

IMPLEMENTING ISO 9000 THROUGH VALUE ENGINEERING

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ABSTRACT

Common Process Initiative, also known as ISO 9000 is the largest and most ambitious Acquisition Reform Innovation ever taken on by the Federal Government. It is fundamentally, a broad based, universally applicable Value Engineering (VE) Program, yet it is not utilizing any of the VE fundamentals. Years of value experience is being lost. The size of the initiative (in financial impact and universality of application); its direct relevancy to the "Cost Reduction Mission" of VE; and its need for enlightened use of the VE contractual protocol and change facilitation techniques, (i.e. VECP's), makes it vital that it be heard at this conference.

INTRODUCTION

The initial publication of ISO 9000, in 1987 has attracted interest throughout the world and is one of the most talked about subjects in international trade. The ISO 9000 publications is a set of universally accepted standards rapidly being adopted by companies from practically every industry. Suppliers are being asked or in many cases required to adopt these standards. Within the ISO 9000 standards is the requirement for internal audits.

WHAT IS ISO 9000 ALL ABOUT?

THE INTERNATIONAL STANDARDS ORGANIZATION (ISO)

ISO stands for the "International Standards Organization". It was founded in 1946 as a

non-governmental organization to promote the development of a uniform international standard and to facilitate the exchange of conforming goods and services worldwide. Such uniformity is designed to promote cooperation in intellectual, scientific, technological, and economic activities. The standards are set and controlled by ISO in Geneva, Switzerland. It has a membership comprised of national standards bodies from more than one hundred countries. The American National Standards Institute (ANSI) represents the United States.

GENEALOGY OF ISO 9000

- 1946-ISO established
- 1946-1979-MIL-Q-9858A developed.
- 1979-1981-England releases BS-5750
- 1981-87-ISO 9000/BS-5750 for common market
- 1987-ANSI/ASQC incorporates ISO 9000
- 1989-RAB established.
- 1991-ISO adds qualification audits
- 1992-ISO adds breakdown of 9000 series.
- 1994-AMSO/ASQC issues Q 9000 series

- 1995-NAVSEA issues detailed guidance.

THE BIG CHANGE IN DoD POLICY (Feb.1994)

In February 1994, the Secretary of Defense William Perry, issued a policy letter authorizing the replacement of MIL-Q-9858A and MIL-I- 49856 standards for quality systems with the ISO-9000/Q90 on all new and follow-on contracts. Mr. Perry recognized the need for an international system that can be used in the U.S. wherever it has a military presence. "We must use commercial specifications and standards," he said, "whenever possible because the United States cannot afford two industrial bases-one for defense and the other commercial." He has required suppliers to DoD to become compliant with ISO-9000 and is encouraging them to develop strategic plans to achieve registration in the very near future.

THE GENESES

From TQM to Acquisition Reform to a Total FAR rewrite to the Deletion of Military Specifications to the adoption of ISO 9000.

WHY CHANGE?

The focus over the **past decade** has been on Total Quality Improvements with a reduction in cost savings. The focus in the **next decade** will add commercial systems, processes and standards Federal contracts in the global marketplace. Even if you are not involved in government contracts, or you do not export, domestic customers are increasingly seeking registered suppliers to better serve their customer needs. Registration is becoming a distinct advantage and of paramount importance when doing business in the U.S. and other world markets. For example, for decades, Chrysler, Ford and General Motors have required their suppliers not only to meet product specifications but to follow prescribed quality systems and procedures. These automobile companies have years of experience in determining which quality systems their suppliers should follow to provide assurance that they are capable of delivering products that meet the companies requirements. With the advent of ISO 9000, these three companies knew the importance and made the decision to require their suppliers to meet ISO 9000.

STATUS TODAY

To date, the ISO-9000 standard has been adapted by over 7,000 U.S. companies and over 70 different countries. QS-9000 is a supplement to ISO 9000 and was developed by the automotive Big Three-Chrysler, Ford, and General Motors- and is available through the Automotive Industry Action Group (AIAG). These manufacturers are requiring their first-tier suppliers to adopt the QS-9000 requirements which incorporate the entire ISO 9000 standard.

