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 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

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 supple-
mented 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 compo-
nents 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.