CQM Training Pre-Assignment

1. Print the material
2. Read the contents
3. Answer the questions
4. Bring answers to the class. Do not email or fax the answers.

Module 1: INTRODUCTION

Submodule 1: What is Construction Quality Management (CQM)?

"PROACTIVE PREVENTION vs. REACTIVE INSPECTION"

Objectives: After completing this submodule, you will be able to:

- State the purpose of Construction Quality Management.
- Discuss the reasoning behind the Corps/NAVFAC policy on CQM.
- Discuss various characteristics that are peculiar to the construction industry.
- Define Contractor Quality Control (CQC).

  Define Government Quality Assurance (QA).

A. ***Introduction and Instructional Procedures:***

This training is presented as a result of partnering efforts with the Associated Builders and Contractors (ABC), Associated General Contractors (AGC), the U.S. Army Corps of Engineers (USACE), and the Naval Facilities Engineering Command (NAVFAC). This is appropriate as Construction Quality Management is a partnering effort between the Government and the contractor. The purpose of this training is to familiarize all quality control personnel, and other contractor management personnel, with CQM policies, requirements, and procedures. In addition to the filmed portions, this training package includes this Study Guide and pertinent classroom exercises provided by your Facilitator. As we proceed through the training, the broader and more general portions of the information will be presented on videotape/DVD. At the end of each segment (module or submodule), the Facilitator will stop the tape/DVD and give you any necessary detailed information. Then, you should read the text for that submodule and proceed to the related discussions and exercises.

B. ***Instructional Content:*** The content of this training package will include, in Module 1, an introduction covering the broad aspects of CQM, including its definition; discussions of quality control procedures and benefits; the characteristics of the construction industry and the responsibilities of the Government and the contractor. In Modules 2 through 6, the various reviews, plans, conferences, reports, and management requirements are described. In Module 7, the information in the first six modules will be integrated into a discussion of the ways and means of making the CQM system work effectively so that the level of quality required in the Corps' and NAVFAC's worldwide construction program is achieved. An optional module, Module 8, is an overview of the Resident Management System (RMS). RMS is a software package that automates and simplifies many project activities used by USACE. Optional Module 9, covers NAVFAC's WEB Construction Management (CM) system.

C. ***History of Construction Quality Management:*** In 1961 a new clause containing but two sentences began appearing in Department of Defense (DoD) solicitations. These same two sentences can still be found today in the Contract Clause entitled "Inspection of Construction" [subparagraph (b)]. These sentences require a contractor to be responsible for achieving and documenting contract quality. By 1968 the Construction Quality Management system had grown into a fairly loose structured process varying from field office to field office in which more paragraphs were placed into the contract defining specific items that were to be accomplished to better manage the task. Most often, in these early years, there were a wide variety of responses on how to manage quality into the job. The Corps and NAVFAC were faced with something of a balancing act. The contractor was either given great latitude in how he organized the effort to get quality or given specific expectations and processes. Over the years, the Corps and NAVFAC have tried many variations and made some very specific choices. With the involvement of industry representatives, including the AGC, it was recognized that the relatively structured method used today was the preferred contract method. The system has some very specific processes, these include the three-phases of control system, formal deficiency /rework items tracking systems, and well-defined submittals. On many jobs, the Corps and NAVFAC specify the contractor's manpower quantity and qualifications. And, of course, this training for contractor personnel is now a contract requirement. Keep in mind that these choices are not free -- there is a cost for them and by putting them into the job, the Corps and NAVFAC have made a choice from a spectrum of possibilities. By entering into a Corps or NAVFAC contract, the contractor has agreed to follow the chosen methods.

D. ***Construction Quality Management:*** CQM is the performance of tasks, which ensure that construction is performed according to plans and specifications, on time, within a defined budget, and a safe work environment. For purposes of this training, quality is defined as conformance to properly developed requirements. For a construction project, quality begins with requirements carefully developed, reviewed for adherence to existing guidance, and ultimately reflected in criteria and design documents which accurately address these needs. Therefore, the designer establishes the quality standards and the contractor, in building to the quality standards in the plans and specifications, controls the quality of the work. The purpose of CQM is the Government's efforts, separate from, but in coordination and cooperation with the contractor, assure that the quality set by the plans and specifications is achieved. CQM is the combined effort of the contractor and the Government. The contractor has primary responsibility for producing construction through compliance with plans, specifications, and accepted standards of the industry. CQM, if used as outlined in this course, enables contractor and Government personnel to be proactive and, thereby, prevent mishaps and deficiencies from occurring. Continuing to work in a reactive mode and relying on inspection to achieve required quality of product means that CQM is either not understood or that the philosophy has not been adopted.

E. ***Contractor Quality Control:*** The primary function of contractor quality control (CQC) is to assure that the completed project meets all quality requirements of the contract. To guide the contractor in this task, a CQC plan must be prepared to ensure that the required standards of quality construction are met. In the CQC plan, the contractor defines the procedures by which he will manage and control his own, all subcontractor's and supplier's' activities so that the completed project complies with contract requirements. At the end of this submodule is a list (Table 1.1-1) entitled Components of CQC.

