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Impact of hybrid propulsion on the project of passenger ferries for Italian scenario.

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In Italy there is a large fleet of passenger ferries, this fleet is operating in a very special scenario: no matter if we talk about Internal waters like the lakes or the Venetian lagoon or the islands in Gulf of Naples or the Sicilian islands, all those ferries must deal with port structures, often of historical interest, and environmental situations extremely particular and requiring attention. In fact the ferries operating in those areas have the need to offer great manoeuvrability, silent running, low emissions or no emissions. For all those aspects the hybrid propulsion, combining the use of diesel electric generators and batteries offers the possibility to adopt efficient systems for manoeuvrability and propulsion, like azimuthal or azimuthal propellers and battery packs to ensure silent approaching to the mooring facilities, the possibility to stay at night in port without generators working during the nocturnal stop, realizing a ship that close the areas of interest can operate with almost complete silence and no pollution.

All those advantages have an impact on the general layout of the project considering the necessity to respect the limitations in terms of stability, with special attention to the damaged stability conditions.

The disposition and the subdivision must be adequate to the navigation requests, according to the range calculation performed considering the results of tank tests and the evaluation of the size batteries.

Furthermore the hybrid propulsion, as well known, can be more "space demanding" in terms of installation, due to the need to install not only the diesel engine but also several components for the management of the propulsion system, and this has an impact on subdivision.

In conclusion the subject of the work is the case study of several projects for ferries, different in size and typology, with hybrid propulsion, examining the fact that the request of maintaining the stability criteria and consequent choices of project, oblige the naval architect to a careful disposition of the subdivision and the work aims at underlining those aspects.

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