

THE NEW IATF 16949:2016 STANDARD IN THE AUTOMOTIVE SUPPLY CHAIN

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Abstract: The automotive industry is one of the most important sectors of the global economy. It has long been setting new standards not only in quality management (QS 9000/VDA or ISO/TS 16949). It is also an inspiration for seeking efficient production methods, such as lean production, agile production and tools that support such production in the global automotive supply chain. Since October 2016, a new quality management standard in the form of the IATF 16949:2016 system has been in place in the automotive industry. The standard amends the existing ISO/TS 16949:2009 based on the revised ISO 9001:2015 and customer-specific requirements (CSR).

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1. INTRODUCTION

Today's automotive companies seek perfection in an increasingly globalized and internationalized world economy in which businesses search for new markets, cheap labor and new locations in less developed countries in which they rely on well-tested technologies. A case in point are the manufacturing enterprises of automotive industry suppliers and subsuppliers (OEM-Tier 1, Tier 2, Tier 3, Tier 4, etc.), who account for 80% of the parts needed for new-automobile assembly. This statistic suggests that the market is dominated by suppliers facing pressures to adapt to the global environment, cater to the specific needs of individual automobile companies and their customers and create environments supportive of continuous change. Most of the changes result from technological advances and innovations, shorter product life cycles, reduced production costs and shorter lead times. Also of significance for suppliers is the industry-wide trend of streamlining relying on such systems as lean production and agile production and tools that support lean management and agile management. The manufacturing environment, which changes rapidly in the globalized market, is affected by highly variable and complex economic processes. Ever stiffer competition in the industry not only on design and technologies but also lead times and product life cycles, as well as the demands and opportunities of the circular economy (product manufacturing, use and disposal as waste "from cradle to grave") urge automakers and their suppliers to put an immense effort into searches for more efficient methods and management support systems. To that end, they make use of information and IT-mediated ERP systems and the new automotive quality management system standard IATF 16949:2016 (Misztal, 2016).

The goal of this article is to discuss some of the key changes introduced by the new IATF 16949:2016 standard affecting suppliers and sub-suppliers and present the author's draft plan of modifications and certification to the new standard to fit into the short transition window of 23 months between the publication of the new standard on October 1, 2016 and the expiry of ISO/TS certificates on September 14, 2018.

2. PRIOR ISO TECHNICAL SPECIFICATION 16949:2009

The first edition of ISO/TS 16949 was prepared in 1999 by the International Automotive Task Force (IATF) and ISO under the name Quality management systems for automotive suppliers – particular requirements for the application of ISO 9001:2004 with a view to achieving world-wide integration of country-specific assessment and certification systems, i.e. the North American QS 9000, the Italian AVSQ, the French EAQV and the German VDA, with the ISO 9001:2004 standard. Its successive editions (2002, 2009) were essential to keep up with advances in

the automotive industry and with amendments to the 2000 and 2008 editions of the ISO 9001 standard. The aim of the existing ISO/TS 16949 was to put in place a global quality management system throughout vehicle, component and part lifecycles to provide for continual improvement emphasizing defect prevention and the reduction of variation and waste in the supply chain (OEM-Tier 1, 2, 3, 4, etc.). The ISO technical specification emphasizes design, planning and production, all of which are subject to the most stringent regulations and require an interdisciplinary approach at every stage. The technical specification calls for a broad approach to analyzing error types and their effects in design, production and logistics failure mode and effects analysis (D/P/L FMEA). It is crucial to document and implement total productive maintenance (TPM) and production instrumentation management systems. The overall production documentation (technological manuals, inspection and test plans) must be based on process flow layouts, supported with analyses of production capacity (Cm, Cp, Cpk) and measuring system capacity (Cg, Cgk) relating to D/P/L FMEA. ISO/TS 16949 calls for a process-based approach, top management commitment to quality through quality measures, contingency planning, involvement in layered process audits and the selection of a customer representative by top management. Invariably, the standard additionally refers to customer-specific requirements (CSRs) of individual auto manufacturers referred to in APQP (Advanced Product Quality Planning), PPAP (Production Part Approval Process), FMEA (Failure Mode and Effect Analysis), MSA (Measurement Systems Analysis), SPC (Statistical Process Control), Formel Q Konkret manuals and GM/GP procedures (ISO/TS 16949:2007).

