A few small miracles give birth to an ISO quality management systems standard for **the automotive industry**

The potential for using ISO standards as a basis for alignment of customer requirements in global industries was established with the publication of ISO/TS (Technical Specification) 16949:2002. This standard, "Quality management systems – Particular requirements for the application of ISO 9001:2000 for automotive production and relevant service part organizations", *represents a significant advance to support the global automotive manufacturing industry.*

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Dream or reality – a globally agreed sector standard?

The recently published standard, ISO/TS 16949, *Quality management systems – Particular requirements for the application of ISO 9001:2000 for automotive production and relevant service part organizations*, was not directly linked to the early start described in the box on p. 4, and arose instead from the work of a number of organizations operating global businesses that had already produced national or global specific requirements for the management of quality systems and products in the automotive industry. The first edition of ISO/TS 16949, *Quality management systems – Particular requirements for the application of ISO 9001:2000 for automotive production and relevant service part organizations*, published in 1999, was largely an integration of these existing documents. They were:

AVSQ 94, from ANFIA (Associazione Nationale Fra Industrie Automobilistiche) in Italy;

EAQF 94, from PSA/Renault/FIEV (Fédération des Industries des Équipements pour Véhicules) in France;

QS9000, from Ford, DaimlerChrysler and GM (General Motors) in the USA;

VDA6.1, from the VDA (German Association of the Automotive Industry) in Germany.

Together, these documents have achieved over 20 000 third party registrations worldwide, with the first three aligned or containing ISO 9001:1994, *Quality systems – Model for quality assurance in design, development, production, installation and servicing*, and the last based on the broader content of ISO 9004:1994, translated into requirements.

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The lead-up

While there have been several positive approaches to third party certification in the global automotive industry, possibly the earliest independent third party registration for an automotive manufacturing business in the United Kingdom, to comply with an independent national QMS (Quality Management System) requirements standard, appears to be based on BS 5750 in 1985. At the time, while some national automotive standards existed, many requirements were specified by customers, generally in the form of discrete contract requirements, and automotive component manufacturers who adopted independent third party certification were motivated, in part, by the opportunity to present a single common system to all customers.

The history actually goes back further to the initial proposal for a generic quality management system standard, when pressure from different sectors of industry in the United Kingdom to have an equivalent series of quality standards to existing defence standards for contract purposes. This led to the submission of a first draft standard by the Society of Motor Manufacturers and Traders to the British Standards Institution.

This was circulated for public comment in 1973. The work was developed further, leading to the publication of the three Part BS 5179 series of guidance standards in 1974:

BS 5179: *Guide to the operation and evaluation of quality assurance systems*

- Part 1: *Final Inspection system*
- Part 2: *Comprehensive inspection system*
- Part 3: *Comprehensive quality control system*

Subsequently, the BS 5179 standards were then converted into BS 5750 in 1979. In turn, this three-part structure led to a similar structure for BS 5750 and ultimately the first ISO 9001/2/3 documents.

The process for the integration was already under way as a purely industry initiative, when a proposal was made that the group – by now known as the International Automotive Task Force – could also fulfil the role of conducting a pilot study within ISO/TC 176, *Quality management and quality assurance*. This would test procedures for the development of sector-specific standards, to be based on the future ISO 9000 family of standards.

When one looks back, during the two years prior to the publication of ISO/TS 16949:1999, a number of small miracles took place. At the outset, even members of the drafting team were not wholly convinced that the result – a globally agreed sector standard for the automotive industry – would be achieved. The influences within the team included company requirements, legislative requirements – that varied nationally – existing standards, let alone the individuals who first drafted the document and then had to seek support for those efforts within their own organizations. Overlaid on all this, the members of TC 176 appeared to sit in a number of camps, ranging from active support to develop a strategy that was becoming more urgently needed by global industries, to those who saw any interpretation of the generic requirements of ISO 9001 as anathema – notwithstanding its earliest origins.

The agreed work plan with TC 176 always envisaged a document that aligned to ISO 9001:2000. There were two potential routes – the first to expand the group, to encompass the global industry, including other suppliers and vehicle manufacturers not directly involved in the original four documents, and draft a new standard aligned with ISO 9001:2000. The second, the method that was employed, was to use the existing team in a first phase to integrate the existing documents, based on ISO 9001:1994, publishing as ISO/TS 16949 first edition, then, in phase two, to expand the group, as outlined above, leading to the current document.

A win-win process

Three points of focus have emerged from this work. The first is the direct result of the publication of ISO/TS 16949:2002. Third party certification to IATF (International Automotive Task Force) procedures[2] is accepted by all major automobile manufacturers in the world as evidence of effective quality

[2] This refers to the IATF certification process that is not part of the standard, and relates to IATF contracting with certification bodies.

management system deployment by an organization. This has provided a clarity and common global language that has the potential to move throughout the automotive supply chain, without the confusion of a myriad of different requirements. This will not only avoid waste and unnecessary cost; it will allow for development of suppliers to a common model.

