NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

AN EVALUATION OF THE NAVY'S RED YELLOW GREEN PROGRAM AND HOW THIS PROGRAM IS INTENDED TO IMPROVE THE SELECTION OF QUALITY CONTRACTORS

by

Krista Ann Hagmann

December 1989

Thesis Advisor: E. Neil Hart

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a REPORT SECURITY CLASSIFICATION: UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION/AVAILABILITY OF REPORT: Approved for public release; distribution is unlimited
2b DECLASSIFICATION/DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION: Naval Postgraduate School; 6b OFFICE SYMBOL (If applicable): 36	7a NAME OF MONITORING ORGANIZATION: Naval Postgraduate School
6c ADDRESS (City, State, and ZIP Code): Monterey, California 93943-5000	7b ADDRESS (City, State, and ZIP Code): Monterey, California 93943-5000
8a NAME OF FUNDING/SPONSORING ORGANIZATION; 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS: PROGRAM ELEMENT NO; PROJECT NO; TASK NO; WORK UNIT ACCESSION NO

11 TITLE (Include Security Classification)
AN EVALUATION OF THE NAVY'S RED YELLOW GREEN PROGRAM AND HOW THIS PROGRAM IS INTENDED TO IMPROVE THE SELECTION OF QUALITY CONTRACTORS

12 PERSONAL AUTHOR(S)
Hagmann, Krista A.

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Master's Thesis	FROM _____ TO _____	1989, December	133

16 SUPPLEMENTARY NOTATION
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Contractor Quality; Quality; Source Selection Tool.

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

The Navy is currently testing a new source selection tool known as Red Yellow Green (RYG). RYG helps field contracting activities obtain the best purchase value by adding the costs of poor contractor performance into the source selection equation. The program should improve the quality of material received by the Government and the performance of Government contractors. RYG can be used in conjunction with Blue Ribbon Contractor programs and moves field contracting activities toward Total Quality Management implementation.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT	21 ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	Unclassified
22a NAME OF RESPONSIBLE INDIVIDUAL: CDR E. Neil Hart	22b TELEPHONE (Include Area Code): (408) 646-2966; 22c OFFICE SYMBOL: Code 54Hr

DD Form 1473, JUN 86 Previous editions are obsolete SECURITY CLASSIFICATION OF THIS PAGE

S/N 0102-LF-014-6603 UNCLASSIFIED

Approved for public release; distribution is unlimited

An Evaluation of the Navy's Red Yellow Green Program and
How This Program is Intended to Improve
the Selection of Quality Contractors

by

Krista Ann Hagmann
Lieutenant, Supply Corps, United States Navy
B.S., United States Naval Academy, 1982

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1989

Author: _____
Krista A. Hagmann

Approved by: _____
E. Neil Hart, Thesis Advisor

_____
David V. Lamm, Second Reader

_____
David R. Whipple, Chairman
Department of Administrative Sciences

ABSTRACT

The Navy is currently testing a new source selection tool known as Red Yellow Green (RYG). RYG helps field contracting activities obtain the best purchase value by adding the costs of poor contractor performance into the source selection equation. The program should improve the quality of material received by the Government and the performance of Government contractors. RYG can be used in conjunction with Blue Ribbon Contractor programs and moves field contracting activities toward Total Quality Management implementation.

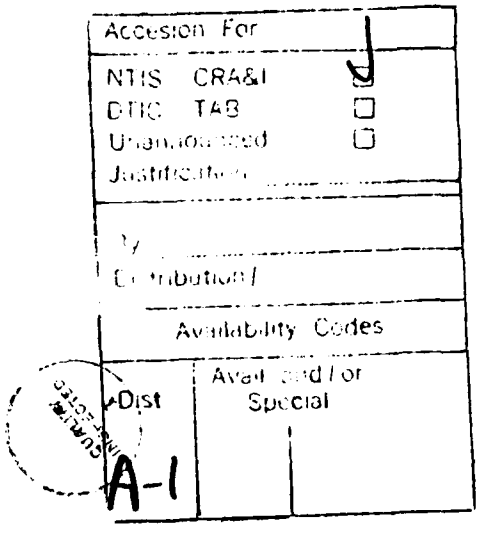

TABLE OF CONTENTS

I. INTRODUCTION

A. BACKGROUND

The Navy is currently testing a new source selection tool known as Red Yellow Green (RYG). The test is being conducted at five Navy field activities (Naval Air Engineering Center Lakehurst, Naval Avionics Center Indianapolis, Naval Ships Parts Control Center Mechanicsburg (Code 021, Level 1/SS), Naval Supply Center Charleston/Naval Shipyard Charleston, and Naval Supply Center Pensacola/Naval Aviation Depot Pensacola). The purpose of the RYG program is to assist Government contracting personnel in obtaining the best purchase value by adding the costs of poor contractor performance into the source selection equation [Ref. 1]. The RYG program was designed especially for use by field contracting activities [Ref. 2].

In addition to RYG, several other contractor quality programs are currently being employed or developed within the Department of Defense (DOD) that consider contractor quality and past performance in the source selection process. Three notable quality programs are the Blue Ribbon Contractor program, the Contractor Performance Assessment Reporting System (CPARS), and Total Quality Management (TQM). This thesis will describe the four programs listed above. It will then evaluate the RYG program by comparing and contrasting it

to the other three programs, discussing its strengths and weaknesses, and describing the status of the program test.

B. OBJECTIVES

DOD and its agencies have continuously sought ways to improve the quality of Government contractor performance while complying with the statutes, regulations, and policies that govern the Federal acquisition process. Recent problems with the quality of material delivered to DOD, many of them highlighted in the press, have increased DOD's emphasis on contractor quality management. At the same time, steadily increasing Congressional oversight in the form of more and increasingly detailed statutes and guidance have made development of a viable program more difficult. Some of the programs currently employed or under review by DOD commands include the Navy's RYG program, Blue Ribbon Contractor programs within the Navy and Air Force, the Air Force's CPARS, and the DOD-wide TQM initiative.

One of these programs, the Navy's RYG, is the subject of this thesis. This program is intended to eventually be extended to all DOD agencies. It uses the data contained in the Navy's newly established unified, centralized Contractor Evaluation System (CES). These data are compiled from many sources including Quality Deficiency Reports (QDRs) and the Naval Material Quality Assessment Office (NMQAO). [Ref. 3] Prior to CES, these data were found in many different forms

and each came from a different source. Now, they are available in a single location and can be accessed by field procurement activities from a computer terminal using an on-line call-up menu. CES is used to classify contractors (by Federal Supply Class (FSC)) as high risk quality performers (Red), moderate risk (Yellow), or low risk (Green). Contractors who do not meet established criteria for RYG classification are listed in the "Insufficient Data" category. [Ref. 1:p. 1] The RYG classification is used by contracting personnel to either apply Technical Evaluation Adjustments (TEAs) to contractor proposals [Ref. 1:p. 1] or, if the Fixed Price-Greatest Value method is employed, to rate the offerors in terms of expected quality of performance [Ref. 1:encl (3), p. 3]. The TEAs represent the anticipated cost to the Government to correct or take appropriate action due to poor contractor performance [Ref. 1:encl (1), pp. 1-2]. Proposals including TEAs are used to help determine a source selection that will result in the best overall price to the Government [Ref. 1:encl (1), p. 6].

The RYG program is undergoing a one-year test coordinated by the Office of Assistant Secretary of the Navy (Shipbuilding and Logistics) Reliability, Maintainability, and Quality Assurance (ASN(S&L)RM&QA) which began 1 August 1989 using a limited number of commodities.