IMPLEMENTING ISO 9000

1. Assess current quality policies
2. Document quality assurance procedures.
3. Develop plan for registration.
4. Develop a process flow diagram.
5. Conduct a self-audit.
6. Implement corrective actions.
7. Re-audit.
8. Select registrar from either RAB or National Accreditation Council for Certified Bodies (NACCB).
9. Choose level of certification.
10. Train audit response teams.
11. Schedule audit.

BENEFITS OF ISO 9000

1. **A foundation for Total Quality Management.** It is a common language. It provides the basics on which to build TQM. It is readily understood throughout the world.
2. It is **universally accepted**-no trade barrier. With a single standard for quality systems worldwide, a common language will be used when dealing with quality standards. Customers can purchase and sell products avoiding any confusion on expectations from suppliers.
3. It keeps the **customer focused** and makes products more responsive to customer needs. Registration means that a company ensures their competitive position in the European Community. Customers will demand that suppliers be registered.
4. There are many **cost benefits**, such as reducing the costs of operation and support. A registered company will reduce the costs to customers, because

they will not have to audit the areas covered by the ISO-9000 audit.

5. Their will be **no independent audits**. A companies compliance to ISO-9000 will be sufficient evidence to the customer that the supplier has an adequate quality system.

6. As a registered company, has a definite **competitive advantage** in the marketplace over those companies not registered. It will give customers confidence in the ability of the registered company delivering quality products. Over time registration will become a requirement to enter the market and conduct business throughout the world.

7. All companies registered with ISO will be published and the list made available to purchasers. This **recognition** of a company will show when the company was first registered and the companies products covered by the registration. This listing of manufacturers is like the *Good Housekeeping seal* of approval for consumer goods.

ELEMENTS OF ISO-9000 REGISTRATION REQUIREMENTS.

1. Management responsibility
2. Quality System
3. Contract review
4. Design control
5. Document control
6. Purchasing
7. Purchaser (The Customer)
8. Product identification/tractability
9. Process control
10. Inspection and testing
11. Inspection, measuring & test equipment
12. Inspection and test status
13. Control of non-conforming products
14. Corrective action
15. Handling, storing, packaging & delivering
16. Quality records
17. Internal quality audits
18. Training
19. Servicing
20. Statistical techniques

FOLLOW-ON STEPS

1. Surveillance audit every six months.
2. Complete re-audit every three years.
3. Practice continuous measurable improvement.

HOW DO WE MAKE BLOCK CHANGES?

HOW DO WE APPLY THE CHANGES IN A CONTRACTUAL ENVIRONMENT?

Once a common process or a single process has been achieved you would use block changes to alter the contract.

THE DEFINITION OF A BLOCK CHANGE.

Modify existing defense contracts on a facility-wide basis to consolidate, eliminate or substitute selected multiple management and manufacturing requirements with a system that will improve efficiency, reduce cost, and advance acquisition reform.

OBJECTIVE OF BLOCK CHANGES

Block changes enables contractors to modify existing contracts by substituting ISO 9000 (type) processes for military specifications and standards. It also allows contractors to use normal or commercial processes. Finally, it encourages contractors to eliminate multiple, redundant, overlapping and non-value added government requirements

HOW DOES A CONTRACTOR SUBMIT BLOCK CHANGES

1. Establish an internal management council.
2. Develop company strategy and proposal plans.
3. Train all proposal participants.
4. Select and schedule candidate changes.
5. Evaluate magnitude of changes.
6. Measure implementation and savings.
7. Submit concept document with ROM figures.
8. Negotiate block changes.
9. Execute class modifications on block changes.
10. Implement changes.

COST CONSIDERATIONS

1. Concept paper will include:
 - a. Cost-benefit analysts
 - b. Rough order of magnitude (ROM)costs.
 - c. Sufficient supporting data for analysis.
2. Implementation costs will the estimated
3. Savings will be estimated.
4. Contractor will reflect costs and savings for all approved process changes.

- 5. Contractor submits changes to forward pricing rates (in most cases overhead will go down.)
- 6. No certified cost or pricing data required.

