

COST/RISK OPTIMISATION CASE STUDY

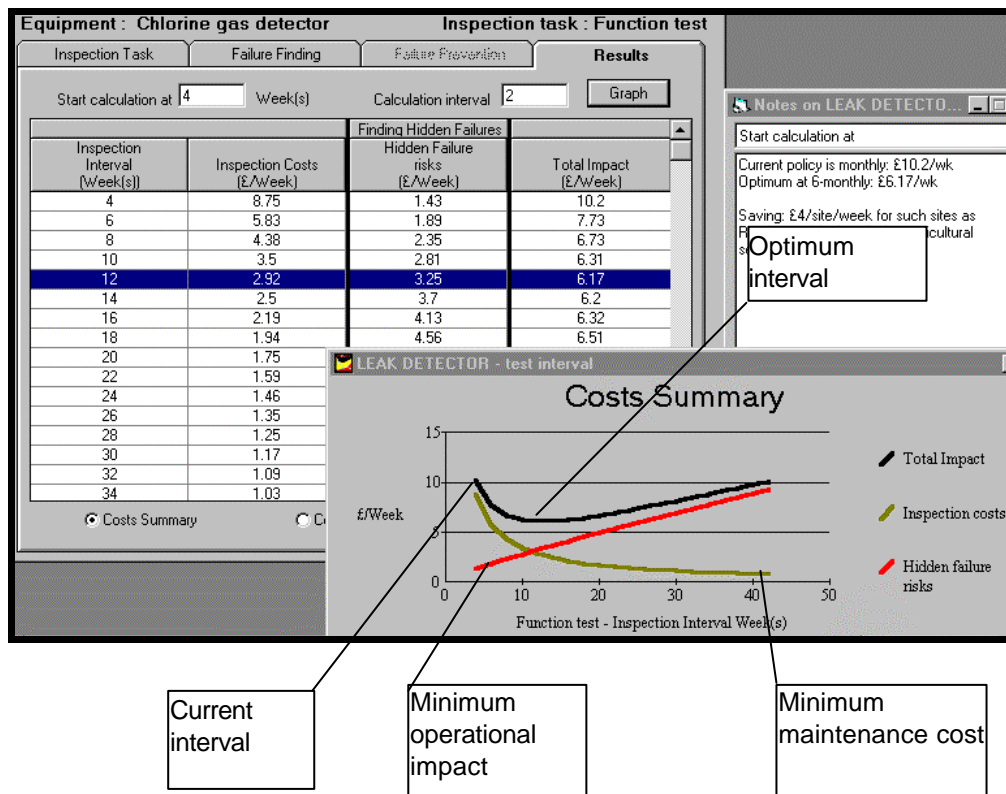
REF: 012
INDUSTRY: Water supply
PROJECT: Predictive/Condition Monitoring
CLIENT: UK water supplier
TASK: Estimate the pattern of unit failure and the cumulative probability of failure of chlorine gas leak detectors and devise an appropriate cost/risk optimised inspection strategy.

RESULTS

The analysis indicated optimal and sub-optimal strategies to suit the client's desired risk exposure.

The study indicated that the inspection interval could be changed from monthly to quarterly. The marginal increase in risk exposure would be offset by a substantial reduction in maintenance and inspection costs.

Switching to a quarterly strategy would save £4 per site, per week. This figure represents the premium the client would pay for public image if it continued to pursue a monthly strategy for confidence or public image reasons.



DEMONSTRATES

- The use of APT-INSPECTION to analyse the cumulative and hidden probabilities of unit failure
- The connection between inspection results and the implied operational risks associated with different strategies
- That APT-INSPECTION provides the robust assessment required by the regulator to support any change in safety-critical test intervals
- That APT-INSPECTION is a viable alternative to safety-critical decisions based on subjective judgement

DETAILS

The client's population of chlorine gas leak detectors are located at 15 supply sites that regulate the introduction of chlorine into the water supply as part of the purification process. A Reliability Centred Maintenance (RCM) study identified several failure modes for the supply loop and noted that the risk exposures associated with failure of the leak detectors were

particularly high. These included public confidence in the company and a number of regulator-controlled implications, including customer payments for disrupted supply. Limited test result data was available.

The existing inspection policy for the leak detectors was monthly to reflect the high penalty costs associated with failure.

ANALYSIS

The client commissioned a cost/risk optimisation study of the leak detection units. This formed part of a wider assessment of MACRO tools to determine their suitability.

Maintenance and inspection testing strategies are designed to reveal and control not just the pattern of failure of the detectors but the cumulative and hidden probability of their being in a failed state. For this reason The Woodhouse Partnership selected APT-INSPECTION software as the most appropriate analysis tool.

APT-INSPECTION proved particularly suitable in this instance, where the risk exposures of failure are high, because it can demonstrate the connection between test results and the implied operational

risks associated with alternative testing strategies. It provides the reliable justification for changing safety-critical inspection intervals demanded by the water regulator.

The software indicated that a switch from monthly to quarterly inspection intervals was viable since the increase in risk exposure would be offset by a reduction in maintenance and inspection costs. The change would result in savings of £4 per unit per week.

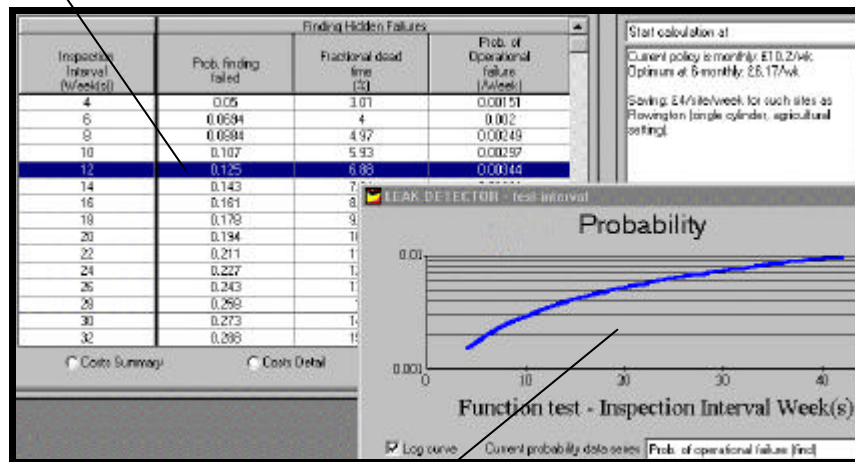
This "saving" was alternatively identified as the cost of deliberately pursuing a sub-optimal policy of monthly inspections. It thus represents a premium the company would pay for its public image, confidence and any other intangible reasons not already incorporated into the analysis.

APT-INSPECTION

APT-INSPECTION is a flexible software tool that helps asset managers plan optimum inspection strategies for all types of assets. It provides solutions based on fact and scientific rather than subjective judgement. It will optimise the associated costs and risks, using incomplete data if necessary, and range-estimates can be used to test data sensitivity.

APT-INSPECTION will compare current policy against the optimum and provide a financial measure of the Total Business Impact of each strategy. During this process it will highlight the often vast disparity in costs between optimum and existing or supplier-recommended strategies. The software has the versatility to cope with any inspection task individually or as a 'bundle' of activities.

Failure rate (12%) if optimum policy is adopted



Displays probability of failure relative to inspection intervals

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