constructions in France sufficient to allow continuous improvement in this area ? In other words, do shipowners have enough opportunities, given by new constructions, to improve safety and working or living conditions in comparison with their previous ships ?
- For authorised new constructions, which are the parameters that project promoters take in account when specifying the main features of their future ship ? Among this “set of constraints”, what is the weight of dimensional limitations, and particularly of tonnage limitations resulting from the European fisheries management provisions ?
- How are things in other countries ? How did some foreign countries organise their fisheries management so as to protect and sustainably manage their marine resources ? How did these options impact their fishing fleets, employment, and occupational accident rates ? Which lessons can be learnt from their experience in order to amend our “model” in a favourable direction in terms of improvement in safety and health on board fishing vessels ?

The “ErgoSpace” study was carried out from July 2005 to June 2007, thanks to co-funding by the European Union and the Etablissement National des Invalides de la Marine (ENIM).

I. STATISTICAL LINK BETWEEN “SPACE FACTOR” AND OCCUPATIONAL ACCIDENT RATES

This analysis is developed in section I of the report. For three risk or nuisance factors (fall overboard during fishing gear operation, physiological consequences of catch processing operations, noise levels on board) and for two types of accidents (fall overboard, backache while processing catches), it correlates the lengths of the vessels, considered as the most significant parameter that determines the “space factor”, against two data sources :

- data related to accident risk (accidentability) that were processed for the purpose of the “ErgoSpace” project on the basis of the reports on observations made on board by the IMP technical staff during fishing trips from 1996 to 2005,
- the database of maritime occupational accidents (ATMs) reported to IMP, using the Questionnaire on the circumstances of ATMs (QCATM) designed by the national security system for seafarers (ENIM).

For the above selected three risk or nuisance factors and two types of accidents, the correlation between vessel lengths and accidentality or accidentability was not easily demonstrated. Such a correlation exists, however it is not systematic. In some instances, it is biased by other correlations, particularly the type of fishing gear.

The fact, for this statistical link, not to be systematic, does not mean that the correlation between available space and occupational safety or working conditions is weak, or even non-existent. However, it could mean that the overall length might not be a sufficiently accurate criterion for studying the incidence of the “space factor”. As a matter of fact, when using the length as the sole parameter, we neglected a lot of other relevant aspects describing the activities carried out on board (manning, fishing gear, amount of processed catches, working positions, ...) that impact the spatial conditions of work, and therefore the risk seafarers are subject to. The possibilities to prevent accidents or to improve living conditions do not so much depend on the absolute value of the ship length as on the length/activity ratio. Finally, it is not necessary to have a larger vessel, what is really needed is to have a sufficiently spacious ship for activities on board to be conducted in satisfactory safety and comfort conditions..., which is rather obvious *a posteriori*.

This conclusion leads us to ask the following question : which parameters do determine the main features of the ships and their fitting out ; this matter is developed in the third section of the report, and is summed up in III below.

Further to the results related to the link between the “space factor” and occupational accidentology, processing the reports on fishing trips on board fishing vessels by IMP staff members shows a “generation effect”, with a central age of about twenty years. Beyond this age, analyzed risks or nuisances appear to be higher in general. On the opposite, even if large potentialities remain, vessels of less than twenty years are safer and more comfortable in general.

The above statement generates a first reflection in relation to the space available on board fishing vessels. It appears, from the on-site observations, that, for given values of their lengths and tonnages, the vessels of the recent generations have generally a larger beam than those of older ones, particularly in the stern. This bonus in working spaces could be one of the factors that would contribute in explaining the overall reduction of risk on board vessels of less than twenty years ages.

On the other hand, the likely existence of this “generation effect” is clearly an argument in favor of a continuous renewal of the fishing fleets, therefore in favor of a sufficient rate of new constructions. As already stated several times in this report, before considering the constraints put on the design and construction processes, the question of the feasibility of building new fishing vessels is an obvious prerequisite.

II. ABOUT THE FEASIBILITY OF BUILDING NEW FISHING VESSELS

Since the early 80s, the evolution of the French fishing fleet, and in principle of the other European fleets, is governed by a Common Fisheries Policy (CFP) that is decided at the European level.

