

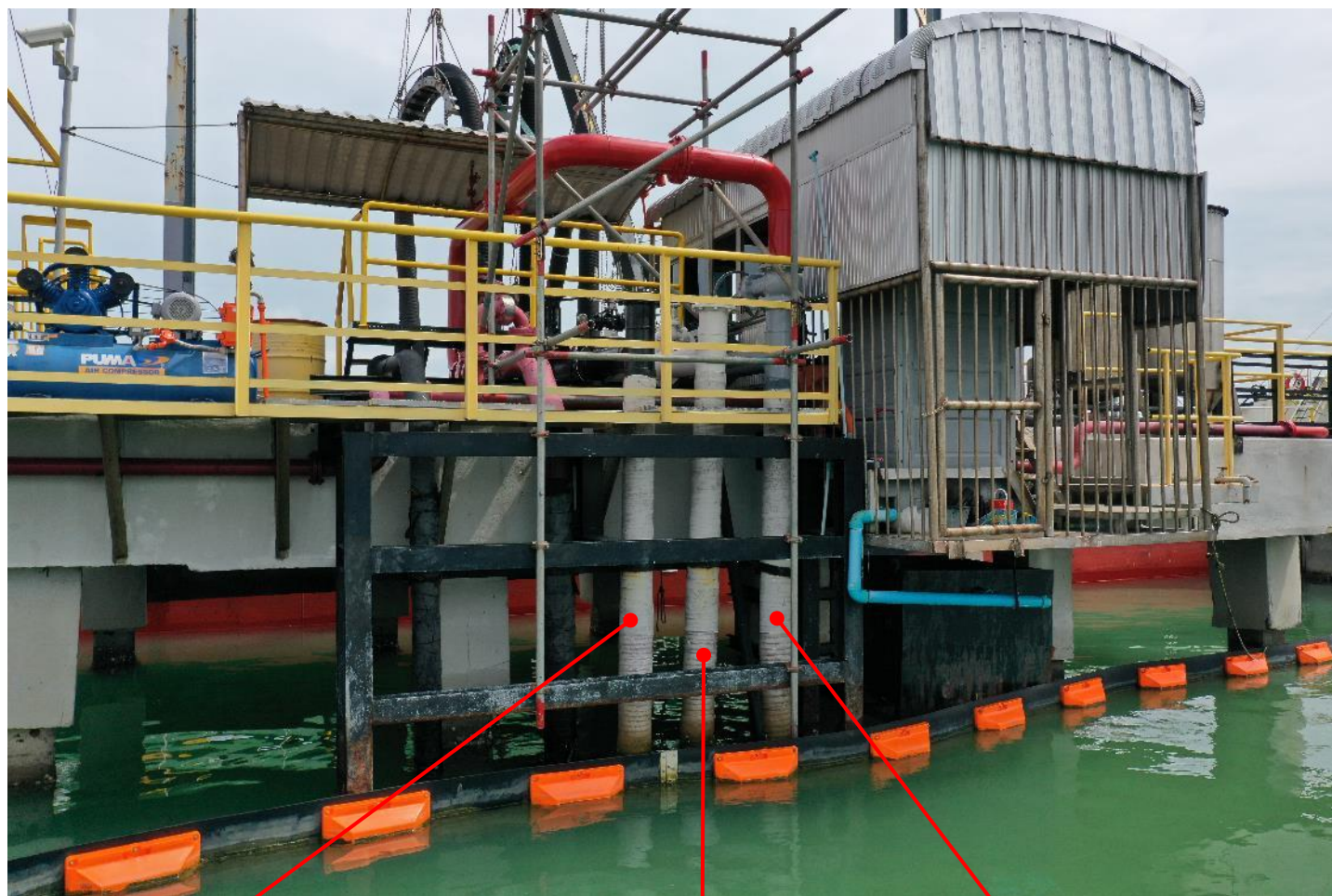
Rehabilitation of an offshore crude oil pipeline in Thailand

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25th May 2023



**Chevron Corporation** is a large North American oil corporation with over **50,000 employees** in more than 180 countries and a turnover that last year skimmed **195 billion dollars**.



Pipeline 1

Pipeline 2

Pipeline 3

Songkhla JO operates three 8-in concrete lined jetty transfer pipelines at Songkhla Port, Thailand. The lines were installed in 1997 and are used to transfer white and black hydrocarbon products between the jetty and tank farm.

