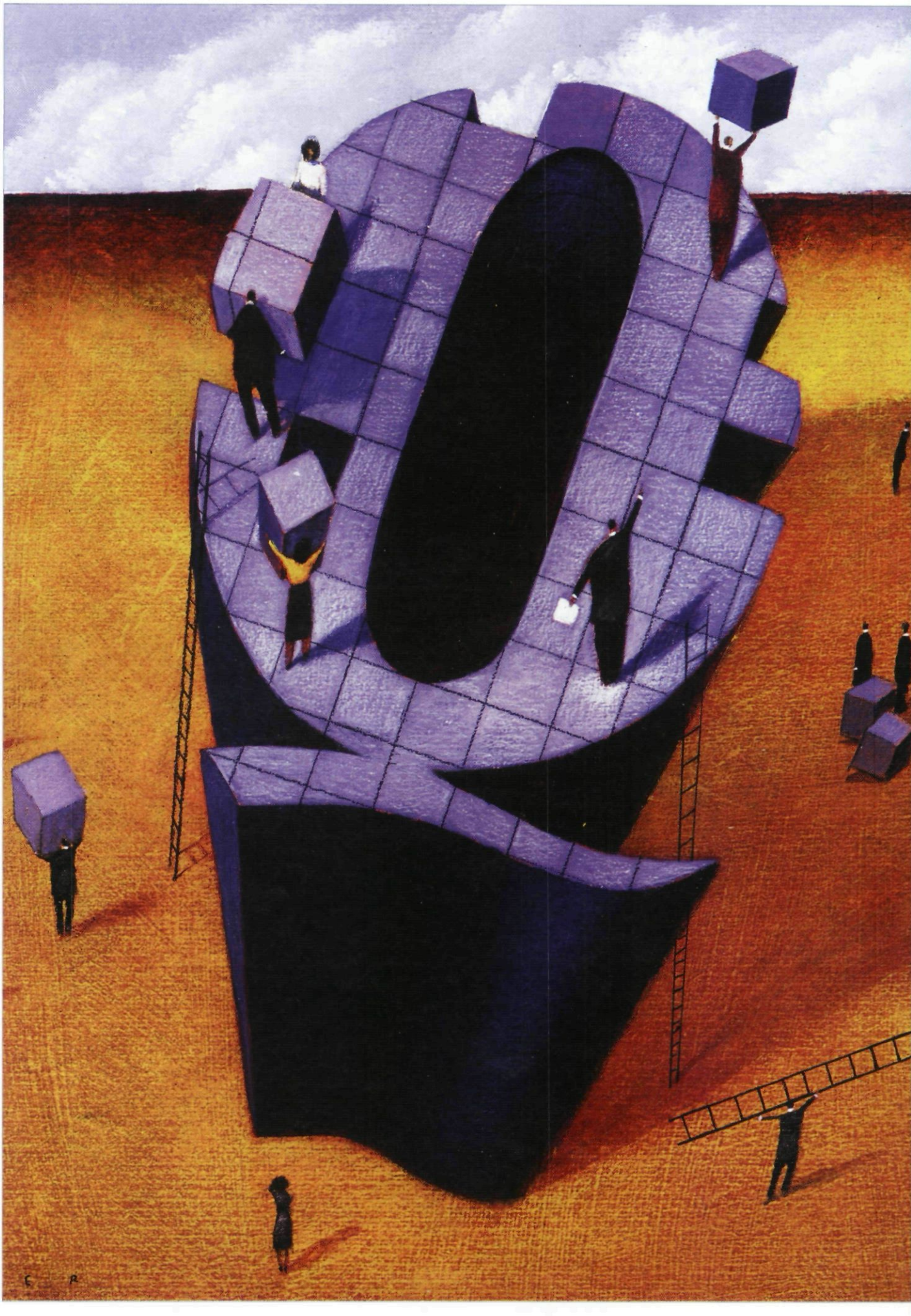

Setting the standard

UNTIL RECENTLY AUTOMOTIVE QUALITY SYSTEMS HAVE FAILED TO PROMOTE CONTINUAL IMPROVEMENT BUT, WITH THE INTRODUCTION OF NEW STANDARDS, THAT HAS NOW CHANGED. By David Hoyle

With over 8 million people working for 50 manufacturers producing over 60 million vehicles each year, the automotive industry is the biggest industry in the world and is constantly changing. But what are the factors that have shaped the international requirements for the management of quality in the automotive sector and which are continuing to challenge producers and regulators in the supply chain?

