



Leonardo da Vinci

Course: Quality Assurance
Module 8

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MODULE 8

Objective:

Have knowledge about identification and traceability

Scope:

- *Introduction of ISO 3834: Quality Requirements for Welding*
- *Implication of failure; product liability*
- *ISO 3834 and product documentation*

Expected results:

- *Introduction of ISO 3834: Quality Requirements for Welding*
- *Identify the key documents for identification and traceability*
- *Identify actions to maintain identification and traceability through the production process*

Delivery of the product.

Manufacturing processes such as fusion welding are widely used to produce many products, and for some companies, these are the key production features. Products may range from simple to complex; examples include pressure vessels, domestic and agricultural equipment, cranes, bridges, transport vehicles and other items.

These processes exert a profound influence on the cost of manufacture and on the quality of the product. It is therefore important to ensure that these processes are carried out in the most effective way and that appropriate control is exercised over all aspects of the operation. In general, ISO 9001 standard has been developed in order to apply a consistent Quality Management System.

However, surface coating, painting, composite manufacture, welding and brazing are considered as “special processes” because the quality of the manufactured product cannot be readily verified by final inspection. In the case of welded products, quality cannot be inspected directly in the product, but has to be built in during fabrication, as even the most extensive and sophisticated non-destructive testing does not improve the quality of the product.

For this reason quality management systems alone may be insufficient to provide adequate assurance that these processes have been carried out correctly. Special controls and requirements are usually needed, which require adequate competence control before, during and after operation. For products to be free from serious problems during production and in service, it is necessary to provide controls from the design phase through material selection, into manufacture and subsequent inspection. For example, poor design may create serious and costly difficulties in the workshop, on site, or in service; incorrect material selection may result in problems, such as cracking in welded joints.

To ensure sound and effective manufacturing, the management needs to understand and appreciate the sources of

potential problems and to implement appropriate procedures for their control.

The EN ISO 3834, is more process oriented and attentive to the technical aspects; in fact:

- not only the quality manual is unneeded as before,
- but even the unwritten praxis, rooted on a specific technical competence, tend often to replace, with an equal value, the documented procedures.

Even the non-conformances appear to be primarily evaluated depending on whether they affect or not (and if yes, in what extent) the product real quality (instead of to be only a breach to the quality system), leading therefore to a process oriented assessment.

Identification and traceability

Identification of pieces and parts, and the possibility to retrace their position during the manufacturing stages and when delivered to the customer is one of the most effective way to achieve quality of the product and to have feedback about its functionality.

However, it shall be noted that identification and traceability can imply expensive procedures and are therefore not required by the ISO 3834 standard. However, they can be required by standards, fabrication codes or by the customer himself.

Whenever required, it shall be maintained during the manufacturing process, which means that for every piece or component it shall be possible to retrieve its history by marking the parts and controlling the relevant documentation. Documented systems to ensure identification and traceability of the welding operations shall include:

- identification of production plans;
- identification of routing cards;
- identification of weld locations in construction;
- identification of non-destructive testing procedures and personnel;
- identification of welding consumable (e.g. designation, trade name, Manufacturer of consumables and batch or cast numbers);
- identification and/or traceability of parent material (e.g. type, cast number);
- identification of location of repairs;
- identification of location of temporary attachments;
- traceability for fully mechanised and automatic weld-equipment for specific welds;
- traceability of welder and welding operators of specific welds;
- traceability of welding procedure specification of specific welds.

Quality records

Quality records shall be retained for a minimum period of five years in the absence of any other specified requirements.

Quality records shall include, when applicable:

- record of requirement/technical review;
- material certificates;
- welding consumable certificates;
- welding procedure specifications;
- equipment maintenance records;
- welding procedure approval records (WPAR);
- welder or welding operator qualification certificates;
- production plan;
- non-destructive testing personnel certificates;
- heat treatment procedure specification and records;
- non-destructive testing and destructive testing procedures and reports;
- dimensional reports;
- records of repairs and non-conformance reports.

Non-conformance and corrective actions

Measures shall be implemented to control items or activities, which do not conform to specified requirements in order to prevent their inadvertent acceptance. When repair and/or rectification is undertaken by the manufacturer, descriptions of appropriate procedures shall be available at all workstations where repair or rectification is performed. When repair is carried out, the items shall be re-inspected, tested and examined in accordance with the original requirements. Measures shall also be implemented to avoid recurrence of non-conformances.