C. THE RESEARCH QUESTIONS

The primary research question is: How is the Navy's Red Yellow Green program structured and how is it intended to improve the quality of material procured by the Navy? The subsidiary research questions are:

1. How are Red, Yellow, and Green contractors defined?
2. What are the other current contractor quality initiatives within DOD?
3. How does RYG compare and contrast to these other programs?
4. What are the strengths and weaknesses associated with RYG?
5. How is the RYG program being tested in the market?

D. SCOPE AND LIMITATIONS

The purpose of this thesis is to evaluate the potential effectiveness of the Navy's RYG program. It will analyze the program in detail and describe other DOD contractor quality initiatives in brief. It will compare and contrast the RYG program to the other DOD initiatives and will attempt to identify RYG strengths and weaknesses. It will evaluate the success of RYG tests as far as they have progressed. Finally, it will consider the viability of the RYG program in the future, both within the Navy and DOD.

The research effort was limited by the short period of time over which the test of RYG could be evaluated. Although some test activities were able to begin implementation of the RYG program on 1 August 1989, others were delayed. This

thesis evaluated the program very early in the test period, and, therefore, relied on limited data currently available.

E. METHODOLOGY

Two methods were used to collect data and answer the research questions. Data were collected from secondary sources to obtain information about RYG and other DOD contractor quality initiatives. Data were collected from primary sources, specifically through telephone and personal interviews, to add to the above areas and to assess the current status of the test and the potential for future expansion of the program. The interviews involved personnel at ASN(S&L)RM&QA, NMQAO, the Naval Supply Systems Command, and the five activities involved in the test.

F. ORGANIZATION OF THE STUDY

The remainder of the thesis is organized into the following chapters:

1. Chapter II, "Red Yellow Green Program," will describe the RYG program concept and how it is being coordinated.

2. Chapter III, "Other Department of Defense Quality Initiatives," will briefly describe other current DOD contractor quality programs in place or under review.

3. Chapter IV, "A comparison of Red Yellow Green and Other Contractor Quality Initiatives," will compare and contrast the RYG program to the quality programs described in Chapter III.

4. Chapter V, "Strengths and Weaknesses of Red Yellow Green," will describe the advantages and potential problems and limitations associated with RYG. It will also discuss the status of the RYG test, describing how

the program test is progressing and attempting to project how the program will fare in the future.

5. Chapter VI, "Conclusions and Recommendations," will discuss whether RYG will be effective in improving the quality of material procured by the Navy and will comment on possible changes for weak areas of the program.

II. RED YELLOW GREEN PROGRAM

A. BACKGROUND

The Navy's Contractor Evaluation System (CES) and Red Yellow Green (RYG) program were established to both assist Navy activities in procuring quality goods and services and to comply with Department of Defense (DOD) and Secretary of the Navy (SECNAV) policy. Specifically, DOD Directive 4155.1 states:

> DOD Components shall assure that contracts are not awarded to contractors with a previous history of providing products or services of an unsatisfactory quality. Contractor quality history data shall be maintained and used for this purpose. [Ref. 3:p. 1-1]

Further, SECNAV Instruction 4855.7 states:

> It is Secretary of the Navy policy that:
> a. Contractor quality history data be collected and maintained in a single Navy CES.
> b. Contractor quality history data be used to assure that contracts are not awarded to contractors with a previous history of providing products of an unsatisfactory quality, and to determine actions necessary before and after contract awards to assure product quality. [Ref. 4]

The CES and RYG program satisfy the requirements of these policies.

B. CONTRACTOR EVALUATION SYSTEM

The CES is currently composed of data from the Product Deficiency Reporting and Evaluation Program (PDREP) data base. The Navy has plans to expand the CES to include other general information about contractors such as financial data in

addition to information concerning contractor quality. This expanded CES will be called the Buyer Information System. It will be available to Government contracting personnel to help them better evaluate offerors. At present, however, the CES/PDREP is a quality reporting system managed by the Naval Sea Systems Command (NAVSEA) Detachment, Naval Material Quality Assessment Office (NMQAO), under the direction of the Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics) Reliability, Maintainability, and Quality Assurance (ASN(S&L)RM&QA). [Ref. 3:p. v]

PDREP was established to satisfy the requirements of SECNAV Instruction 4855.1A for "a product deficiency reporting and data feedback system, maintenance of contractor/supplier quality history and effective use of the data to influence the pre-contract award process and formulate the basis for necessary post award quality assurance actions." [Ref. 5] The purpose of PDREP is to

> ...implement a product deficiency reporting and evaluation program that will feed data back to those activities responsible for design, development, purchasing, production, supply, maintenance, contract administration, and other acquisition functions and initiate action to appraise, correct, and prevent product deficiencies, decrease material ownership costs, evaluate contractor/supplier performance and use performance data for making procurement decisions. [Ref. 5:p. 2]

PDREP's purpose, then, is compatible with the goals of the RYG program. Therefore, it was a logical data base to be chosen for the Navy's new CES which was intended to be used to

categorize contractors as Red, Yellow, or Green within a given Federal Supply Class (FSC).

The CES is composed of contractor quality information collected from the sources which are described below.

1. Quality Deficiency Reports (QDRs). QDRs are prepared by Navy field activities to document product quality deficiencies, design deficiencies, or inadequate procurement documents resulting in defective new and newly reworked material being delivered to the Navy [Ref. 6]. All QDRs are submitted to Naval Air Systems Command (NAVAIR), the Navy focal point for QDRs. Once each week QDRs determined to be contractor liable and with defects verified are transmitted by NAVAIR to NMQAO for inclusion in PDREP. [Ref. 7]

2. Material Inspection Record (MIR). MIRs are prepared either by Navy representatives performing technical inspections at a contractor's plant or by Navy field activities performing technical inspections upon receipt of material. MIRs are submitted to the Navy Systems Command having cognizance over the field activity. [Ref. 3:p. 1-5] The Systems Commands (NAVAIR, NAVSUP, Naval Facilities Engineering Command, and Space and Naval Warfare Command) then transmit the MIRs to NMQAO. The MIRs generated by NAVSEA activities are submitted directly to NMQAO. [Ref. 7]

3. Reports of Discrepancy (RODs). RODs are prepared by Navy field activities to document receipt of incorrect material, shortages and overages, and discrepancies in preservation, packing, and marking [Ref. 6:p. 1-2]. RODs are submitted to Naval Supply Systems Command (NAVSUP). Procedures are currently being developed to transmit RODs from NAVSUP to NMQAO for inclusion in PDREP. However, at present they are not being transmitted and, therefore, are not yet part of PDREP. [Ref. 7]

4. Defense Logistics Agency (DLA) Contractor Improvement Program (CIP) Alert List. Contractors are placed on the DLA alert list if DLA has placed them in the CIP, if they have received a negative pre-award survey, or if Defense Contract Administration Services (DCAS) has recommended they be given a pre-award survey for a particular reason [Ref. 8]. DLA sends a hard copy of the list to ASN(S&L)RM&QA. ASN then sends a copy to NMQAO. [Ref. 7]

5. DLA Method C, D, and E Corrective Action Listing. Contractors are placed on the corrective action listing if DLA has documented deficiencies in their quality programs. Specifically, method C indicates that the contractor has a serious quality problem or has not corrected a deficiency documented using method B (a major deficiency). The Government sends a letter to the firm's top management requesting corrective action. Method D indicates that less severe methods of corrective action (i.e., A, B, and C) have failed. The acquisition quality assurance program is discontinued, and the contractor is advised that the Government will not accept his goods or services until deficiencies have been corrected. Method E is used to advise a prime contractor that a subcontractor has quality deficiencies that would justify method C or D corrective action in a prime contractor and to request that the prime take corrective action with his subcontractor. [Ref. 9] DLA sends a hard copy of the listing to ASN(S&L)RM&QA. ASN then sends a copy to NMQAO. [Ref. 7]

6. Navy Vendor Data Analysis Report (VDAR). The VDAR identifies contractors who, because of past poor performance, should be considered carefully before being awarded a contract and should be monitored after contract award. Evaluation of performance is based on data from pre-award surveys, product oriented surveys, quality system reviews, QDRs, open DLA method C, D, or E corrective action, and conviction of or investigation for malpractice or fraud. [Ref. 8:p. E-5] The VDAR is compiled by NMQAO based on past performance and input from Navy Systems Commands and their field activities [Ref. 10].