In order to sustainably protect marine resources against the risk of overfishing, Europe always made the choice of a fleet structural adjustment, of which the Multi-annual Guidance Programmes (MAGPs) are one instrument. In France, the successive MAGPs resulted, between

1983 and 2005, in a 54% decrease in the number of fishing vessels (-57% for vessels less than 12 m long, -40% for those beyond 12 m), that was obtained through two kinds of provisions :

- public grants for withdrawal of existing vessels,
- limitation of new constructions, through :
 - a strict control of tonnage and power amounts to be allowed to construction projects (individual authorization system),
 - suspension of public grants.

This second provision resulted in a lack of new constructions, in comparison with the 1991 renewal rate, the estimate of which is 30% for the 1991-2005 period (27% for vessels less than 12 m long, 38% for vessels of more than 12 m) despite the slight recent recovery observed following the small fishing fleet modernisation plan that was decided in 2003.

The lack of new constructions resulting from the European fishing fleet adjustment policy had two consequences in France :

- ageing of the fleet, with an average age that increased from 15.3 in 1991 to 22.6 years in 2005 : a 7.3 increase during a 15 years period, that is close to six months per year,
- on the basis of the information available in the Regional Safety Commission for Brittany, in a region where the fishing fleet represents a significant share of the French fleet (30%), a likely transfer of investment from new buildings to modernisation or transformation of existing vessels.

This lack of new constructions, which is likely to be continued following the termination of grants as from 31/12/2004, could negatively impact safety and working/living conditions on board for three reasons :

- first, it implies that opportunities for improving safety and working/living conditions are reduced. This does not mean that a new construction systematically results in significant improvement in these aspects, however it provides at least an opportunity,
- second, it generates fleet ageing. Aged vessels are therefore kept in activity. As partly demonstrated in section I, they are globally less safe because they do not offer fishermen the benefit of safety and working/living conditions improvements resulting from technological innovations occurred since the time of their construction,
- finally, it favours a transfer of shipowners' investment towards modernisation/transformation projects on existing vessels that they either already own or purchase on the second hand market. In terms of safety and working/living conditions improvement, such projects do not provide such an open potential for improvement as a new construction, inasmuch as they are constrained by the existing features : stability, structure, available spaces ... In the most favourable case, they do not allow for safety and working/living conditions improvement at the same level as for a new construction ; at the worst, they can result in a dis-optimisation of the vessel as a whole (e.g. stability loss) and/or a damage to crew living/working conditions (e.g. space congestion).

Though the possibility to build new fishing vessels during the recent years was significantly reduced, it existed however. In such a case, how is the "space factor" on board determined ? Which are the constraints that impact the processes of designing and building a new vessel ? Which is the incidence of this set of constraints on the options made by the promoters in relation to the characteristics and fitting out of their future vessel ?

III. THE SET OF CONSTRAINTS ON THE DESIGN AND CONSTRUCTION OF NEW FISHING VESSELS

The analysis of this set of constraints, as developed in section III of the report, is based on different works carried out under the “ErgoSpace” study : interviews with designers and builders ¹, with the representative of a producers’ organization (PO) and with six recent fishing vessel promoters, statistical analysis of new constructions from 1991 to 2005 in order to identify threshold effects resulting from applicable regulations.

III.1. Description of the set of constraints

On this basis, and without the ambition to be exhaustive, seven constraints having some incidence on future vessel characteristics were identified and detailed.

1. Catch limitation : TACs and quotas

Even if they are collective in France, and mainly managed by POs, annual quotas from European TACs have a heavy incidence on the numbers, features and fitting outs of new constructions, as they are determinant factors in setting up the project business plans. This results in a major lack of visibility. As nobody knows how TACs will evolve, any business plan is liable to be put in question from one year to another, with the consequences we can imagine.

2. Limitation of the fishing capacity : tonnage limitation

Within the framework of the new CFP, that entered into force in late 2002, any new construction has to be compensated by the withdrawal of an equivalent capacity, estimated in tonnage units. Furthermore, for ships of more than 100 GT, the withdrawn tonnage is to be at least 1.35 times the newly built capacity.

In France, this rule is a major constraint in the process of designing and building a new fishing vessel. It limits the vessel size, and therefore the internal space, which in many instances has detrimental effects on safety and working/living conditions (narrow circulation spaces, exiguous living spaces, reduced phonic insulation, ...) and also on other aspects such as fuel consumption.