As it amended ISO 9001:2015 (Gołaś, Mazur, Misztal & Gruszka, 2016) a IATF commenced updating work, which has led to the publication of the IATF 16949:2016 version titled: Quality management system requirements for automotive production and relevant service part organizations (IATF, 2016).

3. KEY CHANGES INTRODUCED BY THE NEW IATF 16949:2016 STANDARD RELATING TO SUPPLIERS

IATF 16949:2016 specifies quality management system requirements for the design, development and production and, where applicable, assembly, fitting and servicing, of automotive products, including products with embedded software. IATF 16949:2016 shares the same section headings and clause structure as ISO 9001 and, after its 2015 update, follows the same high level structure (Supplement SL) with 10 clauses dedicated to ensure alignment with standards governing other management systems (such as ISO14001 and the ISO27000 series). As opposed to ISO/TS 16949 and other industry standards, IATF 16949:2016 does not contain the ISO 9001:2015 text, which may make it harder to read and understand its requirements (ISO/TS 16949 did cite the text of ISO 9001). To a certain extent, the

changes adopted in IATF 16949:2016 reflect those introduced in ISO 9001:2015. Others are either variations on ISO/TS 16949:2009 or all-new issues. The key changes provided in the IATF standard can be summarized as follows:

- Chapter 4 Context of the Organization

Context of the Organization is a new concept describing the need to ensure that quality management systems reflect the circumstances that affect the functioning of organizations. It is a “combination of external and internal factors, which may either positively or negatively affect the organization’s approach to defining and achieving its goals”. Understanding the context of the organization is vital for laying the groundwork for defining key system elements such as the scope of the quality management system, processes, policies, quality objectives and risk and opportunity identification. The key change enshrined in IATF 16949 is to ensure that products and processes (together with service parts from third-party suppliers) live up to customer, statutory and regulatory requirements (Sections 4.4.1.1 and 8.4.2.2) as well as product-safety-related characteristics in the form of special approvals cascaded throughout the supply chain (Section 4.4.1.2 Product safety).

- Chapter 5 Leadership

Both ISO 9001 and IATF 16949 emphasize leadership in addition to management. This means that the organization should formulate and implement a corporate responsibility policy covering at least anti-bribery policy, an employee code of conduct and an ethics escalation (whistle-blowing) policy (IATF Section 5.1.1.1 Corporate responsibility).

- Chapter 6 Planning

According to Section 6.1.2.1 of IATF 16949, risk analysis should be extended to product recalls, product audits, field returns and repairs, complaints, scrap and rework. Section 6.1.2.3 IATF obliges organizations to prepare contingency plans, which should include data associated with the identification and evaluation of internal and external risks for all production processes and infrastructure development to maintain production outputs and ensure the satisfaction of customer requirements.

- Chapter 7 Support

IATF 16949 places more emphasis on the multidisciplinary approach covering the risk identification and risk mitigation methods employed in preparing and improving plant, facility and equipment plans (Section 7.1.3.1), keeping process environment in a state of order, maintaining cleanliness and making repairs in keeping with product and production process needs (Section 7.1.4.1). The organization’s internal laboratory as well as any external laboratories it uses should have a specified scope of expertise and, specifically, demonstrate the ability to perform the required checks, tests and calibrations (Section 7.1.5.3).

- Chapter 8 Operation

Product and service design and development should apply to all stakeholders in the supply chain (a multidisciplinary approach with qualified personnel applicable to the use of APQP, FMEA, DFM and DFA, DFSS, DFMA and FTA tools and

techniques, Section 8.3.2.1). New and extended requirements apply to product specifications; borderline and interface requirements; the consideration of alternative design methods; risk assessment, the organization's ability to mitigate/manage risks as well as software design and development and self-assessment capabilities. With respect to shrivelling externally provided products, processes and services, IATF 16949 introduces supplier selection criteria and type and extent of control and assessment of product, material and service risk to verify their conformity with, among others, statutory and regulatory requirements in the country of receipt, shipment and the customer-specified country of delivery (Sections 8.4.2.1 and 8.4.2.2). The requirement criteria extend to supplier quality management system development (Section 8.4.2.3) and automotive product-related software and automotive products with embedded software (Section 8.4.2.3.1).