7. Pre-Award Surveys. Pre-award surveys are conducted by contract administration offices when a procuring contracting officer needs additional information to determine contractor responsibility. The survey evaluates the contractor's management, financial capability, and technical capability to determine whether he will be able to perform the proposed contract. [Ref. 11] Only those pre-award surveys requested by Navy activities are included in PDREP. The Navy activity that requested the survey submits a copy to the cognizant Systems Command. The Systems Commands then transmit copies to NMQAO. [Ref. 10] NAVSEA activities submit copies of surveys directly to NMQAO [Ref. 7].

8. Product-Oriented Surveys. Product-oriented surveys are technical product inspections conducted in a

contractor's plant when a buying activity desires to perform a special test on an item. They are performed by DCAS when requested by the buying activity. If DCAS does not have the necessary resources, the buying activity may perform the survey. When a Navy activity requests a product-oriented survey, it submits a copy to the appropriate Systems Command. The Systems Commands then transmit the surveys to NMQAO. [Ref. 10] NAVSEA activities submit copies of surveys directly to NMQAO [Ref. 7].

9. Quality System Reviews. Quality system reviews are performed by DCAS. They involve an evaluation of the contractor's quality procedures and verification that the contractor's quality practices conform to those procedures. [Ref. 9:p. 23] The reviews also evaluate the Government's in-plant quality assurance program. Navy activities receive copies of quality system reviews if they participate in the review with DCAS or if they request a copy. [Ref. 10] Copies received by Navy activities are submitted to the appropriate Systems Command. The Systems Commands then transmit the reviews to NMQAO. NAVSEA activities submit copies directly to NMQAO. [Ref. 7]

10. Certificates of Competency (COCs). If a small business is determined to be non-responsible by a Government buying activity, the small business can request that the Small Business Administration (SBA) determine whether the business is responsible. If the SBA concludes that the small business is responsible, it will prepare a COC to document that determination. The buying activity must then treat the small business as a responsible offeror. [Ref. 3:p. 1-8] The SBA sends hard copies of COCs to NMQAO for inclusion in PDREP [Ref. 7].

The CES data base excludes:

1. Material evaluations for base application and local use.

2. Contractors developing major weapon systems.

3. Medical procurements, material, suppliers, or evaluations.

4. Subsistence procurements, material, suppliers, or evaluations.

5. Unsatisfactory material condition caused by improper handling after receipt, deterioration during local storage, or inadequate maintenance or operation.

6. Transportation discrepancies caused by the carrier.

7. Ammunition and explosives accidents.

8. Nuclear weapon procurements, material, suppliers, or evaluations.

9. Naval Nuclear Power Plant primary system procurements, material, suppliers, or evaluations.

10. Strategic Systems Project Office procurements, suppliers, or material evaluations. [Ref. 3:p. 1-3]

C. RED YELLOW GREEN PROCEDURES

A one year test of the RYG program commenced 1 August 1989. It is being conducted at the following five Navy activities: Naval Air Engineering Center Lakehurst, Naval Avionics Center Indianapolis, Naval Ships Parts Control Center (SPCC) Mechanicsburg (Code 021, Level 1/SS), Naval Supply Center Charleston/Naval Shipyard Charleston, and Naval Supply Center Pensacola/Naval Aviation Depot Pensacola. [Ref. 2]

The RYG program is a source selection tool that uses information documented in the CES to evaluate contractor past performance. Based on information in the CES, contractors are classified by FSC as high risk quality performers (Red), moderate risk (Yellow), or low risk (Green). New contractors or those for which the CES does not have enough data are classified as "Insufficient Data." Because the classification is by FSC and contractor, one contractor may have several color classifications if he supplies the Government with more than one commodity. [Ref. 1:encl. (1), p. 3]

The general descriptions of the color classifications as outlined in the program procedures are:

1. Red. The contractor's performance history indicates he has supplied goods or services in a particular FSC of poor enough quality to warrant requirement of special quality actions and higher level review before contract award. He is designated as a high quality risk.

2. Yellow. The contractor's performance history indicates he has supplied goods or services in a particular FSC of poor enough quality to warrant requirement of special quality actions. He is designated as a moderate quality risk.

3. Green. The contractor's performance history indicates that he has supplied high quality goods or services and, therefore, is designated as a low quality risk. His proposal is evaluated without anticipating special quality actions. [Ref. 1:encl. (1), pp. 3-4]

Contractors are classified as Red, Yellow, or Green based on the specific criteria listed in Appendix A [Ref. 1:encl. (1), attachment (2)]. The RYG data base will be updated monthly to reflect a particular contractor's current classification [Ref. 1:encl. (1), p. 5].

If no negative quality performance data are received on Red or Yellow contractors during the previous 12 months, they will be reclassified. Red contractors will automatically be reclassified as Yellow, and Yellow contractors will be placed in the Insufficient Data classification. If a contractor was classified as Red or Yellow because of his reject rate on MIRs, and if no rejects have occurred on the inspection of five or more lots of material during the past six months, he will be reclassified as Yellow or Green respectively. If a contracting officer has reason to question a commodity

classification, NMQAO should be contacted for confirmation of the current classification. [Ref. 1:encl. (1), p. 5]

Contractor classifications will be updated by NMQAO monthly based on new data received. After each update, NMQAO will send a computer tape to each of the five test activities reflecting the new contractor classifications. The most current data will then be used by the activities in performance of the test. [Ref. 12]

The RYG test procedures stress that a contractor's color classification should never keep him from competing for a Government contract. They specifically state:

> The procedures set forth herein do not in any way obliterate the requirement that a written responsibility determination is to be made for every requirement prior to award. A contractor's color classification alone is not sufficient to determine that a contractor is or is not responsible without further consideration of the standards set forth in FAR 9.104. [Ref. 1:encl. (1), p. 4]

The detailed procedures of the RYG program are divided into three categories, simplified small purchase, major purchase, and fixed price-greatest value procedures. A description of the application and specific requirements of each of these categories follows.

