



Module 8: QUALITY CONTROL SYSTEM (QCS) and RESIDENT MANAGEMENT SYSTEM (RMS)

Submodule 1: Introduction and Overview

(Module 8 is mandatory for Contractors having Corps of Engineer contracts. It is optional for Contractors having NAVFAC contracts since some QCS - QC functions may be similar to NAVFAC jobs. Module 8 serves as an overview of a typical computer based construction information management.)

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

- List the benefits of the RMS and QCS applications for controlling Contract Administration and Construction Quality Management.
- List major output products of the QCS and RMS applications.

A. Introduction and Background:

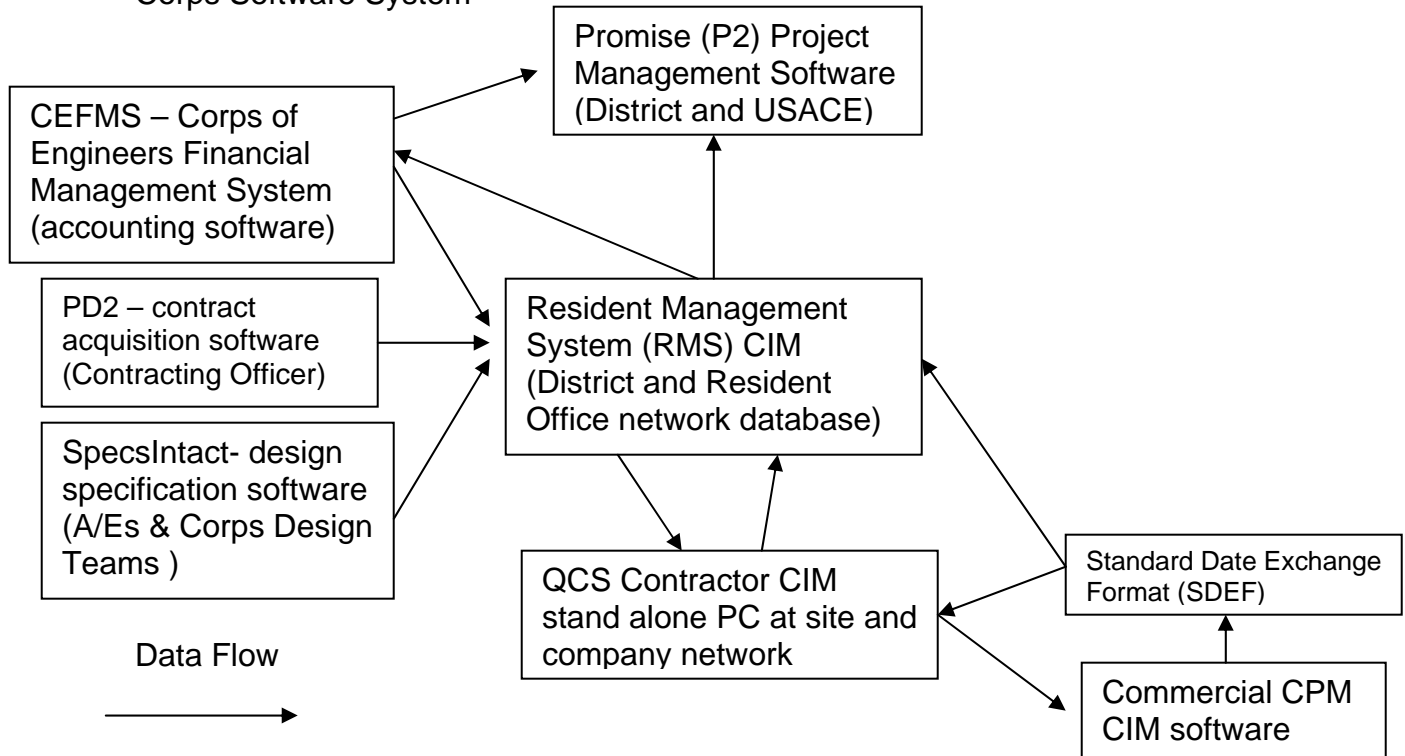
Resident Management System (RMS) is a construction information management (CIM) system the Corps of Engineers developed to control construction quality management and contract administration. It has two modules; "RMS" used by Contracting Officer and "QCS" used by Contractor. RMS started in late 1980s developed by a Resident Engineer, Mr. Haskell Barker, Los Angeles District. Early DOS based RMS used a simple database to provide simple automated methods to use desk top PCs for Resident Office construction quality management and contract administration. As computers became more powerful and "windows" made construction applications more "user friendly," RMS transformed to an integrated Construction Management Information system used at Resident Office, Contractor Offices and Corps District-level Management. In 2001 RMS was mandated by USACE for use Corps-wide.

