Reliability Black Belt®

Training number: Reliability_A02

About the topic:

Effective reliability engineering is about knowledge engineering: knowing why you do what you do, knowing that you do it well, and always learning how to do it better.
The Reliability Black Belt® adds specialist tools that are key to deeper understanding of reliability and causes of failure.

Training procedure and goal:

The Reliability Black Belt® comprises the second module in the qualification as a Reliability Engineer. This module builds upon the structure provided by the Reliability Green Belt®. The Reliability Black Belt® adds specialized tools from the fields of Reliability Management, Root Cause Analysis, Design of Experiments, Durability Modeling, RAM/LCC and Software Quality; that allow development of greater understanding and improved decision-making.

The goal of this module is to train specialists who can independently solve complex problems and work on challenging issues in your organization. The Reliability Black Belt® is thus also able to professionally handle organizational and project-specific interfaces (e.g. Production, Sales and Purchasing).

Target group:

Engineers, technicians, specialists, managers and executives from the areas of development, testing, design, research, production and quality assurance who wish to deepen their reliability skill-set.

Training content:

- **Reliability Management**
  Reliability process | Reliability targets – system view/component view | Reliability monitoring | Reliability growth management

- **Repairable Systems and RAM/LCC**
  Availability and maintenance | Modeling and simulation of system parameters | Composition and optimization of maintenance plans | RAM/LCC

- **Life-stress Models - Physics of Failure**
  Degradation modeling | Monte-Carlo simulation | Life-stress models of various technologies | Multi-parameter damage accumulation

- **Design of Experiments DoE**
  Fractional and full factorial experimental designs | Test for non-linearity | Main effects and interactions | Robust design - increasing the robustness of a design by consideration of non-linearities and interactions | Setting up of system behavior models from empirical data

- **Root Cause Analysis**
  Simple questioning techniques | Families of variation | Multi-vari-analysis | Concentration chart | Paired comparisons | Process search | Components search | Variables search | Validation techniques

- **Reliability of Electronics and Software**
  Reliability validation of electronic components and systems | Quality and reliability of software-intensive systems | Dimensions of software quality | Capability of software development process

Prerequisites:
Participation in the Reliability Green Belt® training

Software requirements:
Each participant must have a laptop with the following software: Microsoft Excel, Adobe Reader and Minitab (Version R15 or above). A demo version of the software Minitab can be downloaded from www.minitab.com.

Examination / certification:
The training will end in all cases with a certificate of participation. Furthermore, participants may elect to take a written examination for a certified **Reliability Black Belt®** at the end of the course. The certificate will be awarded by the University of Stuttgart and the Institute of Machine Components. The examination is in multiple choice form.

Training duration:

5-day training:	Monday from 09:00 am to 05:30 pm Tuesday to Thursday from 08:15 am to 05:30 pm Friday from 08:15 am to 01:30 pm
Examination:	Friday from 01:30 pm to 03:30 pm

Training fee:
The training fee is 2,700.00 EUR excl. VAT.

Scope of services:
- Training documents in paper form
- Training documents as pdf document
- Certificate of participation
- Catering during the training
- Evening event

Examination fee / certification:
The fee for the optional examination and certification is 150.00 EUR excl. VAT.

Dates / Registration:
Detailed information is available on our website www.reliability-academy.com

In-house:
We also offer all our seminars and trainings as an in-house event.

Coaching:
Should you so wish, we can put together a time and content tailored coaching concept for you after completion of the training.