Further to these aspects that are directly linked with tonnage limitations originated from the European regulations, the tonnage calculation rules, imposed at the European level as well, also have an impact. Below a 15 m length limit, this calculation is simplified and advantageous. A promoter may order a 14.99 m vessel with a 45 GT tonnage, while he would need 60 GT for a 15.01 m long vessel. This distortion forces owners of a small amount of GT units to order hulls of less than 15 m length, though their financial resources would allow them to envisage a larger and more spacious one, which would well fit for the future exploitation as well.

3. Limitation of the fishing effort : licenses and special fishing permits (SFP)

In France, application for licenses or SFPs is conditioned by rules related to ship characteristics. For getting a scallop license in the St Brieuc Bay, for instance, the ship must be less than 12 m long.

1 Refer to : « Shipbuilders’ constraints in relation to the design of fishing vessels » : a report by Marine activities ergonomics and safety laboratory – LESAM, South Brittany University, June 2007.

Depending on the exploitation for which they are intended, such constraints obviously can have a decisive incidence on future ship characteristics.

4. Financial and economic constraint

The fishing vessel, as any enterprise, has to be profitable. This financial and economic constraint has incidences on :

- the decision or the possibility to build : where an applicant for a new construction cannot display an acceptable business plan, he will have to give up his project,
- the vessel's characteristics and fitting outs : being basically limited, the budget available to the promoter will determine his options related to the characteristics and fitting outs of the vessel. These options are first oriented towards productivity and fishing capacity, possibly in conflict with fitting outs that would improve crew working or living conditions.

In France, following the termination of investment grants imposed by the EU and the stricter enforcement of national quotas, the financial and economic constraint has a first rank importance, so that the main question is not the new vessels' characteristics, but the mere possibility to have them built. Without public grants, and with a turnover determined by quotas, it is questionable whether owners of one or two ships will still have, in the future, resources enough for renewing their working tool.

5. Constraints related to social regulations

Among these constraints, the most noticeable is the significant increase in the rate of social contributions by the employer (retirement fund and general security fund of ENIM) as from a 12 m length. This incites many shipowners to build ships slightly below this size in order to benefit a cheaper rate.

6. Technological constraints

Under this heading we put together the national ship safety regulations requirements and the specific shipbuilding technological requirements that are complied with by the ship designers and shipyards.

Among the statements that were gathered from fishing vessel recent promoters, the former appears not to be determinant in the choice of the characteristics and fitting outs of the future ships. On the opposite, they are systematically mentioned by the designers and builders, for which they have a first rank importance.

In the design and construction process, ship construction rules, in terms of structure for instance, are another major constraint, which is so obvious that it is never mentioned by designers or builders. However, it can impact the general features of a vessel. During the construction stage, or even the late design stage, some structural elements cannot be modified any more, even if they have detrimental effects on optimised fitting up of working or living spaces.

7. Cultural constraints

There can be local fitting up models or "traditions" which promoters cannot escape, subject to the risk, in particular, to have difficulties in recruiting their crews. The development

and dissemination of such standards within a geographic area generate a cultural constraint that impacts the fishing vessels' design and construction process, and partly determines their features.

In northern France, the birth and dissemination of a catch processing system, efficient both in terms of productivity and of working conditions (reduced penibility of heavy load handling, catch sorting in a standing straight position) well illustrates such a phenomenon.

III.2. Questioning the tonnage constraint

Within the set of constraints that impact new ships' characteristics, space available and fitting outs, the gross tonnage constraint appears to be questionable for three reasons :

- tonnage is a volume measurement of ships that, mainly in merchant marine, is used to determine different taxes (port taxes, pilotage taxes), insurance rates, required competency certificates for officers. It was never intended for assessing a fishing capacity, which naturally leads to question its relevance and, therefore, the interest of limiting it in order to protect fish resources. It is reminded that this relevance was questioned in the reports on MAGPs made by France and the European Commission in the early 2000s. Both concluded that the strict fleet control through tonnage and power did not result in a significant decrease of the fishing capacity, due to the simultaneous technological progress. So, why should the overall tonnage limitation be kept ?
- for ships more than 15 m long, the fishing vessel tonnage calculation mode is defined by the 1969 London Convention for merchant vessels of a more than 24 m length. This method is quite accurate. It consists in adding the weighted volumes of the enclosed spaces, with possible variations in the enclosed or open characters of the different spaces, particularly in the superstructures. To take one example, on board a trawler the volume of the fishing deck below the upper deck is considered as enclosed if the distance between the gantry legs is less than 90% of the ship's beam at this section, or open in the opposite case ... It is acceptable that this method is used for measuring the gross tonnage of a fishing vessel as such. However, it seems absurd this result to be used for measuring its fishing capacity : which can be the relationship between the fishing capacity and the distance between the gantry legs ?
- with the priority importance of the financial and economic constraint, resulting for the stricter quota enforcement and the elimination of public grants, the tonnage limitation for new constructions has not any more a real justification in terms of fishing capacity control. Taking account of its detrimental effect on safety and working/living conditions, it appears today as an extra constraint. Without any negative incidence on the sustainable resource management, it could be withdrawn for the benefit of the sole quota enforcement, that is to say the strict economical rationality, which by itself is able to regulate the number of new constructions and to influence their main characteristics.

