



*Certified Sustainable Cable Maintenance*

# Repair and Life Extension of Electrical Cables



# Repair and Life Extension of Electrical Cables

- The FS5 cable repair system is designed to repair damaged or brittle LV to HV cables without shutdown or loss of production whilst removing the costly need for cable replacements.
- We pride ourselves on minimal business interruption as we efficiently find a solution to repairing the damaged cables.
- After rebuilding the damaged sheaths and restoring both insulation and mechanical integrity with our repair system, the cables are protected against both environmental stress and fire.



## UV exposed cables usually do not keep its integrity throughout its designed lifetime

Early aging, brittle outer sheath and water ingress causes disruptions in the facility's operation and becomes a safety hazard.



## FS system can fully repair, restore and upgrade the cables to become UV resistant

Our repair system will create a protective barrier that will ensure the expected lifetime of the cables to be extended by at least 10 years and in most cases much longer.



## Repair of HV cables where sharp bend radius has caused cracks to open on the cable's outer radius

Cracks are filled and repair tape applied to create a new smooth surface before FS coating is applied to add insulation and make it a certified permanent cable repair.



## FS coating is applied to encapsulate the cables

The coating will restore any loss of the cables electrical integrity and upgrade the cables fire technically in accordance with IEC-60331 standard. Our coating is highly elastic and will cope with any minor movement in the cable outer sheath.



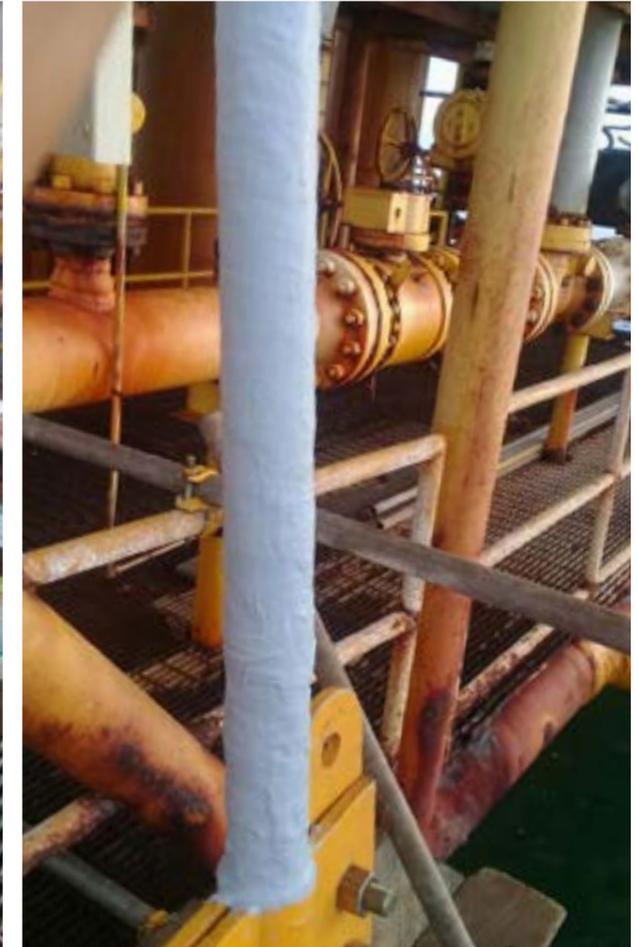
**Oil, drilling mud and hydraulic fluid softens and damages cable sheaths**

FS repair system is resistant to this hydrocarbon degradation, ensuring our cable repair will extend the life of cables exposed to the harshest conditions.



**HV Cables with fire damaged outer sheaths will usually be replaced**

FS repair system will fully replace the sheath where required and restore the cables insulation value. If the cable insulation and conductor is in a good working condition after the fire, the cable does not need to be replaced as our repair solution can fully repair and restore the existing cable.



**Subsea Cable Repair**

Corrosion of the protective armour of a Toplevel subsea cable will normally fail long before the cable itself. This vital cable can then be exposed to impact and easily be damaged. FS has extensive experience in repairing these cables by replacing the damaged armour before applying our coating to stop further saltwater, weather and wind degradation.