- Chapter 9 Performance evaluation

IATF 16949 requirements strengthened the need to drive a risk-based approach to the development and deployment of an organization-wide internal audit program covering systems, processes and products." The audit program should have specified risk priorities for internal and external performance trends and process criticality (Section 9.2.2.1-3)".

- Chapter 10 Improvement

IATF 16949 offers a more specific coverage of requirements for problem solving (Section 10.2.3), customer complaint handling and field failure test analysis, including "an analysis of the links of the integrated organization product software within the framework of the customer's end product system (Section 10.2.6)". IATF adopts new requirements for "warranty management system (Section 10.5.2)" – "any organization required to provide a warranty for its products should prepare and deploy a warranty management process" (IATF, 2016; ISO 2015, ISO/TS 2009; Owczarzak 2016; Reiche & Bastick 2016).

4. TRANSITION FROM ISO/TS 16949:2009 TO IATF 16949:2016

In keeping with the IATF-published strategy of transition from ISO/TS 16949:2009 to IATF 16949:2016, which accounts for the possibility that certain organizations may already be certified to the old editions of VDA 6.1 and ISO 9001:2008, IATF defined detailed transition rules and the related requirements for both certification bodies and organizations seeking an IATF 16949:2016 certificate (Fig. 1). For organizations seeking new IATF certification, the transition will take 23 months from the publication of the new standard to the expiry of ISO/TS certificates on September 14, 2018. Post October 1, 2017, no audits (initial, surveillance, recertification or transfer) may be conducted to ISO/TS 16949:2009.

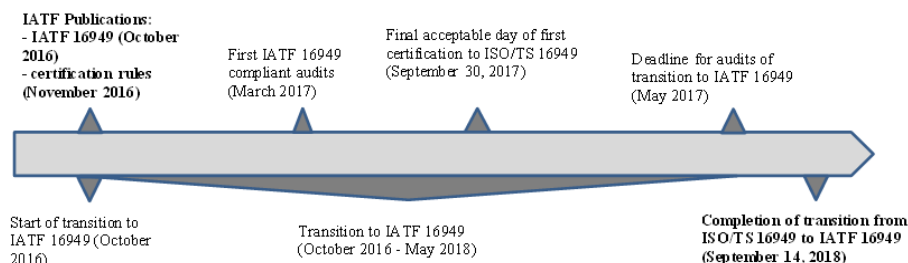


Fig. 1. Timing of transition from ISO/TS:16949 to IATF:16949 (Tuv-Sud, 2016)

Organizations certified to ISO/TS 16949:2009 should transition to the new IATF 16949 through a transition audit in line with the current audit cycle for ISO/TS 16949:2009 (i.e. at a regularly scheduled recertification or surveillance audit). Assuming that all prerequisites are satisfied (proof of an organization’s compliance with IATF 16949 requirements, auditor qualifications, etc.), organizations may begin their transition in October 2016.

No.	Thematic scope of task	Responsible	Deadline - year/month																																				Progress achieved	Uwagi	
			2016			2017												2018																							
			10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9															
1.	Purchase ISO 9000, 9001 standards, 2015 edition, and IATF:2016		█	█																																					
2.	Familiarize yourself with the standards and demands for transition to IATF:2016			█	█	█	█	█	█																																
3.	Hold internal training including change timeline analysis					█	█	█	█	█																															
4.	Appoint team to analyze gaps and prepare plan for transition from ISO/TS to IATF					█	█	█	█	█																															
5.	Prepare changes to system documentation based on gaps						█	█	█	█	█																														
6.	Train personnel and internal auditors regarding changes in system						█	█	█	█	█																														
7.	Implement changes									█	█	█	█	█																											
8.	Carry out internal audits															█	█	█	█	█																					
9.	Conduct management overview and agree transition audit date with certification authority																																								
10.	Conduct transition audit																																								
11.	Implement audit recommendations																																								
12.	Obtain IATF certificate																																								

Fig. 2. Draft schedule of transition from ISO/TS:16949:2009 to IATF:16949:2016 compliance

Based on their own experience of cooperation with the automotive industry, the authors propose the following draft plan of transition (shown in Table 1). The draft

plan covers such matters as: purchases of new editions of ISO standards, IATF 16949 and an online purchase of the standard of transition to IATF:2016 (IATF 2016). Next one should familiarize oneself with ISO 9000 and ISO 9001, IATF 16949 and the strategy of transition to the IATF standard (IATF 2016, ISO 2015). This can be achieved by way of internal training offered to selected employees. The change schedule can be agreed with the certification body. An essential part of the transition should be to appoint the organization's internal team tasked with analyzing gaps in the existing system against the new requirements and formulating a transition plan in consultation with the certification body.