Oil prices have risen considerably since the start of the second Gulf War, and today's consumers are interested in more fuel efficient, smarter and safer automobiles. Consumer groups are pressing for sustainability, thus impacting not only the selection of materials but also the efficiency and effectiveness of the production processes.

In the 1950s, customer expectations were much lower. Owning a vehicle that started first time, had a radio and a heater, and which did not transform into a rust bucket after three years, was a dream. Now we take all these things for granted thanks to the marvels of innovation in design and production techniques. Technology is forever pushing the frontiers and customer expectations are continually changing.

Back in 1945, Toyota was faced with having to cut costs while producing a small number of many types of cars. It began to develop a different strategy to that used in the West – one in which the consumer pulls the goods they need thus eliminating overproduction. The automotive industry in the West was one that pushed products onto the market in quantities derived from sales forecasts. This strategy depended on sustaining consumer demand but, with the oil crisis of 1973 and the subsequent recession, gas-guzzling cars were no longer wanted. In the late 1980s and early 1990s, as companies became aware of the Toyota Production System, they too started to adopt what is being called a lean production philosophy.

Product quality is a function of three parameters; quality of design (the extent by which the design reflects users' needs and expectations); quality of conformity (the extent by which the design is faithfully reproduced in the manufactured product) and the quality of use (the extent by which the user is able to secure continuity of use from the product). Over the last 50 years there have been many changes in technology that have had a dramatic impact on the quality of design, conformity and use. There are those that have shaped the product and those that have shaped the processes concerned with its conception, production and maintenance. Among the most significant of these would be the advancements in computer technology and materials

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science. But was this miracle of engineering the product of a culture shaped by principles or procedures? In our societies there are those whose only need is a set of principles from which they are able to determine the right things to do. There are countless others who need a set of rules derived from principles that they can apply to what they do and indeed others who need a detailed prescription derived from the rules for a particular task. Unfortunately, we live in an age where prescription and regulation shapes the way we are governed, which is why standards such as ISO 9000 and its derivatives continue to be used.

From the days of Henry Ford when everything was done in-house, even to the extent of mining the ore from which the steel was made, the industry has been transformed by a supply chain where the vehicle makers are no more than design and assembly plants. The →

industry has become a global industry. Cars designed in one country are assembled in another with parts made in a third, fourth or fifth country. Organisations operating in the automotive sector continually have to improve product quality and delivery, reduce material and labour costs, waste and vulnerability in the supply chain. Under these conditions the need for harmonisation in management systems is essential. When it was all under one roof, there were common values, common objectives and common operating procedures. Now, with so many different players, the risk of there being conflicting objectives, priorities and loyalties is enormous. It is against this background that pressure for a common set of quality management system requirements emerged.

Generic international requirements for quality management systems came in 1987 with ISO 9000. From an amalgam of company-specific requirements, namely QS-9000 (USA), EAQF'94 (France), AVSQ'94 (Italy) and VDA 6.1 (Germany), the first international automotive specification ISO/TS 16949 emerged in 1999. This was followed by a second edition in 2002 that incorporated ISO 9001:2000. For many years these standards have been based on the premise that if you document what you do, and what you do conforms with the standard and to your documented procedures, you would produce quality products. Regrettably, as the standards did not address the social, economic, political and environmental issues, the resultant management systems reflected only some elements of the organisation and therefore the forces that influenced customer satisfaction lay outside these systems.

As the latest version of ISO 9001 embraces business excellence principles and now recognises that it is well managed business processes that create business results, not documented procedures, why couldn't the automotive industry simply adopt it?

In principle, the automotive industry could have settled for ISO 9001:2000. There are no additional principles embodied in ISO/TS 16949:2002. The difference is in the detail. Almost every additional requirement could be derived from the existing ISO 9001 requirements with a little imagination. But the industry cannot depend on people using their imagination. One of the key messages of ISO/TS 16949 is "the reduction of waste in the supply chain", thus echoing Toyota's strategy because, while there is waste in the supply chain, costs will continue to rise unnecessarily.