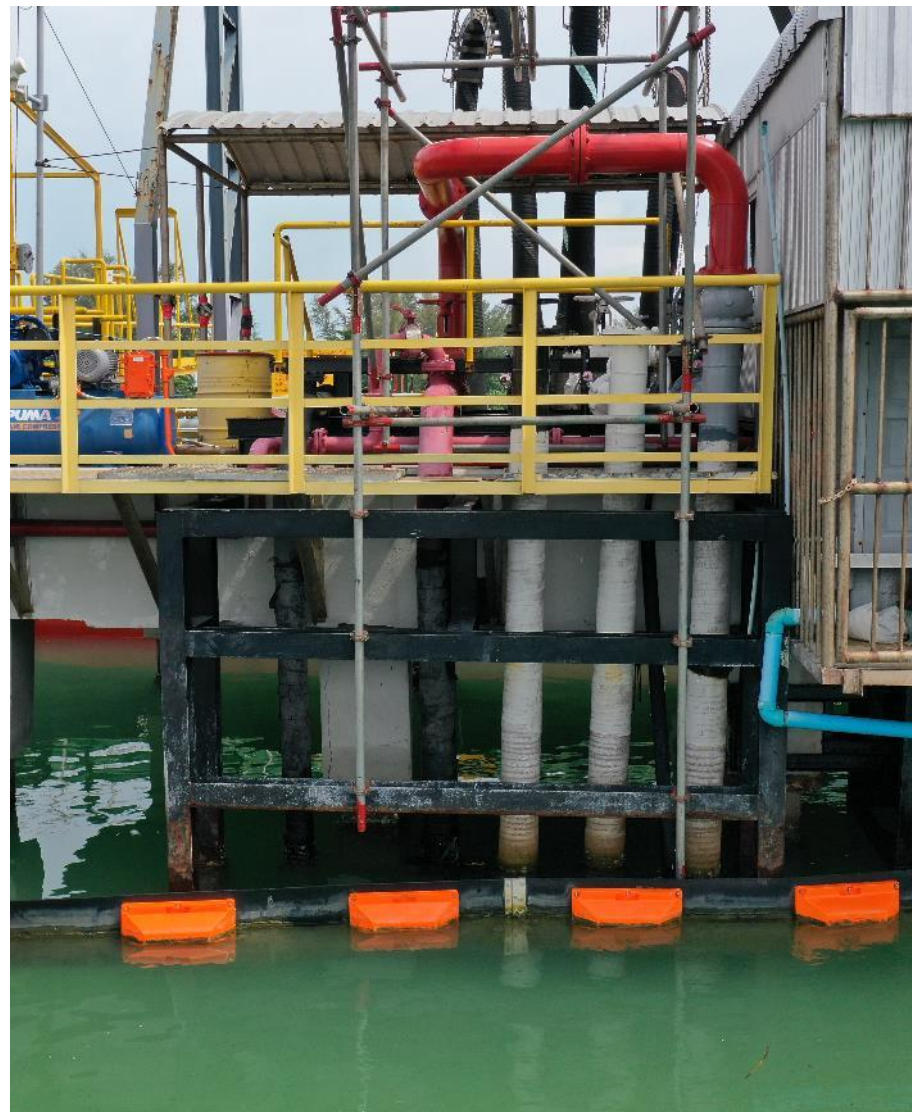


- **Location:** Songkhla Port, Thailand
- **Pipeline length:** 1.000 m
- **Pipeline diameter:** 219 mm
- **Year installed:** 1997
- **Nominal Wall Thickness:** SCH80 12,7 mm
- **Material:** API5L Grade B Carbon Steel
- **Internal Liner:** 10mm NWT Cement
- **External Coating:** Bitumen Wrap
- **Number of Pipe sections:** 141
- **Number of Girth Weld joints:** 150
- **Number of Elbows:** 10



## Project working steps.

1. Site mobilization onshore
2. Site mobilization offshore
3. Pipeline CCTV
4. Pipeline cleaning pig
5. Pipeline cut and temporary piping
6. Rope connection
7. Liner installation
8. Liner pressure test
9. Tie-in and test spool piece installation
10. Site demob.