1. Simplified Small Purchase Procedures

The simplified small purchase procedures will be tested at all five test activities. They apply to all oral or written quotations solicited during the one year test for selected FSCs that will result in purchase orders with an estimated value greater than $2500. The FSCs used for the

test were chosen by each test activity. They may be modified during the test by agreement between the test activity and NMQAO. Each activity can choose whether to employ these procedures for purchases under blanket purchase agreements, imprest fund purchases, and delivery orders against established contracts or with the General Services Administration. However, if RYG procedures are used for these purchases, the activity must issue a written or confirming purchase order to document the purchase for the file. Waiver of the use of these procedures may be granted by the Chief of the Contracting Office for all test sites except SPCC. At SPCC, the Director of the Hull, Mechanical, and Electrical Contracting Department must grant any waivers. [Ref. 1:encl. (1), pp. 1-2]

When a purchase made under these procedures requires a synopsis in the Commerce Business Daily, the notice will explain that, although price will be a significant factor in proposal evaluation, other factors, including the contractor's quality history, will also influence the award decision. Likewise, the solicitation document must include a clause explaining the RYG program to prospective offerors and advising them of its use for the solicited procurement. [Ref. 1:encl. (1), p. 6] The clauses to be used for simplified small purchase procedures are provided in Appendix B [Ref. 1:encl. (1), attachment (6)].

Since the basis of a contractor's color classification by FSC does not vary, the level of quality risk is the same regardless of the procedures used for the procurement (i.e., small purchase, major procurement, or greatest value). However, the procedures that contracting personnel follow after receiving proposals does vary. Under the simplified small purchase procedures, the following procedures are followed.

First, each offeror's classification must be determined from the data base--Red, Yellow, Green, or Insufficient Data. If the contractor is classified Green, his proposal is evaluated as received since past performance indicates that quality should not be a concern if he is selected. If the offeror is classified Yellow, the appropriate TEA is added to his quoted price. The adjusted price should better represent what the actual cost to the Government would be (considering the cost to correct quality problems) if he were selected. If the contractor is classified Red, again his quoted price is adjusted by adding an appropriate TEA. This TEA will be higher than the one assigned to a Yellow contractor since the costs the Government incurs while doing business with a Red contractor will probably be greater than that of a contractor classified as Yellow. If there are insufficient data to assign the contractor a color classification for the FSC involved in the

solicitation, there is no basis for adding a TEA to his cost proposal, so none is assigned. [Ref. 1:encl. (1), pp. 3-4]

After TEAs are assigned to proposals from Red and Yellow contractors, adjusted prices are used in the source selection process. If a contract is awarded to other than a Green contractor, additional actions must be taken by the purchasing activity during the test period. It is anticipated that similar actions will be required when RYG is exported for general use by procuring activities. If award is made to a Red contractor, for example, the head of the contracting office must approve the award. The RYG test procedures stress, however, that under no circumstances is a Red contractor to be barred from competing for a contract. [Ref. 1:encl. (1), p. 4] If award is made to either a Red or Yellow contractor, contracting personnel should ensure that any necessary quality control requirements are included in the purchase order [Ref. 1:encl. (1), p. 6]. If award is made to a contractor on which the Government has insufficient quality data, even though no TEAs were assigned, the procuring activity may choose to require greater quality controls than they would if dealing with a Green contractor [Ref. 1:encl. (1), p. 4].

The TEAs for the simplified small purchase procedures are set at standard values [Ref. 1:encl. (1), p. 2]. The TEA for a Red contractor is $2499 and for a Yellow contractor is $1255 [Ref. 1:encl. (1), attachment (4)]. These values are

based on the anticipated requirement for the following additional Government quality actions. For a Red contractor, additional requirements would be Government source inspection (GSI), receipt inspection at destination performed with a Navy representative present, and a quality assurance letter of instruction. For a Yellow contractor, the requirements would be GSI and a quality assurance letter of instruction. [Ref. 1:encl. (1), attachment (3)] The dollar values were calculated by estimating the costs the Government would incur in performing these activities. Specifically, GSI is assigned a cost of $500 by estimating this would take the Government 14 hours at $34.18 per hour. Receipt inspection at destination is expected to cost the Government $1194 based on eight hours at $43 per hour plus $200 for material handling and $650 for testing. Finally, the quality assurance letter of instruction is estimated to cost $755 based on eight hours at $34.18 per hour for DCAS personnel plus 16 hours at $30 per hour for procurement representative personnel. [Ref. 1:encl. (2), attachment (3)]

2. Major Purchase Procedures with TEAs

The major purchase procedures with TEAs will be used at only two of the five test activities, SPCC Mechanicsburg (Code 021, Level I/SS) and Naval Supply Center Pensacola/Naval Aviation Depot Pensacola. These procedures apply to all negotiated competitive solicitations with an estimated value greater than $2500 for the FSCs covered by the test during the

one year test period when large purchase procedures are used. As with the simplified small purchase procedures, each test activity has chosen the FSCs to be analyzed during the test, and these may be modified by agreement between the test site and NMQAO. Waiver of the procedures may be granted by the Chief of the Contracting Office or, at SPCC, by the Director of the Hull, Mechanical, and Electrical Contracting Department. [Ref. 1:encl. (2), pp. 2-3]

When a procurement covered by these test procedures requires a synopsis in the Commerce Business Daily, the notice will explain that, although price will be a significant factor in proposal evaluation, other factors as detailed in the solicitation, including the offeror's quality history, will influence the award decision [Ref. 1:encl. (2), p. 7]. The solicitation will include essentially the following notice to offerors:

> This procurement is part of a test of the Navy's Contractor Evaluation System, "Red/Yellow/Green" Program. Award will be based upon the Contracting Officer's decision as to which offer provides the best value to the Navy--price, past quality performance, and other factors considered. Details are provided in the provisions entitled "NOTICE TO PROSPECTIVE OFFERORS" (Section L) and "ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (MAJOR PURCHASE PROCEDURES)" (Section M). [Ref. 1:encl. (2), p. 7]

The clauses to be included in Sections L and M of the solicitation are provided in Appendix C [Ref. 1:encl. (2), attachment (5)].

When proposals are received, contracting personnel query the RYG data base to determine the color classification

of each offeror for all FSCs covered by the solicitation. As with simplified small purchase procedures, a Green classification indicates that the offeror is a low quality risk and, therefore, no TEAs are assigned to his proposal. If the contractor has a Yellow classification, the procurement package and the contractor's quality history will be used to determine necessary Government quality assurance actions and associated TEAs. The TEAs are then added to the offeror's proposed price. If the contractor has a Red classification, appropriate TEAs are determined in a manner similar to those for Yellow contractors. However, a greater number of quality assurance actions will be expected when dealing with a Red contractor. Therefore, the TEAs assigned will probably be higher. If the contractor does not have a color classification because of insufficient data, he will not be assigned any TEAs. [Ref. 1:encl. (2), p. 4] Additionally, if the procurement is from a sole source supplier, no TEAs will be assessed regardless of the applicable color classification [Ref. 1:encl. (2), p. 6].

The TEAs for major purchase procedures are based on the specific quality deficiencies in the performance history of the contractor for a particular FSC. These deficiencies are used to determine which additional quality assurance actions the Government should take to ensure receipt of a quality good or service. [Ref. 1:encl. (2), p. 2]

Contracting personnel take the following steps when assigning TEAs under major purchase procedures.

First, contracting officers ascertain the reason for the contractor's classification being Red or Yellow by pulling his classification code from the RYG data base (listed in Appendix A). Second, they decide which additional quality assurance actions the Government must take. A guideline is provided to assist them (Appendix D) [Ref. 1:encl. (2), attachments (3)&(4)]. As can be seen in Appendix D, the contractor's deficiency code or codes are tied to an alpha-numeric code for additional quality assurance requirements. Now, contracting personnel perform the final step, assignment of TEAs. The alpha-numeric codes for quality assurance actions correspond to the list of quality assurance requirements and associated TEAs in Appendix D. The TEAs listed are calculated in the same way as those used in the simplified small purchase procedures. Specific calculations for each TEA are detailed in Appendix D. The test procedures stress, however, that the costs on which the listed TEAs are based are provided as examples. Since labor rates and test costs may vary considerably between procuring activities, each test activity should recalculate the TEAs to reflect the procuring activity's estimated costs.

