

# Technological Challenges in the Design, Build, and Operation of a world-class Global Network

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## Core Network Reach





# Serving Carrier Markets

Focused on partners and customers that can benefit from our Tier 1 peered network, global presence, european core network, and premier support:

IP / Data-centric

Migrating to converged IP networks

Replacing TDM with VoIP

European and Global presence



# Serving Carriers Markets



Tier 1 Internet; v4&v6;  
Private MPLS-based  
Converged IP solutions



Secure, reliable and scalable data  
transport with global reach and  
flexible access options.



Traditional TDM, Voice Over IP,  
and interworking services



Integrated audio, web and  
video services

# Technological Challenges in the Design, Build, and Operation of a world-class Global Network

## Planning Horizon

Technology

Economic

Political

## Stupid or Intelligent?

Layer 1 vs Layer 3

Shifting Demand Profiles

Managing risk uncertainty

## Cable vs Satellite

## System Architectures

(SDH) rings vs pt-pt (waves)

Competitive vs Monopoly

Repeater vs Repeaterless

# Technological Challenges in the Design, Build, and Operation of a world-class Global Network

## The Project

- Planning
- Legal
- Technology
- Survey

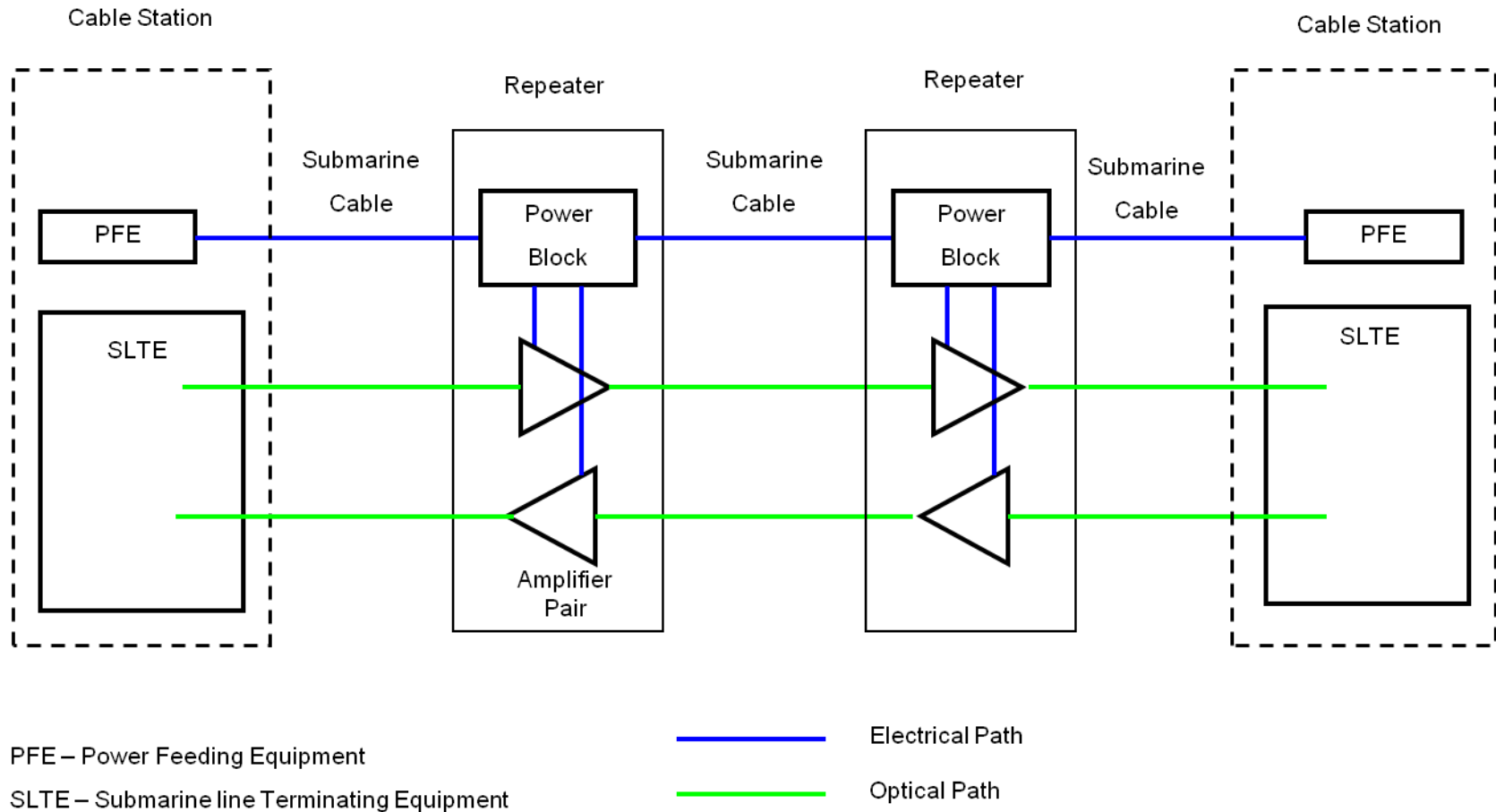
## Implementation

- Timescales
- Contracting
- Co-ordinating backhaul and sub-sea

## Operations

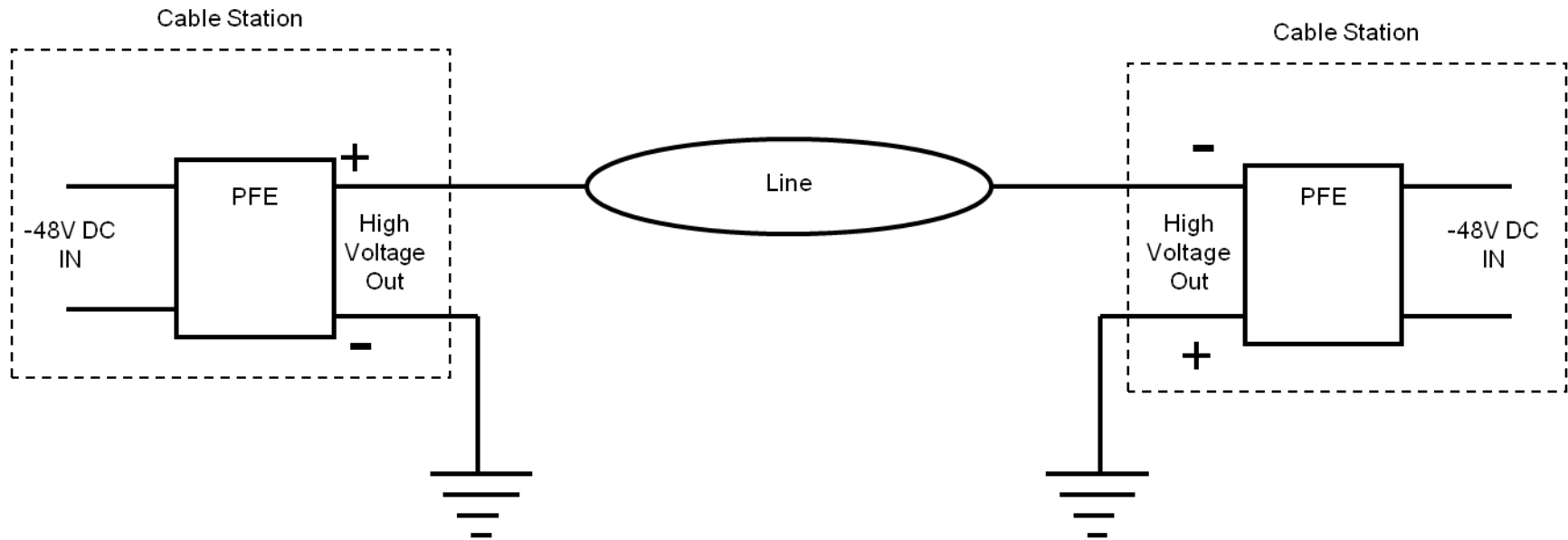
- Monitoring, Resilience, Repairing

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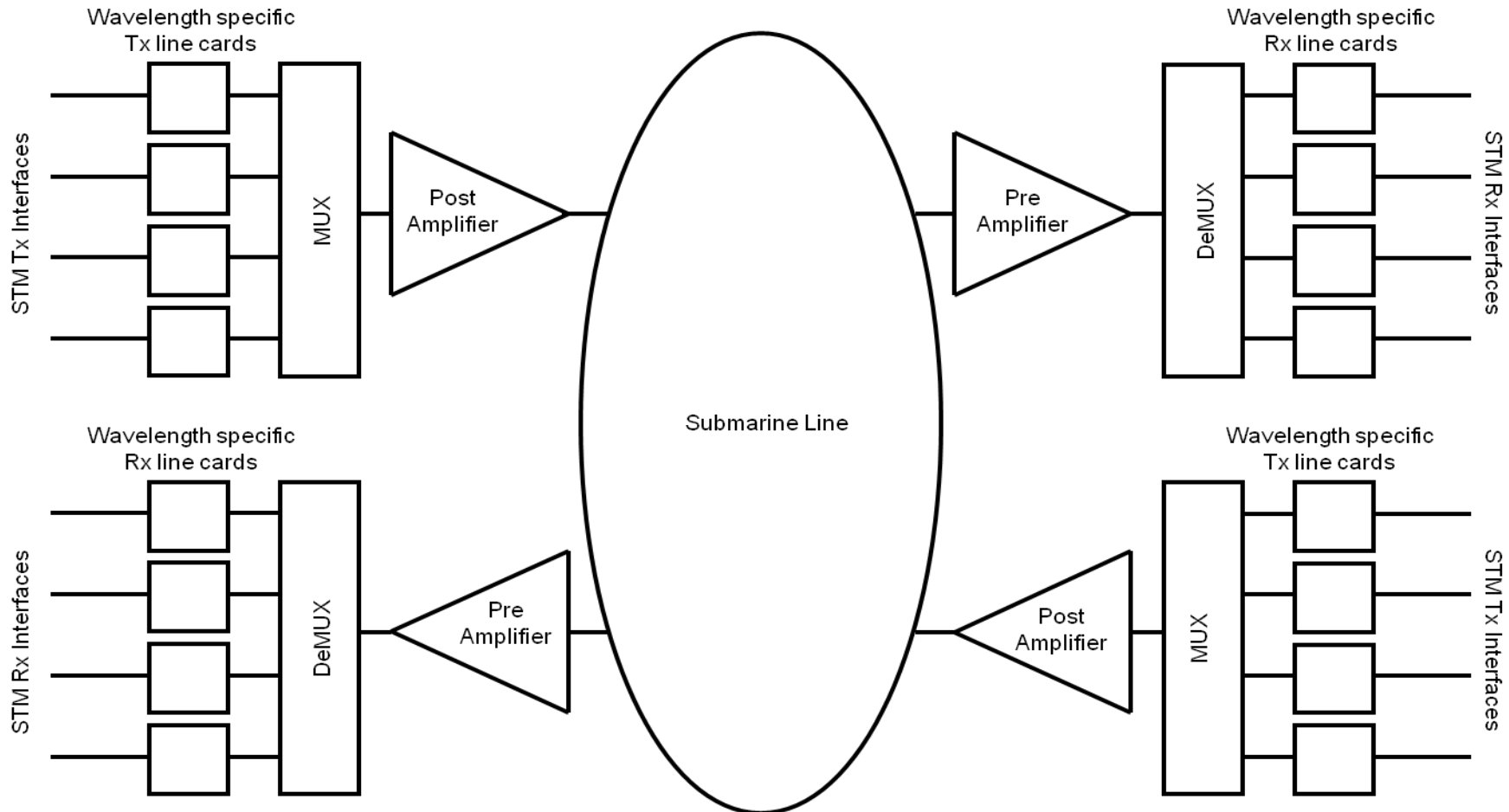
## System Power Feeding Schematic