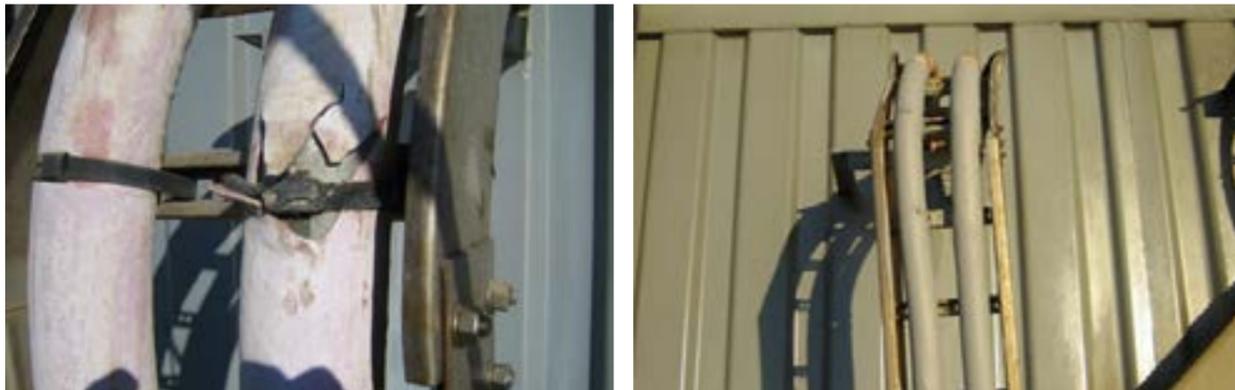
**Drag Chain Cables**

Drag chain cables are in constant movement and exposed to UV, oil and drilling mud. Here extensive single cable repair is carried out on a drilling rig before spraying of all cables to avoid further degradation. Feedback from our customer states this specific cable repair was still in good working condition 8 years after we conducted the job in 2012.



### Chafing Damage

Chafing damaged cables is a typical damage for FPSO's and Vessels due to movement in the hull. FS repair system will fully repair these cables and prevent further chafing to occur in the future.



### Mechanical Damage Cable

Some of the major advantages of using FS cable repair system is that we can repair the cable only where the damage is, while the cable is energized. If the cable is located in a high-risk area for mechanical impact, we can also make the cable mechanically stronger than the original.



FS repair system fully repair chafing damages and prevent further chafing to occur in the future.



## Sustainable Cable Maintenance

*Protecting and prolonging the life span of electrical cables, FS has proven its worth for decades. We have an extensive reference list stretching from industrial plants, oil rigs and cruise ships to offshore wind farms. Our products are approved by leading classification societies and authorities. Our core activities are:*



*Using warranty backed applications only, FS repairs and upgrades damaged cables.*

### **Cable life extension**

The FS coating systems upgrade your cables and extend the lifetime by up to 3 times. No other fire protective cable coating is certified to be as resistant to UV, water, mud, oil, and a wide variety of damaging chemicals.

### **Cable repair**

We repair cable sheaths that are damaged by UV, oil, mud, and mechanical stress. The coating restores the cable value, prevents future damage to cables and cable jackets, and eliminates the need for large-scale replacement. This is done with minimum shutdown time.

### **Fire protection**

No other cable coating system has equal or better fire protection properties. Our coating provides superior fire protection compared to standard cables and can upgrade existing cables to the highest fire technical standard.

**SAVE LIVES / SAVE COSTS / SAVE THE ENVIRONMENT**





## Certified Sustainable Solutions

*FS offer certified sustainable solutions to extend cable life and avoid electrical fire, using nothing but non-toxic materials.*



Our commitment to the environment is documented through our DNV ISO 14001 environmental management systems certification.

mitigates the negative end-of-life environmental impact of cables, as well as the inherent environmental and resource cost of excessive production and installation of new cables.

### Repaired cables are fully restored and functioning

FS procedures are tested and approved. We deliver a turnkey solution that avoids operation shutdown, removes the costly need for cable replacements, and halts the spread of further damages. Rejuvenated cables continue their operation with a warranty backed application.

Fire Security products and systems are LEED and EPA 24 compliant, non-toxic, solvent-free, phosphate-free, and do not contain asbestos or any other substance identified as being cancerogenic. Our products release no poisonous and corrosive gases and smoke.

### Significant reduction of excessive production and waste

By extending the life of cables, FS limits the need for resource-intensive cable replacement. Cables contain large volumes of plastic, PVC, XLPE in sheets and insulation. Those components are commonly incinerated openly or disposed of in landfills. Extending cable lifetimes

### Prevention of toxic and poisonous gasses

Our coatings prevent flame propagation and prevent escalation from a small fire to a major incident. FS cable fire protection minimizes impact from short circuits, removes cables as a source of combustion and prevents the release of toxic & poisonous gasses.



#### GREENHOUSE GAS EQUIVALENCIES CALCULATIONS

The Global Warming Potential (GWP 100) of production of 1000 meters of Single Core 630 mm<sup>2</sup> Voltage Grade 64/110KV cable is 32863 kgCO<sub>2</sub>eq. Extending the operating life of such cables and avoiding replacement has significant positive impacts.



**1 meter = 82 miles**  
Keeping just 1 meter of cable in service is the equivalent of removing the GHG emissions of an average family car being driven for 82 miles.



**10 meters = 39,975 charges**  
Keeping just 10 meters of cable in service is the equivalent of removing the CO<sub>2</sub> emissions 39,975 smartphones being charged.



**100 meters = 1.1 tonnes**  
Keeping just 100 meters of cable in service is the equivalent of avoiding the GHG emissions of 1.1 tonnes of unrecycled waste in a landfill.



**1000 meters = 76 barrels**  
Keeping just 1000 meters of cable in service is the equivalent of removing the CO<sub>2</sub> emissions from the consumption of 76 barrels of oil.



## Certified Sustainable Cable Maintenance

FS offer certified sustainable solutions to extend cable life and avoid electrical fire, using non-toxic materials.

*Save Lives / Save Costs / Save The Environment*

Our products have been approved by leading classification societies and authorities including U.S. COAST GUARD, IMO MED D & IMO MED B, Lloyd's Register, Achilles, Bureau Veritas, DNV, RINA, NMA, ABS, FM and UL



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