After TEAs are assigned to appropriate proposals, all proposals are evaluated together (using adjusted prices for contractor's assigned a TEA) [Ref. 1:encl. (2), p. 6]. If the

contract is awarded to a Red or Yellow contractor, the contracting officer must ensure that the additional quality assurance actions used to calculate TEAs are called out as requirements in the contract [Ref. 1:encl. (2), p. 7]. If the contract is awarded to a Red offeror, approval for the award must be granted by the head of the contracting office [Ref. 1:encl. (2), p. 4]. If a contractor on which the Government has insufficient quality data wins the award, the procuring activity will require appropriate quality assurance actions to ensure a certain quality level even though TEAs were not assigned [Ref. 1:encl. (2), p. 4].

3. Major Purchase Procedures with Fixed Price-Greatest Value

The greatest value procedures will be used at only three of the five test activities; Naval Air and Engineering Center Lakehurst, Naval Avionics Center Indianapolis, and Naval Supply Center Charleston/Naval Shipyard Charleston [Ref. 1:encl. (3), p. 2]. These procedures apply to all negotiated competitive solicitations with an estimated value greater than $2500 for the FSCs covered by the test during the one year test period where sealed bidding procedures would otherwise be most appropriate [Ref. 1:encl. (3), p. 2]. Each test activity has chosen the FSCs that will be covered by the test; these may be modified by agreement between the activity and NMQAO [Ref. 1:encl. (3), p. 3]. Waiver of the procedures may be

granted by the Chief of the Contracting Office [Ref. 1:encl. (3), p. 3].

Solicitations prepared under these procedures will include the same notice used under the major purchase procedures employing TEAs [Ref. 1:encl. (3), p. 7]. The clauses to be included in Sections L and M of the solicitation are provided in Appendix E [Ref. 1:encl. (3), attachment (3)]. The source selection/evaluation plan will be prepared by the Quality staff and will specify the criteria to be used in evaluating Red, Yellow, and Green commodities. This plan will be forwarded with the procurement request to the contracting officer for review and approval. [Ref. 1:encl. (3), p. 3] For those commodities covered by these procedures, the source selection/evaluation plan will assign price a minimum weight of 40 percent, with the remainder assigned to quality assurance considerations under RYG procedures [Ref. 1:encl. (3), p. 2]. During the test, no factors other than these two shall be considered without prior approval from Naval Supply Systems Command (NAVSUP) Code 02 via NAVSUP Code 021 [Ref. 1:encl. (3), p. 2]. Appendix F [Ref. 1:encl. (3), p. 8] provides an example of the RYG evaluation portion of the source selection/evaluation method.

If a contractor is determined to be Green, he will normally be rated as "Excellent" or "Good." A Yellow classification will normally carry with it a rating of "Good," "Average," or "Marginal." Red commodities will usually be

rated "Marginal" or "Unacceptable." If there are insufficient data to evaluate the offeror, the proposal will be considered technically acceptable and will be evaluated solely on the basis of price. The contracting officer can exercise discretion in the use of adjectives (i.e., excellent, good, etc.) for each color classification or other locally determined source selection criteria. [Ref. 1:encl. (3), pp. 4-5]

When proposals are received, the contracting office will forward the names and Commercial and Government Entity (CAGE) codes of all offerors to the Quality staff. The Quality staff will determine the color classification and the associated reason codes for each offeror for each FSC. They will then assign ratings to each offeror based on the criteria outlined in the source selection plan. If commodities of different offerors lie within the same color classification, their relative differences will be explained in an accompanying narrative. This evaluation will be forwarded to the contracting office. [Ref. 1:encl. (3), p. 3]

If the contract is awarded to a Red or Yellow contractor, the Quality staff will determine any necessary additional quality assurance requirements that should be imposed on the contractor. The contracting officer will ensure that these are included in the contract. [Ref. 1:encl. (3), p. 3] If the contract is awarded to a Red contractor,

approval for the award must be granted by the head of the contracting office [Ref. 1:encl. (3), p. 3].

D. SUMMARY

This chapter described the Navy's RYG program. First, it explained reasons behind establishment of the program. Second, it described the CES data base on which the program is based. Finally, it detailed the test procedures that are being used to implement the program. The next chapter will briefly describe three other current DOD contractor quality programs.

III. OTHER DEPARTMENT OF DEFENSE QUALITY INITIATIVES

A. INTRODUCTION

One factor in the researcher's evaluation of the Red Yellow Green (RYG) program is an assessment of how this program compares with other contractor quality programs being used or considered for use by the Navy. Three programs evaluated by the researcher are the Air Force Contractor Performance Assessment Reporting System (CPARS), the Naval Avionics Center (NAC) Indianapolis Blue Ribbon Contractor program, and the Department of Defense (DOD) Total Quality Management (TQM) initiative. These three programs were chosen for the assessment because each has been considered for use by the Navy as an alternative to RYG. Therefore, a discussion of the merits and shortcomings of these programs and their relationship to RYG is considered important. The evaluation described above will be the subject of Chapter IV of this thesis. In preparation for the assessment in Chapter IV, this chapter provides background information on the procedures associated with each of the three programs.

B. CONTRACTOR PERFORMANCE ASSESSMENT REPORTING SYSTEM

The first program evaluated is CPARS used by the Air Force. As stated in Air Force Systems Command (AFSC) Regulation 800-54, "The sole purpose of CPARS is to provide

for a command-wide performance data base used in AFSC source selections." [Ref. 13] CPARS currently includes 84 contractors and their divisions and subsidiaries. These contractors were chosen because the Air Force conducts most of its business with them. Therefore, it was determined that the benefits of maintaining performance data on them would be worth the effort involved in the CPARS process. [Ref. 14] A Contractor Performance Assessment Report (CPAR) is prepared on contracts with the 84 contractors included in the program valued at more than $5 million. Preparation of the reports are further limited to contracts for concept demonstration and validation, full-scale development, and full-rate production and deployment. The program excludes contracts for laboratory work, services, and operations and maintenance. [Ref. 13:p. 1] Following are the areas of contractor performance evaluated in the CPAR:

1. Product system performance.
   a. Engineering design/support;
   b. Software development.
2. Schedule.
3. Cost performance.
4. Product assurance.
5. Test and evaluation.
6. Integrated logistics support program.
7. Management responsiveness.
8. Subcontract management.