High Voltage  
Return through  
Earth's Mass

# Technological Challenges in the Design, Build, and Operation of a world-class Global Network

## Submarine Line Terminating Equipment



# Technological Challenges in the Design, Build, and Operation of a world-class Global Network

## Repeater Schematic

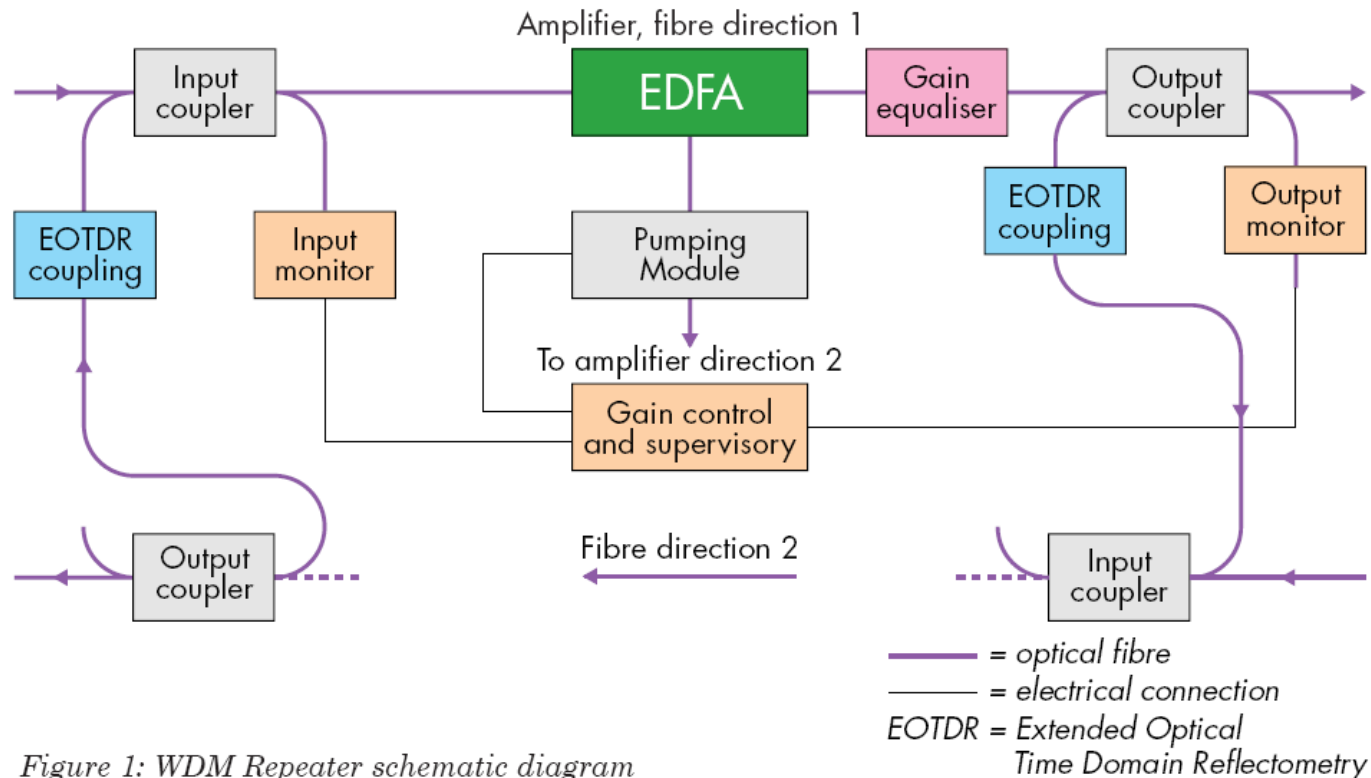


Figure 1: WDM Repeater schematic diagram

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## Operations and Maintenance

