

Current quality assurance practices in global supply chain of U.S. automakers

By

Jayanta K. Bandyopadhyay and Gopal Mishra
Central Michigan University, Mt. Pleasant, Michigan

ABSTRACT:

Quality assurance practices in supply chain of American automakers have evolved through decades from quality inspection and quality control to statistical process control and quality auditing. Emergence of quality audit had been accompanied by creation of numerous customer specific quality standards. Further with globalization of the supply chain, quality assurance practices in global supply chains have been taking a new direction from that of inspection and quality control to QS-9000/ISO-9000 registrations , quality auditing and statistical process control.

This research, present the result of a questionnaire survey., exploring the current quality assurance practices of the suppliers of automotive components, and automobile sub-assemblers, in global supply chains of the American automakers for achieving competitiveness in world market place in this new millennium.

Key Words: Quality Assurance, QS-9000, ISO-9000, American automakers quality assurance practices

1.0 INTRODUCTION

In this new millennium, in a world market place, particularly for the automotive industry, competition is no longer among companies but among global supply chains. Moreover, quality has taken precedence over all other order winning criteria and become the order qualifier (6). Therefore, for achieving competitive advantage, quality assurance by the assemblers, as well as by each and every individual supplier has become essential. Due to this new challenge in world market place, quality assurance practices in global supply chains have been taking a new direction from that of inspection and quality control to QS-9000/ISO-9000 registrations , quality auditing and statistical process control.(9) From 1950's through 1960's quality assurance practices were dominated by receiving inspection, outgoing inspections and statistical quality control of works in progress, whereas during 1970's and 1980's they were complimented by statistical process control, internal quality audit, and supplier's quality audit using customer set standards. While each customer was

setting its own quality standard, Very soon numerous customer's quality standards were created all over the world, which imposed severe stress on many suppliers of automotive parts and sub-assemblies, particularly, those who wanted to supply more than one customers for expanding their customer base (8). For example, if a supplier wants to supply its parts to Chrysler, Ford, and G.M., then it had to comply with all three auto maker's individual standards such as Chrysler's *Supplier Quality Assurance standards*, Ford's *Q-101 Quality Systems Standards*, and General Motor's *NAO Target of Excellence standards* (15).

In early 1990s, in order to bring harmony among all customers standards in world market places, representatives of the Institutes of Standards of various countries including U.S.A., Canada, U.K., France, Germany, Netherlands, and Switzerland, gathered together in Geneva, Switzerland, and created a new common international standard for all quality systems around the world, known as "ISO-9000 Series of Quality Standards"(8). Thus, in 1990s, ISO-9000 became the predominant quality standards implemented by many suppliers with the expectation of supplying multiple customers. However, ISO-9000 was designed as a generic standard with wide flexibility applicable to all kinds of companies belonging to wide spectrum of industries.(3) Because of its wide flexibility, the big three automakers of the United States viz. G.M., Ford, and Chrysler, did not accept ISO-9000 as their suppliers' quality audit standard, rather, they jointly developed a set of more rigorous Quality Standards, known as QS-9000 which includes all twenty elements of ISO-9000 as the core requirements.(5) Thus, QS-9000 was introduced in mid -1990s as the fundamental quality systems requirements by the big three auto makers, General Motors, Ford, and Chrysler, the Truck Manufacturers, and other subscribing companies for quality assurance in their global supply chains. They applied QS-9000 to all internal and external suppliers of raw materials, components, sub-assemblies, and service parts in their global supply chains. (5)

General Motor Corporation mandated that all of its suppliers be registered by a third party (independent) QS-9000 Quality Systems Registrar no later than December 31, 1997. For all new suppliers General Motors also started performing Potential Supplier Audit since January 1, 1995 based on Quality Systems Assessment (QSA) document. and by January 1, 1996 third party registration to the QS-9000 Quality Systems Requirements had been required of all new suppliers by General Motor.(4)

Ford required all its suppliers to be registered to QS-9000 Quality Systems Requirements on or before December 31, 1996. However, Ford had been extending this deadline on case by case basis. Also Ford had announced that it would also perform second party audit, instead of third party audit, on exception basis.(4)

Chrysler Corporation had laid down a demanding schedule for QS-9000 implementation by its suppliers. All Chrysler's suppliers were asked to complete a self-assessment to QS-9000 by July 7, 1995, and all production and service part suppliers to Chrysler were asked to register to QS-9000 by a third party registrar by July 31, 1997. However, they had also been closely reviewing their suppliers and extending the deadline on case by case basis.(4). Thus, quality assurance practices in global auto supply chains has changed significantly over the past decades, and has been taking a new direction in this new millennium. As compared to inspection and quality control, the current practices are becoming more quality system audit oriented registration of suppliers using ISO-9000, and QS-9000 series of quality standard (12).