## Products for hydrocarbons



G-Liner for gas



O-Liner for oil



F-Liner for overland piping

## Composition of the liner – DN 150 to DN 500.

### Outer layer:

Abrasion-resistant PE sheath

→ Protection of the fabric during insertion process

### Reinforcement:

Aramid fibre fabric (one or two layers)

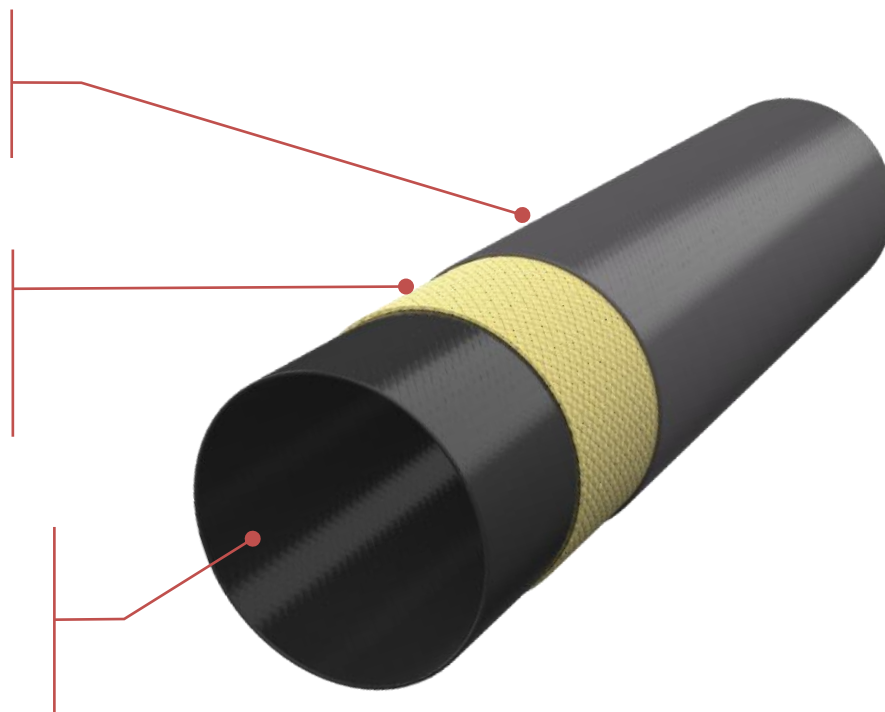
→ Absorption of the tractive forces during insertion

→ Accomodates the operating pressure by itself

### Inner layer:

Based on PE or TPU

→ Sealing the reinforcement against the transported fluid



## Primus Line technology



Flexible high-pressure liner

Patented end fittings

Primus Line® system



## What is Kevlar ® ?

Synthetic aramid fiber developed by Dupont® in 1965.

Ultralight and ultra-resistant material.

Great mechanical tensile strength.

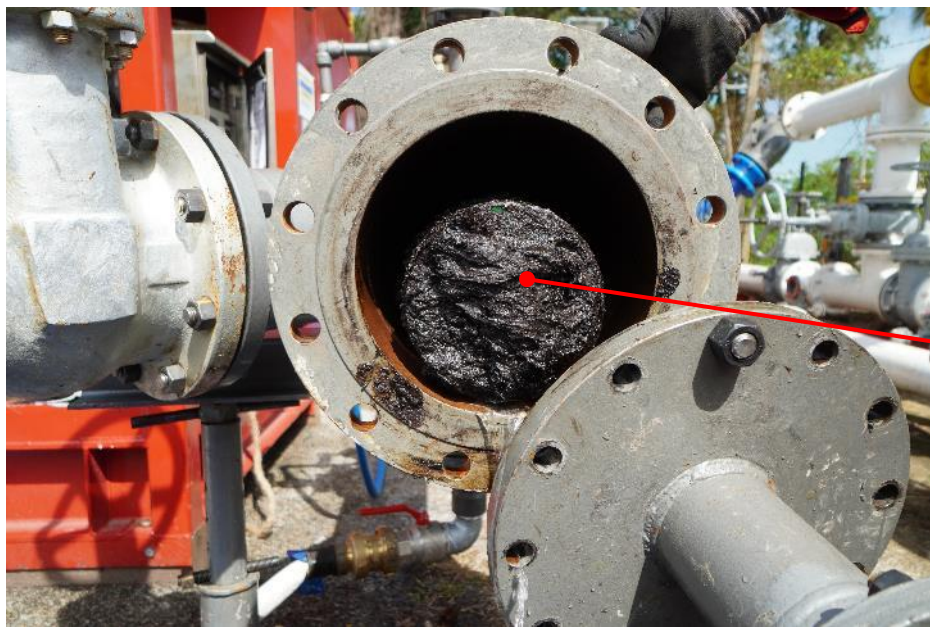
Weight for weight it is 5 times stronger than steel in tensile strength.

Used for PPE, bulletproof vests, motoring, aviation, sports equipment etc.