An essential part of the transition should be to appoint the organization's internal team tasked with analyzing gaps in the existing system against the new requirements and formulating a transition plan in consultation with the certification body. The team should not only identify gaps but also coordinate the preparation and supplementation of system documentation by accounting for changes. Another essential step should be to hold internal training for the organization's functions in which system documentation was changed, the aim being to deploy the changes and carry out internal audits. If the audit and management review results are positive, the organization may agree the date and scope of transition audit and system certification to IATF16949:2016 with the certification body.

5. CONCLUSION

Regardless of the changes resulting from amendments to ISO 9001:2015, the new edition of IATF 16949:2016 should be implemented no later than 2018 to the extent of leadership and the context of the organization, the emphasis on risk management, and the focus on change aims, measurement and management, communication and awareness. IATF 16949:2016 contains detailed supplementation for the automotive industry, including significant changes regarding:

1. The adoption of the top level management structure, which is binding under ISO 9001:2015.
2. The understanding and definition of the context of the organization and the related internal and external problems relative to such context, resulting from risk and opportunity identification.
3. Top management engagement in corporate responsibility policy, including at least an anti-bribery policy, an employee code of conduct and an ethics escalation policy.
4. Increased emphasis on safety-related products and processes.
5. More stringent requirements concerning product traceability to comply with the latest regulatory changes and requirements for products with embedded software.
6. Added requirements related to corporate responsibility.
7. Taking account of the warranty management process.

8. Increased requirements for internal and external auditors.
9. More specific requirements concerning supplier/sub-supplier management and development.

REFERENCES

- Gołaś H., Mazur A. & Misztal A. (2016). Model doskonalenia przedsiębiorstwa przez zarządzanie ryzykiem zgodnie z ISO 9001:2015. *Problemy Jakości* 10, ISSN 0137-8651.
- Gołaś H., Mazur A. & Gruszka J. (2016). Improving an organization functioning in risk conditions in accordance with ISO 9001:2015. *Proceedings of the 2016 International Conference on Economics and Management Innovations*, 57, pp. 257-261.
- IATF16949:2016 Quality management system requirements for automotive production and relevant service parts organizations. 1st Edition.
- IATF16949, Transition, Strateg, and, Requirements_REV02, [www.iatfglobaloversight.org/docs/ISO 9000:2015 Quality management systems - Fundamentals and vocabulary](http://www.iatfglobaloversight.org/docs/ISO%209000:2015%20Quality%20management%20systems%20-%20Fundamentals%20and%20vocabulary).
- ISO 9001:2015 Quality management systems – Requirements.
- ISO/TS 16949:2009 Technical specification
- Owczarzak A. (2016), IATF:2016 Przegląd najważniejszych zmian w ISO/TS 16949:2009 www.qualityaustria.com.pl/baza-wiedzy/art/iatf-169492016.
- Misztal A. (2015), Kryteria brzegowe implementacji systemów zarządzania jakością w przedsiębiorstwach branży motoryzacyjnej. Wydawnictwo Politechniki Poznańskiej.
- Reiche Ch. & Bastick J. (2016), Automotive QMS Update IATF 16949:2016, [www.aieg.org Tuv-Sud.pl/automotive-information-pl-v10.pdf](http://www.aieg.org/Tuv-Sud.pl/automotive-information-pl-v10.pdf).

BIOGRAPHICAL NOTES

Jozef Gruszka is an Associate Professor at the Faculty of Engineering Management, Poznan University of Technology. His research interests include surface engineering and quality engineering. He authored and coauthored of more than 100 scientific articles and 40 industrial implementations.

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