RMF SYSTEMS

PASSING BY

Newsletter from RMF Systems **edition 10, July 2001**

RMF Systems specified for Statoil Gas Receiving terminals.

Zeepipe.
Statoil is the operator of the Zeepipe, which is a network of pipelines for the transport and processing of gas. The Zeepipe consists of a 40 inch diameter pipeline from Sleipner East to the Zeepipe terminal in Zeebrugge, Belgium, with a total length of 814 km, a 40 km pipeline from Sleipner East to the Draupner platform and last a 300 km pipeline from Kollsnes Norway to Draupner East. Most pipelines are in trenches or on the seabed, and in areas with strong currents pebbles are used to assure the pipeline's stability.
The gas flow through the Zeepipe is regulated and controlled from the control centre in Bygnes in the South-west of Norway. This control centre continuously receives information about volume, pressure and composition of the gas directed from the various gas fields to the receiving terminals.

Zeepipe Terminal.
The Statoil operated Zeepipe terminal is a receiving station for gas from Sleipner East and West as well as Troll. The terminal is located in the back port of Zeebrugge and connected to the landing point of the Zeepipe with a 5 km underground pipeline. At the receiving station the gas is freed of possible fluids and solid particles. The gas is heated, pressure lowered and the quality checked prior to inland distribution. The Zeepipe terminal has three parallel process units of which two are operational and one unit is a back up. The terminal has a daily capacity of 42 million Nm^3 gas, the yearly capacity is 12 billion Nm^3. The Zeepipe terminal has been operational since October 1993 and supplies customers in Belgium, France and Spain.

NorFra pipe line.
The NorFra pipeline starts at Draupner East and comes ashore 840 km further at Dunkerque, running across the Norwegian, Danish, German, Dutch, Belgian and French territorial waters. The steel tube is protected by an external anti-corrosion coating and a coat of concrete some 60-110 mm thick. Aluminium anodes are attached to the pipe to prevent corrosion. The line is designed for a maximum pressure of 156,8 bars and its annual transport capacity is about 14 billion cubic metres of gas. At its start, the route by and large parallels the Zeepipe trunk line which runs from Sleipner to Zeebrugge, the two lines are installed about 50 to 100 m apart. At its southern end, the NorFra pipeline turns to the west and follows a new route for about 100 km to its landfall.

Landfall.
NorFra comes ashore in the industrial district of Dunkerque's Port Ouest, in the community of Loon Plage. The pipeline is buried over 3,7 km between the isolation valve of the landfall station and the receiving terminal. The receiving terminal is similar to the Zeepipe terminal in Zeebrugge, it can attain a daily capacity of 50 million cubic metres of gas. A fiscal metering station is integrated in the terminal to verify volume and quality.

RMF Systems at Dunkerque.

In 1999 the Belgium RMF Systems distributor BSF Filtertechniek was approached by Statoil to tender for some custom made filter systems to protect the four Remote Operated Valve systems at the Dunkerque station. These ROV's are hydraulic operated and part of the safety shut down system for the terminal. The filter systems had to be independent of the system and guarantee suitable fluid cleanliness for the hydraulic fluid. Special requirements obviously existed in way of electrical connections and protection of the harsh salty sea air. A solution was found in a more or less standard off-line filters with flows of maximum pump flow of 1,2 litres a minute.

The units were mounted in stainless steel cabinets to protect them from the sea air. Depending on the zoning in the plant Eex(d) electrical motors were fitted in combination with corresponding on-off motor switches and thermal protectors. The tender included installation on site, inclusive of all hydraulic piping in stainless steel. It excluded the on site electrical connection which would be carried out by Statoil. At the beginning of the year 2000 the project was completed successfully.

Satisfied customer

Statoil ran the RMF system filters to their complete satisfaction, and towards the end of the year 2000 they decided to carry out a similar project for the Zeebrugge terminal where five ROV's were successfully retrofitted with RMF System filters.

At the Zeebrugge plant contamination checks were done with on line particle counting. The result was astonishing.

System without RMF filter operational

ISO CODE	23/22/21
> 2 µ	5308087
> 5 µ	3659580
> 15µ	1162867
> 25µ	421312
> 50µ	10901
> 100µ	674

System with RMF filter operational

ISO CODE	11/9/00
> 2 µ	1102
> 5 µ	393
> 15µ	45
> 25µ	0
> 50µ	0
> 100µ	0

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