THE INTERIM RULE

On April 29, 1996 an interim rule was issued as part of the Federal Acquisition Streamlining Act (FASA) FAC 90-30, FAR CASE 94-723 and Section 10002. This rule authorizes, but does not require, modification of existing contracts without requiring consideration, upon request of the contractor, to incorporate changes into existing contracts. Contracting Officers are encouraged, if appropriate to make such changes. This rule does not require re-negotiation or modification of existing contracts. It encourages contractors, does not require them to make changes. The contracting officer would determine that the modification of an existing contract is appropriate to incorporate changes authorized by the FASA.

EMPHASIS ON SMALL BUSINESS

Small business suppliers throughout the world are being requested, pressured, and even coerced into ISO-9000 registration or going out of business all together. For example, Du Pont, General Electric, Eastman Kodak, British Telecom, and Philips Electronics (to mention just a few) are among the big companies that are urging or even coercing suppliers to adopt ISO-9000. GE Plastics commanded 340 vendors to meet the standard. They told the vendors, "If you want the work, you have to be registered." The Big Three Auto makers are using the standard to advertise and sell their products. Other industries currently implementing ISO-9000 include chemical, computer, steel, pharmaceutical, and medical devices.

WHAT MAJOR DEFENSE CONTRACTORS ARE PARTICIPATING

- ALLISON ENGINE COMPANY
- BOEING
- GE AIRCRAFT ENGINES
- HUGHES-TUCSON
- LOCKHEED-MARTIN VOUGHT SYSTEMS
- LORAL DEFENSE SYSTEMS
- LORAL FEDERAL SYSTEMS
- MCDONNELL DOUGLAS
- RAYTHEON
- ROCKWELL COLLINS

TEXAS INSTRUMENTS
UNITED DEFENSE

WHERE DO MOST OF THE FREQUENT CHANGES COME FROM

- Calibration Standards
- Configuration
- Cost Data Reporting
- Electronic Manufacturing
- Material Reviews
- Military soldering
- Quality Systems
- Software Development
- Subcontract Approval
- Test Requirements

HOW CAN VALUE ENGINEERING HELP?

Their are two aspects of ISO-9000 where Value Engineering can help a company: The first is helping a company with certification and registration. The second is in the area of achieving the greatest block changes, with the least amount of effort and cost. In other words the most beneficial to the company from a Return-on-Investment point of view.

UTILIZING THE VE JOB PLAN TO ACCOMPLISH THE TQM PROBLEM SOLVING PROCESS FLOWCHART

The seven phase VE Job Plan of a value analysis study works well with the seven steps of a Problem Solving Process Flow Chart:

The VE Job Plan

- INFORMATION
Clearly define process
Identify opportunities
- FUNCTION
Define actual process steps
Arrange steps in proper order
- SPECULATION
Brainstorm steps
Prioritize solutions
- SOLUTION
Select best solutions
- PRESENTATION/REPORT
Make presentation
- IMPLEMENTATION
Evaluate
- FOLLOW-UP
Measure results

The Process Flowchart

- UNDERSTAND CUSTOMER
Identify problems
Prioritize problems
- SAY WHAT YOU DO
Define problems
Analyze problems
- DO WHAT YOU SAY
Brainstorm solutions
Collect solutions
Prioritize solutions
- PROVE IT
Select best solutions
- MONITOR IT
Make presentation
- IMPROVE WORK PROCESS
Evaluate solutions
Implement solutions
- MEASURE IMPROVEMENT
Set up control procedures

ACHIEVE CONTINUOUS IMPROVEMENT

WHERE TO PLACE THE VE EMPHASIS

Establish VE teams on a facility-wide basis in the following areas:

- Quality Assurance
- Systems Specifications
- Configuration Management
- Procurement Activities
- Document Controls
- Inspection, Testing & Measuring
- Handling, Storing, Packaging, & Delivery
- Management Systems
- Material Handling Requirements

ACHIEVING BLOCK CHANGES THROUGH THE PROVEN VE FORMAT

With the magnitude of potential changes in production and the need to achieve “continuous improvement”, the value methodology is the ideal tool to be used in determining which targets to attack. The steps to take are:

1. Analyze all existing MIL-STD/Contract requirements in the area of interest and compare those with commercial practices. Some areas to look at are:
 - Improving machine downtime.
 - Determine machine change over times.
 - Deducing excessive cycle time.
 - Eliminating scrap, rework and repair.
 - Better use of floor space.
 - Attacking excessive variation.
 - Achieving 100% first-run capability.
 - Analyzing testing requirements.
 - Reducing labor and material waste.
 - Attacking the non-value added effort.
 - Reducing difficult assemblies or installations.
 - Reducing excessive handling/storage costs.
2. Utilize the VE technique to find the best results.
3. Use a modified value engineering change proposal approach to submitting concept proposals.

