PiReM | Systems

PiReM District Heating

Secure market advantages!

The increasing expansion of district heating systems is an indicator of the increased environmental awareness in the European energy market. The use of renewable energy as an energy carrier in the heating market, serves the sensitized demand for environmentally friendly energy, coupled with an unchanged requirement for security of supply and sustainability. To reliably assure the latter, even into the future, requires long-term planning and the formulation of appropriate maintenance strategies.

Rehabilitation planning of district heating networks is hindered in particular by the partly underground infrastructure, which prevents direct inspection. Both thermal expansion and the combination of different materials in the pipe system affect the aging of the routing systems and call for professional maintenance planning for the network system. Forward thinking rehabilitation planning using **PiReM** requires the appropriate basic data from the control system, optional condition assessment data and failure statistics as well as informed methods. Hence, a district heating network can be renewed dependent on the piping and routing system, matched to the aging behaviour.

Safeguard the properties of system and equipment

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Develop parameters for condition assessment

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Forecast damage risks

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Reduce downtime through improved maintenance

Expertise for risk-orientated maintenance in district heating networks

"District heating networks are, in comparison with other supply networks, relatively "young" systems. Many district heating systems were only installed in the 1960s and 70s. The maintenance of an effective, safe and reliable heat supply was mainly limited to inspection and maintenance as well as partial, spot repairs of individual weak points in the type of pipelines, underground structure, valves or other plant parts. This approach is confirmed by the very small proportion of renewals in the statistics of the AGFW (The German Energy Efficiency Association for Heating, Cooling and CHP).

The future challenge will be to deal with an, in parts, very sudden expansion of district heating networks during the founding years by provision of a planned rehabilitation strategy which permits a systematic approach. A further future challenge will be that presented by the whole maintenance area. Since maintenance costs increase with the increasing age of the district heating network while simultaneously the economic framework conditions develop in the opposite direction, the prioritization of maintenance activities according to risk becomes ever more important. Influences on life cycle costs, the technical service life and the predicted damage behaviour can be represented through the software-based technical comparison of various maintenance scenarios.

Structured and comprehensive network data, damage data and condition data are necessary for such considerations. In general these are not usually available ad hoc, but rather must be gathered and compiled over long periods. As a result, programs such **PiReM** *can deliver ever more detailed and comprehensive results and contribute to an optimized and economic rehabilitation and maintenance strategy for the company,"* says Dipl.-Ing., Dipl. Wirtsch.-Ing. Siegfried Finkbeiner (EnBW Kraftwerke AG).

Risk-orientated maintenance

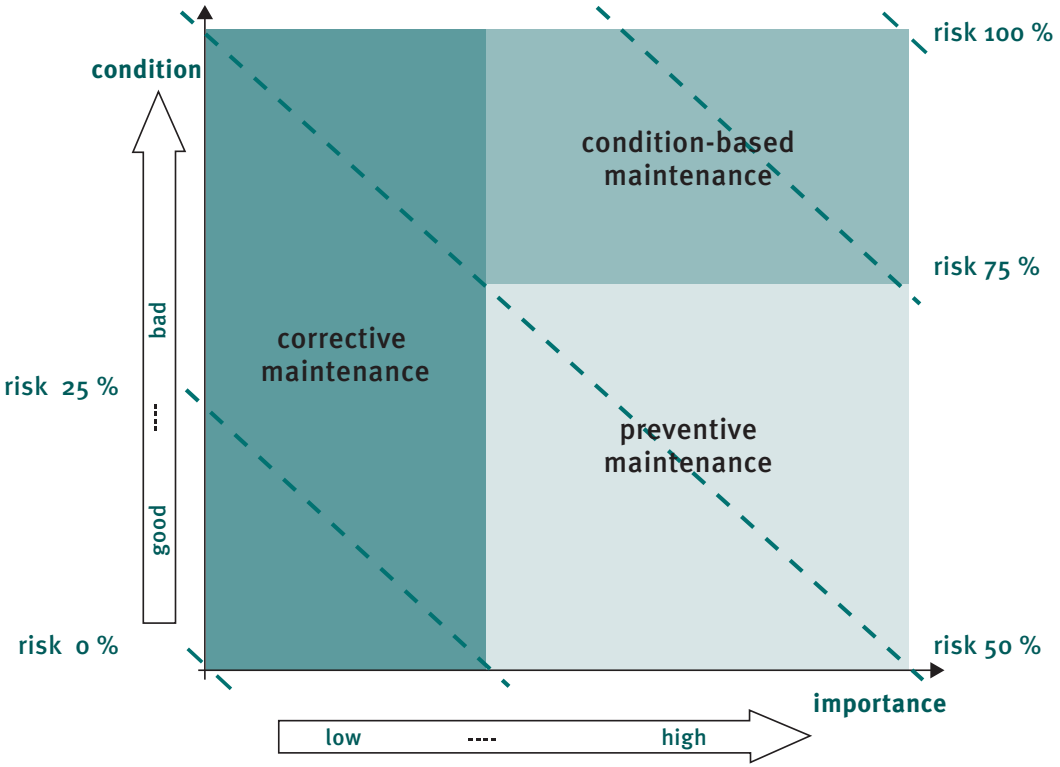
In the conflict area between budget limits and required security of supply, network operators must align their strategies. In PiReM, a valuable decision support system for selection of an appropriate rehabilitation strategy for routing systems in district heating networks has been developed. Its integrated "risk-orientated maintenance" is the strategic approach, taking into account the importance and the condition of an individual maintenance item, to formulating a suitable maintenance strategy. Suitable maintenance strategies can be formulated through the bundling together of individual maintenance measures. These can be graphically displayed in PiReM dependent on the risk, that is relative to condition and importance, for defined areas.

