



**EPIC Technology Meeting on Optical Fiber Sensing
for Structural Health Monitoring**



Fiber Optic Cables & Networks Health Monitoring

Daniele Costantini, Ph.D.

Global Product Marketing Manager – Fiber Test Systems

November 7th 2022

VIAVI Market Leadership

For Complex Network and Sensing Issues

#1 TEST AND MEASUREMENT



Fiber



Enterprise



Cable and Access



Metro and Transport



Lab Production and Manufacturing

#1 WIRELESS AND AVIONICS



5G Test and Assurance



Land-Mobile and Military Radio



Location Intelligence



Aerospace, Nav/Comm, and Transponder

#1 SECURITY, SENSING, AND AUTHENTICATION



3D Sensing



Anti-Counterfeiting



Spectral Sensing



Automotive



Government and Aerospace

VIAVI in Europe

SCOTLAND

- Edinburgh (Services)

IRELAND

- Dublin (Wireless)

ENGLAND

- Newbury (RAN, Geolocation)
- Stevenage (Wireless)

FRANCE

- **Saint-Étienne (Fiber Optics)**
- Plaisir
- Saint-Herblain (Railway Telecoms)

SPAIN

- Madrid



SWEDEN

- Kista

GERMANY

- **Eningen (Optical Transport, Fiber Optics)**

AUSTRIA

- Leobersdorf

ROMANIA

- Bucharest (Systems Software, Enterprise)
- * R&D Center of Excellence

ITALY

- Milan
- Rome
- Torino (Railway Telecoms)

EUROPEAN FUNCTIONAL STAFF SUMMARY

RESEARCH & DEVELOPMENT

455

PRODUCT & SERVICES MANAGEMENT

204

SALES & MARKETING

259

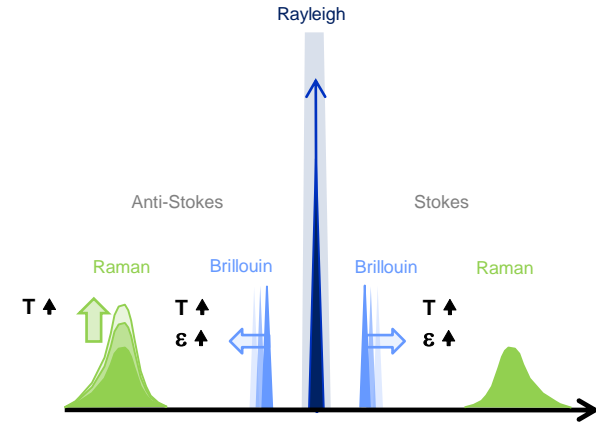
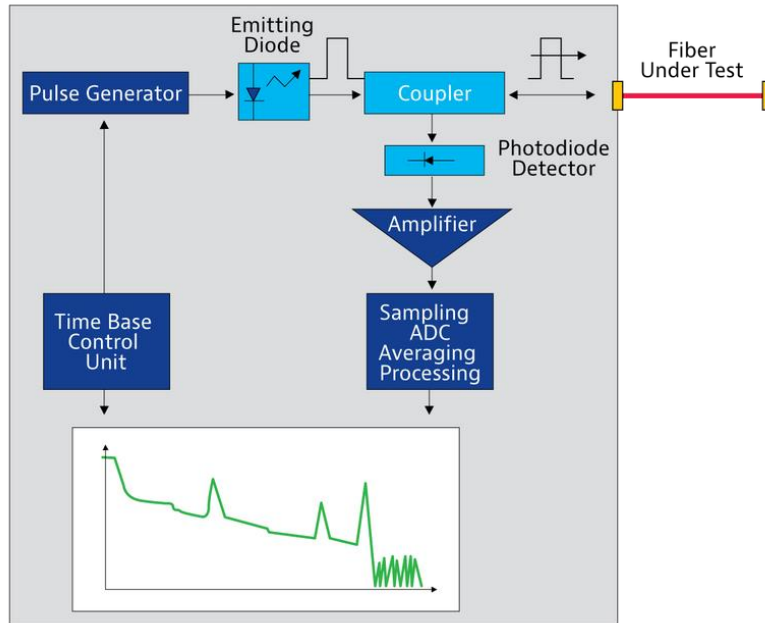
G&A FUNCTIONS

78

TOTAL EMPLOYEES

996

VIAVI OTDRs & Optical Fiber Sensing



Rayleigh OTDR

→ Fiber Monitoring - Loss, Reflections & Failures

Raman OTDR

→ Distributed **Temperature** Sensing (**DTS**)

