

PRODUCT OVERVIEW

V-LIFE technology
supporting
operators for
over a decade

10⁺
YEARS

V-LIFE

Insulation Resistance Recovery



 **VIPER**
INNOVATIONS[®]

Award-winning technology with proven results since 2012



V-LIFE is the only preventative and active ‘healing’ solution for low insulation resistance caused by water ingress.

The most common cause of subsea electrical failures is the ingress of water into the cable insulation, which decreases the insulation resistance (IR) and may produce short circuits or leakage to earth. These faults often lead to loss of power and/or communications to subsea equipment and have the potential to halt production from subsea wells.

It has been demonstrated that prolonged operation of subsea power circuits with particularly low IR can lead to the loss of copper from the conductor at the fault site which in turn can lead to the complete loss of operability of the system. Before V-LIFE became available, expensive subsea fault-finding interventions and the replacement of cables, equipment and umbilicals were the only solutions to this problem.

The V-LIFE effect is achieved by the application of a low-voltage passivation signal to the faulty line, which through an electro-kinetic and electrochemical process generates and sustains a solid precipitate at, and only at, the location or locations in the subsea circuit where seawater has ingressed. The precipitate produced is electrically insulating and its propagation at the source of the fault results in an increase in the IR of the circuit often by more than 100x.

A V-LIFE application involves the installation of a V-LIM line insulation monitor (the hardware) and the enabling of its V-LIFE passivation signal by the upload of a software config file. V-LIM and V-LIFE can typically be installed and commissioned within 2 to 3 shifts offshore. The installation work is all topside. No subsea intervention is required. The only solution other than costly subsea repair or total umbilical replacement.

Key benefits:

- Increases IR without subsea intervention
- Recovers multiple IR failures throughout the system
- Extends the life of failing umbilicals and electrical distribution equipment
- ‘Buys time’ whilst a new umbilical is procured
- Used as an alternative to installing new, costly and long-lead time umbilicals
- Used to delay early field abandonment
- V-LIFE ‘finds’ the points of water ingress, no diagnostics required
- Environmentally friendly alternative to CO2 heavy umbilical replacement methods

V-LIFE - Helping operators to extend the life of subsea assets.

Supporting 30+ global operators, spanning 6 continents

THE LEADING ALTERNATIVE TO SUBSEA INTERVENTION.

Key features:

- Compatible with comms on power systems
- Provides all the features of a Line Insulation Monitor including IR measurements and configurable alarms/trips
- Compatible with power and/or signal lines
- A range of installation options to suit all field applications
- Displays IR measurements graphically in real time
- Compatible with single or three phase systems
- Graphical touch screen LCD
- Advanced control and configuration via USB and Ethernet interfaces
- Typically recovers IR from $k\Omega$ to $M\Omega$ within a few days