RMS is maintained by the RMS Center and has become a powerful CIM application. RMS uses an inter-relational database that feeds project construction phase data into Corps financial (CEFMS) and project management (Promise 2 (P2)) applications. RMS can import contractor generated CPM schedules and resource data from a commercial application like P3 using the Standard Data Exchange Format.

"RMS" has a network-based module, used by Corps Resident Engineer and "QCS" module used by Contractor. Both are simple to learn and use. When QCS and RMS are used from the very start of the contract and maintained current, users have found it to be an outstanding tool to increase productivity, improve

contract administration and help document construction quality.

Corps Software System

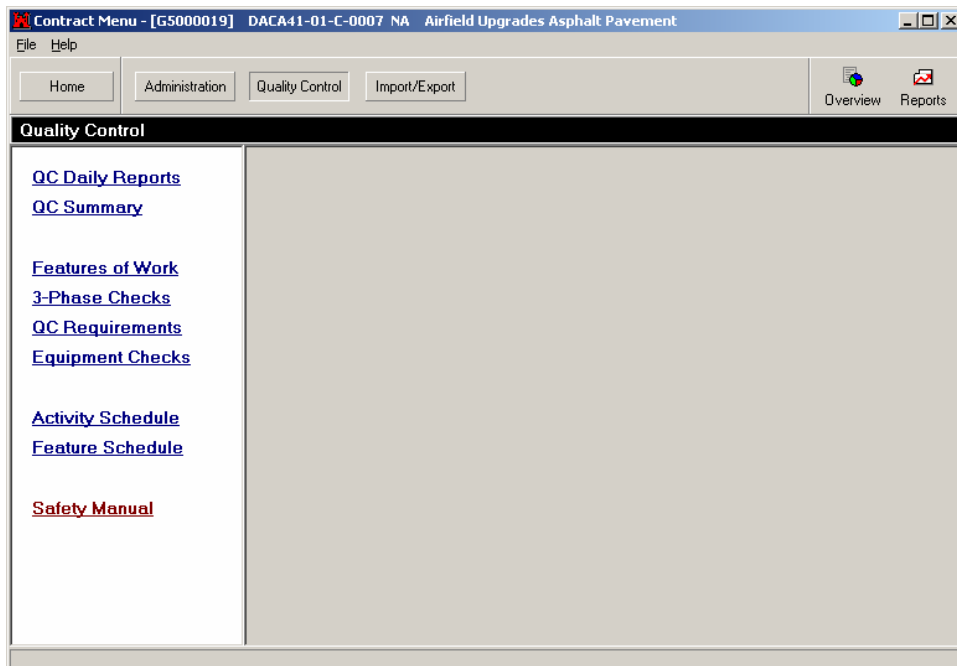
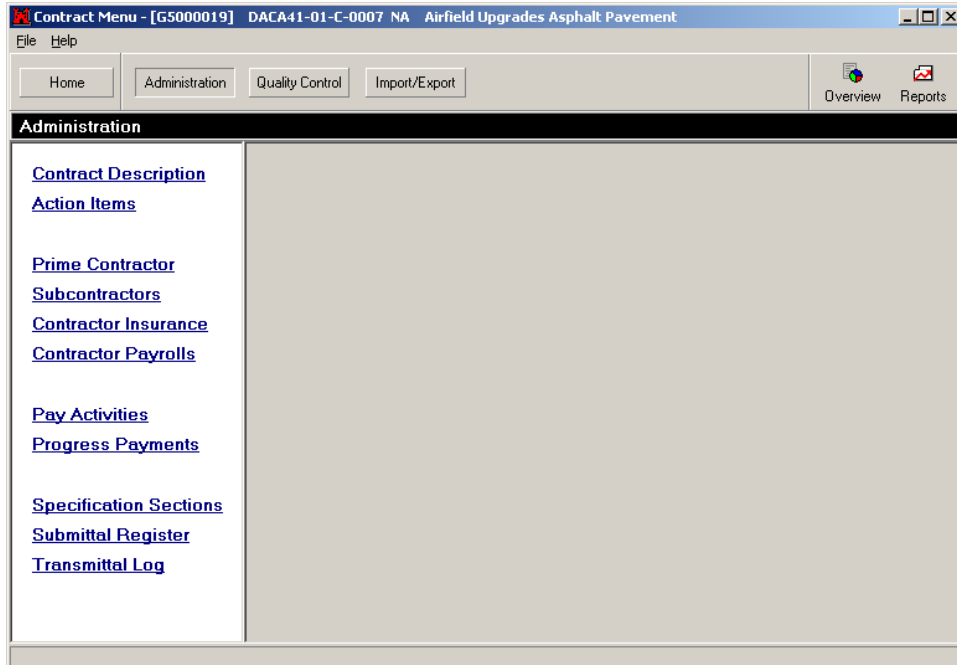