Brillouin OTDR

→ Distributed **Temperature & Strain** Sensing (**DTSS**)

VIAVI OTDRs & Optical Fiber Sensing



Single Fiber - Single End Distributed Temperature Sensing (DTS)

Buildings & Infrastructure

Fire Detection

Pipelines

Leak Detection

Electrical Power Cables

Hot Spots | Depth of Cover | RTTR

Single Fiber - Single End Distributed Strain & Temperature Sensing (DTSS)

Buildings, Bridges, Pipelines

Pile Load | Structural Health Monitoring

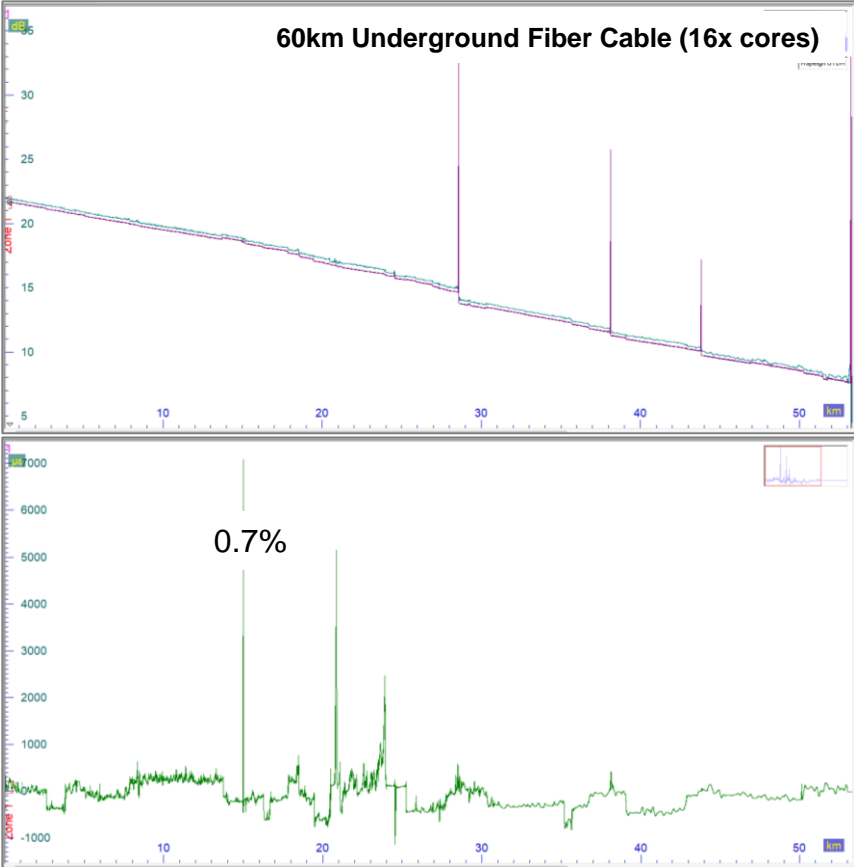
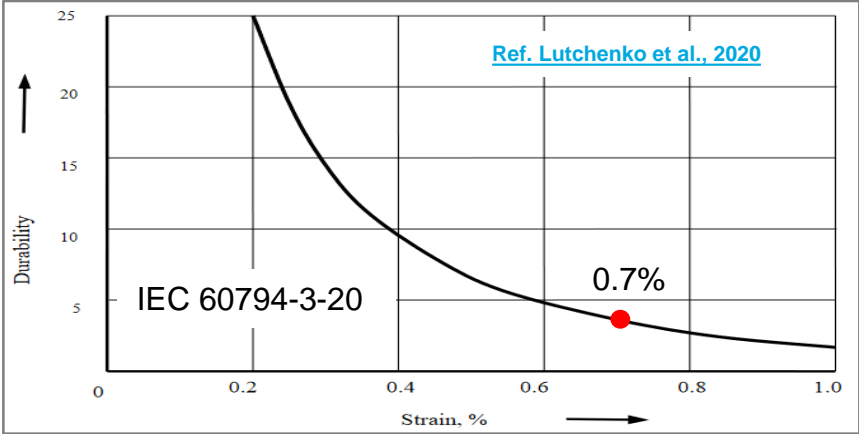
Mining & Tailings Dams