## Pipeline cleaning

FO line to be converted in Diesel/Mogas line



Cleaning pig



## Pipeline cutting



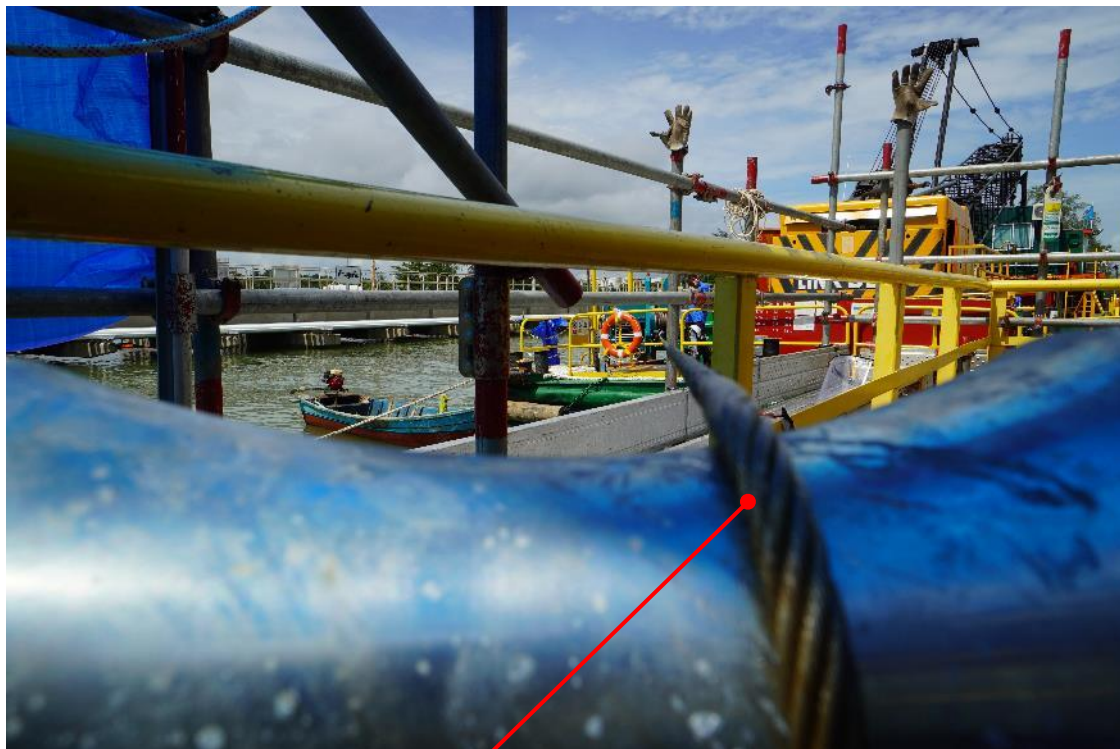
Cold cut offshore



Cold cut onshore



## Cable pulling

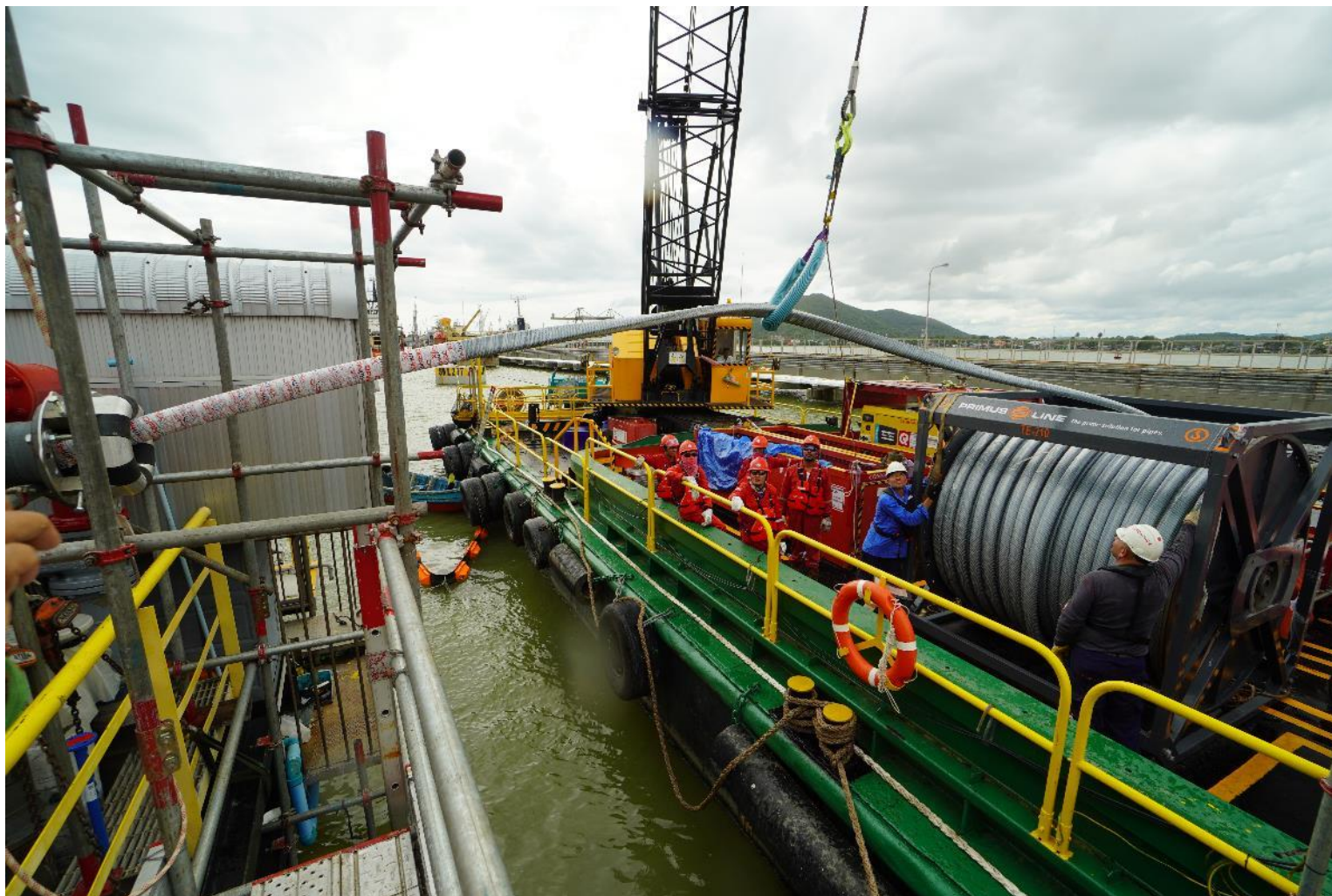


Cable pulling