Construction management functions QCS Supports - QCS module of RMS supports following:

Project Construction Activity Planning and Scheduling
Quality Control

- QC and Production Reports
- Procurement Reports
- Submittal and RFI Management
- Contract Administration
- Progress Payments
- Correspondence Tracking
- Safety Administration and Accident Reporting
- Contract Modification Processing
- Management Reporting
- Single-Entry Data Communications with CEFMS and P2

QCS IN CONTRACTS - *Quality Control System (QCS)* is the Contractor's Quality Control module of the Government's *Resident Management System (RMS)*. This software has been implemented as Corps' standard worldwide. QCS is to be used on a daily basis by Contractor while performing his normal duties. QCS is specified in Corps contracts in Section 01312 where required computer hardware and detailed execution instructions are described. QCS has templates of most required forms and required reports. Data entry for these are described in detail in the QCS and RMS User's Guides. Two primary screens of QCS, "ADMINISTRATION" and "QUALITY CONTROL" show major QCS functions.



- **Correspondence Management** – QCS / RMS indexes and tracks all incoming and outgoing correspondence related to a contract. This feature allows Contractor and Contracting Officer to maintain a complete historical record of correspondence and effectively relate it to contract and construction management activities over the life of the contract.
- **Submittal Register and Transmittal Control** - A powerful feature of QCS/RMS is it imports the submittal register data file generated by designers from SpecsIntact specifications software. After contract award Contractor can import this data file for the start of his procurement and submittal planning. Once QCS submittal register is completed by Contractor it is exported to the Government RMS database and submittal status can be tracked by Contractor QC Staff, Submittal Reviewers, Contractor and Contracting Officer's Management. Used correctly it ensures more timely review and transmittal turn around.
- **Construction Schedules - QCS** facilitates schedule analysis showing proposed schedule and effect of logic changes. QCS makes maintaining a current schedule and analysis cross-reference among past schedules for delay analysis *much easier*. RMS contains a Standard Data Exchange (SDEF) module and a Schedule Analysis module. The SDEF provides a capability to import and export scheduling and work activity data with several commercial scheduling systems such as Primavera and Open Plan. It is an independent piece of software, which also enables conforming commercial system to communicate with each other. Use of this feature will not only speed up a complex task, but will also help reduce number and size of construction-related disputes and claims.
- **Quality Control Data** - Contractor QC Staff can easily input data for Quality Control daily reports, Phase Checklists, Subcontractor List, Testing Schedules, On-site Equipment Lists, Deficiency Tracking List, Request For Information. Formats built in and once input are available for Contractor management use. Export of updated *quality control data* on a daily basis to the Government provides Area Engineer and District-level managers with construction-related data for decisions and monitoring at levels above Resident Office.
- **Cost Control and Payment** - Contractor can use QCS payment item features for cost control, and tracking of invoices and progress payment requests. Since QCS integrates with RMS and CEFMs, it allows faster quality assurance and contract administration activities by Corps field construction personnel to facilitate prompt payment.

