



INTEGRITY MONITORING

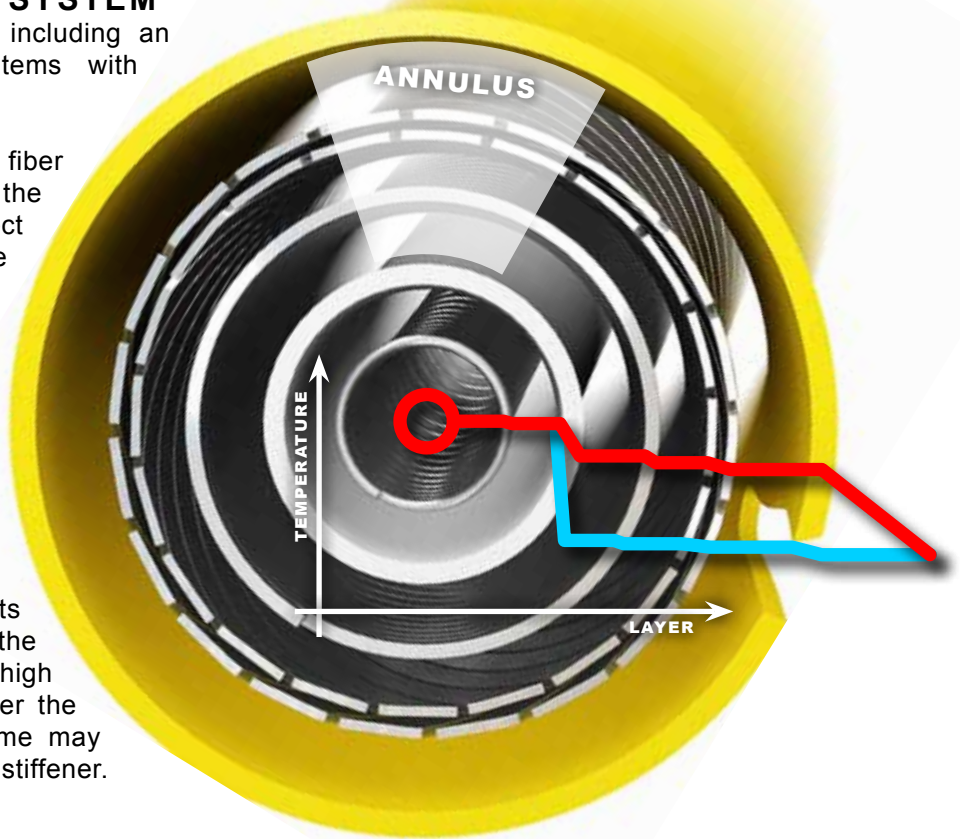
TEMPERATURE MONITORING SYSTEM

NKT Flexibles is offering the option of including an embedded temperature monitoring systems with deliveries of flexible risers.

The monitoring system is based on optical fiber sensors embedded into the annulus of the flexible riser. The sensors are able to detect the temperature continuously along the entire length of the instrumented pipe, and log coherent data of temperature, time and position.

With the design information of the flexible pipe, including the thermal profile, the data from the temperature monitoring system can be used for condition monitoring and event detection.

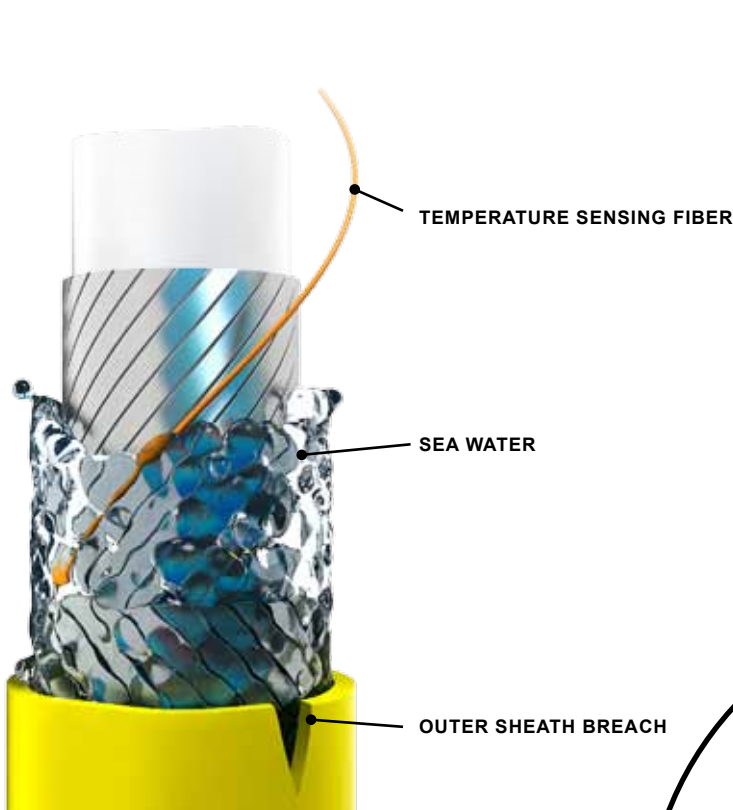
One application is monitoring of hot spots in the flexible pipeline, such as under the bending stiffener for wells operated at a high bore temperature. A high temperature over the design limit at an extended period of time may degrade the polymer layers in the bending stiffener.



- The thermal profile shows a characteristic temperature drop across the various layers
- A breach of the outer sheath will cause a temperature drop in the annulus

Temperature monitoring along entire pipe length during shut-down (prevent hydrate clogging due to trenching)

Temperature Monitoring System



Detection of breach of outer sheath. When the outer sheath is breached, sea water will enter into the annulus resulting in a local temperature drop. This will be detected and reported with time and position of the occurrence.

