

# Qualified Remote Monitoring

Intelligent monitoring system irds<sup>®</sup>



# Qualified Remote Monitoring

Improved reliability and availability



Trend monitoring systems are a vital requirement where high demands are made in respect of reliability and availability. Along with other elements of modern condition-based maintenance, the continuous retrieval of operating data, with storage of all relevant machine and plant parameters, forms part of equipment monitoring.

## Project goals

MAN PrimeServ has installed the irds® teleservice system in 18 machine units as part of a comprehensive service contract at a well-known company in the rubber, chlorine and petrochemical industry with numerous production plants worldwide.

The aim of installing the irds® (intelligent remote diagnostic system) was to increase the operating reliability of the trains within the scope of condition-based maintenance. This was taken into account in the service contract concluded between the customer and MAN PrimeServ.

## The MAN PrimeServ solution

The installed system processes data from over 1,000 analog measuring points (equal to approx. 10 MB/day) which is recorded and transmitted periodically. The collected raw data is then automatically evaluated by adams® – our intelligent software tool to access automatic or manual analysis – for defined deviations and changes in parameters.

Trend presentations of parameters allow impending faults to be recognized at an early stage and thus help to reduce outages.

## Project results and customer benefit

Our customer in the petrochemical industry achieved an average operating reliability of 99.7% of all trains whilst maintenance costs were significantly reduced at the same time – with an efficient information flow and improved software solutions for transmission and evaluation of all available data. The high level of reliability achieved was the best value of the customer's 150 manufacturing sites worldwide and has gained extensive recognition throughout the petrochemical industry. The key to this success lies on the one hand in the use of modern diagnostic technology with the

irds® and on the other hand in the cooperative partnership between the customer and MAN PrimeServ.

The benefits of this modernization project are improved plant reliability and availability:

- qualified failure analysis on the basis of quasi real-time data
- determination of specific fault rectification measures
- performance evaluation
- short-term and long-term residual life evaluation
- more precise preparation of maintenance measures
- advance planning of requisite corrective action
- improvement of start-up reliability and availability
- improvement of cost efficiency and repair intervals
- spare parts management

Additionally, another irds® system installation on a globally known oil platform shows the benefits of qualified remote monitoring. The continuous data evaluation helps to optimize the operations and maintenance. The facility is always checked by our experts.

For a well-known municipal power plant customer, our dedicated specialist carries out the troubleshooting. Data is collected and analyzed. If there are any uncertainties regarding our gas turbines, our experts are always up-to-date – and this has been the case for 12 years. Availability is shown by regular reports in order to optimize plant operation, and maintenance measures can be planned accordingly.

# Intelligent Remote Diagnostic System irds®

## Optimum plant operation

With the MAN PrimeServ intelligent remote diagnostic system irds®, operators and manufacturers have numerous options for optimizing plant operation. Cost efficiency, machine reliability and repair intervals, as well as failure rates are all improved on a sustainable, long-term basis. Condition analysis enables – in addition to the preventive maintenance – measures to be planned in convenient time and with a high level of precision, and then to be implemented only when truly needed. The availability and reliability of the installations concerned are significantly increased and spare parts management is improved.

### Data collection and transmission

The irds®-monitoring system is modular in design. An industrial computer with a real-time operating system collects process data via direct links with the open-loop/closed-loop control system of the machine installation. The long-term data is acquired as streams via PROFIBUS-DP, MODBUS-RTU or MODBUS-TCP/IP, written to a ring buffer and automatically transferred at intervals to the central database of MAN PrimeServ. Furthermore, high-resolution ring buffers with a sampling rate of 10 ms can be used to get process data or alarm messages from the control system of the machine. This data is event-triggered, stored on the local computer and transferred if necessary. Remote data transmission is carried out by means of ISDN, DSL (broadband) or customer's LAN via the Internet using a local VPN Box that establishes an SSH connection for high security. Transmission via satellite is also possible.

### Data evaluation by an expert system

The operating data transmitted by each individual machine is automatically examined by adams®. If a limit value infringement is found by the automatic analysis, the system saves this result in the database in the form of graphic and text information. adams® makes these messages available to the experts for further processing. Expected conditions are calculated using physical and experience-based equations, which are influenced by several different parameters. As these parameters and influences vary under different operating condi-

tions, the automated data analysis distinguishes possible operating states of a machine.

