

QUALITY ASSURANCE

THIRD PARTY'S TECHNICAL ASSISTANCE SERVICES ON ELECTRICAL EQUIPMENT DESIGN AND PRODUCTION



INTRODUCTION OF "IN PROCESS QUALITY ASSURANCE SERVICES"

Besides its experience in laboratory tests and power system studies and factory inspections, CESI has a well-established World wide experience in quality assurance services and in particular about in-process inspection of electrical equipment as Transformers, Cables, GIS, Switchgear, Photovoltaic panels, etc..

Such experience is allowing CESI to propose an innovative QA service for almost all Manufacturers of electrical equipment ranging from LV up to UHV both in AC and DC. Such knowledge is continuously upgraded and updated, following the evolution of company organization, production processes , techniques and materials.

In-process quality assurance service is applied for the following activities::

- Organization evaluation
- Design review
- In process Quality Assurance
- In factory test witnessing
- Sub suppliers qualification
- Sub suppliers monitoring

A new CESI Quality Assurance service is proposed for:

PROCESS CERTIFICATON and STRATEGIC AUDIT

In the frame of this service, innovative activities as in the following are proposed:

Analyzing the results and defining an improvement plan and preventive actions for the costs reduction , risks management and product quality;
Company rating calculations and "radar charts".

WHY ADOPTING A NEW STRATEGY FOR QUALITY ASSURANCE

CESI has developed an innovative strategy for the preventive management of electrical equipments life cycle and optimizing of the ratio cost/benefits for the Manufacturers and the end users.



The CESI Quality Assurance service will change the standard approach of Quality Control (QC) based on the control of single production steps: CESI has the right expertise and adequate tools to provide these services by very effective approach.

For Manufacturers it could mean costs and risk control and, in case of Process Certification and Strategic Audit, to increase sales opportunities all around the World.

Finally, upon successful completion of the service, a

CESI CERTIFICATE OF QUALITY ASSURANCE

can be issued for the equipment under consideration referring to its "certified" production line.

ORGANIZATION EVALUATION

The latest philosophy of Quality Assurance management says:

The quality of the products is strictly connected to the quality and efficiency of the organization, in brief the quality of the Company Management.

Starting from this requirement CESI developed a method for the "organization evaluation" and this can be considered the first step of Quality Assurance management.

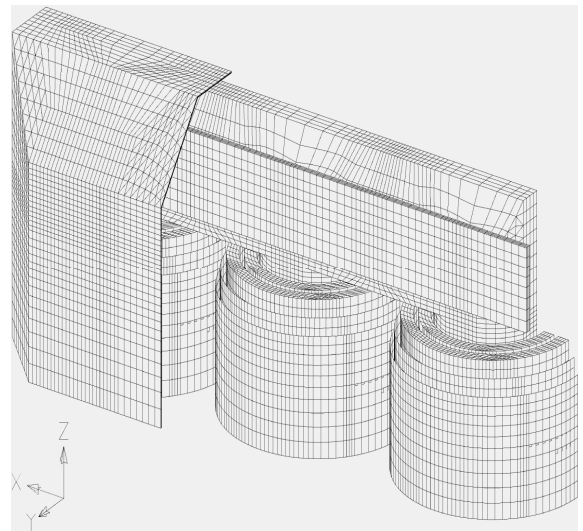
The evaluation consists in a whole in process inspection and final rating calculation to verify the compliance with the whole company process to the QA international requirements before starting with the QA project. The benefits for Manufacturers will be a costs reduction following to the achievement of a condition of process stability.

DESIGN REVIEW

Design review activity is normally carried out prior to put the equipment in production and it is a useful step of the new Quality Assurance strategy proposed by CESI in order to assess and confirm the validity of the design and then assure the Quality of the equipment to be manufactured since its design stage.

CESI services for design review of equipment apply mainly to transformers, circuit breakers, GIS, cables and bus-bars but also to any other equipment should be concerned.

The approach to design review is aimed at verifying that the equipment have been properly designed and enough safety margins have been set by the Manufacturer.



On the basis of CESI experience, the following items will be considered in the frame of the activity:

Compliance of design with technical specifications;
Verification of crucial and known weak points of the equipment;
Estimation of safety margins adopted by the Manufacturer.

The QA application in DR phase is focused to guarantee two very important issues:

The life cycle of the product;
The risks management.