9. Variances.
   a. Cost;
   b. Schedule;

10. Other areas unique to the contract evaluated. [Ref. 15]

The CPAR is prepared by the program director or program manager. An initial CPAR for a new contract is prepared between six months and one year after contract award. Following this, CPARs are submitted annually during the contract performance period. Additional CPARs are completed when the program manager changes or if the program manager determines that a contractor's performance has changed sufficiently to warrant modification of the most recent CPAR. In addition, the contractor can request that a CPAR be completed before the annual report is prepared if he believes that his performance has changed enough to alter the assessment. The final CPAR is prepared within six months after the final major end item is delivered or when a contract is terminated. [Ref. 13:p. 2]

Preparation of the CPAR involves four steps. First, the program manager or engineer responsible for the contract prepares a preliminary assessment with associated documentation. Second, the program manager forwards the original of the preliminary CPAR to the contractor and retains a copy. The contractor has 30 days to respond to the CPAR. Upon receiving a response from the contractor or 30 days after transmitting the CPAR to the contractor, whichever occurs first, the program manager takes the third step and signs the

CPAR. He may first revise his evaluation if the contractor's response indicates that a change is appropriate. Finally, the program manager sends the signed CPAR with its attachments to the Product Division of the AFSC having cognizance over his program for input into the command-wide data base. [Ref. 13:p. 2]

As part of his assessment, the program manager translates his evaluation of the contractor in each of the ten performance evaluation areas into a color classification. The following is a description of the criteria he must use in assigning colors:

> Blue (Exceptional). Indicates performance clearly exceeds contractual requirements. The area of evaluation contains few minor problems for which corrective actions appear highly effective. For cost performance, blue indicates a positive cost variance.
>
> Green (Satisfactory). Indicates performance clearly meets contractual requirements. The area of evaluation contains some minor problems for which corrective actions appear satisfactory. For cost performance, green indicates no cost variance or a negative cost variance greater than zero but less than or equal to five percent.
>
> Yellow (Marginal). Indicates performance meets contractual requirements. The area of evaluation contains a serious problem for which corrective actions have not yet been identified, appear only marginally effective, or have not been fully implemented. For cost performance, yellow indicates a negative cost variance greater than five percent but less than or equal to 15 percent.
>
> Red (Unsatisfactory). Indicates the contractor is in danger of not being able to satisfy contractual requirements and recovery is not likely in a timely manner. The area of evaluation contains serious problems for which corrective actions appear ineffective. For cost performance, red indicates a negative cost variance greater than 15 percent. [Ref. 13:p. 7]

Since each area is evaluated by color, a contractor might receive several color classifications under one contract. For example, he might be classified Red in quality, Green in cost control, and Blue in the remainder.

When making assessments of contractors, the AFSC Regulation covering CPARS cautions program managers to base their evaluations on facts. Their assessments should be supported by contract management data "such as cost performance reports, technical interchange meetings, financial solvency assessments, production management reviews, contractor operations reviews, functional performance evaluations, and earned contract incentives." [Ref. 13:p. 1] The Regulation specifically states, "Subjective assessments concerning the causes or ramifications of the contractor's performance should be provided; however, speculation or conjecture should not be included." [Ref. 13:p. 1]

The intention of the program is that during source evaluation, CPARs will be used to evaluate a contractor's past performance and assess the risk involved in doing business for the contract under consideration. Specifically, during the source selection process, the contracting officer will check the CPARs of contractors submitting proposals. If he determines that the effort described in the CPARs applies to the current procurement, they will be assembled into a report for the Performance Risk Analysis Group (PRAG). The PRAG considers the CPARs along with other contractor past

performance data to determine contractor risk. The PRAG usually expresses contractor risk as low, medium, or high. This risk assessment is then used as part of the source selection. [Ref. 14]

At present, each Product Division within the AFSC maintains a complete set of hard copy CPARs. The Air Force intends eventually to automate CPARS. The automation effort has been delayed for two reasons. First, the resources required to input the CPARs and ensure compatibility with the computer hardware at all commands are not currently available. Second, the Air Force is still developing a method to ensure the security of the automated data. [Ref. 14]

Each CPAR will be retained for five years unless the program manager requests a longer retention period. CPARs are considered source selection sensitive because they will be used for procurements throughout their retention period. They may also contain proprietary information. Therefore, all CPARs and attachments will be marked "For Official Use Only/ Source Selection Sensitive." Additionally, the forms and the data base (if automated) must be protected from disclosure to organizations or personnel not involved in the source selection process. [Ref. 13:p. 3]

C. BLUE RIBBON CONTRACTOR PROGRAM

The Blue Ribbon Contractor program at NAC Indianapolis began in December 1987. It was inspired by the Packard

Commission recommendations of 1986 [Ref. 16] and the Blue Ribbon Contractor program at Tinker Air Force Base begun a year earlier [Ref. 17]. NAC has attempted to learn from some of the difficulties experienced at Tinker and has tailored the program to respond to their concerns and conform to their resource constraints [Ref. 18].

The program at NAC is applied to contracts, purchase orders, and blanket purchase agreements with up to a $25,000 estimated value [Ref. 16:p. 41]. Procurements made for the bomb-rack program, which have historically caused difficulties for NAC, are excepted from this dollar limit and are all included in the Blue Ribbon Contractor program [Ref. 19]. Other exemptions to the program are procurements awarded via sealed bidding procedures and involving small, disadvantaged business set-aside awards. Additionally, the program is not a substitute for procedures governing contractor responsibility determination [Ref. 19:p. 2].

In order to qualify as a Blue Ribbon contractor, a contractor must first apply in writing to NAC. If he has made one delivery during the last 12 months, he will be placed on the list in that category. To receive the benefits of being designated a Blue Ribbon contractor, however, he must have and maintain an on-time delivery rate of 95 percent or greater. [Ref. 19:p. 2] This delivery rate is calculated by dividing the number of delinquent orders by the number of open orders and multiplying by 100 [Ref. 18]. Only data collected at NAC

Indianapolis are used in determining this delivery rate [Ref. 19:p. 3]. If a Blue Ribbon contractor does not qualify to receive the benefits of Blue Ribbon status upon application, or if his on-time delivery rate drops below 95 percent, he is notified that he is still listed as a Blue Ribbon contractor, but he cannot exercise the benefits of the program until his delivery rate improves [Ref. 18].

There are three benefits accruing to Blue Ribbon contractors with a qualifying delivery rate. First, the contracting officer has the authority to award to a Blue Ribbon contractor over other offerors at a price up to ten percent higher than the lowest priced responsible offeror. If the procurement is in support of the Navy bomb rack program, the contracting officer has the authority to award to a Blue Ribbon contractor at a price up to 20 percent higher than the lowest priced responsible offeror. [Ref. 19:p. 1] Second, NAC Indianapolis solicits Blue Ribbon contractors to the maximum extent possible. The bidders list is rotated, but 70 percent of it is made up of Blue Ribbon contractors. [Ref. 18] Third, Blue Ribbon contractors are permitted to use their status in their marketing programs [Ref. 18].

So far, the Blue Ribbon Contractor program has resulted in only 3.5 percent of awards (of contracts in the program) being made to Blue Ribbon contractors that were not the lowest priced responsible offerors. However, the delinquency rate on blanket purchase agreements has dropped from 67 percent before

the start of the program to 8.7 percent in July 1989. Seventy percent of the suppliers awarded contracts in July 1989 are the same suppliers that were receiving awards when the program began. One protest has been filed by a low offerer who lost a contract to a higher priced Blue Ribbon contractor. The General Accounting Office dismissed the protest because it was not timely. [Ref. 18] Therefore, no protest related to the Blue Ribbon Contractor program has yet tested the program's criteria.

D. TOTAL QUALITY MANAGEMENT

TQM is a management style introduced to the Japanese in the late 1940s by Americans participating in the post-World War II effort to rebuild Japan. TQM proved to be a very successful management method in Japan. As a result, it is gaining an increasing following within U.S. industry trying to regain competitive position both internationally and domestically. Based on successes in Japan and within the U.S., DOD is attempting to adopt TQM in an effort to operate more efficiently in a time of dwindling resources. This section of Chapter III will attempt to describe the TQM effort as it applies to DOD and, more specifically, DOD procurement. First, it will describe TQM in general, concentrating the discussion on those aspects of TQM that most directly impact upon procurement practices and, therefore, that would compete

with RYG. Second, it will outline current DOD implementation plans related to acquisition.