- **Contract Administration** – QCS supports construction contract administration by importing government furnished RMS start data. This allows Contractor and Contracting Officer field construction staffs input construction contract payment and modification data. RMS allows *contract change requests* and *contract modifications* tracking during the contract.

Construction Management Uses - QCS payment, schedule and QC data exported to RMS is standardized for integration with CEFMs and P2 and allows higher levels of Contractor and Corps Management to track a contract's status and allows earlier identification of project-related issues. *Contract status data* consists of *budget* and *schedule* information plus a field report.

INFORMATION FOR FIELD USE OF QCS

(Note - This portion can be used by QC Managers to train Staff using the QCS software.)

QCS is Government furnished to Contractors without cost. Contractor needs to access <http://216.86.193.60/qcs>. User's Guides and installation instructions available on Internet website maintained by the RMS Center. Training necessary to learn QCS program usually requires ½ day of instruction and demonstration. QCS setup file is available from the website (<http://216.86.193.60/qcs>)

QCS program directly benefits Contractor QC Staff in:

- **Daily QC Report.** Provides fully integrated Daily Reporting for Quality Control personnel as required by the contract.
- **Punch List Items.** Provides the mandated Deficiency Tracking System required by the contract.
- **Scheduling.** Provides an easy means to import schedule Activities by importing from commercial scheduling packages (e.g., Primavera).
- **Submittals.** Provides a comprehensive program to submit, process and track Transmittal of Submittal items required by the contract (e.g., ENG Forms 4288 and 4025).
- **Payment.** Automates the Payment Request Process (ENG Form 93) for monthly progress updates.
- **Subcontractors.** Provides comprehensive information on items requiring action by Subcontractors, including work items not yet complete, outstanding submittal actions required, status of Insurances and payrolls, etc.

- **QC Requirements.** Provides complete tracking for *Transfer Property, Installed Property, Quality Control Testing, and User Schooling* as required by contract.
- **Three-Phase Inspection.** Provides a tool to alert the contractor of prior similar difficulties and challenges from current and previous contracts for use in the Preparatory, Initial, and Follow-up inspection process (Lessons Learned, Safety Checks, Inspection techniques, etc.).
- **Action Items.** Provides a comprehensive report mechanism itemizing outstanding items or items requiring attention covering all area of the contract administration process.
- **Reports.** The QCS reports are available in each major area and many can be sorted or tailored for desired output.

B. Approach to Data Management:

Corps and Contractor fully integrate QCS/RMS by update data exchanges. Corps provides QCS software package and RMS start data to Contractor's jobsite field office and company office for contract administration and quality control uses. Contractor exports data updates to Corps Resident office on a regular basis by E-mail or on disk.

C. Benefits:

- Reduces input. Once data is entered one time on easy to use input screens, the computer draws on that data for a wide variety of input-output products. Many items are either drawn from other databases (such as Network Analysis data), or selected through "look-up tables" eliminating the need to completely type them.
- Merges data drawn from the RMS and QCS databases to produce useful tools to perform QC and QA functions.
- Provides reports for key suspense items and data.

D. Major CQM Output Products of QCS and RMS:

- *Preconstruction Conference and Coordination Meeting* minutes and agenda.
- Submittal Registers, submittal tracking, and completed (filled in) Transmittal Forms.
- Three-Phase Control checklists, agenda, and meeting minutes.