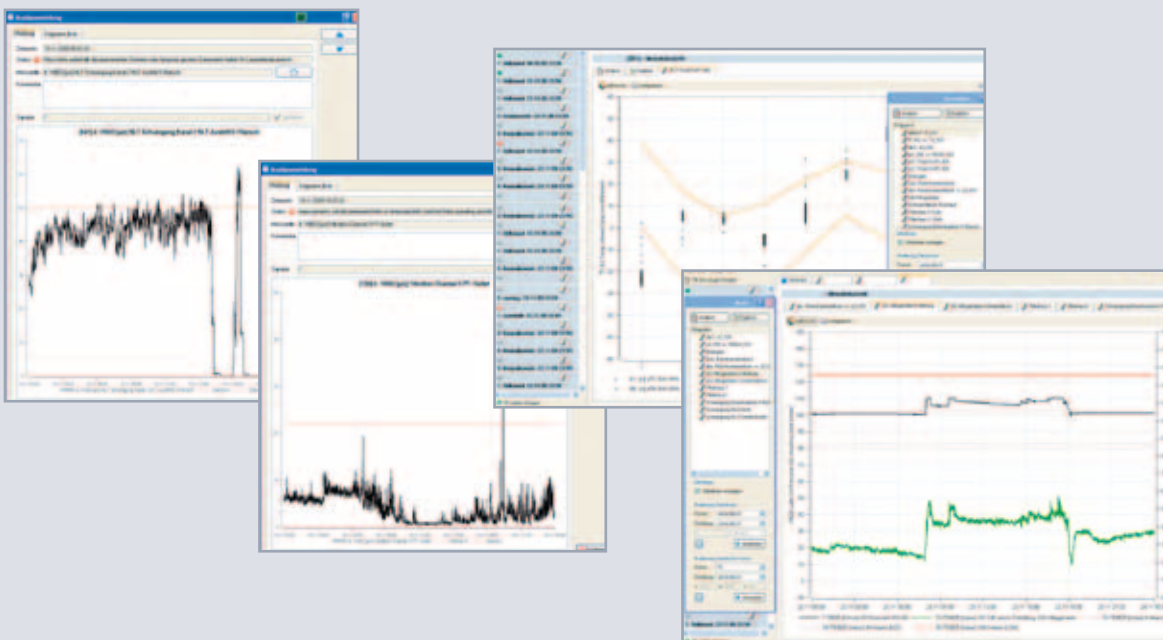
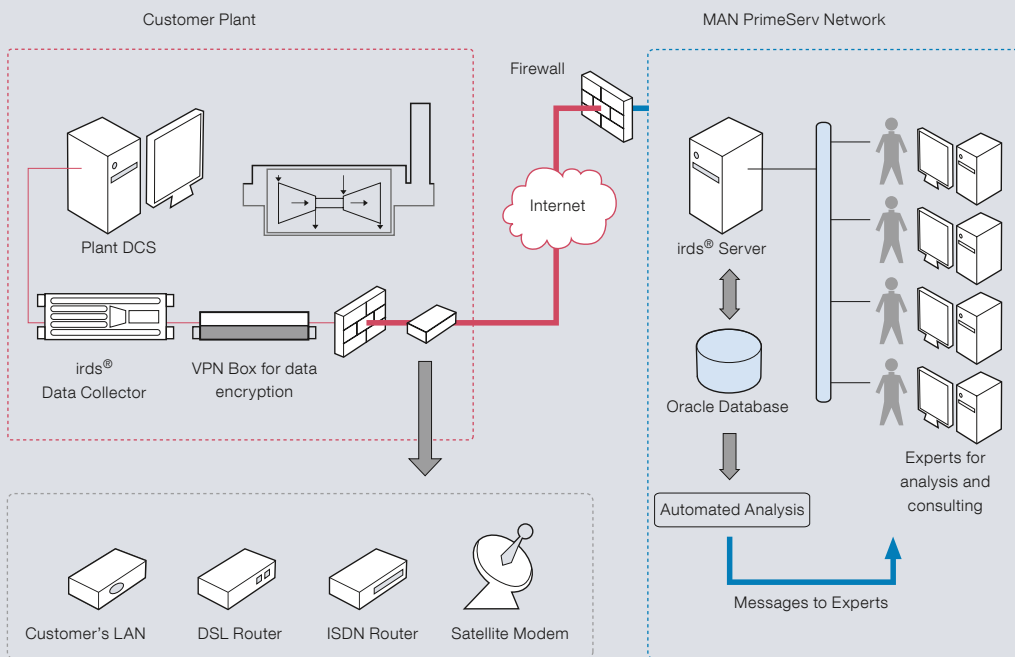
The system determines whether machines are operating free of disruption and will automatically flag possible faults for the MAN PrimeServ service engineer responsible for the machine. In order to improve the analysis quality, detailed rules/algorithms can be formulated for fault detection. The functional dependency between the machine parameters can be modeled and mapped into the database. As a result, existing diagnostic knowledge can be further deepened and refined. Over time the system accumulates the specific operating behavior of each machine. This individual history provides a sound basis for regular reports including measures and recommendations for preventive maintenance.

With the introduction of irds®, it has been possible not only to optimize plant operation but also to significantly increase plant availability. Malfunctions and causes of failure can be analyzed and rectified within the minimum of time. Spare parts stocking for the machines in question is directly related to evaluation of the operating data. For example, special spare parts can be ordered in advance so that they arrive at the facility in good time ready for preventive replacement during the next scheduled shutdown.

### Application and objectives

If a turbomachinery installation is equipped with a monitoring system and the data is transmitted back to the manufacturer, the operator and manufacturer have at their disposal a wide range of possibilities for optimizing plant operation. There is a direct relationship between the efficiency of condition-based maintenance and repair and automation of the evaluation system. Although fixed cycles are now prescribed in respect of inspection and maintenance work, a direct condition-related maintenance regime can be effectively implemented within the framework of these activities. The benefit for the operator is the prospect of significant reductions in maintenance costs combined with a simultaneous improvement in plant reliability and availability.

# irds<sup>®</sup>-System Structure



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