1. TQM Implementation--General

Adopting TQM means that everyone within an organization must be involved in improving the quality of their product. Whether they are manufacturing a product or preparing documents, everyone produces something and every product has a customer. Therefore, everyone in the organization can improve quality. The basic theory behind TQM is that as quality improves, productivity improves because rework is reduced [Ref. 20]. As quality and productivity rise, competitive position also improves [Ref. 21].

One of the key figures in the introduction of TQM to the Japanese is Dr. W. Edwards Deming. Dr. Deming has devised 14 principles for management which he believes U.S. firms must follow if they desire to adopt TQM. His 14 principles are:

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and stay in business, and to provide jobs.

2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.

3. Cease dependence on mass inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.

4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.

5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

6. Institute training on the job.

7. Institute leadership (see Point 12). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

8. Drive out fear, so that everyone may work effectively for the company.

9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.

10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.

11. Eliminate work standards (quotas) on the factory floor. Substitute leadership. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.

12. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of super visors must be changed from sheer numbers to quality. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, inter alia, abolishment of the annual or merit rating and of management by objective.

13. Institute a vigorous program of education and self-improvement.

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job. [Ref. 20:pp. 23-24]

Although all 14 points are interrelated, two have the greatest implications for changing traditional procurement

practices. These are number 3, "Cease dependence on mass inspection" and number 4, "End the practice of awarding business on the basis of price tag." Therefore, the discussion in this section will focus on how these two principles should be implemented.

The push to do away with mass inspection is based on the theory that inspection is ineffective in ensuring quality. This is true for two reasons. First, inspection occurs too late in the process. If quality has not been built in during production, it cannot be inspected in [Ref. 20:pp. 28-29]. Inspection can only separate good items from bad. Second, even if 100 percent inspection is employed to separate good from bad, some defective material will slip through. One hundred percent inspection is unreliable because inspectors are human and make errors, no matter how conscientious, because of boredom and fatigue. [Ref. 20:p. 29] In addition to being ineffective, mass inspection is very expensive. First, it is very labor intensive, so it requires the employment of many inspectors. Second, the items that fail inspection are either discarded or reworked. The first alternative wastes the costs of material and production used to make the item. The second alternative wastes the additional material and man hours employed in reworking the item. These are all resources that could be better employed elsewhere.

In place of mass inspection, Statistical Process Control (SPC) should be employed. SPC is a method to build quality into a product during production. It is a tool to be used by management to identify the reasons a product is not produced with consistency. Management charts a process, perhaps one segment of production, to see the fluctuations in the output of the process. If the process exhibits more than simple random variation, it is not in statistical control. This means that local sources of trouble are affecting the process. [Ref. 21:p. 5] Examples of local problems are differences in materials used in production, readjustment of machinery at the beginning of each shift, and use of different procedures on each shift. These local problems must be eliminated to bring the process into statistical control. Only when the process is in control, can improvements be made effectively. This is because if the process is not in control, management will not be able to observe the affects of changes made to it. [Ref. 21:p. 5] Once the process is in control, changes made to it will shift the entire control chart in either a favorable or unfavorable direction, giving management feedback about its innovations. Management can now follow the Plan, Do, Check, Act (PDCA) cycle. First, data are analyzed to determine what change might improve the process. Second, management tests the idea by putting it into practice. Third, the control charts are monitored to determine the affect (favorable or unfavorable) of the change. Finally,

based on the feedback from the third step, the change is either implemented permanently or discarded. The PDCA cycle is then begun again. The result is continuous improvement of the process in smaller and smaller increments.

The key to employing sampling inspections and SPC in place of mass inspection is the determination of which characteristics to monitor and which inspection method to use. Dr. Ishikawa explains that it is important to inspect quality characteristics that are unstable, thus causing defects, as well as vital characteristics that affect the life of a product [Ref. 22]. These inspections are not performed after the product is complete; they are conducted by the worker during the production process. In addition, only a sample of the items produced are inspected to either determine whether the process is in control or to be sure that the process remains in control. Because only a small sample of items are inspected, inspectors can do the job properly. [Ref. 20:pp. 29-30] Dr. Ishikawa further explains that the goal of SPC should be a product with 100 per cent acceptable quality. SPC makes this goal feasible. [Ref. 22:pp. 117-118] Mass inspection, on the other hand, is guaranteed to result in some percentage of failures.

The second principle that applies directly to procurement is number 4, "End the practice of awarding business on the basis of price tag." What this principle means is that when purchasing material, an organization should

consider the lowest total cost of the item rather than the lowest initial cost [Ref. 23]. The organization must have long term goals. Buyers have a new job. They have traditionally sought lower and lower prices for material with little or no concern for quality or service. [Ref. 21:p. 25] It is difficult to select a contractor with a higher initial price since it can be very subjective when defending the selection during an award protest. Now buyers must concentrate on quality because, as Dr. Deming states:

> Price has no meaning without a measure of the quality being purchased. Without adequate measures of quality, business drifts to the lowest bidder, low quality and high cost being the inevitable result. American industry and the U.S. Government, civil and military, are being rooked by rules that award business to the lowest bidder. [Ref. 23:p. 23]

In order to ensure receipt of quality goods and services, an organization must do two things. First, it must require that its suppliers practice TQM. Second, it must reduce the number of suppliers it deals with and seek long-term relationships with these suppliers.

To verify that a supplier practices TQM, an organization should require the supplier to provide statistical evidence of quality. This means supplying the buying organization with control charts and proof that the supplier is working on changing its management style to conform with Deming's principles. [Ref. 21:p. 113] The buying organization must be sure that the control charts provided represent the proper inspection technique taken at

the critical points in the production process using the correct sample size. This requires a close relationship between the buying activity and the company supplying the material. The activity buying material must be sure that the supplier is capable of producing a quality product before the item is produced. In Dr. Deming's words, "The customer that waits for delivery of material to learn what he has bought will take what he gets." [Ref. 20:pp. 40-41] This concept opens a new world of responsibilities to the contract administration activities within DOD. It suggests that their traditional role inspecting the quality of material after it has been produced must change. Instead, they would be expected to participate with the contractor in verifying the quality of his production processes before and during production of required material.

The concentration on long-term goals and close buyer-supplier relationship requires a long-term relationship with a small number of suppliers. This is in direct conflict with the Competition in Contracting Act of 1984 and a concept that DOD must deal with to successfully implement a TQM philosophy. The buying activity's goal is still to purchase material of high quality at the least cost. However, the buying activity must also devote resources to assist the vendor in employing TQM if it is to succeed. Therefore, as the number of suppliers an activity deals with increases, the number of resources devoted to ensuring a TQM philosophy also increases.

Even after the activity is working with suppliers dedicated to TQM and is receiving high quality material, if this material is supplied by two different vendors, there will be differences. These differences will surface when the material is placed into the production process. [Ref. 20:p. 35] For these reasons, Dr. Deming encourages organizations to reduce their suppliers for a given end item to one [Ref. 20, p. 23]. Ishikawa believes, however, that an organization should maintain at least two suppliers for a given product in case one firm is unable to supply the item [Ref. 24].