- A deficiency tracking system.
- Daily QC Reports and QA Reports.
- Various closeout documents (including Installed Property, Transfer Property, User Schooling, etc.).

E. Other QCS and RMS Features:

- Tracks pay estimate data, and generates pay requests. Carries scheduling activities and resource data input from commercial scheduling packages (i.e., Primavera©).
- Track variety of personnel data, subcontractor listings, correspondence, RFI, and safety items.
- Once start data is input, QCS / RMS automatically prints heading data onto numerous reports and forms at correct place. Most contracts will include some CQM forms but as QCS versions are updated forms may slightly change. Current forms and reports are available from Resident Office office.
- Because data is being entered and a contract QCS/RMS data base is built early in a job, software allows QC and QA staff to effectively manage an assortment of QC/QA items.



EXERCISE

Submodule 8.1

1. What is the Corps' standard software package used on construction projects?
2. What are the benefits of RMS and QCS?
3. What are the major output products of QCS?

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS



Module 8: QUALITY CONTROL SYSTEM (QCS) AND RESIDENT MANAGEMENT SYSTEM (RMS)

Submodule 2: Quality Control Components

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

- Describe three major QC components included in QCS.

A. Preparatory and Initial Phase Meeting Agendas and “Check” Databases:

- Preparatory, Initial, and Follow-up Control phases provide common structure for CQM System in Corps contracts. Included in QCS and RMS is a large database (+/- 12,000 items) of useful quality control data:
 - (1) Repetitive deficiencies list developed from lessons learned on past similar Corps contracts
 - (2) “Checks,” requirements that are “flagged” as being worth special attention.

Past deficiencies and Checks are linked to definable features of work or specification section number. Once Definable Features of Work are agreed to by QC and QA, a feature of work is selected by Contractor from an available list; QCS then generates an agenda for preparatory or initial control phase meetings. This agenda includes a comprehensive checklist on the definable feature of work to review at the meetings.

- In addition, QC and QA staffs can review contract drawings and specifications to make additions to the special interest “Checks” on any definable feature of work. QCS application will generate information on appropriate form or meeting agenda.
- For QC Manager’s use, QCS also automatically generates on meeting agenda forms required applicable tests, submittal status, and relevant contract data, such as schedule activities.

B. Submittal Process in QCS and RMS:

Using QCS linked with RMS makes transmittal tracking and submittal item managing easier. Once data for a submittal item is entered in the system, it never needs to be re-described. By entering dates and action codes promptly, QCS output documents make procurement, submittal tracking and material control easy for QC personnel. QCS integrates important submittal dates to corresponding work break down activities in the construction schedule. Submittal items not yet approved or materials not yet received can be easily identified during Preparatory Phase reports generated by QCS. Outstanding submittal items will be reflected as *Outstanding on Pay Estimate Worksheets*. QCS automatically generates and numbers transmittal forms ENG 4025, complete with contract data and items selected for transmittal.

C. QC/QA Deficiency Tracking System:

QCS includes *Punch List Items* that represent a data management feature for entering and keeping track of deficiencies found on the project. Deficiencies can be sorted by various categories for managing correction status. Corps' RMS software has a similar function for tracking government Punch List Items during the contract. Contractor by contract requirements and Corps QA Staff (by Engineering Regulation) must maintain formal deficiency tracking. QCS fulfills this by using software tools. Punch list process involves using entering data in easy to understand input screens and offers a variety of output reports.

D. Summary:

The submodules only provide Contractor and Corps management level overview of QCS and RMS software with general descriptions of major QCS components. QCS and RMS are like any commercial CIM application, data must be entered daily and maintained current. As new users learn QCS and work with it they will find ways that QCS makes their job easier. To be successfully used to best advantage QCS and RMS requires a partnering effort between Contractor and Corps' field office staffs and may require District level support. Each District is responsible for training Corps employees in RMS and to assist Contractor staff use QCS at Corps jobsites.



EXERCISE

Submodule 8.2

What are three major QC components included in RMS?

NOTES
CONSTRUCTION QUALITY MANAGEMENT
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