# Fledermaus
FM Offshore

Modern and Dynamic Tools for the Offshore Project.

A truly dynamic planning tool for the modern offshore project. FM Offshore is an interactive 4D geo-spatial processing and analysis tool for the planning, monitoring and review of seabed engineering and construction projects. It provides an intuitive and collaborative environment for multidisciplinary teams involved in site investigation and development. This integrated software bundle facilitates the entire process — from survey and field project layout to review and inspection — all within an interactive 4D environment.

FM Offshore is the ideal software bundle for:

- **Project Surveyors** onshore who need to plan LBL arrays, survey lines and the project survey workflow, including toolbox story boards.
- **Project Engineers**, both onshore and offshore, interested in interactively designing pipeline and umbilical routes, exporting long and cross profiles to span analysis packages, and planning construction operations.
- **Site investigation teams** wanting to incorporate all sensor data in one 3D scene to aid in the identification of geohazards.
- **Offshore Surveyors and ROV Supervisors** who need to see construction operations in real-time 3D, navigate in reduced visibility,
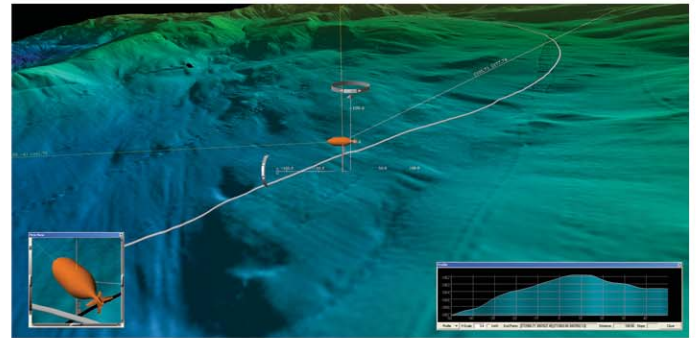
AUV over pipeline

and compute umbilical overage routes.
- **Data Processors** that require the ability to manage huge volumes of data, generate DTMs at the highest resolutions, export long and cross profile output for pre-built and as-built surveys, and visualize hot pipe movement.

FM Offshore moves users beyond the world of isolated project teams and static 2D representation and analysis. Easy import of multiple data types, dynamic planning tools, and export to standard GIS and CAD packages allows the offshore project team to take a project from initial design to final installation and review in one 4D space.

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Interdisciplinary project planning & communication

- Interactively plan LBL arrays in 4D using DTM and view-shed to aid transponder placement.
- Simulate ROV/AUV flight paths to check for obstruction and intervisibility.
- Build interactive temporal-spatial scenes for multi-discipline project review that can be supplemented and distributed as the project progresses:

    - Scenes with 3D seismic data and GIS/CAD site plans for kick-off meetings.
    - Toolbox Talk story boards for specific project tasks.

Site investigation and geohazard analysis

- Integrate all available data types in the 4D environment to enhance your site investigation, facilitate the identification of geohazards, and support efficient analysis.

    - Quickly create sun-illuminated 3D surfaces from gridded and ungridded data using an easy wizard-based interface.
    - View different resolution DTMs in the same scene without resampling or degradation
    - Supporting datasets including seabed and core samples, sidescan sonar, backscatter, multivariate grids (gravity and magnetic data), and shallow seismic imagery can be added.

- Analyze your integrated data with our growing suite of tools: slope analysis, rate of change, instant interactive profiling, contouring, and surface difference.
- Option to add the latest generation of backscatter processing (FM Geocoder [1]) for identification of potential shallow gas occurrences and semi-automated seabed characterization.
- Add seafloor interpretation with new node-less selection and attribution tools.
- Option to add water column data processing (FMMidwater) for mapping, monitoring, and visualization of gas plumes and underwater structures.

Pipeline, flowline, umbilical and cable routing and survey

- Interactively design and edit routes — insert, move and delete intersection points and dynamically change curve radius.
- Aid route design by coloring the DTM by slope, rate of change of slope, or seabed sediment type.
- Add design information and existing structures into the scene for an even more complete integrated site study — design files, field layouts, feature shapefiles, existing pipeline and cable information, hazard grids, structural models from AutoCAD files, ASCII text files, and more can be easily imported.
- Generate, display, and export contours to support analysis.
- Dynamically create, update, and output along-route long profiles at user-defined spacing and intervals for span analysis and charting.
- Generate cross-profiles with user-defined spacing; export in ASCII and Abaqus format for engineering analysis packages and charting.

- Calculate and export fixed pipeline length data files.
- Prepare data for alignment sheet production — create sun-illuminated bathymetric surfaces and drape mosaic sidescan geo-referenced images.

Data management, product creation, and presentation

- Use the Project Data Management tools to create processing block workflows and automate data production for alignment sheets.
- Create and export high-resolution digital terrain models.
- Generate contours for export to CAD/GIS.
- Engage audiences at every level — from operational talks to full project reviews and walkthroughs — using highly immersive, interactive visualization.

    - Interactive temporal-spatial scenes can be shared using the free viewer, iView4D.
    - Stereo support, both active and passive, for presentation in visualization centers and on GeoWall systems.

- High-resolution graphics for reports, posters and publications.
- Generate fly-through movies of project development or along specific routes for distribution to project stake holders.
- Generate Google Earth web-ready files for upload and distribution.
- Seamless workflow to project databases and data models via optional interface to ArcGIS [2] software

Notes:
(1)   The FM Geocoder product originates from research by Luciano Fonseca at the Center for Coastal and Ocean Mapping/Joint Hydrographic Center at the University of New Hampshire.

(2)   Integration with ArcGIS software requires an ArcGIS license, and is only available for Windows 32-bit systems. Trademark provided under license from Esri.