



Fault Location on Subsea Cable

Using TDR techniques to save downtime and \$\$\$

Problem

The client had a need to identify the cause of the low Insulation Resistance (IR) readings on a 750m subsea cable connected to a wave generator. Time Domain Reflectometry (TDR) testing was offered to the client as a means to determine the location of the cable fault which contributed to the low insulation resistance readings.

Fault Location

The TDR technique was employed to detect the fault. By injecting a pulse onto each phase with the timing of the reflected pulses being calculated to determine the cable length and fault locations.

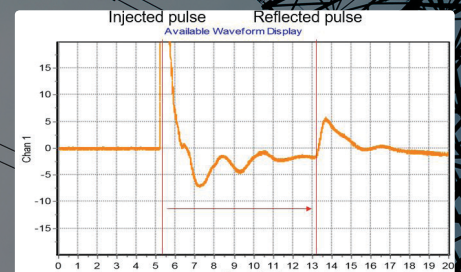
Results

	Cable Length	750 m
	Pulse Return Time	8.03 μ s (93m/ μ s)
A Phase	Reflection	3.72 μ s
	Location	3.72 x 93 ~ 346m

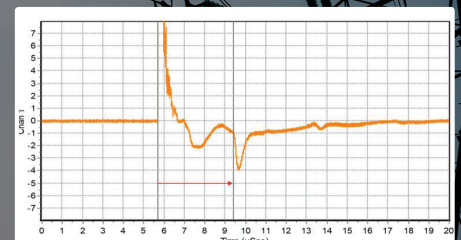
Findings

The TDR test technique was able to accurately locate the fault on the A Phase cable at 347 metres from the land based Transformer end of the cable.

A diver was sent to the nominated location (347 meters along the cable) and the cable fault was clearly visible, with damage caused by the cable moving on the reef.



Results from TDR Testing



Results from TDR Testing



Damage located on subsea cable by TDR Testing

Outer sheath and one phase cable almost completely worn through

The next step...

Following repairs, commissioning tests were conducted which included Insulation Resistance (IR) and On-Line Partial Discharge Testing.