Industry Profile
Energy Systems

Konzept
Informationssysteme

Optimally Supplied

A reliable supply with energy is a core factor in our daily life. We contribute to this significantly.

The reliability of supply from power plants is ensured also in case of a failure of the external power supply, for example, by the use of emergency power systems. This enables continued operation or controlled shut-down of the power plant. Fail-safe and high-availability controllers and control units developed according to the highest world-wide functional safety standards are used for diesel engines in this domain. Clearly defined processes implemented on the basis of IEC standards provide the basis for this.

Scope of Services

- Process control according to IEC 61508 and IEC 60880
- Realization of development tasks in all project phases
- Preparation of the FMEA / FMECA for the hardware and software used
- Development of safety concepts

Security and Safety in Power Plants

Other cornerstones ensuring the reliability of supply are security and safety in power plants to protect them against unauthorized intrusion or intentional attacks from the outside. We support power plant operators and utility companies with development and maintenance services for high-availability access control systems – even in the most sensitive and critical areas of the energy supply system such as, for example, in nuclear power plants.

Safety

With our comprehensive competence and experience in the areas of safety and security, we support our clients from the initial concept to the implementation of their projects or perform this inhouse under our own management. Professional application of relevant standards is a routine element in the daily work of our engineers.

Specific Project Experience

- System and software engineering for emergency diesel generator engine controllers
- Development and maintenance of access control systems
- Requirements engineering at system and software level for safety-critical engine controllers
- Test management at system and unit level
- Development of an ID card issue and access control system with client-specific optimization of the system
- Implementation of the safety requirements according to client's and BSI-IT guidelines – reinforcement of systems
- Maintenance and support for this system (server and workstation hardware and software), focusing on operational reliability and maximum availability
- Support for the client's network topology
- Requirements analysis of customer specific safety requirements in the ‚access control' business process and IT
- Consulting regarding the BSI fundamental security, IT-Grundschutz Catalogues

Systems Engineering

- Requirements engineering at system level
- System design / architecture
- Preparing the system development plan
- Analysis and consulting for the selection of server technologies focusing on client's needs
- Interfacing heterogeneous periphery components
- Interfacing the access control system with the client's higher-level plant systems

Software Development

- Requirements engineering at software level
- Software architecture design
- Implementation in various optimally suitable languages and use of appropriate frameworks on different OS platforms
- Simulation of interfaces and system and periphery components
- Model-based development

Functional Safety

- Support for / preparation of the system FMEA

Support Processes

- Configuration management
- Problem and change management
- Tool development and tool management
- Tool qualification
- Development of simulation environments

Verification and Validation

- Preparation of module tests
- Preparation of software integration tests and software tests
- Preparation of system integration tests and system tests
- Preparation of the test documentation
- Creation of automated test sequences (module, integration, software and system tests)
- Test and risk management
- Analyses
  - Static code analyses
  - Code reviews
  - Dynamic code analyses
  - Compiler analysis report
  - Compiler failure report
  - Coverage analyses (MC/DC etc.)
  - WCET analysis
  - Stack use analysis
  - Runtime error analysis
- Reviewing all results from the development process

Standards

- KTA1401
- EN 50133 / DIN VDE 0830 Part 8
- Analysis of safety requirements
  - BSI ‚IT-Grundschutz Catalogues'
  - SEWD IT guideline
- IEC 60880
- IEC 61508

Tool Experience (synopsis)

- Jira, confluence, git
- MKS/PTC
- Enterprise Architect
- Matlab, Simulink
- Esterel SCADE, MTC, QTE, KCG
- Eclipse
- Diab C Compiler, CompCert
- AbsInt a (aiT, Stack), Astrée
- Lauterbach Debugger
- Vector CANalyzer
- Cantata++
- NI TestStand

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