The second area was the opportunity for accredited experts from the automotive sector, engaged in application of standards, to be fully integrated into the teams that produced ISO 9000:2000. This was significant in terms of commercial companies providing user expertise that was generally acknowledged to have strengthened the ISO process. It also provided for changes that have subsequently occurred in ISO and specifically ISO/TC 176 – the formation of the "Liaison forum", to provide support for the Chair of TC 176 when considering sector needs, and the development and alignment of future sector-specific requirements. The publication of ISO Guide 72 itself (*Guidelines for the justification and development of management system standards*) received input from ISO/TC 176, based on consideration of issues from the automotive pilot project.

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The third area is the potential in the future – perhaps for "manufacturing sector" alignment or the development of integrated management systems – to reflect the way in which industry is already moving, to integrate the management of quality with environment, health and safety and even business risk. The reality is that the size of the automotive market provides for input from a user community to ISO that must influence future direction and products.

The new document – purpose and content

Apart from the obvious – as defined in the title – the purpose of the document was to provide a globally transferable recognition of system compliance for any automotive manufacturing organization. Allied to this is the ability to avoid duplication of systems and associated effort, and to provide a comparable benchmark level for competition.

This global consistency also led to the decision to set up what amounts to an automotive, industry-specific recognized certification scheme. It is specifically intended to promote audit consistency and supplier improvement as measured by significant improvement in delivered part quality, elimination of supplier disruptions, on-time delivery, reduction in warranty claims, and continual quality system improvements.

These performance indicators point to the effectiveness of the quality management system in terms related to customer satisfaction. There continues to be concern among automotive customers about inconsistencies among third party audit practices applied to existing standards. These include:

- Not using specified quality tools such as control plans;
- Failure to audit against customer-specific requirements;
- Poorly written nonconformities;
- Using a "checklist" as the requirements document;
- Organizations with a fragmented quality system;
- Quality records that failed to address basics;
- Incomplete instructions or lack of records for on-the-job training;
- General lack of understanding the ISO 9001 basics – particularly related to process management.

The second edition also promotes the use of the requirements throughout the automotive supply chain. It requires that direct product manufacturing suppliers to the organization have their quality management system in harmony with the organization seeking certification to the technical specification. This essentially means the organization's direct product manufacturing suppliers need to have in place a robust development programme aimed at achieving compliance with ISO/TS 16949. There are a number of steps to be considered including conformity to ISO 9001:2000 as the first, followed by registration to ISO 9001:2000[3].

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Accepting ISO/TS 16949 certification from suppliers

ISO/TS 16949, first published in 1999, represents the collaborative efforts of OEM representatives to IATF including BMW, DaimlerChrysler, FIAT, Ford Motor Company, General Motors Corporation, PSA (Peugeot-Citroën), Renault, and Volkswagen. The supplier trade organizations included the Automotive Industry Action Group (AIAG), Associazione Nazionale Fra Industrie Automobilistiche (ANFIA/Italy), Fédération des Industries des Équipements pour Véhicules (FIEV/France), Society of Motor Manufacturers and Traders (SMMT/United Kingdom) and Verband der Automobilindustrie – Qualitäts-management Center (VDA-QMC/ Germany). The second edition also reflects participation by the Japan Automobile Manufacturers Association Inc. (JAMA).

Each of the subscribing automotive manufacturers has agreed to accept ISO/TS 16949 certification from suppliers in lieu of potential additional second party or third party assessments. Each OEM reserves the right to also impose customer-specific requirements in addition to the ISO/TS 16949 requirements document[4]. One of the strengths of the new technical specification is that it is aligned with the process-based approach of ISO 9001:2000. The focus on product realization and the process approach overcomes the concern that the quality system audit was too oriented to procedures based on an element-by-element assessment. □

The purpose of ISO/TS 16949 is to provide a globally transferable recognition of system compliance for any automotive manufacturing organization.

[3] This relates to the text in the TS, where compliance with the TS is required for an organization's suppliers, but that certification to ISO 9001 is a first step. This is not seen as a conflict, since the TS contains ISO 9001 verbatim – therefore, gaining certification to that is a halfway house.

[4] TS 16949 is supported by a number of non-ISO documents developed by IATF. These documents are not part of the TS, but relate to the audit process. They are all available from the IATF Oversight members – those who hold copyright and whose e-mail addresses are listed in the TS (FIEV, VDA, AIAG, SMMT, ANFIA).