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AUTOMOTIVE QUALITY SYSTEM

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ABSTRACT
Automotive manufacturers require suppliers to certify their quality systems to the industry's own requirements. It can be a challenge to make the right decision for organisation and develop a system that will satisfy customers in the years ahead. It is important to note that the general trend is a move away from the national standard schemes to the international ISO/TS 16949:2002.
Keywords: automotive industry, quality system, specific requirements

1. INTODUCTION

The automotive industry is a holder of the most modern management methods. The specificity requirements for management quality system in automotive industry often exceed possibilities of the system built by standards ISO 9000, so there were established additional national instructions like QS 9000 (USA), VDA (Germany), AVSQ (Italy), EAQF (France), and ISO 9001/2 (Japan). Automotive manufacturers require suppliers to certify their quality systems to the automotive industry standards. It is important to note that the general trend is a move away from the national standard schemes to the international ISO/TS 16949:2002.

2. TECHNICAL SPECIFICATION ISO/TS 16949:2002

2.1. Development of ISO/TS 16949

Standard ISO/TS 16949:2002, commonly referred to as TS2, was introduced in March 2002 as a globally accepted automotive sector Technical Specification. TS2 is the result of a phased-in industry approach to developing a single standard for the entire automotive supply chain, including design/development, production, installation and servicing of automotive components. Developed by the International Automotive Task Force (IATF) for global recognition, it has become a mandatory set of requirements for many automotive manufacturers in North America and Europe. This standard recognizes the uniqueness of every automotive supplier's process, while providing critical tools to help company better meet customer-specific requirements.
The IATF consists of an international group of vehicle manufacturers, BMW Group, DaimlerChrysler, Fiat Auto, Ford Motor Company, General Motors Corporation, PSA Peugeot-Citroen, Renault SA and Volkswagen, plus national trade associations, AIAG

(America), VDA (Germany), SMMT (UK), ANFIA (Italy) and FIEV (France).
ISO/TS 16949:2002 is an ISO Technical Specification. The IATF wrote TS2 in conjunction with the International Organization for Standards (ISO). This specification aligns existing American (QS-9000), German (VDA6.1), French (EAQF) and Italian (AVSQ) automotive quality systems standards within the global automotive industry.
Together with ISO 9001:2000, ISO/TS 16949 specifies the quality system requirements for the design/development, production, installation and servicing of automotive related products. In addition, there are customer specific requirements that are required by individual subscribing vehicle manufacturers.
TS2 does not replace the existing quality system requirements. However, along with customer specific requirements, ISO/TS 16949 has been accepted as an equivalent to QS-9000, VDA6.1, AVSQ, and EAQF. ISO/TS 16949 will eliminate the need for multiple certifications.

2.2. Benefits of ISO/TS 16949 implementation

Management Quality System according to TS2 makes possible to:

- Improve automotive supply chain product and process quality;
- Apply common and consistent international quality system requirements for the automotive industry;
- Gain confidence in global supplier quality;
- Implement policies and procedures for a common third party registration scheme to ensure consistency worldwide;
- Introduce process-based audits focusing on customer satisfaction;
- Increase customer satisfaction;
- Improve efficiency and profitability;
- Gain global acceptance of the standard in place of national standards.

2.3. Key Requirements of ISO/TS 16949

ISO/TS16949:2002 focuses on the effective linkages between the company's business plan, quality policy, quality objectives and measures, planning on how objectives can be achieved, and deploying objectives throughout the organization.

Some of the key additional requirements include the need for [1]:

- Top management involvement including establishing and implementing a business plan, including linkages to clearly defined measurable quality objectives.
- Clear definition of responsibilities, including shift activities and authority to stop production to correct quality problems.
- Top management review of the performance of the quality system, including reporting and evaluation of the cost of poor quality.
- Human Resource management including processes for defining competence requirements, providing training (including on the job training for employed and temporary and agency personnel), and verifying effectiveness of actions taken.
- A process to achieve quality objectives and continual improvement, creating an environment to promote innovation.

- A process to measure the extent to which personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.
- Focus on product and process design.
- Use of automotive core tools (Statistical Process Control (SPC), Failure Mode Effect Analysis (FMEA), Measurement System Analysis (MSA).
- Development of suppliers using ISO/TS16949: 2002.
- Controlling production processes by use of control plans including provision of adequate work instructions.
- Ensuring effective control of internal and external laboratories.
- A process for measurement of customer perception and satisfaction·
- Undertaking effective system, process and product audits.
- Effective analysis of data to drive continual improvement.
- Evidence of continual improvement through the organization and manufacturing process improvement.

The Process Auditing Model

TS2 is based on the process approach model of ISO 9001:2000, and requires companies to develop management systems that align with the way they do business. Companies define themselves with the processes they employ in running their operations, the sequences in which processes are done, and their interaction with one another. This model allows greater emphasis on the organization's unique characteristics. The process audit approach also encompasses all processes implemented within an organization's management system, including Management Responsibility, Resource Management, and Measurement, Analysis and Improvement.

The specific procedures for the effective control of processes

Besides a documented quality policy, documented quality objectives and a quality manual, TS2 mandates only seven specific procedures for the effective control of processes [2]:

1. Control of Documents (clause 4.2.3)
2. Control of Records (4.2.4)
3. Training (6.2.2.2)
4. Internal Audit (8.2.2)
5. Control of Nonconforming Product (8.3)
6. Corrective Action (8.5.2)
7. Preventive Action (8.5.3)

This "short list" of mandatory procedures places less emphasis on the amount of documentation required of the organization.

