EXPERIENCES ON MANAGEMENT, RECYCLING AND RECOVERY OF WASTES OF BOAT SCRAPPING

END-OF-LIFE BOATS
DECOMMISSIONING AND RECYCLING OF BOATS, COMPONENTS AND MOULDS

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UCINA is the Italian Marine Industry Association, a non-profit organization for the development and the promotion of boating. We have more than 500 members, operating in the production and distribution of Boats, RIBs, Superyachts, Engines and Boat Accessories, with an overall turnover of some € 3,4 billion (2010). We have been organizing for over 50 years the Genoa International Boat Show, the biggest event in the world dedicated to boating.

The UCINA Research Department manage technical issues (such as directives, standards and laws), statistical data and institutional themes, such as the End-of-life Boats project.
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THE PROBLEM

After 50 years of recreational FRP boats production, grown at an impressive rate in the last years, the amount of End-of-Life Boats (ELB) has substantially increased, also sustained by a continuous upgrade of the market.

Environmental sustainability is gaining a considerable economical value

It represents a high cost for certain industries
Positive or negative image return given by “green” or “non-green” policy

The theme is strategic!!
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THE ISSUE

The industry has to find an environmental compatible solution:

• identifying the best technologies (existing or innovative),
• applying the right management system,

to the following problems:

• implementing a "green" policy,
• not increasing the cost or, better, get valuable.
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THE REGULATORY POSITION

At international level there is no specific rule for the management of the waste generated from the scrapping of pleasure boats.

There is a more general rule made for the ships but it does not fit adequately to the pleasure boating.

The 2000/53/EC – ELV End of Life Vehicle Directive could also be used, but...

Pleasure boat scrapped could be treated as special waste under the 98/08/EC Directive.

The legislative path is well established by the 98/08/EC Directive.
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THE DIRECTIVE 98/08/CE

The key points of the Directive are:
• the definition of “complex object”;
• the management of the waste generated by the treatment;
• the responsibility of the end-of-life object.

The responsibility falls on the owner of the object, in this case the boat.

If the boat is abandoned and there is no possibility to find the owner, the responsibility could be attributed to the builder of the boat.

In both cases it is an issue (or an opportunity?) for the boating industry.
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THE DEFINITION OF “COMPLEX OBJECT”

The definition of “complex object” in the 98/08/EC Directive is: object composed of more than one material and more than one component. It needs to be disassembled before any treatment.

- Engine Parts
- Wood
- Plastic
- Glass
- Insulation
- FRP
- Equipments

The disassembling of the boat is very complex due to the large amount of hull structures and house furniture that have to be heavily fixed to withstand the stresses of marine environment.
The Directive 98/08/CE outlines also the concept of “hierarchical order” of the waste management:

- reduction;
- reuse;
- recycle;
- recovery;
- disposal.

A correct management will lead to follow only those three “paths of the waste”

Since FRP is very difficult to recycle, the “most advanced” management of the FRP waste is, in many countries, the combustion to produce energy or cement. Otherwise the disposal in landfill is the only other option.

These two actions do not follow the hierarchical order!

FRP should be reused... How?
Mr. Potočnik (EU Commissioner for the environment), stated that all waste, thus including end – of – life boats, have to be seen as source of “secondary raw material”, which is capable to generate benefits both environmental and economical.

The large majority of the small leisure boats are made of FRP (up to 90% of the total weight) and ELB project was conceived to deal with this issue.

ELB project consist of two main parts:
- disassembling of end of life boats and sending to reuse or recycle their components;
- producing a secondary raw material from FRP waste, generated by disassembling, using a new technology based on WSMC (Waste Sheet Molding Compound) process.
The WSMC process allowed the developing of a new technology experimented by the Italian national research institute ICTP/CNR (Pozzuoli - Naples).

This technology allows to obtain composite thermoplastic sheets, blending different kind of polymers and using also fibers (e.g. FRP) as reinforcement.

The sheets are moulded through a process with low energetic cost, obtaining a “technocomposite” with high mechanical performances, so that it can also be used as structural component in the building sector and could be recycled after use indefinitely.
END-OF-LIFE BOATS
THE PROJECT

A simplified scheme of the project is:

Fibre Reinforced Plastic (FRP) + Polystyrene (EPS)

GRAINS → Molded structural components

SHEETS → Tiles → Solid surfaces (≈ Corian®)
The new correct approach is to move toward a successful developing of the **Design for Disassembling** policy:

- **Life Cycle Design**: considers the impact of all the product’s life-cycle;

- **Life Cycle Assessment**: assesses environmental impacts associated with all the stages of a product's life;

- **Life Cycle Cost**: sum of all costs over the full life span of a good.
The ELB decommissioning supply chain is an initiative to show a sustainable management of complex objects at their end of life. The disassembling of a boat is very difficult but the knowledge gained in this field could be widespread to other sectors (caravans and campers, planes but also wind turbines...)

The ELB decommissioning supply chain will help to create a new set of enterprises with different job opportunities.
QUESTIONS?

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