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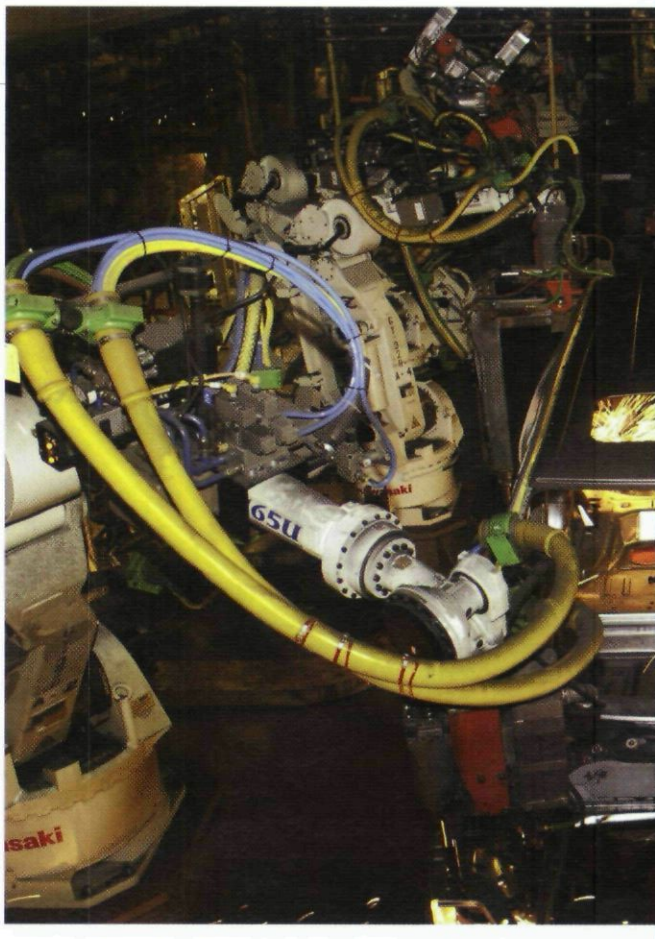
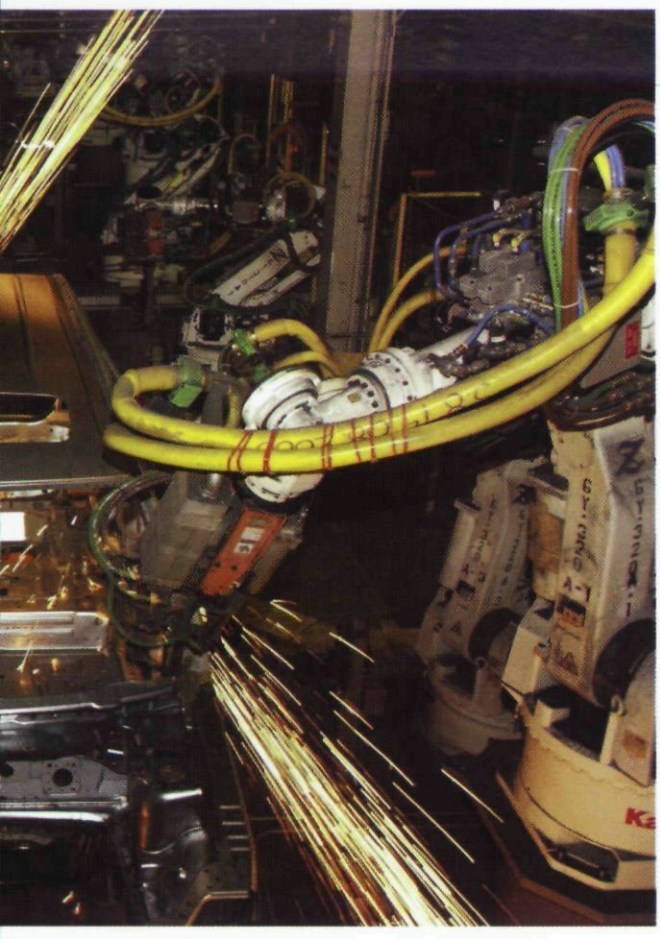


A number of techniques are used within the automotive industry that cannot be left to the imagination. Advanced Product Quality Planning (APQP), Failure Mode and Effects Analysis (FMEA), Production Part Approval Procedure (PPAP), Measurement Systems Analysis (MSA), Statistical Process Control (SPC) and error proofing are among the more important techniques.

