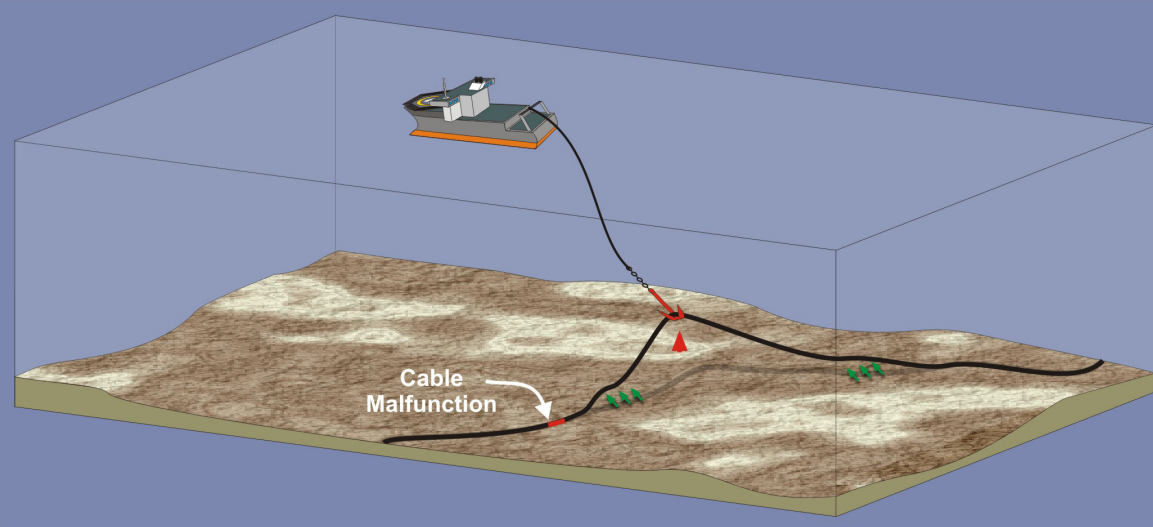


MakaiPlan Pro Repair Module for Cable Repairs



WHAT'S NEW IN THE REPAIR MODULE?

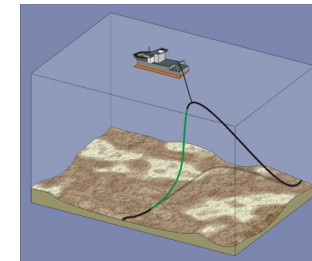
Over \$850,000 in R&D funds have been used in the development of a new repair module for MakaiPlan Pro. The goals of the new recovery software were successfully achieved:

1. Improve the recovery techniques and increase vessel speed at which cables can be retrieved.
2. Minimize cable tensions during retrieval to minimize cable dragging and snagging on the seabed and disruption of ocean habitats.
3. Decrease the probability of cable fouling with other cables and obstacles in the repair vicinity by displaying detailed and accurate positional data on existing cables and seafloor obstacles.

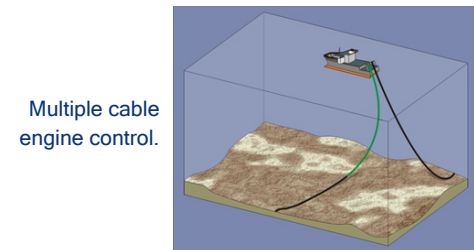
4. Provide recovery planning tools which include an inventory of repair cables and equipment.
5. Provide a software tool that seamlessly integrates with the existing MakaiPlan Pro software and provides the ability to perform detailed simulations of the installation and recovery process.

FEATURES

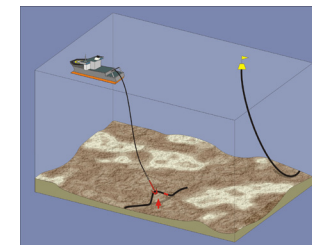
- Model and simulate multiple cable branches interacting with each other and the seabed simultaneously.
- Simulate two separate cable branches being controlled by two cable engines simultaneously.
- Improved modeling of lateral dragging along the seabed.
- Create, import and edit as-laid cable paths.
- Prepare and save grapnel rig assemblies.
- Simulate grappling operations including lowering and dragging of the grapnel on the seabed.
- Simulate the cutting, grabbing, and retrieval of an already laid cable.



Multiple cables interacting with the seafloor.



Multiple cable engine control.



Simulate grappling operations.



Makai Ocean Engineering Inc.