2.0 CURRENT QUALITY ASSURANCE PRACTICES IN AUTOMOTIVE SUPPLY CHAIN

In order to explore the current quality assurance practices of the suppliers of automotive components, and automobile sub-assemblers, in global supply chains of the American automakers for achieving competitiveness in world market place in this new millennium, a questionnaire survey has recently been conducted among 100 tier one and tier two suppliers of American automotive assemblers which reveals the following results.

- 70 % of all tier one suppliers surveyed are QS-9000 certified
- 50% of all tier II suppliers surveyed are either ISO-9000 or QS-9000 certified.
- Among those suppliers surveyed who are not ISO-9000 or QS-9000 certified, they plan to certify themselves, within the next 3-5 years.
- Among those surveyed, 100% of all QS-9000 or ISO-9000 certified tier I suppliers are getting audited every six months by their registrar for retaining their registration.
- Among those surveyed, 100% of all tier II suppliers who are not ISO-9000 or QS-9000 certified are getting audited by their customers at least once every year.
- 100% inspection of incoming materials has become the common practices by suppliers.
- 100% inspection of outgoing materials has become the common practice by suppliers.
- SQC and SPC have been commonly used by suppliers for their works in processes.

3.0 CONCLUSION

Undoubtedly, quality has become the order qualifier for an automotive supplier in this new millennium. In order to survive in a competitive market place, tiers I as well as tier II suppliers are continuously striving to achieve excellence in quality. Almost all tier I suppliers are already QS-9000 certified, and majority of the tier II suppliers are either QS-9000 or ISO-9000 certified. Moreover, those who are ISO-9000 certified, they are upgrading their certification into ISO/TS16949 or QS-9000 in the next 3-5 years. Also, repeated surveillance audit by registrars and by customers have become the common practice to keep the suppliers alert on its quality maintenance efforts. With continuous efforts for improvement by the tier I and tier II suppliers, the automotive supply chain has become much more reliable and dependable today than it was ever in the past.

4.0 REFERENCE

1. Automotive Industry Action Group(AIAG) (1997), "AIAG/ASQ, 1997 Quality Survey Overview", AIAG Southfield, Michigan.
2. AIAG(1994), *Quality Systems Requirements: QS-9000.*, AIAG, Southfield, MI
3. Bandyopadhyay, J.K.(1993) *Practitioner's Handbook: How To Achieve Registration in Compliance With ISO 9000 Series of Quality Standards*, Quality & Productivity International, Midland, Michigan.
4. Bandyopadhyay, J.K.(1995), *QS-9000 Handbook for Implementation and Audit*, CRC Press, Tampa, FL.
5. Bandyopadhyay, J.K.(1996), " QS-9000: The new quality systems requirement for automotive industry", *Production and Inventory Management Journal*, APICS, Falls, Church, Virginia, December, p.23-27.
6. Clements, R., Sidor, S.M., and Winters Jr. R.E.(1995), *Preparing Your Company for QS-9000*, ASQC Quality Press, Milwaukee, Wisconsin.

7. Dunn, R.,(1996)" New meaning for Integrated Supply Systems, *Plant Engineering*, Sept.,
8. Eckstein, A.L., and Balakrishnan, J.(1993), " The ISO Series :Quality Management System for the Global Economy." *Production and Inventory Management Journal*, Fourth Quarter.
9. Higgason, Larry, (1995), "AAIG 1995 Quality Survey Results Summary", *Proceedings of 1995 ASQC Automotive Division Fall Conference*, Troy, Michigan.
10. Kalinosky, I.S.(1990), " The Total Quality System Going Beyond ISO 9000." *Quality Progress*, June.
11. Larson, Melissa,(1996),"QS-9000: Not firing on all cylinders", *Quality*, September,1996
12. Lofgren, G.(1991),"Quality Systems Registration", *Quality Progress*, May, p. 35-37.
13. Lofgren G.(1992), ISO 9000: A Universal Standard of Quality, *Management Review*, January,
14. Morgan J.(1997)"Is integrated Supply the way to future", *Purchasing*, May, , p.40-47.
15. Murphy, T,(1997),"Suppliers facing a mountain of Challenges",*Auto World*, July,
16. Ramsay, M.(1992), "ISO 9000: "The Myths and Misconceptions." *APICS The Performance Advantage*, June..
17. Marquardt, D. W., et. al (1991), " Vision 2000: The Strategy for the ISO 9000 Series Standards in the 90s." *Quality Progress*, May.