Principles of the performance improvement

Specification includes of eight principles that can be used by top management to lead the organization toward improved performance:

1. Customer Focus
2. Leadership
3. Involvement of People

4. Process Approach
5. System Approach to Management
6. Continual Improvement
7. Factual Approach to Decision Making
8. Mutually Beneficial Supplier Relationships

New Analysis and Measurement Requirements
TS also includes new analysis and measurement requirements for continual evaluation of the organization's management system and processes. They include:

- Measurable quality objectives, defined by top management, at relevant functions and levels within the organization;
- Enhanced requirements for the management review process;
- Customer satisfaction measurement, including customer perception as to whether customer requirements have been met by the organization, with emphasis on:
  - Delivered part quality performance
  - Customer disruptions, including field returns
  - Delivery schedule performance (including incidents of premium freight)
  - Customer notifications related to quality or delivery issues
- Monitoring and measurement of processes to demonstrate that the management systems processes and manufacturing processes are achieving desired results;
- The analysis and use of data, including characteristics, trend of processes and products, progress towards objectives and actions related to customer satisfaction.

2.4 General steps for Transition to ISO/TS 16949
The following actions can help organization planning and preparations for TS2 registration go more smoothly [3]:

- *Make sure you qualify*
  The IATF have made it clear that the applicability rules will be strictly enforced. TS2 is applicable to organizations that make or add manufacturing value to 'parts that go on vehicles'. Organizations that do not add any manufacturing value (e.g., sequencers, distributors, shipping companies, etc.) may not become registered to TS2. The only exclusion permitted for companies seeking registration to TS2 is the product design aspect of clause 7.3, design and development, if they are not design responsible. Organizations with the authority to establish a new, or change an existing product specification are considered design responsible.
- *Make sure your auditor is qualified*
  By transition from national instruction to ISO/TS 16949, organizations must have upgrade audit performed by a third-party registrar. Some organizations may find that their current registrar may not be able to perform the upgrade to TS2. It is important for all organizations to exercise due diligence in selecting a registrar that is duly recognized.
- *Learn what your customers are mandating*
  As previously mentioned, many customers have specific requirements that go beyond TS2, and that must be incorporated in the implementation of the management system.
- *Create an implementation strategy and prepare for transition*
  At minimum, the organization's preparation for transition should include:

- a clear understanding of TS2 requirements,
- a thorough review of IATF Rules, Guidance, Checklist and Customer Specific requirements,
- a gap analysis, comparing compliance and performance,
- a plan for implementing changes,
- selection of an IATF recognized certification body.

➢ *Perform internal quality audits*
Internal quality audits are important not only for examining if the organization conforms with the requirements of a recognized standard, but also to determine if the company is providing customer satisfaction and driving continual improvement.

3. THE UPSHOT

The general trend seems to be a move toward acceptance of ISO/TS 16949, but not all companies or national schemes have issued formal deadlines.
The following may be taken as a guide on the position of Auto Manufacturers on ISO/TS16949 [4]**:**

- *DaimlerChrysler*: Required registration of suppliers to ISO/TS 16949:2002 by the 1st July 2004.
- *GM / Ford*: Required registration to either ISO/TS 16949:1999 or ISO/TS 16949:2002 accepted as optional to QS-9000 up to 15th December 2006. After December 15th 2003 mandatory registration to ISO/TS 16949:2002 before 15th December 2006
- *PSA Peugeot Citroen*: Required registration to ISO/TS 16949:1999 or ISO/TS 16949:2002. Accepted as optional to EAQF up to 15th December 2003. After December 15th 2003 registration to ISO/TS 16949:2002 required by 1st July 2004, except for suppliers currently registered to ISO/TS 16949:1999, who must upgrade to ISO/TS 16949:2002 by 15th December 2004.
- *Renault*: Required registration to ISO/TS 16949:1999 or ISO/TS 16949:2002. Accepted as optional to EAQF up to 15th December 2003. After 15th December 2003 registration to ISO/TS 16949:2002 mandatory.
- *Volkswagen*: Required registration to ISO/TS 16949:1999 or ISO/TS 16949:2002. Accepted as optional to VDA 6.1 up to 15th December 2003. After 15th December 2003 registration to ISO/TS 16949:2002 or VDA 6.1 mandatory.
- *BMW*: Required compliance only to ISO/TS 16949:1999 or ISO/TS 16949:2002. After 15th December 2003 require compliance only to ISO/TS 16949:2002.
- *Fiat*: Required registration to ISO/TS 16949:1999 or ISO/TS 16949:2002. After 15th December 2003 registration to ISO/TS 16949:2002 mandatory.
- *Nissan*: Required compliance only to ISO/TS 16949:1999 or ISO/TS 16949:2002. Will accept existing other national standard for ANPQP new products. After 15th December 2003 require compliance only to ISO/TS 16949:2002.
- *Toyota*: no current QMS requirements, but will reduce 2nd Party audits for automotive QMS registered suppliers. Policy after December 15th 2003 not yet decided.

- *Other Japanese manufacturers*: Acknowledge TS, but don't require it as a supplier approval mechanism. They may reduce second party audits if the supplier is ISO/TS 16949:2002 certified.

All this indicates that ISO/TS 16949:2002 will be the standard that is used by the automotive industry internationally.

4. REFERENCES

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