F. ***Government Quality Assurance:*** Quality Assurance (QA) involves the means by which the Government protects its interests. Through reviews, inspections, and tests, the Government assures that CQC is working effectively, and that the end product complies with the quality established by the contract.

G. ***The Corps' and NAVFAC's CQM System:*** (Engineer Regulation) ER1180-1-6 and NAVFAC's P-445, and other references provide guidance to Corps and NAVFAC personnel in performing effective CQM in the field. While these regulations provide minimum requirements, each project must be tailored to suit its specific conditions and requirements.

H. ***The Benefits of CQM:*** Both the contractor and the Government must be interested in effective CQM. The benefits to the Government are many: work is performed according to plans and specifications, on time, within a defined budget, easily maintained, and a safe work environment. This can be summarized as "Getting our money's worth!" The benefits to the contractor are increased profit and production, better communication, planning, improved organizational skills, and outstanding performance evaluations to obtain future contracts.

I. ***Characteristics of the Construction Industry:***

1. The construction industry has become highly specialized because of the changing market. Increased technology and regulation have resulted in increasing numbers of specialty contractors (such as general building, heavy construction, and special trade contractors) that make coordination and management more difficult for the general contractor and complicates both CQC and QA.

2. Whether large or small, specialized or general, success for all contractors is based on their ability to:

   - manage personnel,
   - control costs,
   - finance work,
   - estimate jobs,
   - schedule the work,
   - manage cash flow,
   - manage an effective safety program, and
   - maintain an effective quality control system.

3. Over 80% of all construction companies are small firms that gross less than $500,000 annually. For every 1,000 firms in operation, 110 to 130 firms enter the field each year. A similar number leave the field each year. It is a fact that the rates of entry and failure are among the highest of all industries.

4. Construction projects are difficult to manage because:

   - construction projects are unique by nature, making standardization difficult,

   - construction operations involve many skills that are nonrepetitive and do not lend themselves to an assembly line approach,

   - construction projects are, to a large degree, dependent upon environmental conditions which are beyond the contractor's control, and

   - subject to varied regulations from numerous government agencies.

5. For the contractor, adequate technical performance is not sufficient to ensure profit. There simply is too much competition and too little profit. The typical gross profit on a commercial building project is 5%. After deducting home office overhead, the before tax gross profit is reduced to 2-3%. After taxes, the net profit percentage is minuscule. Construction contracting is a very high risk, volatile business. To run a successful and profitable business, contractors must employ effective management.

J. ***In the Future:***

1. New government regulations will impose more restrictive requirements, especially in the areas of environmental concerns, occupational health and safety, and employment.

2. There will be a greater degree of influence from the client/customer, to include their involvement in project design and construction, and the requirement to assure full documentation and timely response to all comments from them.

3. Items that will be of significant benefit to both the Government and the contractor are:

   - the improvement of QC and QA requirements;

   - construction-oriented management information systems, such as the Corps' Resident Management System (RMS) and NAVFAC's WEB CM system;

- formal partnering, involving all stakeholders, will become a way of doing business;

- there will be increased contractual requirements for exchange of data in electronic format for all communication required during the course of the project; i.e., drawings on Computer Aided Drafting and Design (CADD), correspondence, RFIs, submittals, invoices, contract changes, as-built drawings, reports, schedules, and electronic bid documents;

- Increased performance based requirements, less prescriptive;

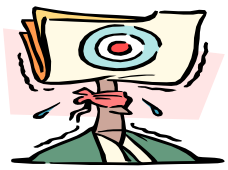
- More reliance on design-build; and

- More consideration on life cycle requirements as opposed to just construction.

4. Conversion to metric units and metric size components will require careful coordination, and

5. International competition will introduce ISO 9001: 2000 series standards of quality management on an important sector of our industry.

K. ***Conclusion:*** The construction industry will continue to be presented with complex, difficult challenges. To face the increasing challenges, we must have the best tools and properly utilize them. Even with a sound system structure, CQM requires the combined efforts of QC personnel and QA personnel to achieve our shared goals – a safe work environment, quality construction, built on time and within budget. The traditional, adversarial roles of Government versus contractor must be abandoned in favor of success through joint implementation of an effective construction quality management system. The CQM system presented here will, with our joint efforts, always be successful in providing desired quality.



EXERCISE

Submodule 1.1

1. In construction, what establishes the quality requirements?

2. What is the purpose of CQM?

3. Define CQM.

4. What are the two principal areas of CQM activity? Define each.

5. What are the benefits of CQM to the contractor? To the Government?

6. What two factors have caused the construction industry to become highly specialized?

7. Why are construction projects difficult to manage?

8. What factors will influence both the Government and the construction industry in the future?