FAGIOLI

SALVAGE & WRECKS REMOVAL

Since 1955

Salvage & Wrecks Removal Service Provider

Wreck

Bathymetric Mapping

Load in / Heavy Transport

FAGIOLI IN

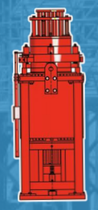
FAGIOLI OUT

Feasibility Study Design Phase

-Feasibility study and design phase to come up with the most suitable operative procedures for the recovery of shipwrecks and other heavy items laying on the sea bed, taking into consideration the safeguard of sea environment.

ROV and Underwater Operations

Under Fagioli responsibility:
-Use of ROV (Remotely Operated Underwater Vehicle) used to explore sea depths while being operated by someone at the water surface. Specialized divers for the plumbing at sea depth for a precise bathymetric mapping.
-Trained divers for welding activity at sea for eventual disassembly operations of wreck into sections after detailed study issued by Fagioli engineering department.



Wreck Removal Activity

After all the technical analysis Fagioli has one of the largest and powerful equipment fleet to remove complete wrecks or sections by using:
-High Capacity Crawler Cranes
-Strand jacking system
-Barges for the removal of sections
-SPMTs for the heavy transport activity.

Environmental Matters

Under Fagioli responsibility:
During and After the removal operations activity, a constant monitoring of the area, decibels and birdlife conditions are executed, including sampling and classification of seabed.

Waste Disposal Recycling

-Sections are removed and taken away by means of barges and SPMTs and destined to final officially certified European disposal / recycling areas

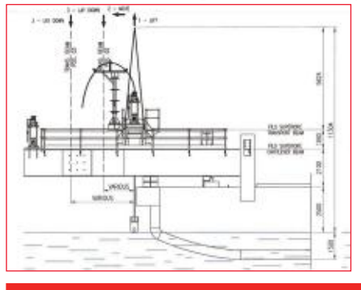
SALVAGE & WRECKS REMOVAL

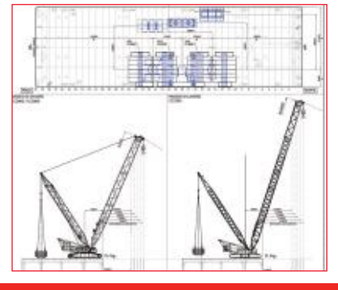
Fagioli has a dedicated department for the recovering of wrecks after accidents occurred at sea. Fagioli was involved in the salvage of a wreck in Italy, cut in six sections with an outstanding operation executed with three crawler cranes and the famous Concordia Wreck Removal project, an enterprise never before performed requiring the rotation, refloating and towing operations of a 300 meters long, 114,000 ton weight, cruise vessel. Safety and environmental protection were our first priority!

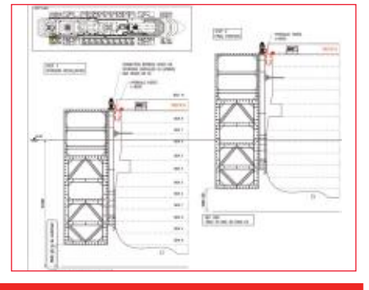
Some common tasks that Fagioli usually performs for the Salvage industry are: the lifting, transport and removal operations of wrecks and heavy items fallen to the bottom of the sea. Fagioli heavy transport and lifting department works in strict collaboration with Fagioli certified in-house engineering division to grant a package of top level services starting from detailed prepared studies up to innovative and tailor-made planning and construction of dedicated structures, for a safety, time and economic savings solutions dedicated to this peculiar activity. As a matter of fact each “salvage“ project brings along its own challenges to be overcome.

HEAVY TRANSPORT AND LIFTING

Fagioli Engineering Department provides worldwide design, engineering and technical consultancy services with particular focus on Fagioli equipment and steel structures, providing technical services for all Company’s departments and for Clients who need a support for studies and applications in the Salvage sector, in compliance with HSE ISO 45001 and QUALITY ISO 9001 regulations. Fagioli engineers and draftsmen have a sound background of heavy steel constructions, civil and offshore and industrial plants, able to identify the best technical solutions in heavy transport, heavy haulage and lifting activities through dedicated softwares (2D and 3D rendering, FEM analysis) with the support of Fagioli in-house softwares operated by our engineers, for a top level quality structural analyses and rendering.



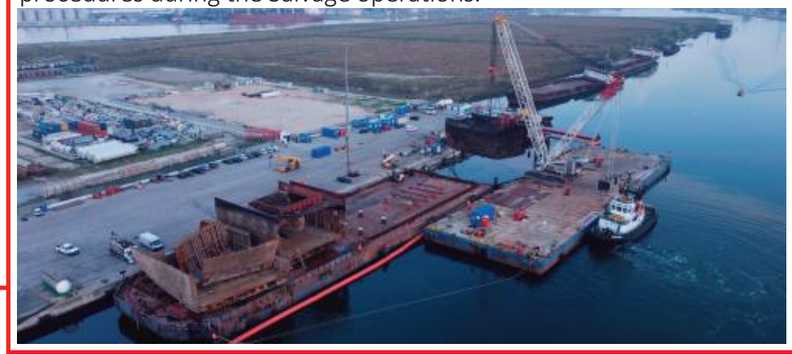




ENGINEERING

MARINE OPERATIONS

Fagioli has a long record track of marine activity which includes the recover / towing and re-floating of a vessel, or the repair or substitution of a ship section, such as thruster change-out. Being proprietary of barges and tugboats for river and sea transport activity of heavy items in the Mediterranean and North Seas, Fagioli is able to provide the necessary assistance for this kind of activity, including the engineering support for the moorings as well as ballasting and sea-fastening procedures during the Salvage operations.



