



Experiences with evaluation and approval of the application of composite solutions onboard the E-ferry

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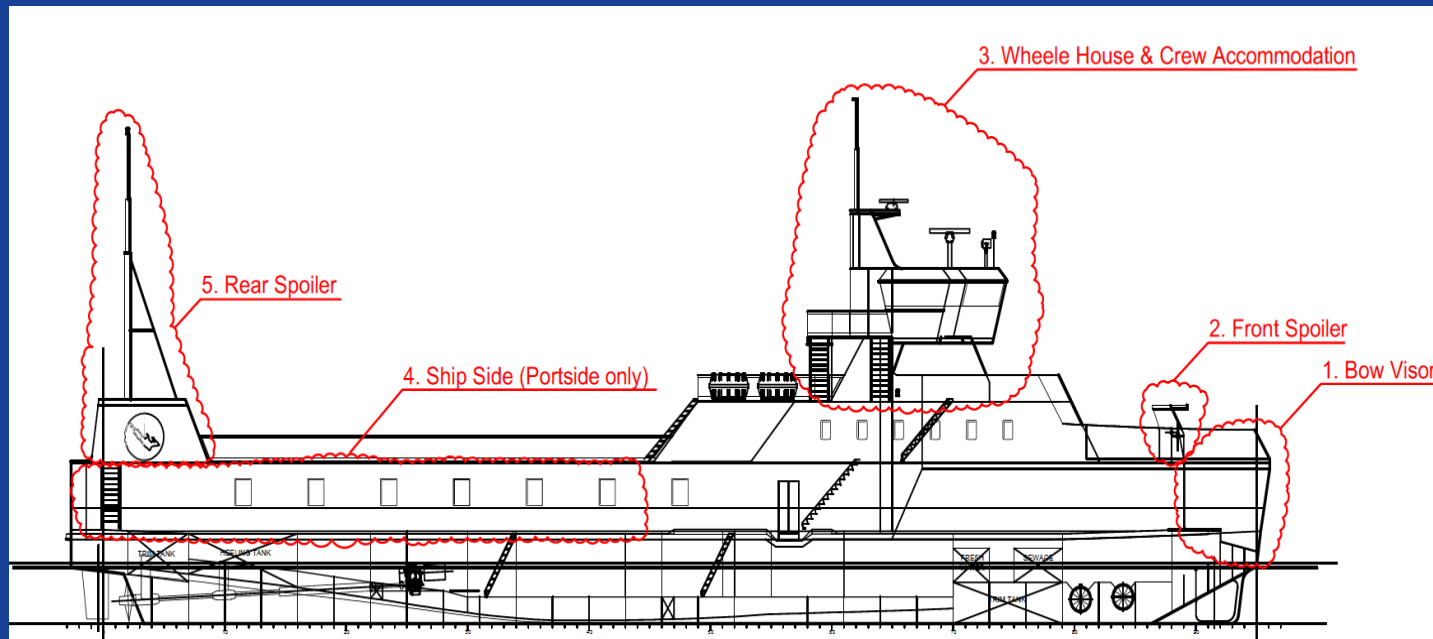
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Objectives of E-ferry

- <https://www.youtube.com/watch?v=UOdkd9zEfb8>

Composite materials as weight saving alternatives



Rule basis

- DMA/Flag Notice A, Notice D
 - Directive 2009/45/EC (Passenger ship directive (EU))
 - DNV rules for ships
 - SOLAS ch. II-2 Part F
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- Alternative design to be evaluated and approved according to IMO MSC.1/Circ.1455

Possible caveats

- E-ferry E(nergy)S(torage)S(ystem) as alternative design to be evaluated and approved according to IMO MSC.1/Circ.1455
- Umoe Ventus Incident in December 2015
- E-ferry started in June 2015
- Marine Accident Report in September 2015



Preliminary evaluation

- Bow visor:
- Initial weightsaving potential excellent
- Ice belt, structural relevancies = added weight
- Electric actuators = potential ignition sources
- Firm close of visor directly weight related
- Lack of options for repair yard(s) in operational area

Preliminary evaluation

- Bulkhead/portside:
- Initial weight saving potential good to excellent
- Mooring system requires structural strengthening (steel)
- Structural tension of hull beam problematic for creating seams between steel and composite

Preliminary evaluation

- Wheel house/crew area:
- Initial weight saving potential excellent (weight and distribution)
- Benefits in terms of climate control inside
- Benefits in terms of maintenance
- Only approvable through costly 1455 procedure
- Safeguards and mitigating effects costly and weight adding
- Probably incompatible with E0 class

Preliminary evaluation

- Spoiler(s):
- Weight saving potential low
- Little impact on safety and operational relevancies
- Safeguards and mitigating effects of low economic and weight consequences
- Approvable through MSC.1/Circ. 1274 procedure

1274 evaluation of spoilers

- Conclusion is that spoilers can be made of composite materials with some mitigating features in place for equivalence
- Final requirement for application procedure is that selected/suggested composite solutions are tested according to the FTP code
- Tests are still pending – task with leader of composite Work Package 5
- Parallel construction of E-ferry means that approval will not be implemented in practice