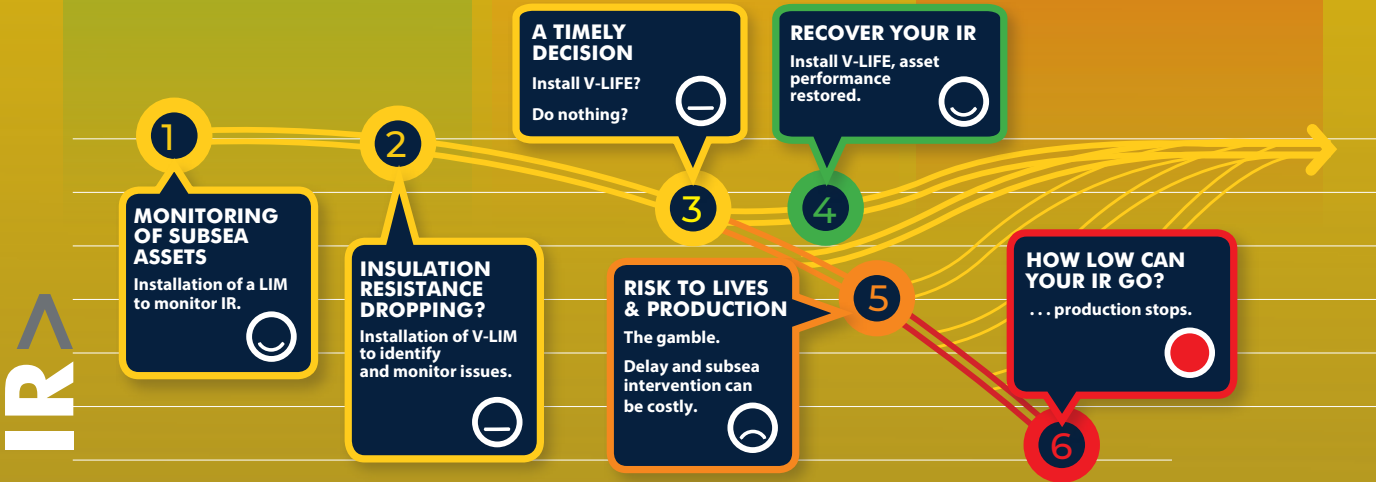


ARE YOU EXPERIENCING LOW IR?

If you are experiencing low IR, a timely decision is essential, as ignoring the issue can be costly and results in health & safety mitigations.

WHAT ARE YOUR OPTIONS?

<h1 style="font-size: 48px; margin: 0;">1</h1> <h2 style="margin: 0;">Commission V-LIFE</h2> <p>Simple and easy to install.</p> <p>V-LIFE technology is embedded within the V-LIM, a LIM device with a difference.</p> <p>As well as continuously monitoring IR levels, this proven technology uses an electro-kinetic and electrochemical process to actively heal and improve cable insulation that is failing due to water ingress.</p>	<h1 style="font-size: 48px; margin: 0;">2</h1> <h2 style="margin: 0;">Replace hardware</h2> <p>The traditional approach.</p> <p>The decision to replace failed hardware is affected by many factors – ranging from technical to economic. The cost of subsea intervention can be substantial.</p> <p>The decision-making process is complex with no guarantee of a successful outcome.</p>	<h1 style="font-size: 48px; margin: 0;">3</h1> <h2 style="margin: 0;">Mitigate the issue</h2> <p>Choosing to ignore the issue can lead to a risk to production and potentially the safety of personnel.</p> <p>It can also result in damage to the electrical conductor due to copper loss, which could ultimately lead to an unrecoverable system failure.</p>
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IR >

TIME >

V-LIFE - A solution that's proven & successful.



CASE STUDY

V-LIFE RECOVERS INSULATION RESISTANCE BY 200 TIMES, PROVIDING OPTIMUM OPERATIONAL LEVELS FOR OPERATOR IN THE GULF OF MEXICO.

Operators in North America have benefitted from Viper's V-LIFE insulation resistance (IR) recovery technology in a number of locations across the continent, with a major Operator now leading the charge in the Gulf of Mexico.

This case study looks at how V-LIFE was used to avoid a threat to continued production of a subsea production control system, resulting in a 200 times increase in insulation resistance (IR) within a week. Six months later, the channel continues to provide strong and consistent IR results; providing a value-added solution.

As part of their asset management process, an Operator in the Gulf of Mexico was keen to activate V-LIFE to help recover the electrical integrity of the umbilical; helping to avoid loss of communication after experiencing low IR levels of 460k Ω .

The subsea control system Original Equipment Manufacturer (OEM) was tasked with installing the V-LIM hardware topside into the subsea production control system. V-LIM, Viper's line insulation monitor, is an accurate and precise sensor which monitors electrical cable integrity and allows activation of V-LIFE via software config file. No subsea intervention is required.

Due to excellent collaboration between the Operator, the OEM and Viper, along with detailed planning and bespoke procedures prepared for the task, this process was completed efficiently and seamlessly with V-LIFE activated after only 2 hours.

The activation of V-LIFE resulted in an IR increase of almost 100 times on the same day, with the initial reading of 460k Ω increasing to 43.8M Ω within hours. Within a week, this had doubled again to over 200 times the initial readings, reaching in excess of 100M Ω . These strong results remain stable and consistent, avoiding the need for costly subsea repair or total umbilical replacement.

Following the success of the initial results, the Operator took the decision to continue using V-LIFE as part of their asset management strategy to mitigate the costly risk of loss of a production. 6 months later, the channel continues to provide strong and consistent IR results.

THE OPERATOR COMMENTED:

"V-LIFE was activated seamlessly and has delivered outstanding results, providing protection against subsea controls failures."





Get in touch with one of our experts today and learn what V-LIFE could do for you.

For more information visit:

www.viperinnovations.com/us/v-life

or speak to one of our experts on:

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