IV. COMPARISON WITH THREE FOREIGN COUNTRIES

The objective of the three travels abroad organized under the "ErgoSpace" study was to discover other resource management models and to analyze their impact on fishing fleets, new constructions and occupational accidentology. Five main lessons, which may contribute in the reflection on the evolution of the French situation, were drawn from these trips to Denmark, Alaska and Iceland.

1. Systematic fleet concentration

In all three selected countries, the implementation of resource management systems based on individual fishing allowances, owned by their beneficiaries and transferable (individual transferable quotas, numbers of authorised fishing days) systematically resulted in the concentration on smaller numbers of ships, operated at higher profitability rates.

In all three cases, in order to moderate the excessive effects of this optimised adjustment of the fleets to the amounts to be fished, rules intended to limit the quotas that can be owned by a single shipowner, or to protect smaller vessels, were adopted, even if they were not always fully implemented.

On the other hand, it is to be reminded that the implementation of an individual fishing rights system, such as ITQs, may have a positive impact. In Alaska, it highly contributed in improving fishermen safety through, inter alia, the deletion of the “derby fishing” phenomenon, which consisted in uncontrolled rushes towards resources that were solely managed by the means of overall TACs.

2. Reduction in the fishermen populations

The reduction in the fishing fleets generate a related reduction in the employment and in the fishermen populations.

In contexts of manpower shortage, this evolution does not result in social problems. However, in the absence of provisions that could limit its effects, employment problems are likely to appear if the number of ships is too sharply decreasing.

3. Collapse of the new construction rates

The implementation of resource management systems based on individual fishing quotas, owned by their beneficiaries and transferable, comes with the near disappearance of new constructions, the profitability of which would require quota amounts that would be difficult to gather together.

4. Investment transfers towards second hand vessels

New constructions being hardly economically feasible, shipowners often transfer their investment towards modernisation or transformation of existing ships, either already owned or purchased on the second hand market.

As in France, keeping aged ships in service and modernisation/transformation of existing ones can result in worsening working conditions or a minimizing improvement in comparison with what it could be with new constructions.

5. Different “sets of constraints” in the design and construction processes

For new constructions, which were even more scarce than they were in France during the past few years, the concept of “set of constraints” having incidences on the features and fitting outs of future vessels was identified like it was in France.

In comparison with France, and for fisheries that are regulated on the basis of individual fishing rights, the main difference in the set of constraints is that the tonnage criterion is not imposed to new constructions. The main constraint is the financial and economic constraint, in relation with the fishing rights a shipowner owns or may purchase. These rights determine the turnover that can be expected from the future ship. In fact, they also determine the amount of the initial investment to be decided, and therefore the characteristics and fitting out of the new ship.

V. CONCLUSIONS AND WAYS TO SOLUTIONS

The studies carried out in France and abroad under the “ErgoSpace” project provided us with different lessons about the relationship between :

- occupational accidentology and space available on board fishing vessels, that is the “space factor”,
- “space factor” and set of constraints on fishing vessels’ design and construction process,
- set of constraints and sustainable fisheries resources management,
- resource management systems and evolution of the fishing fleets.

On that basis, this final chapter intends to formulate recommendations in favour of improved occupational risk prevention and living conditions on board fishing vessels, according to the initial objective of the study and to the recently stated CFP. These recommendations are organised in two parts :

- ensure a steady renewal of the fishing fleets,
- alleviate the set of constraints on the fishing vessels design and construction process.

V.1. Ensure a steady renewal of the fishing fleets

In the maritime fisheries sector, occupational risk prevention and living conditions improvement require ship new constructions. Construction projects are a prerequisite, even if they are not sufficient. Consideration of occupational safety and living conditions will always to a large extent depend on shipowners’ willingness.

