Examination Procedure	Beteckning / Document
	KBE EP-187
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Evaluation of operating experiences	2013-08-20
	Ersätter / Supersedes
	2 (E)

1 Scope

This Examination Procedure is applied electrical equipment including programmable electronics with a programmable application, and to programmable electronics with a fixed application.

2 Purpose

To verify that the product has been sufficiently tested and to create a platform from which later modifications can be evaluated.

3 Method

This examination procedure assumes that the Manufacturer has a system for the collection of operating experiences from users of the product concerned.

By actively collecting experiences from users of the product in similar applications and of the same complexity as the product to be delivered, a quantitative measure is obtained of how well proven the product is. This must be evaluated by the Manufacturer answering questions in accordance with section 6 and making and engineering assessment of the operating experiences.

This evaluation of operating experiences shall be presented to the Purchaser at the tender stage and shall be included in the tender evaluation.

4 Acceptance Criteria

4.1 Generic requirements

The evaluation shall show that a large number of units, normally at least 1 000, have been in operation for at least one year without faults that obstruct functioning. A lower number of units may be accepted after approval by the Purchaser. For equipment made in small series, where the reliability cannot be judged using the above criteria, verification can be done as for a programmable application, according to section 4.2.

The statement below about definition of faults that obstruct function and the assessment of simple faults applies here as well. Modification involving upgrading function, measuring range, etc, may be approved after assessment. Otherwise a new qualification period is required.

4.2 Programmable application

The basic requirement is that the same basic software with a corresponding combination of software, tools and hardware has been operating for at least one year without any fault that obstructs its function.

A "fault that obstructs its function" means a fault that caused a failed or spurious function, a fault that put a risk on the function of a redundant subsystem or a fault that was not signaled. Equipment or system functions shall not have been affected and shall not have affected other equipment or system functions.

Simple faults, including faults that caused a redundant subsystem to engage in the intended manner, may be accepted after assessment. However, it is a precondition that the fault can be shown not to be generic but of a stochastic nature, usually a hardware fault. Software faults are not normally accepted.

5 Documentation

The evaluation is documented in a report. It is suggested that such a report be produced for current version of the product and it must be kept updated by means of continuous monitoring of experiences.

The report shall at least contain:

- Inspected item (system, software etc.)

Product, designation and version number. For the software it shall also include versions of included software modules.

- Evaluation model

Reference to users of equipment with the same software version, total operating time, experiences and results.

- Approval

The document shall have been examined and approved by the unit responsible for quality and in other respects in accordance with the internal QA/QC instructions of the Suppliers.

6 Additional Checks

As well as the above, the following are added when the examination procedure is used together with KBE IP-106:1-3, KBE IP-106:2-3.

Method

As an alternative to this method, evaluation according to IEC 60880 may be applied.

Acceptance criterion

At least two systems/sets of equipment (each with at least one year's operating time) shall be examined.

7 Questionnaire for Evaluation of Operating Experiences (Programmable Electronics)

Generic

- What is the current revision of the product?

- State the date of issue of the different revisions

- How many products of the different revisions have been sold?

- Show a reference list of users.

- If microprocessor is used in the product, which version of the software is used?

Software

System software

- What type and version of compiler is used?

- What type and version of operating system is used?

Standard software

- Which programming language is used?

- Describe the overall structure of the software.

- Where are different parts of the software stored and on what type of storage medium?

- Principles for naming files, modules etc.

- What versions are current today?

- State the date of issue of the released versions.

- How many copies of the released versions have been sold?

- Show a reference list of users.

- What type and version of microprocessor is used?

- What method is used to verify that the used software is identical to the master version?

- How are supplied software identified?

Feedback of experience

- Describe the system for collecting and processing reported problems and faults.

- What method is used to ensure that users report problems and faults?

- Have any problems or faults been reported concerning the current product version? What are they?

- Does the Supplier have various routines correcting function changes compared with minor error corrections (patches, fixes)?

Approved by: **TBE-Group**