MAIN EQUIPMENT FLEET FOR THE SALVAGE & WRECKS REMOVAL INDUSTRY

STRAND JACKS

over 1,000 units (15-750 ton)

CRAWLER CRANES

Up to 3,000 ton capacity

BARGES

10 Units sea and river activity

MARINE EQUIPMENT

Pumps for Ballasting

Available other equipment such as: SPMTs; Jack-up System; Weighing Systems - Screw Jacks - Auxiliary equipment

FAGIOLI SUSTAINABILITY REPORT 2020

Sustainability

FAGIOLI

FAGIOLI has a dedicated "sustainability "program which follows what it's commonly called "The Three pillars of Sustainability":
-ENVIRONMENTAL PROTECTION -GOVERNANCE & ECONOMIC DEVELOPMENT -SOCIAL DEVELOPMENT Fagioli Sustainability Report 2020 booklet is available for download on www.fagioli.com website

Environment

Environmental Protection

Fagioli Group is very close and extremely sensible to problems related to environmental protection

Spill Prevention → **Hydraulic System with Electric PPU's** → **Noise and Pollution Reduction** → **Waste Management Procedure**

Governance

Governance and Economic Development: Research and Innovation

Fagioli provides to all its personnel, suppliers (downloadable online)a «code of conduct» booklet for a sustainable economic approach

Innovation → **Time Saving** → **Lowering the eventual impact on Environment** → **Money Savings for Customers**

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INNOVATION AWARDS

Social

Corporate Social Responsibility (CSR)

Fagioli is committed to a sustainable social campaign focused on worldwide site operations activities and the welfare of all its personnel

Employment of Local Forces → **Local Civil Intervention** → **Personnel Welfare: Health Care Fund** → **Smart Working**

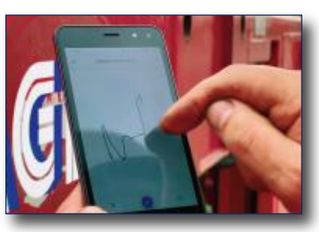
Hse & Quality

FAGIOLI CERTIFICATES : - ISO 45001:2018 - ISO 9001:2015 - ISO 14001:2015

SAFETY Campaigns / HSE Contests → **SAFETY Training** → **IT TOOLS to monitor HSE** → **Reduction of Accidents** → **HSE AWARDS**

HSE CAMPAIGNS - CONTESTS

DEDICATED SOFTWARE TO MONITOR FAGIOLI HSE



SAFETY AWARDS: SPMT SAFETY E-LEARNING

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SALVAGE & WRECKS REMOVAL

CASE STUDY

ITALY: SALVAGE OF BERKAN B WRECK

Fagioli was contracted for the salvage operation of a wreck in the Mediterranean sea which involved the use of barges and crawler cranes.
PHASE 1 - The first operation executed was the confining of the waters surrounding the wreck with barriers to contain any pollutants;
It was necessary the installation of a double containment barrier system to control and manage any leaks that may have occurred during the cutting and removal phases. Fagioli prepared a skimmer system able to suck up any liquids that may have leaked out during the activities.
PHASE 2 - Cutting the wreck into big sections with the aid of a special diamond wire cutting machine operated by a team of specialized divers was the following activity supported by a ROV (Remotely Operated Underwater Vehicle) to analize the water conditions and the underwater activities. The ship was sectioned in 6 parts with measures ranging from 18 to 25 meters and weights ranging from 200 up to 800 ton.
PHASE 3/4 - Fagioli proceeded with the securing of the wreck sections from the water by means of a 600-ton Fagioli crane loaded onto a pontoon for the first five sections whilst for the last one, the stern, it was necessary to employ at the same time, No. 3 crawler cranes positioned onto the barge with a total capacity of 1750 ton for the complete removal of the 800 ton item.
Two barges were prepared and use for the recovery action: one provided with high capacity crawler crane (s) for the lifting operations and one called “service barge”, ready to receive the sections to be taken away.
The operations consisted in the : lifting of the different sections harnessed with the crane (one by one); keeping the section raised to leach any liquid releases coming out of the sections; moving the barge with the wreck items and the crawler crane near the service barge and place the sections on the latter. This operation was repeated for the No. 5 lighter sections. After several years of the wreck laying into the water, it was almost impossible to calculate the actual weight of the heaviest section, the stern. On the papers it was supposed to weight 500 ton, but at the end the stern weight turned to be 800 ton. For this reason , if Fagioli at the beginning of the project planned and studied a tandem lift operation with one crane on the barge and one positioned onto the quay, it had been necessary to study a new technical approach. Three crawler cranes, positioned onto the barge was eventually used to remove the stern .
Once the lashing activities of all the blocks was completed, the service barge was ready to leave to Piombino area for the discharging operation.
PHASE 5 -Final cleaning of the seabed and removal of containment barriers.
Once the barge with all the sections left the area, the following operations were carried out:
-bathymetric surveys with the use of a control sonar to acquire information on the seabed
- underwater video inspection.
-sampling and characterization of the seabed to evaluate any substances released by the wreck;
- investigation for the identification of any items remained in the seabed including a dredging operation.
At the end of all these activities, the mooring poles and temporary barriers were removed with a barge.

Removal Operations of Berkan B Wreck