In general the QA activity in the design process must meet the best solution as technology, materials, and know how. Thanks to CESI well proved capabilities to evaluate these factors, from a Third Party point of view and as a whole, it is guaranteed the achievement of the a.m. important issues.

IN PROCESS QUALITY ASSURANCE

With reference to the ISO 9001:2008 Standard and CESI procedures, the approach described in the following is usually adopted to carry out the in-production quality assurance of the involved electrical equipment.



Quality assurance inspection will be carried out at the Manufacturer's facilities covering, for each product considered, all organization processes and manufacturing phases and/or processes in order to verify the compliance of the final product with the operational requirements, guaranteed performances and life cycle.



The service is aimed at:
Defining the scope and the boundaries of the quality assurance work with the Management of the involved Company;
Collecting the documentation for understanding the manufacturing processes;

Verifying the capability of the Company, by means of an inspection of all organization and workshops;
Pointing out all possible non-conformities or deviation relevant to manufacturing phases and/or processes and materials;
Reporting.



For each typology of production CESI can check all the critical points of the process which sometimes may appear as simple and evident details while they are very important when seen from CESI expert eyes. Often, by the accumulated experience, very crucial items found as weak points are the training and the basic knowledge of involved personnel. CESI huge experience, accumulated along thousands of in process inspections all around the World, is drawing two very important conclusions: Absolutely, there is a great need of Quality Assurance improvement;
It is confirmed the presence of significant margins to improve the costs control in the manufacturing process.



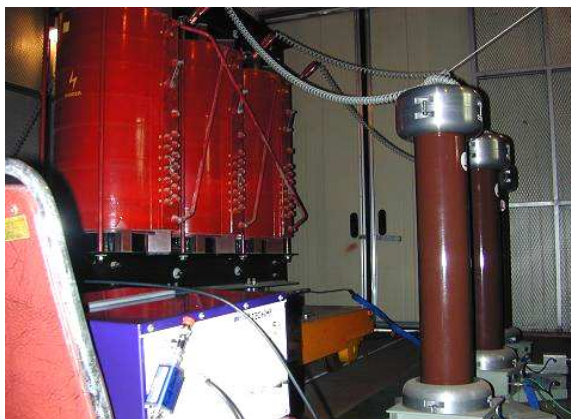
IN FACTORY TEST WITNESS

Routine and type tests carried out in the in-factory laboratories are the last steps of equipment manufacturing. The correct performance of this activity is of paramount importance to assure that the equipment have been properly manufactured.



As aid to Manufacturers who require high quality and high performance equipment, CESI draws up a team of expert inspectors, able to closely and strictly follow-up the test activities carried out in the in-factory laboratories thus duly and timely evaluating test results and pointing out defects and weak points, if any.

The specific activity of witnessing type and/or routine tests will be accomplished by means of highly trained personnel having a strong experience in testing activity and a high level of knowledge (membership in international WG) as regards to basic themes linked with the equipment involved in the present Project.



Key points on which usually test witnessing activity is based are:
Accurate check of the calibration of the test instrumentation;

Deep check of test procedures;
Accurate check of test layout (circuits and connections);
Continuous check of test parameters;
Critical evaluation of test result.

As for the test procedures, the laboratory will be asked to strictly follow the agreed test procedures, as deviations could result in overstress of the equipment.

The experience of CESI inspectors is available for quite all electrical equipment, ranging from transformers, circuit breakers, GIS up to cables, switchgears, VTs, CTs and HVDC thyristor valves.

SUB-SUPPLIERS EVALUATION AND MONITORING

The activity of sub suppliers evaluation and monitoring is a special application of the method applicable for "organization evaluation" and it is very useful for the Companies because they have to consider this item as:

Preventive action before involving on business with new suppliers or in case of standard suppliers;
Help to guarantee the stability of the out sourcing process according to what required by ISO 9001 2008 specifications.

The rating calculation meets the requirement of Sub-Supplier qualification and the traceability of Supplier quality history too.



Most of the related problems found are shown coming from an insufficient control of the "Suppliers Chain" because the general approach adopted that is based only upon the presentation of a corresponding "Certificate of Type Conformity" does not assure at all the quality of the product.

For those Suppliers identified as critical, the only proved effective control method is a systematic, random activity of in process inspection.

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