- How do the condition of the equipment and its failure performance change with the maintenance strategy used?
- What is the annual cost for maintenance and inspection of the network?

Scenario analysis allows the comparison of several maintenance options, which are simulated and then compared with each other. It is also worthwhile simulating and comparing various depreciation options using the scenario comparison. The practical forecasting tool takes into account an overall consideration of the costs and benefits of maintenance in the district heating network, and thus offers tailored, risk-orientated maintenance.

- What consequences arise from the unplanned outage of a line section?
- What future costs can be assumed from different maintenance strategies taking into account all risks?

Long term renewal strategies using PiReM sustainably lower damage rates and avoid an investment backlog for the maintenance planning of cost-intensive assets. In addition, by using PiReM, the network maintenance costs can be deployed in a risk orientated manner and the security of supply increased. Hence the end customer can be protected from unplanned outages during the period of supply.



Decision support using PiReM - Pipe Rehabilitation Management

- Risk assessment based on condition and importance
- Formulation of a risk-orientated maintenance strategy
- Rehabilitation at the economical ideal time
- Presentation of maintenance costs with reference to importance and condition
- Synergies for multi-utility providers through all-in-one rehabilitation planning
- Know-how transfer by means of multi-sector rehabilitation planning

Online demo at **www.pirem.net**

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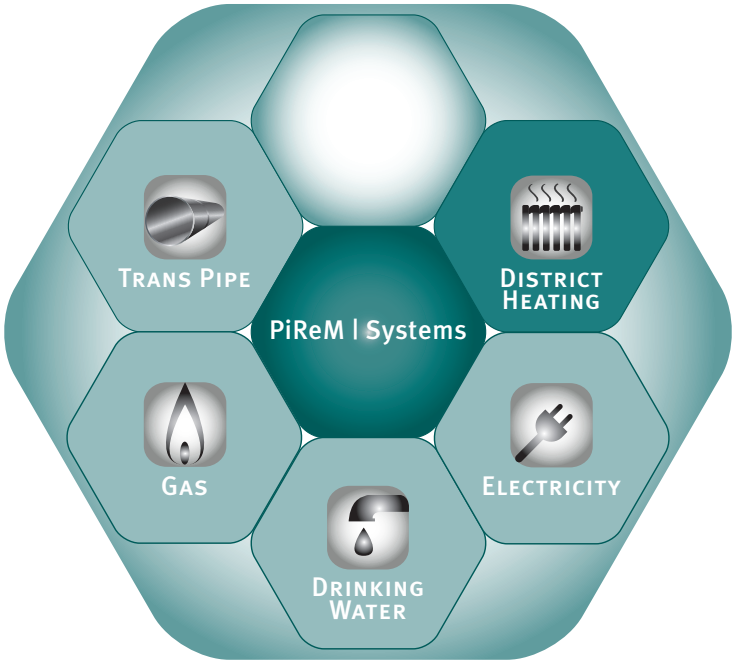

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