


Quality inspection guide

Low voltage switchboards



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Preface

Foreword

On the strength of its experience, Schneider Electric has always sought to produce high quality equipment, fully complying with IEC 60439-1 standard.

But what exactly do we mean by Quality ?

*The standard ISO 9000 defines the quality as:
“degree to which a set of inherent characteristics fulfils requirements”*

Although final inspection is in some respects a statement of failure (as we have not been able to control the necessary quality throughout the assembly process) it is nevertheless a vital stage in equipment production.

This stage must be performed with care and rigour, both with respect to customer specifications (explicit needs), and proper operating procedures (implicit needs), in order to satisfy the customer.

The quality is also the willingness of all the staff, from the manager to the worker to satisfy the customer. This guide is a good means to help you in this way and to reach the excellence.

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Quality inspection: means and process



Procedure

“Set of organisational rules of an administrative nature in order to achieve a certain result

“Specified way of accomplishing an activity”
(see ISO 9001).

1.1 Justification of quality inspection

The implementation of the quality process in production plant will entail to organised the work station on the way to reach the quality target as per imposed by the standard.

A quality inspection process has always been recommended to all our partner and subsidiaries.

Part of the quality insurance, it is a normative obligation of the IEC 60439-1 standards which stipulate that three routine tests should be perform in the scope of the quality inspection procedures to complete the type tests:

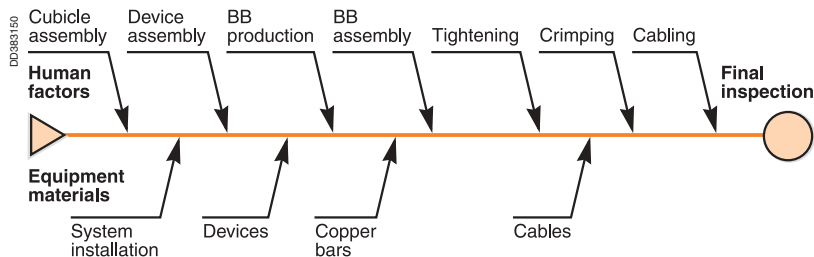
- giving the equipment the TTA label (Type Tested Assembly)
- and which are bound to the panel builder's responsibility.

These three Routine tests are

- inspection of the assembly
- dielectric tests and / or measurement of insulation resistance
- checking of protective measures and of the electrical continuity of the protective circuit.

Human factors

The specificity and complexity of low voltage equipment, the numerous human interventions, and thus risk of errors are the principal source of mistakes in our field, so the main reasons of the implementation of the quality inspection process.



Each job must be checked.

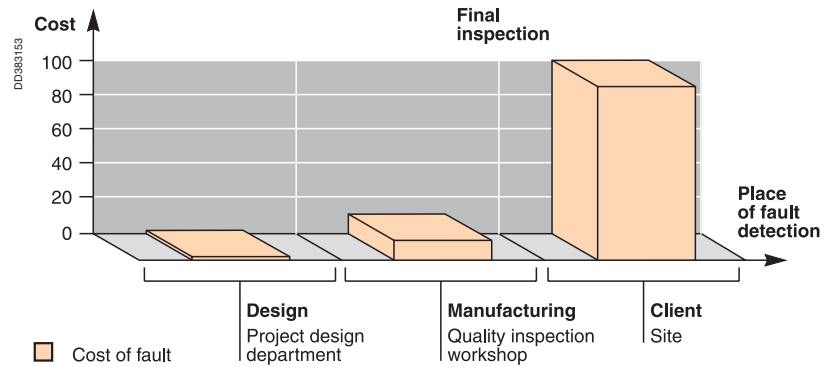
Cost reduction

The non quality manufactured entails extra cost in term of time and money due to:

- product examination
- reparation
- scrap
- incidence in term of delivery schedule, brand image
- etc.

A study shows that a fault detected on customer site can cost one hundred to one thousand times more than if it had been detected during the switchboard design phase (see graph below).

The in process checking operation and the final inspection also guarantee



a good economic management of the switchboard manufacturing process.

The Quality inspection therefore contributes

- to **guarantee the quality** of the equipment:
 - by preserving the company's brand image
 - by guiding the staff training according to the anomalies observed.
- to the **security** of people and equipment
- to the economic **results** of the company.

1.2 Quality inspection function

Guarantee the quality level of the service and insure the brand image. Detect and settle the internal dysfunction and so on increase the plant profitability.

- perform the inspection with respect to:
 - the project file and the customer document
 - Schneider and products rules
 - IEC standards
- carry out acceptance tests in the customers' presence
- perform quality follow-up and corrective actions
- ensure the information, preventive action and training to the production staff
- ensure periodical calibration of inspection and production means.

1.3 Quality inspection responsibility

Quality inspection department

- is directly attached to management and independent from manufacture
- can postpone the delivery of a project and require reworking to ensure conformity
- in event of a dispute, informs the unit manager who alone has the power to decide
- is responsible for the safety of all people entering in the quality inspection zone.

1.4 Quality inspector's profile

- graduate as electrical technician (technician's certificate)
- versatile
- good knowledge of Schneider equipment and devices
- authorised to work near electrical current:
 - knowledge of the hazards of electrical current
 - authorisation by approved training course
 - basic notions of first-aid.

1.5 Necessary documents

To carry out the various checks, the quality inspector must possess a complete, updated production file of the project, including the check list, missing parts list, etc.

1.6 Required human resources

For an accurate and reliable quality process, the quality inspectors account for approximately 10 % of workforce, i.e. 1 quality inspector for 8 to 10 fitters.

Abbreviations

B.N.M.: National Metrology Office.

L.V.: Low Voltage.

I.E.C.: International Electro-technical Commission.

Dielectrimeter: A device used only to perform dielectric tests.

Dielectrometer: A device used for withstand testing. It measures dielectric withstand and insulation resistance.

I.P.: Degree of Protection.

Q.I.: Quality Inspection.

N.N.C.: Notification of Non Conformity.

I.T.P.: Inspection and Test Programme.

P.E.: Electrical Protection.

P.E.N.: Electrical Protection and Neutral.

C.T.: Current Transformer.

MCC: Motor Command and Control

PCC: Power Command and Control

Vocabulary

Main definitions

(Standard ISO 9000)

Quality

Degree to which a set of inherent characteristics fulfils requirement

Quality audit

Methodical examination of all the measures described in the quality manual and his relevant procedures, in co-operation with the involved parties. This on the way to evaluate whether the real statement of the plant is in harmony with the description of the quality manual.

Quality management

Co-ordinated activities dedicated to direct and control an organisation with regard to quality.

Also include the evaluation of the results and the correspondent cost.

Quality manual

Written documents specifying information about the quality management system of an organisation.

Quality plans

Documents describing how the quality management system specify witch procedures and associated resources shall be applied by whom and when, on the way to obtain the quality level of the considered project, product, process or contract.

Also called "quality insurance program".

Procedures

Specified way to carry out an activity or process.

Written document describing the organisation and manufacturing method, control, inspection, checking, assessment, corrective actions intended to be strictly applied on the way to reach the predefine quality level.

Inspection

Conformity evaluation done in the scope of defined process by observation, measurement, testing or gauging.

Non conformity

Non fulfilment or deviation of a need or expectation with respect of the specified requirement.

Traceability

Ability from registered identification, to trace the history process and the location of the product after delivery.

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