TWO EXAMPLES OF SUCCESSFUL VE GENERATED BLOCK CHANGES

1. **TEXAS INSTRUMENTS** submitted two block changes which impacted **770** contracts:

- By using alternative coatings, they were able to delete four MIL-SPECS and reduce environmental emissions by 40%.
- By utilizing commercial standards for quality soldering, encapsulation and electrostatic discharge protection, they were able to delete 19 MIL-SPECS.

2. **RAYTHEON** submitted one block change which impacted **884** contracts at **16** different facilities with savings of **\$6,500,000**. This was done by streamlining **12** processes.

THEIR IS STILL PROBLEMS THAT NEED TO BE SOLVED

1. Conflicting interpretations on interim rule where cost savings are very large, ACO's and PCO's are going to want a share in those savings. They will want some consideration notwithstanding the interim rule.
2. No adequate definition for substantial savings.
3. Inspection and acceptance issues not solved.
4. What happens to the specification baseline.
5. No policy on resultant waivers and authorizations.
6. Subcontract flowdown requirements vague.
7. Cost performance reporting issues not solved.
8. New contracts reinstating “old” processes.
9. Concentration on small issues-not big ticket items.
10. Lack of clear policy on need for formal proposal.
11. ACO/PCO required to monitor multiple common processes.
12. No organized approach to smoking out changes.

CONCLUSION

The Common Process Initiative is the largest and most ambitious Acquisition Reform Initiative ever

taken on by the Federal Government. It is fundamentally, a broad based, universally applicable Value Engineering Program which uses a much different contractual protocol. Thus far, in its regulations and directives, the government has given only passive mention of VE as a possible contractual vehicle. There has been little or no visible attempt to enlist the aid of the VE community in this huge effort. The education and direction of industry, in the initiative, has been handled by the contracting and quality communities. The VE community should be a participant. **VE can help the process.**

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ADDITIONAL SOURCES

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2. MIL-STD 45662 - CALIBRATION SYSTEMS REQUIREMENTS
3. MIL-STD-1535 - SUPPLIER QUALITY ASSURANCE PROGRAM REQUIREMENT

4. MIL-STD-1520- CORRECTIVE ACTION AND DISPOSITION SYSTEMS FOR NON CONFORMING MATERIALS

5. MIL-1-45208- INSPECTION SYSTEMS REQUIREMENTS

DEFINITIONS, ACRONYMS, ABBREVIATIONS

ACCREDITATION is the formal recognition that a registration organization is competent to carry out the process of registration to the ISO 9000 standards.

AIAG is the Automotive Industry Action Group.

ANSI is the American National Standards Institute

CERTIFICATE is a written statement issued by a authorized body stating that an organization has complied with a set of standards.

FAR is Federal Acquisition Regulations

FASA is Federal Acquisition Streamlining Act

NACCB is the National Accreditation Council for Certified Bodies.

RAB (REGISTRAR ACCREDITATION BOARD) is an affiliate of the ASQC that recognized the competence and reliability of registrars of quality systems, and works to achieve international recognition of registrations issued by accredited registrars

ROM is Rough order Magnitude

TQM is Total Quality Management

VE is Value Engineering

VECP is Value Engineering Change Proposal

APPENDIX

ISO 9000-1: This standard provides guidelines and basic definitions that describe what the series is about and helps in the selection and use of the appropriate ISO standard.

ISO 9001: This standard is a model for use by organizations (both manufacturing and service) to certify their quality system from initial design and

development of a desired product or service through production, installation, and servicing.

ISO 9002: This standard is identical to ISO 9001 except it omits the requirement of documenting the design/development process.

ISO 9003: This standard is for use by organizations that need only to show, through inspection and testing, that they are delivering the desired product or service.

ISO 9004-1: This standard is a basic set of guidelines that organizations can use to help them develop and implement their quality management systems.