In France nowadays, the steady ship renewal, at a rate that should be specified, is undermined due to the following :

- no public grants allowed any more,
- lack of economic visibility, as a result of yearly quota variations, leading to insistently express the view that multi-yearly quotas should be considered,
- detrimental effect of collective quotas on individual initiatives.

This last item is to be a little bit analysed, as a modest contribution to the reflexion undertaken by the European Commission on fishing resource management systems.

Where individual transferable quotas (ITQs) are used, the degrees of freedom in fishing vessel design are wider. In order to carry out his project, it is enough for the shipowner to gather a sufficient amount of quotas for ensuring the future ship’s profitable exploitation. This is difficult, as demonstrated by the very limited number of new constructions, but feasible.

On the other hand, ITQ regimes, in their most liberal versions, generate an excessive concentration of fishing rights on a limited number of vessels, the optimised exploitation of which is sought. From this adjustment of the fleet to the quotas, which is commonly appreciated as optimal or rational, results a negative impact on employment rates, on some local economies or on regional policies.

Such consequences are not unavoidable. Implementation of ITQs can be subject to moderating provisions in order to reduce their most detrimental effects : regional quota allocation, limitation of the system to certain species or fishing areas, limitation of the quota amounts that can be owned by a single owner, banning of shipowners grouping or associations, protection of certain ship categories (according to their sizes or specialties) through separate quota exchange markets...

Contrary to ITQs, the collective quotas in France, which are managed by producers' organisations (POs) seem to be less oriented towards an optimised profitability than towards an acceptable one. They limit, without eliminating it, the decrease of the fishing fleets, because :

- they prevent fishing rights' private ownership, and therefore limit their concentration,
- where quotas are reduced, they may to a certain extent be shared between the PO's members in such a way that each of them can benefit a sufficient amount for him to carry on his business.

In a collective quotas regime, the controlled decrease of the ship numbers allows for some alleviation in the pace of the negative impacts on local economies, on regional development and on employment. On the other hand, this system may put a brake on new constructions or fleet renewal, and therefore on occupational safety and living conditions improvement : with the disappearance of public grants, feasibility of projects could require a catch volume that POs will not be in a position to allocate to the promoters, in order not to penalize their other members.

At first sight, this negative effect of collective quota systems can only be prevented through the collective adoption, within POs, of provisions to the effect of favoring or protecting ship new constructions. This recommendation may appear to be surprising inasmuch as ships age and renewal rates matters that are not parts of POs' core mission. However, their missions being closely related to quotas, it is not unreasonable to state that they could be, partly at least, dealt with by organizations in charge of their management. As examples, different provisions could be envisaged :

- to decide on an age and other criteria that would determine the priority status of a ship renewal project, according to its size and speciality,
- to specify, for a given duration, threshold quotas that would be "reserved" for new constructions, so as to soften the effects of sharp variations in quotas, or of hardly sufficient quota amounts,
- to authorize, for new ship constructions only, the association of several shipowners engaged in similar fisheries, and the grouping, for a defined period of time, of part or whole of their anteriorities. The adoption of such a provision could obviously be made only under the condition that previous amendments to the national rule that anteriorities related to a withdrawn vessel are allocated back to the common stock and are re-distributed to POs on the basis of their respective shares.

The choice between ITQ and collective quotas is a political one ². According to the studies carried out under the “ErgoSpace” project, both display, at different levels, heavy drawbacks that are to be anticipated and controlled through the adoption of appropriate supplementary provisions.

V.2. Alleviate the set of constraints

At the fishing vessel design and construction stages, the choice of their characteristics and fitting outs is subject to a set of numerous constraints that mutually interact. In order to allow for occupational safety and living conditions improvement, it appears to us that some of them, the incidence of which on available space on board is major, could be removed or alleviated without undermining the objective of resource sustainable management.

1. Remove the gross tonnage constraint

The strict control of new construction tonnage, together with its side rules (rule of the 100 GT, favorable calculation mode below 15 m overall length) and inconsistencies (tonnage calculation mode for ships above 15 m) should be removed. As a matter of fact, it appears nowadays that, with the predominant role of quotas, this limitation is not necessary any more, having also in mind that the relation between tonnage and fishing capacity or resource preservation is highly questionable.

Remove this limit consists in “let alone” the financial and economic constraint, which, with reasonably well enforced quotas, is sufficient for preventing uncontrolled increase in the numbers and sizes of vessels.