## Liner installation



## Liner installation





## Liner installation





## Liner installation



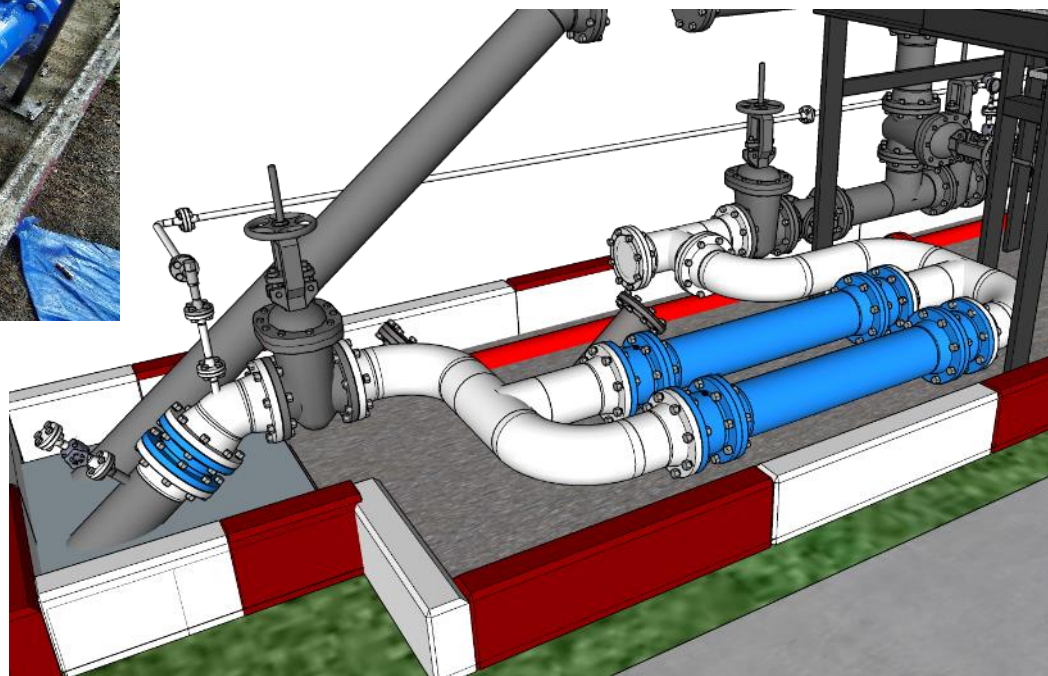


## Pressure testing





## Tie-In and test spool piece installation









# Fine.

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