Monitoring

In-life Repeater Characteristics

Resilience

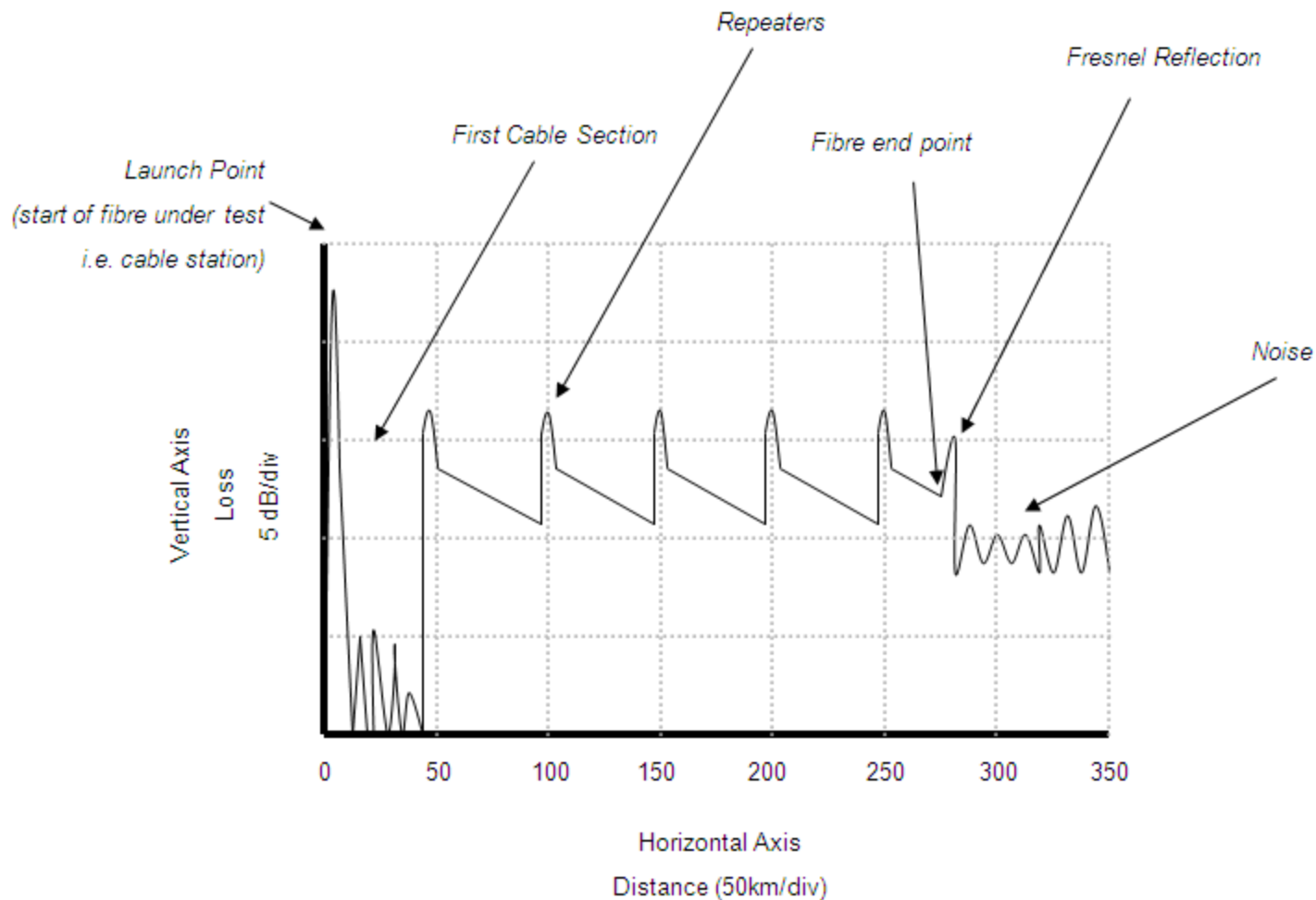
Rapid reconfiguration

Repair

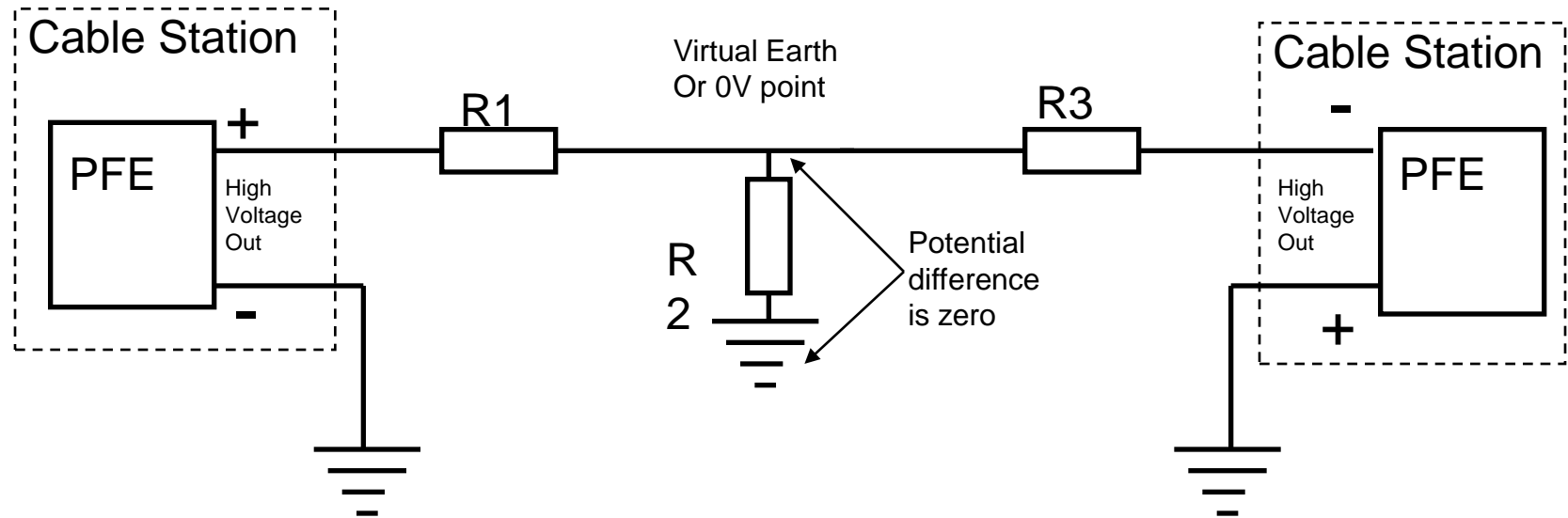
COTDR

Power Feed

# Optical Fault Location Techniques



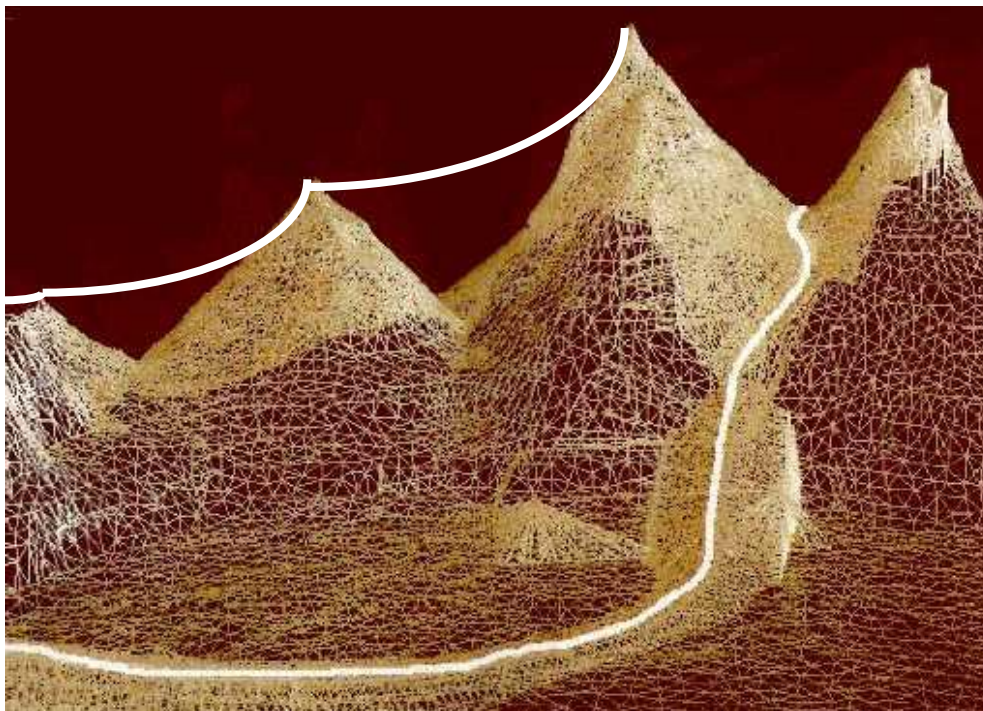
# D.C. Power Fault Location Techniques



# Submarine System Repair Overview

## Indirect causes of submarine cable faults

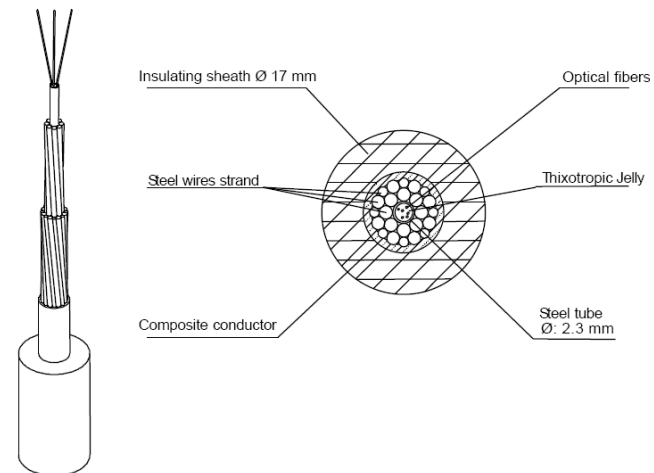
