GF Piping Systems

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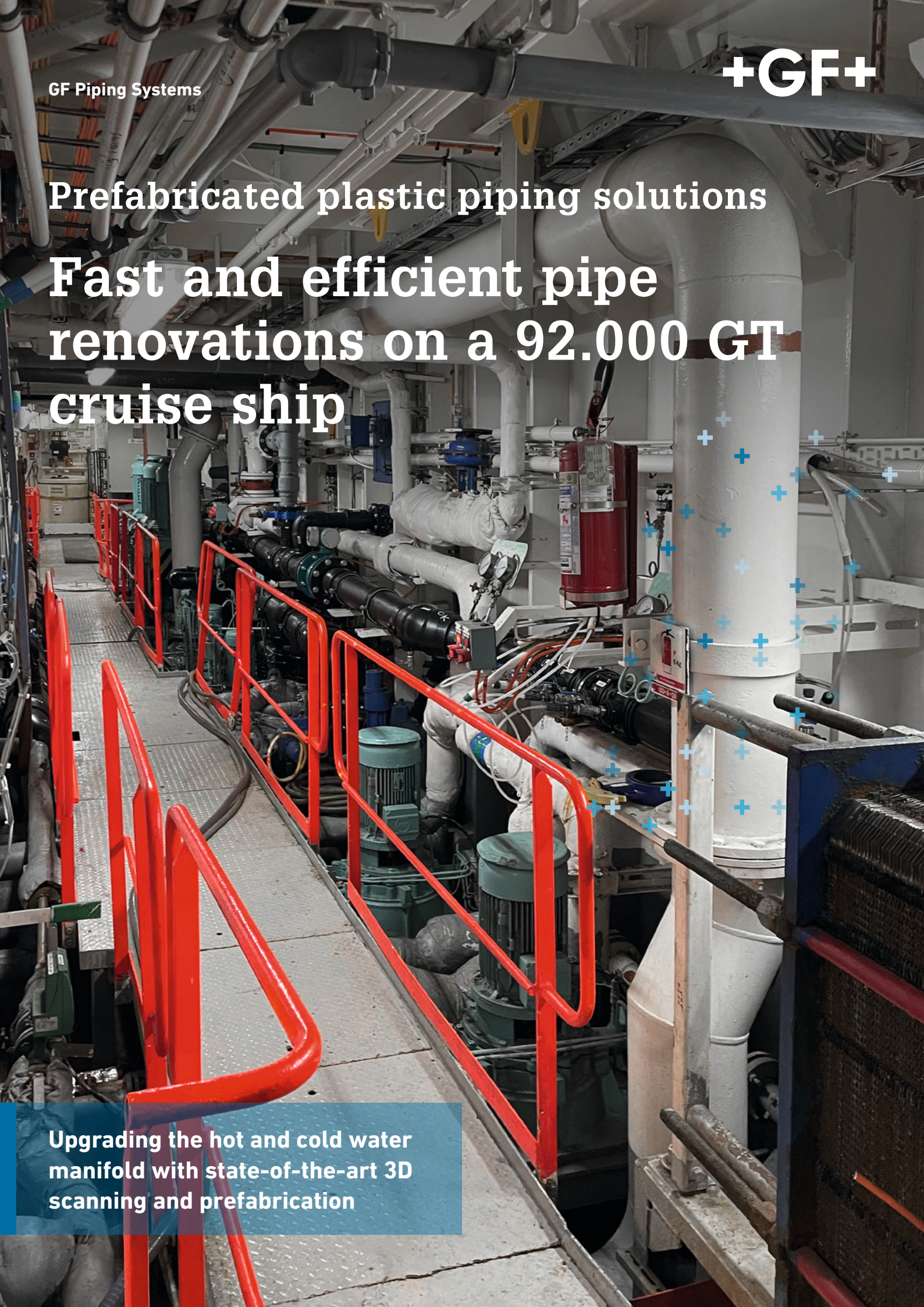
Prefabricated plastic piping solutions

Fast and efficient pipe renovations on a 92.000 GT cruise ship



Upgrading the hot and cold water manifold with state-of-the-art 3D scanning and prefabrication

Replacing a hot and cold water manifold with prefabricated plastic piping systems

The 92.700 GT cruise liner started its service life as Costa Luminosa in 2009. The ship is 300m long and features 1.130 cabins capable of 2.800 passengers. When the hot and cold water manifold on Costa Luminosa showed signs of corrosion, the Costa Cruise line decided to replace them with long-lasting and corrosion-free materials in 2022. To meet the tight project deadlines and install the new systems during running operations, Costa Cruise line decided on state-of-the-art project planning, engineering, and execution practices by Mec.Ship and GF Piping Systems.

Project background

After over ten years of service, the hot and cold water manifolds on board Costa Luminosa suffered from corrosion. At the time, a metal system was installed due to the necessary complexity of the manifold design and the very tight spaces where it was installed. To reduce maintenance requirements and improve efficiency, the former owner of the ship decided to replace the aging components with more durable alternatives. However, this would require extensive and precise planning as the project had to be carried out while the ship was in operation.

Corroded metal manifold before exchange (provided by MecShip/CCL).

Selected technical solution

Before the renovation could begin, the Italian company Mec.Ship conducted a survey of the Costa Luminosa and took highly accurate measurements by 3D scanning the existing system. This data was then used to design the replacement manifold using GF Piping Systems' extensive CAD libraries and prefabrication capabilities. The choice was made to install corrosion-free, lightweight materials from two system ranges: ecoFIT, the polyethylene piping system suitable for transporting water and wastewater at temperatures between -50 °C and 60 °C, with an expected service life of at least 25 years. INSTAFLEX, the polybutene (PB) system designed for drinking water installations. The PB material does not release any taste or pollutants, while smooth surfaces also prevent limescale deposits.

3D Scanning by MecShip to design the replacement of the hot and cold water manifolds (provided by MecShip/CCL).

Hot water manifold after replacement.

Achieved improvement

Thanks to the combined design, engineering, and prefabrication knowledge of GF Piping Systems and Mec.Ship, the replacement manifold could be adapted to the specific needs of Costa Luminosa. The installation was carried out quickly with minimal impact on the passengers and crew. The installation time was also kept short thanks to the easy jointing technologies such as butt fusion or electrofusion and the application of prefabricated parts. And, thanks to the material properties of the new piping systems, the ship benefits from lightweight, corrosion-, and maintenance-free solutions until the end of its service life.

Customer benefits

- **Precise project planning and short execution thanks to 3D Scanning and CAD Libraries that supported design, creation, and installation phases.**
- **Customized products and easy jointing technologies for trouble-free installation during ongoing ship operations.**
- **Corrosion- and maintenance-free materials for a long lasting service life and weight savings.**

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