



CASE HISTORY- PMI-107 **ONGC B193 SUBSEA PIPELINE**

The Problem (as described by ONGC)

"ONGC is experiencing legacy build-up of wax, asphaltenes, scale which results in reduction of pipeline flow due to deposition and reduction in production performance. Currently the 12" pipeline is calculated to have no more than a 3" flow capacity which is un-piggable and in a critical state. ONGC have treated this subsea pipeline every month with xylene and toluene mix at 40% concentration since December 2016 till the last treatment 26th July 2017. The last treatment was completely ineffective and required an immediate repetition. There had been 8 treatments over this period. Every month the pipeline reached a critical pressure of over 100bar which fell within the elastic safety limit thereby creating a state of permanent emergency."

Rectification Proposal

Pipeline Maintenance International LLC (PMI) is a supplier of a range of specialist, proprietary chemicals designed for use in the Oil and Gas Sector. PMI has its Commercial Headquarters in the UAE with its Manufacturing and Technical Centre in the UK.

PMI proposed one of their products - PMI-107 as a solution to ONGC's endemic problem as described by them, above. ONGC accepted the proposal.

PMI-107 Product Description

PMI-107 is a highly effective wax and corrosion inhibitor. Its variant, PMI-107FA has a non-toxic additive which completely neutralizes H₂S at source. PMI-107 is an amphiphilic compound formed of nano-particles.

PMI-107 is applied directly into the oil flow on a continuous low level dosing regime whilst the system is on line, so there is no disruption to production. PMI-107 requires kinetic activity.

The intrinsic feature of the basic product which gives rise to its performance is the ability of PMI-107 to retain all the elements in the flow of produced crude as a homogenous stream whilst keeping the droplets of water separate from the droplets of oil. This results in all the impurities (such as carbonates, salts, sulphur, waxes, asphaltenes, among others) whether they be dissolved in water or entrained in oil, remaining combined as an integrated stream whilst the whole remains in motion. This is inherent in the chemical structure of PMI-107.

PMI-107 is an organic substance which offers a further benefit. There is the natural tendency for organic materials to be adsorbed onto steel surfaces. As a result, once PMI is applied to the system it immediately forms a protective film on steel contact surfaces which prevents the onset of corrosion, wax accretions and reduces drag.

The Objectives of the Procedure

1. To reduce pipeline pressure to 70 bar
2. To achieve a production flow rate of 11,000bbpd

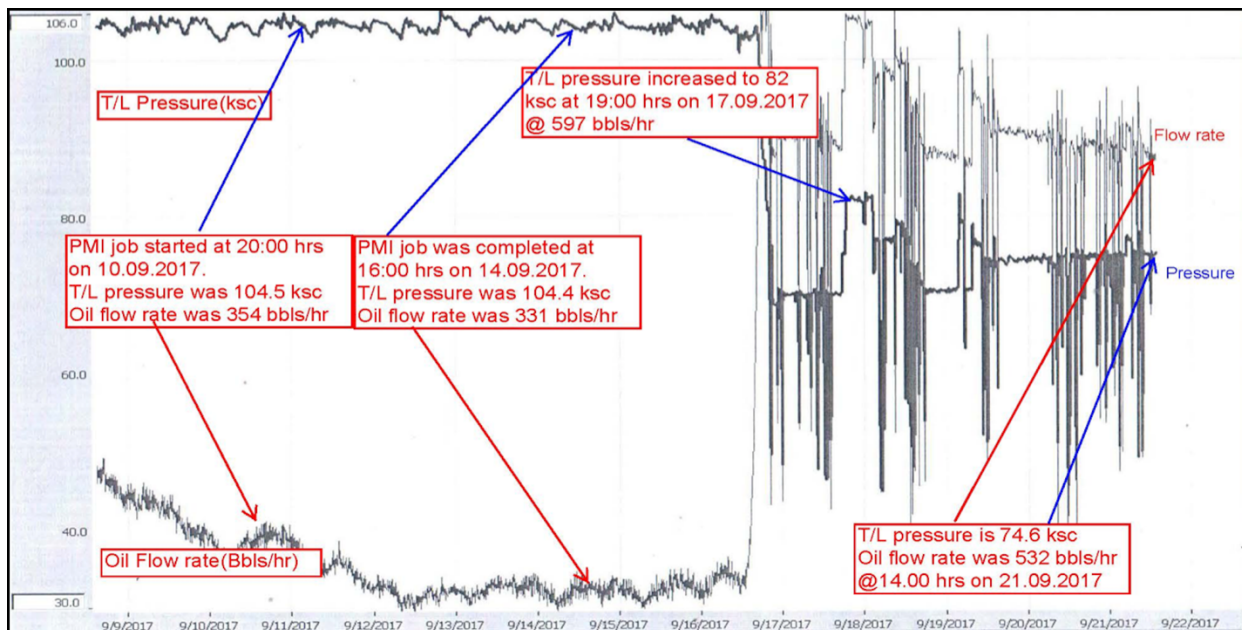
The Method

PMI -107 was injected at the wellhead at a rate of 500ppm directly into the oil flow on the platform. The injection procedure was run continuously over 24 hours by means of an electric pump. The procedure was scheduled to run for 15 days. Adjustments to the dosage rate and dosage pump pressure were made on a real-time basis to take account in changes in the conditions of the oil flow as the procedure progressed.

The Result

After just **four days** of application:

- **Line pressure reduced from 106 bar to 70 bar**
- **Flow rate increased from 8,496 bbld to 14,328 bbld**
- **Total chemical usage 4,500 litres (22.5 drums)**
- **Productivity value increase \$19 million per month (annual equivalent \$228 million)**



Conclusion

The effect of PMI-107 was to re-suspend the legacy wax in the pipeline and prevent new accretions taking place, thereby freeing up the oil flow to a level significantly higher than target.

Operational Line pressures were brought back to a safe level.

The whole result was achieved in just four days compared to the allotted duration period of 15 days

Full supporting literature, SDS and TDS immediately available on request