### Suspensions



Incorrectly laid cable can be suspended between two high spots on the seabed. The “touchdown” points can be under a great deal of stress as the suspended cable moves in the water currents. Faults are eventually caused by abrasion.

# Submarine System Repair Overview

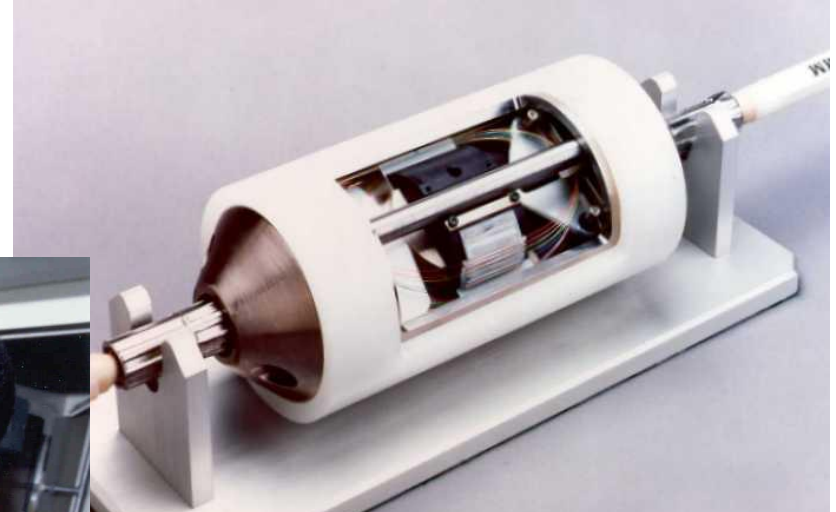
- The Repair Process
- Grapnels



# Submarine System Repair Overview



- The Repair Process