CONTINUAL IMPROVEMENT

Another reason for changing ISO 9001 is in connection with the definition of continual improvement. In ISO 9000, continual improvement is defined as a recurring activity to increase the ability to fulfil requirements. The automotive sector has taken the advice of Joseph Juran, who, many years ago, remarked: "Putting out fires is not improvement of the process. Neither is discovery and removal of a special cause detected by a point out of control. This only puts the process back to where it should have been in the first place". Therefore, taking corrective action to prevent problems recurring is not continual improvement, contrary to what is implied by ISO 9001:2000. Thus in ISO/TS 16949:2002, continual improvement is only applicable when conformity has been established. So suppliers better wake up to this! When they reduce the defect rate from 25% to 10%, or the number of customer complaints from 100 to 25 per month, they are tinkering with the process, not undertaking continual improvement – unless of course the process was designed to produce 10% defectives or 25 complaints per month. These techniques are not unique to the automotive industry but it is an industry that has made most use of them and therefore if they are not prescribed, it sends out the signal that they are not important.

When the 'Big Three' analysed the impact of QS-9000 on their suppliers, they found several reasons why product



quality, price and delivery had not improved as they expected it would. Among these reasons was the competence of third party auditors, the effectiveness of the accreditation process and the ineffective application of the requirements by suppliers.

As of December 2004, The International Accreditation Forum (IAF) recorded 42 accreditation bodies with 77 certification bodies registered with UKAS. The experience of the vehicle manufacturers with ISO 9000 certification led them to question the wisdom of so many certification bodies chasing the same business in a competitive market. The results seemed to indicate that cost reductions by the certification bodies led to a decline in the quality of auditing which was the opposite of what customers wanted.

The organisation that produced a Process FMEA would get a tick in a box from the auditor. However, what concerned the International Automotive Task Force (IATF) was that these organisations were not using the FMEA as intended, i.e. as a tool to prevent nonconformity, so when problems subsequently arose the FMEA should have been analysed to discover why such failure modes had been overlooked. Also auditors were not examining process results and tracking down the causes of poor performance to nonconformity with the standard. This was not only true of FMEA, the same weaknesses were found in the application of Control Plans, APQP, SPC, MSA and process capability studies. It was as though few had understood the role of these techniques in the management of product quality.

Accreditation bodies witnessing third party audits were more concerned with finding evidence of adherence to auditing standards than with the effectiveness of the audit. They were not acting on behalf of the industry and as a result providing little protection against inept certification bodies.

The IATF therefore designed a certification scheme in which they are the regulator for the automotive-specific requirements, and hence have the ability to ensure greater uniformity in ISO/TS 16949 certification than has hitherto been the case. As a result, opportunists in the certification business will be excluded and, unlike ISO 9000 certification, third-party auditors who cannot demonstrate their competency to independent examiners every three years will be removed from this sector.

Many ISO 9000 registered organisations fail to satisfy their customers, but this is largely their own fault – they simply do not do what they say they will do. However, it is often the case that they do not understand what they have written. Instead of defining how they achieve their objectives, they have often paraphrased the requirements of the standard to produce a manual and set of procedures that would pass the scrutiny of the auditors. They have approached the task with the wrong objective in mind. The intent of ISO 9000 was not to create uniform management systems but to enable organisations to produce products and services that satisfied customer requirements.

ISO/TS 16949 was designed as an assessment tool, not a design tool; therefore, after all the business processes have been defined, you can ask, "Where within these processes would we find activities being managed in a way that satisfies this requirement?" If you find a related activity being managed but not exactly under the same conditions as prescribed in the standard, ask yourself, "Does the way we currently manage this activity produce an output that meets the customer requirement?" If it does, simply respond with a brief description of the way it is currently managed. If the output produced does not meet the customer requirements, you have identified an opportunity for improvement that can be entered into an action plan.

The adage 'What gets measured gets managed' applies equally to ISO/TS 16949. If the auditors continue to look for conformance instead of performance, suppliers will continue to focus on procedures and transactions. But in order to produce the 60 million or so vehicles every year on time, within budget and of consistent quality, each organisation needs to be managed as a system of interconnected processes. These processes need to be designed to enable the organisation to satisfy the needs of customers and other stakeholders, not simply short-term profits for shareholders. So understanding the requirements, the principles upon which they are based and how to manage business processes effectively will become a prerequisite for any organisation seeking ISO/TS 16949 certification. ■

David Hoyle is a consultant and well known author on quality management. His latest book 'The Automotive Quality Handbook' was published last month by Elsevier.