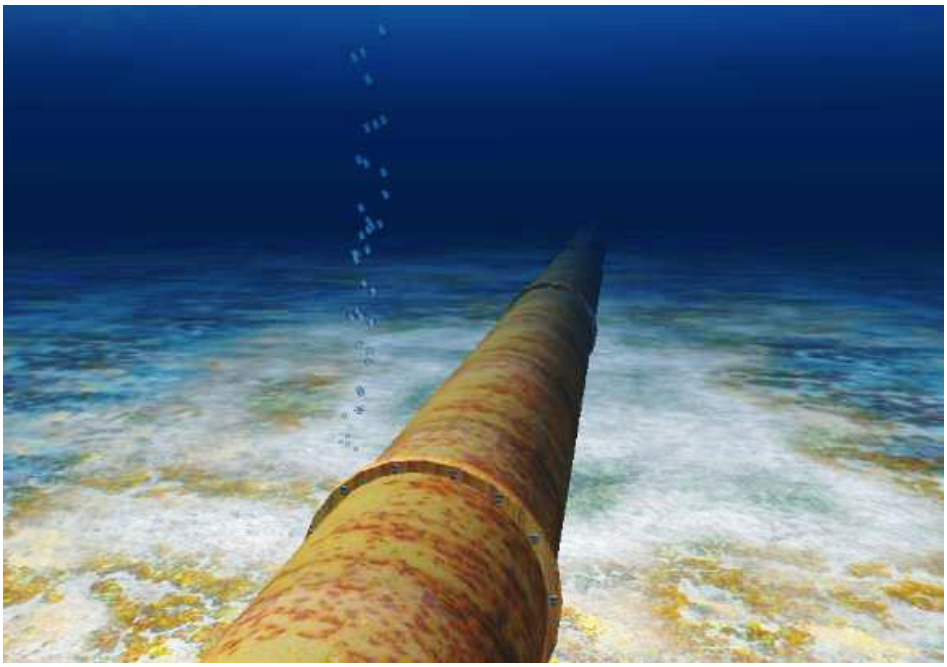
Vortex Induced Vibration (VIV) of Pipeline

Client Confidential

The Problem

A subsea gas trunkline was subject to routine Remotely Operated Vehicles (ROV) inspections. A recent inspection showed that unexpected scouring of the seabed had created an unsupported free-span in the pipeline, some 40m long. It was unclear whether this may have occurred between inspection periods in the past and then been re-covered by later movements in the seabed, nor what the implications were for the life expectancy or integrity of the line. MMI were asked to assess the situation and propose a sensible way forward.



Our Approach

We immediately assessed the safety and commercial risks facing the operator. The pipeline carried gas and was remote, so the safety risk was not assessed as too high. The asset it served was approaching the end of production and so the financial risk; while still significant, was tolerable. We concluded that immediate intervention was not necessary and a more detailed assessment could establish whether there was sufficient fatigue life remaining in the line to see it through to the end of production, or whether some intermediate measures, such as rock dumping, were necessary.

Using historical metocean tide and wave data we were able to develop a VIV fatigue load history and apply it to the pipe. The predictions suggested that the remaining fatigue life would be adequate, providing the future wave loading remained below a statistically determined level.

Outcome

The operator is now in a position to maintain production while monitoring local wave heights. Some future options include instrumenting the free-span area to provide continuous vibration data, and ensure the fatigue life is not exceeded.