# Submarine System Repair Overview

- The Repair Process
- Testing

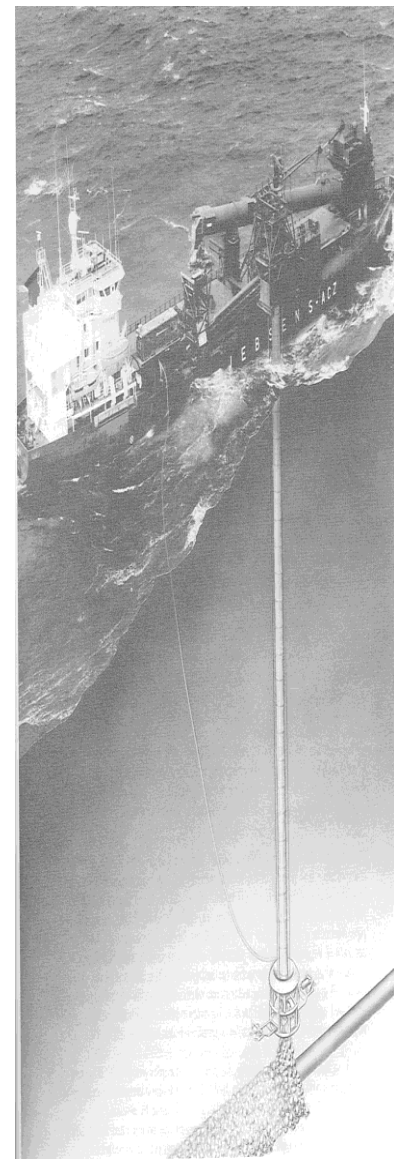


# Customer Experience Scorecard

- 96% of our customers are 'satisfied' with our performance
- 66% are 'very satisfied' with our performance
- 72% 'extremely likely' to recommend us



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Thank You!

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