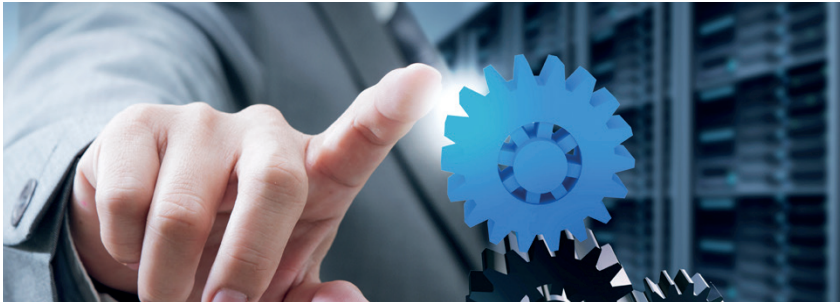


Analyses and studies for data centers

We offer a sound basis for decision-making on future investment planning.



Availability and energy requirements are currently the driving variables in the field of data centers. The innovative FMECA (Failure mode, Effects and Criticality Analysis) / RAM (Reliability, Availability, Maintainability) / ENERGY analysis considers the interaction of these influencing factors and serves as a sound basis for decision-making. The aim is to determine energy saving potential and to quantify its influence of this on availability and reliability.

FMECA / ENERGY sessions

In order to obtain an overview and enable an objective assessment, all systems are recorded on site during FMECA / ENERGY sessions and broken down into their components. At the same time, the system technology is also investigated from an energy perspective.

Data acquisition is key as empirical values, system interdependencies and functionalities have to be recorded so a realistic model can subsequently be developed.

Standardised FMECA lists are used to ensure a holistic approach and the exchange of experience with those responsible for locations is managed by an expert.

Your benefits at a glance

- Our method is multi-level to ensure an appropriate package ties up the most diverse of requirements
- The weak point analysis and the energy efficiency analysis can be carried out independently and in various levels of detail
- The combined analysis offers a sound basis for decision-making on future investment planning

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Our services

(available complete or as modules)

SPOF Quick Check

- Identification and assessment of weak points using a questionnaire on all relevant subsections
- Defining of optimisation measures

FME(C)A – Failure Mode, Effects (and Criticality) Analysis

- Detailed breakdown of the system
- Identification of possible failure modes and investigation of their potential impacts
- Qualitative assessment using a risk matrix
- Qualitative assessment of optimisation measures

RAM system modelling

- Simulation of system availability and reliability within a defined observation period
- Optimisation of the maintenance strategy
- Optimisation of the spare parts
- Quantitative assessment of optimisation measures

FMECA/RAM/ENERGY® analysis

Our innovative and independent analysis includes:

- the identification of weak points and potential areas of energy saving
- the development of optimisation measures (in terms of energy and reliability)
- the estimation of the availability and reliability of the whole system in its current status through modelling and
- the assessment of the impact of the optimisation measures on availability and reliability

Failure Modes and Effects Analysis (FMEA)

The method used for the FMEA is based on the risk analysis and the risk assessment. In the product presented, these are supplemented with Criticality to form FMECA. All components / possible faults are recorded and then assessed in terms of

- the severity of the failure S and
- the probability of it occurring O

This is carried out using the risk matrix agreed with the customer. Multiplying the two factors (S x O) results in what is known as the Criticality, and this is an indicator of components that require more precise consideration.

RAM analysis

The software side of electrical and mechanical systems are depicted in an RBD (Reliability Block Diagram) for the RAM analysis.

In doing this, the relationships between the individual components in the integrated network are presented and fault models and maintenance activities are assigned to these components in order to determine the availability and reliability of the system being investigated.

The basis of the data used for the modelling is provided by the FMECA session(s).

ENERGY analysis

The ENERGY or energy efficiency analysis focuses on the typical areas where energy can be saved along the energy flow within the data center. These include the following areas, among others:

- Emergency power systems
- Uninterruptible power supply
- Air flow optimisation
- CRAC units
- Chiller
- Dry coolers / cooling towers

The areas listed are analysed for their optimisation potential. Corresponding business cases can be prepared at the customer's request. The potential improvements measured are also checked with respect to their effect on the availability of the data center in further RAM simulations.

Added value of the combined analysis

The combination of the analyses presented provides the following added value for our customers:

- Provision of reliable basis for decision-making on future investments
- Avoidance of unnecessary investments
- Definition of potential areas of optimisation
- Definition of Single Points of Failure (SPOF)
- Exchange of experience and reflection on the current situation
- Raising of awareness among the employees involved

The result of the combined analysis is an appraisal of the current situation in terms of energy efficiency, availability and reliability and a collection of energy saving measures including their effect on the above-mentioned parameters. Depending on the objective defined, additional measures to increase availability will also be derived from the analysis in order, for example, to achieve a certain availability. The customer therefore receives a sound basis for decision-making in order to implement the action plans derived from the analysis.

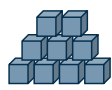
Current situation analysis



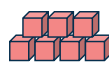
Availability analysis



Energy efficiency analysis

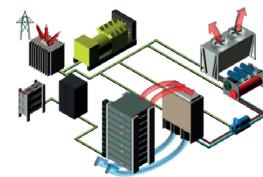


Availability



Energy consumption

Simulation



Current situation



Availability



Energy consumption



Measures

Analysis result



Availability



Mix of measures



Energy consumption