Landslides Monitoring

Electrical Power & Telecom Cables

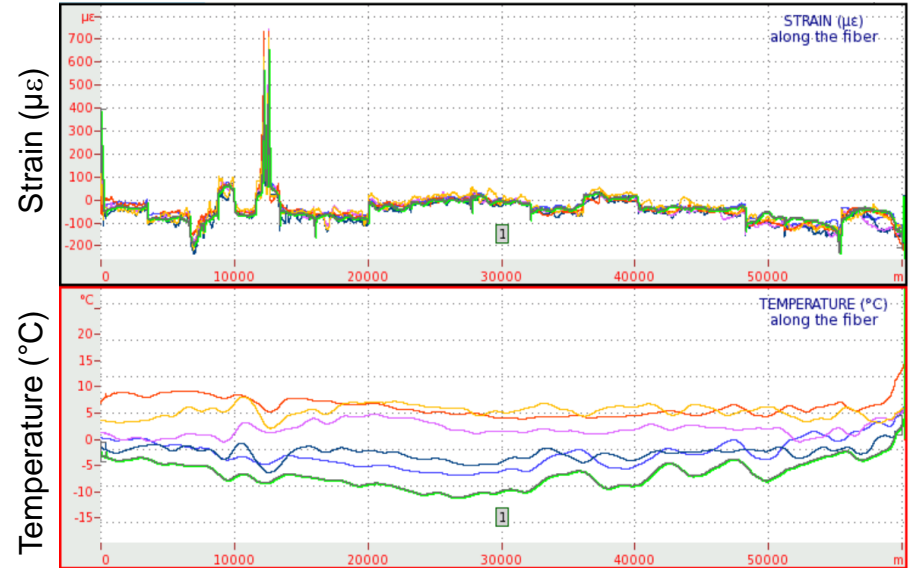
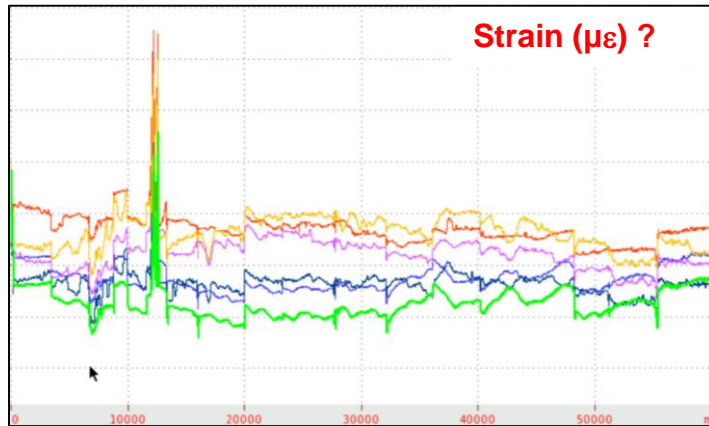
Cable | Asset Health Monitoring

Fiber Optic Cables – Mechanical Reliability



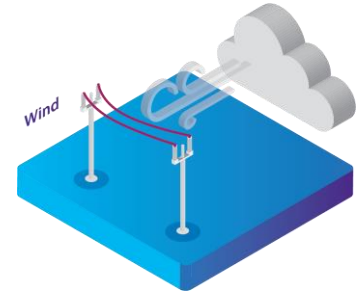
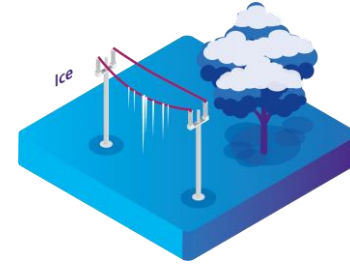
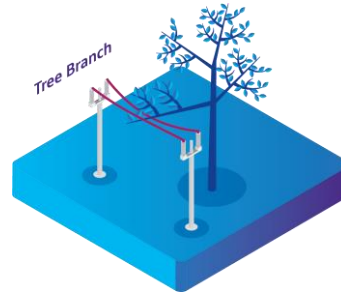
VIAVI Single Fiber – Single End DTSS B-OTDR

60km Aerial OPGW – 6 days & 24h



Fiber Optic Cables & Networks Health Monitoring

Under/Over Ground
Aerial
Subsea



Strain

- Cable Manufacturing
- Cable & Structure Choice
- Installation Loads
- Objects, Ice, Wind Loads
- Ground & Piles Movements
- Seasonal Thermal Loads

Optical Ground Wire (OPGW)



Temperature

- Hot Spots
- Leak Detection

Fiber Optic Cables & Networks Health Monitoring



Asset Lifetime Monitoring Tool

Cable Design & Manufacturing Process

Structure Design & Installation Process

Commissioning

Operations

- Predictive Maintenance
- Repairs Reliability
- Third Party Interference



VIAMI Solutions