At the European level, the translation of this proposal is, at least, the deletion of the regulations that limit new constructions’ gross tonnage, and, ideally, the associated deletion of the framing of fishing fleets with an overall authorised GT amount ³.

In case the removal of the overall European amount of GT units would not be feasible, appropriate provisions should then be decided at the national level in order to endeavour, within the framework of this amount, to alleviate the tonnage constraint’s weight on fishing vessel construction. To that effect, two provisions could be envisaged :

- on the model of the European GT exchange bank, set up a national GT bank operated by the administration. This system consists in gathering all tonnage units withdrawn from the fleets and re-distributing them to applicants for new constructions who need them. This generates two problems :
 - clear and equitable rules for sharing the gathered GTs are needed. One of the allocation criteria could be the living and working conditions improvement on board vessels to be built,

2 Different resource management systems based on catch limitation can exist. The most commonly mentioned is the non transferable individual quotas regime (NTIQ). In this system, of which we could not identify an example at a national scale, quotas are individual but they are not privately owned by shipowners. They are “lent” or allocated for a defined period of time ; such a rationale is existing within the POs, when they have to arrange for sharing between their members a too limited quota that could not be fished without further constraints.

3 In this proposal, as in the “ErgoSpace” report in general, the power limitation that is associated with the tonnage limitation is left aside. Having no significant impact on space available on board, it was not analysed under this study. Furthermore, at first sight, its link with the fishing capacity seems to be more relevant, at least for trawling.

- the risk exists for the system to be sufficiently fed only through incentives for business cessation and ship withdrawal, which means expensive fleet reduction plans.
- set up a tonnage units exchange bank where applicants for new constructions could purchase those they need to shipowners who decided to stop their business or to build and operate a smaller vessel. Setting up this bank, which would imply acceptance of the principle of tonnage units private ownership (following their initial free allocation!), would probably generate some unfairness between those who can or cannot purchase tonnage units, and would carry on with the difficulties for the first establishment of young fishing skippers. On the other hand, it could facilitate business cessation for shipowners who wish it, without any State intervention.

From our point of view, both these proposals are such that they could alleviate the tonnage constraint on future vessel construction, which would be positive for occupational safety and working conditions improvement.

2. Alleviate the financial and economical constraint. Re-establish (targeted !) public grants

The removal, as from 1st January 2005, of public grants to fishing vessel construction is a decision that :

- first, will considerably reduce their number, but also,
- making the financial and economic constraint heavier, could force promoters to questionable options in terms of occupational risk prevention and living conditions : under-dimensioned ships in relation to their planned operation and exploitation, investment mainly oriented towards equipment that optimize fishing, to the detriment of those that would facilitate working on board...

Starting from these statements, the re-establishment of public grants to new fishing vessels construction is to be envisaged. The term “public grants” is to be understood in a wider meaning than the allocation of mere subsidies ; public grants to fishing vessel construction could include as well quota bonuses to be temporarily allocated to promoters who would significantly invest in working and living condition improvement. Such a bonus, which could come from an amount of quota shares kept by the administration, would provide them with an increased turnover, and would ensure profitability during the first years of their operation.

We should not be naïve however. The financial and economic constraint alleviation, as the tonnage constraint alleviation, will not automatically result in a significant improvement of occupational risk prevention and living conditions. Taking these stakes in account also requires an initial willingness of the shipowners. In order to stimulate this willingness, the allocation of public grants could be made under the condition that a specification, including objectives to be reached in terms of occupational safety and living conditions (together with other objectives, such as power savings, selective fishing, ..., but this is not in the scope of this study). Thence, these authorised grants would not be incentives to fishing any more, but incentives to working and living conditions improvement in a sector that suffers from too high rates of occupational accidents.

The specification to be complied with could include goals such as :

- reduction of noise levels on board, in order to meet the overall requirements of the European directive applicable to ships as from 2011, but also to reach, as in Denmark,

specified noise levels in the different living and working spaces [refer to the IMO resolution A.468(XII)],

- reduction of manual handling of heavy loads and removal of work in kneeling positions during catch processing,
- prevention of fall on board risks...

This proposal might not be of a simple implementation, because it requires a good knowledge of the fishermen's activity, a previous assessment of the applications submitted by promoters, a construction follow-up and a final assessment of the vessel... On the other hand, it would allow for crews' safety and working conditions significant improvement, through a wider integration of these stakes at the fishing vessels' design and construction stage.