ISO9001:2008 Certified

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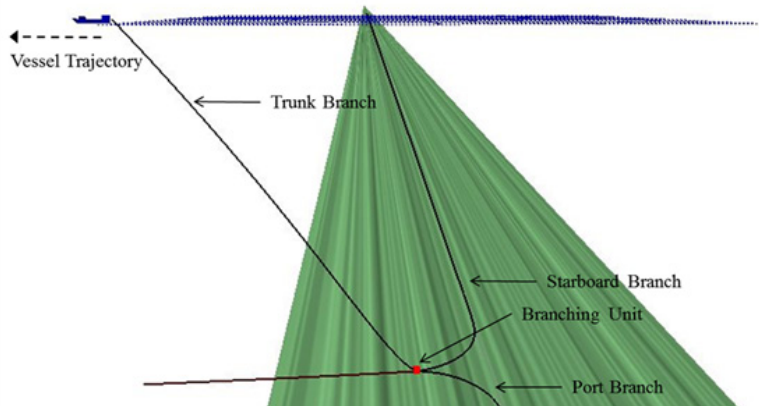
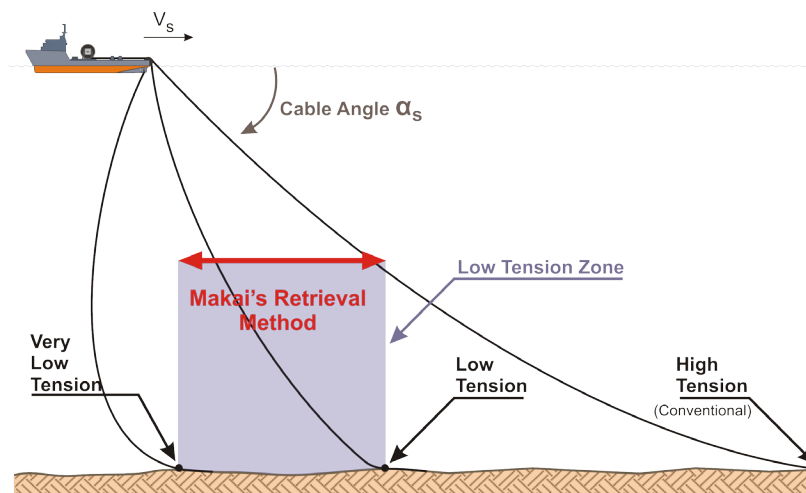
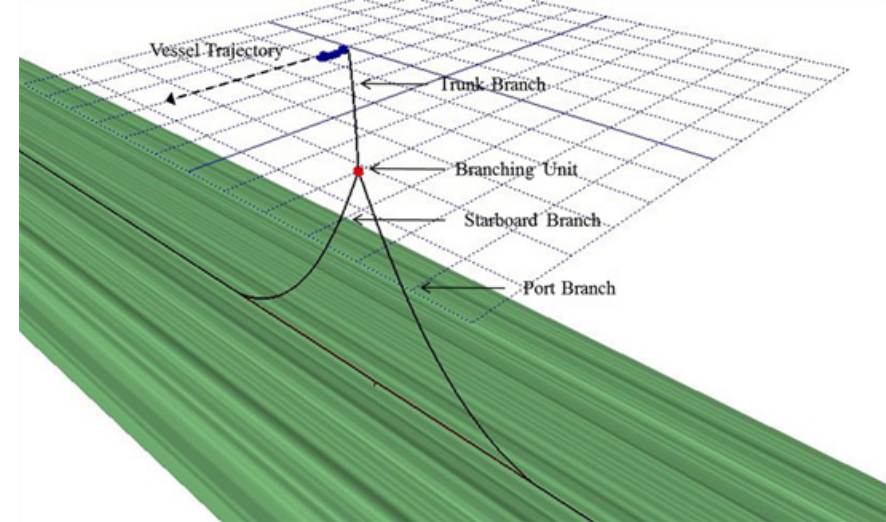
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MakaiPlan Pro Repair Module for Cable Repairs

- Calculate the length of grapnel rope required for user-specified ship speeds and water depths.
- Import echo sounder data and export it to the bottom profile of a cable or grapnel path.
- Include hyperlinks on annotations on the plan view.
- Events database expanded to include grappling, repair and ROV operations.
- Ability to log and display multiple transponder measurements simultaneously.



- Addition of a Kalman filter to smooth measured transponder tracks and display them on the plan view.
- Addition of a Buoy Selection Tool for calculating the required buoyancy to support retrieved cables.
- Calculate the steady state cable configuration using surface conditions.
- Simulate branching unit (BU) deployments.
- Simulate final splice deployments.