

Vibration Isolated Television

Scientific Application

The Vibration Isolated Television (VIT) Optic Fiber equipment is primarily used to provide visual observation of the seafloor during reentry of an existing borehole. Sonar capability is used to locate objects initially out of camera range, such as reentry cones. A wide-field-of-view camera is then used to position the ship and drill pipe over the reentry cone. Video from a HD color camera assists the driller in performing the actual reentry. An altimeter mounted to the frame provides accurate height of the VIT frame above the seafloor. An underwater color camera with pan, tilt, and zoom functionality is used for surveying the seafloor, examining mechanical devices (e.g., CORKS), locating telecommunications cables, etc.

Operation

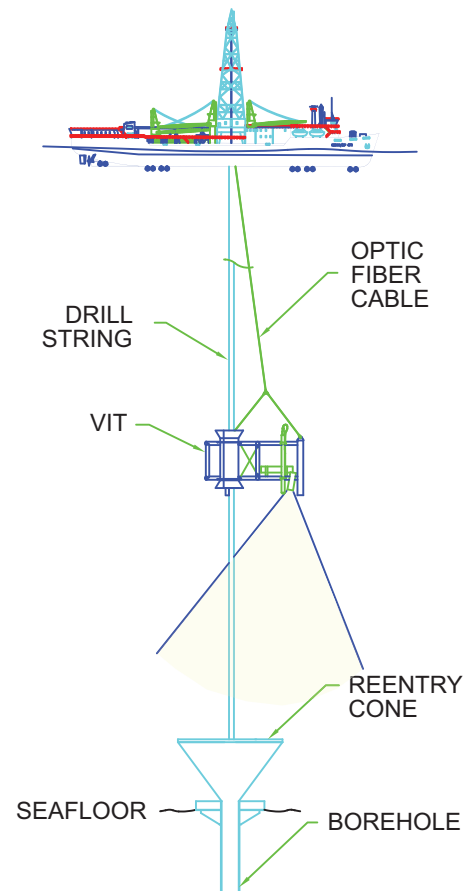
The VIT is deployed by latching its guide sleeve around the drill string. The drill string is used as a guide as the VIT is lowered to the seafloor by means of an armored fiber-optic cable attached to a special winch located in the ship's moonpool area. Power and control are transmitted down the fiber-optic cable to operate the underwater lights, cameras, and sonar. The camera, sonar, gyro and altimeter signals are then transmitted up the fiber-optic cable for display and recording on board the ship.

An acoustic beacon can be attached to the VIT, which allows the ship's dynamic positioning system computers to fix the position of the VIT frame relative to the ship. This is useful in high currents, where the end of the drill pipe can be a considerable lateral distance from the ship.

Features

Underwater Lights

- 3 x 10,000 lumens LED flood lights



Schematic of VIT deployment.

Standard-Definition Wide-Field-of-View Search Camera

- Type: Panasonic WV-CW213L
- Sensing Device: 1/3 CCD
- Horizontal Resolution: 650 TVL
- Minimum Illumination: 0.0025 lx
- Operating Temperature: -10°C to +50°C
- Video: Composite 1v pk-pk (PAL)

High-Definition Color Reentry Camera

- Type: Sony FCB-H11
- 1/2 type CMOS Imager
- Video Output = HD-SDI (780 p)
- Minimum Illumination: 1.0 Lux (ICR-on, Mode-F1.8 50 IRE)
- 10 x Optical Zoom
- Operating Temperature: 0°C to +45°C

High-Definition Color Survey Camera

- Type: Imenco OE14-522D PTZ

Telemetry System

- Seaview Systems Optical Multiplexer

Single-Axis Fiber Optic Gyro

- Type: DSP-3000 FOG
- Stability: < 1°/hr
- Operating Temperature: -40°C to +75°C

Sonar Head

- Type: Seeking side-scan by Tritech
- Dual Frequency CHIRP
 - 300 kHz up to 300 m range
 - 670 kHz for high definition
- Scanning: 360° continuous or locked
- Operating Temperature: -10°C to +35°C

Altimeter

- Type: Tritech PA-500 Digital Precision
- Range: 0.3-50 m
- Resolution: 1 mm
- Beamwidth: 6°conical



VIT being deployed in the moonpool.

Umbilical Cable

Double armored 0.68 inch electro/optical cable

Operating Range

Maximum Depth

Maximum design depth: 5,800 m with 2,000 lb payload

Operational Depth: 5,000 m

Depth to 5,800 m is allowed, derated with heave