A supplier needs the promise of a long-term contract to make it cost effective for him to institute TQM and concentrate on continuously improving his production process [Ref. 21:p. 115]. Without some guarantee of continued business, he will not be willing to invest the resources necessary to bring his processes into control and then improve upon them. DOD must seriously consider the awarding of multi-year contracts (two to five years) or contracts with optional years to assure a contractor that DOD is supporting a basic TQM mandate. Contractors are currently forced to concentrate on making a profit in the short term since DOD is focused on the short term. If, however, a long-term relationship can be developed, both customer and supplier will benefit. The customer will receive high quality material at lower costs. The supplier will no longer need to employ resources in storing and reworking defective material. [Ref. 21:p. 115]

2. TQM Implementation--DOD

The application of TQM within the Federal Government began in 1986 when President Reagan signed Executive Order 12552. The goal of this Executive Order is to significantly improve the productivity of the Federal Government by 1992 through employment of TQM. [Ref. 25] In 1988, DOD initiated its TQM program, issuing the Total Quality Management Master Plan in August of that year.

The strategy of the Master Plan "aims at achieving one broad, unending objective: continuous improvement of products and services." [Ref. 26] In order to achieve this objective, the plan includes goals for the short term (one year), mid term (three years), and long term (seven years). These goals cover a broad range of DOD tasks. They state, however, that the acquisition community will be the first to implement TQM and that others will follow in approximately three years [Ref. 26:p. 3]. Since the acquisition community is leading TQM implementation and this thesis will concentrate its discussion of TQM in the areas relating to RYG, discussion of the Master Plan will be limited to procurement and Government-industry relationships.

In the short term, two of the seven goals directly impact procurement. The first of the two is to "Begin enlisting Defense industry commitment." This goal intends to begin TQM implementation by using programs already in existence within DOD. These programs are to be used to

communicate to industry DOD's desire for continuous process improvement. [Ref. 26:p. 10] The second applicable goal is to "Develop and implement recognition and reward system based on TQM goals and behaviors." This goal discusses the need to revise existing performance incentives to encourage and reward continuous improvement efforts. [Ref. 26:p. 10]

One of the nine mid-term goals applies directly to procurement: "Implementation commitment by major Defense contractors, with 'critical mass' achieved in at least the top 25 contractors." This goal intends to result in a commitment from the top 25 Defense contractors to independently implement continuous process improvement programs. These 25 contractors receive contracts valuing more than 50 percent of DOD's total acquisition expenditures, and they receive most of DOD major system contracts. This commitment is expected to involve the training of senior leadership within these firms in TQM and their active involvement in continuous improvement efforts. [Ref. 16:p. 6]

In the long term, one of the four goals of the Master Plan impacts upon procurement: "Widespread Defense industry implementation of continuous process improvement." Implementation of this goal involves employment of TQM by all DOD prime and subcontractors. Its achievement requires three things of DOD. First, DOD must encourage and assist contractors in their implementation of continuous process improvement. Second, DOD is expected to develop criteria to

evaluate contractor commitment to continuous improvement. Finally, the degree and success of contractor process improvement efforts are to be included in source selection strategies. [Ref. 26:p. 4] Within this goal, the Master Plan states, "The intent of continuous process improvement efforts is to recognize and reward dedication and adherence to the improvement process, and not restrict reward to attaining a specific standard of performance." [Ref. 16:p. 4]

E. SUMMARY

This chapter briefly described three DOD contractor quality programs. The programs described were the Air Force CPARS, NAC Indianapolis Blue Ribbon Contractor program, and DOD TQM initiative. The procedures associated with each program have been provided as background information to support the next chapter. The chapter that follows will discuss the merits and shortcomings of the three programs and their relationship to RYG.

IV. A COMPARISON OF RED YELLOW GREEN AND OTHER CONTRACTOR QUALITY INITIATIVES

A. INTRODUCTION

This chapter will use the background information provided in Chapter III to analyze the Red Yellow Green (RYG) program relative to the other three programs described--the Contractor Performance Assessment Reporting System (CPARS), the Blue Ribbon Contractor program, and the Total Quality Management (TQM) initiative. The purpose of the analysis is to determine whether RYG should co-exist with these other initiatives or if it should replace or be replaced by any one of them.

The assessment will be organized in the same way as the background information presented in Chapter III. First, RYG will be compared to CPARS. Next, RYG will be evaluated relative to Naval Avionics Center (NAC) Indianapolis' Blue Ribbon Contractor program. Finally, RYG will be assessed for its compatibility with the Department of Defense (DOD) TQM initiative.

B. CONTRACTOR PERFORMANCE ASSESSMENT REPORTING SYSTEM

The CPARS devised by the Air Force is intended for use in source selections for major systems contracts. Therefore, the threshold for employment of CPARS is set at $5 million and the number of contractors included in the program has been limited to 84. The Air Force had two major reasons for setting these

limits. The first involves maintenance of the Contractor Performance Assessment Reports (CPARs). The second involves the nature of the information reported in the CPARs and, therefore, the way in which this information must be used in the source selection process. These two factors will be discussed in detail in the following paragraphs.

Maintenance of CPARs requires many resources. First, it involves the time invested by the program manager to prepare the report. Although the reports are supposed to be based on facts, they are not merely collections of data. They are written, subjective assessments of the contractor's performance and, therefore, require some effort on the part of the program manager. The second factor concerning maintenance of CPARs involves the efforts of those who verify the information contained in the reports, ensure that the reports are current, and physically store the reports. Since the CPARs are expected to be used in future source selections, the Air Force carefully verifies the information contained in the reports to ensure that it is compatible with past trends and other CPARs filed on the same contractor. When an activity uses CPARs in source selection, the currency of the information is checked. If a more current CPAR is desired, the procuring activity contacts the program office and requests more up-to-date information. In addition, since the system is not yet automated, maintaining hard copy files of all CPARs at the six Product Divisions within the Air Force Systems Command

requires a tremendous clerical effort. Maintenance of the CPARs is a very labor intensive process.

The information contained in CPARs is subjective. It is based on facts, but much of it is still the opinion of the program manager and members of the program office. Additionally, because a CPAR is a written report, it is a relatively long document. Because of its subjectivity and length, the use of CPARs in source selection requires careful evaluation of the information contained in the report. To perform this evaluation, the CPARs must first be collected, evaluated for their relevance to the procurement in question, and assembled into an integrated report. The resulting report is then further evaluated in conjunction with other past performance data to determine a contractor's level of risk. This is a relatively long process. The Air Force believes the process is beneficial for major weapon system procurements. However, CPARS is not used for non-major acquisitions.

The points discussed above suggest that CPARS would not be appropriate for contracting operations at field activities for three reasons.

First, the investment in resources to maintain the CPARs could not be justified by the relatively small dollar procurements awarded by field contracting activities. The return on investment to obtain higher quality material would surely be less than the cost to prepare and maintain the CPARs.

Second, in order to be effective in field contracting, the number of contractors included in the program would have to be greatly expanded. The contractors that compete in major system procurements are relatively few. However, field contracting offices deal with thousands of contractors. Even if fewer than 100 contractors were included in the system, field activities would find it very difficult to obtain accurate past performance information. An expansion of CPARS at the field level to accommodate such a large number of contractors would be an impossible undertaking.

Finally, even if CPARS were expanded, field contracting offices would have neither the time nor the resources to perform the evaluation necessary to correctly apply it to source selection.

In summary, CPARS seems to be only appropriate for use in the procurement of major systems. It should not be considered for expanded use in field contracting. RYG was designed for use by field contracting offices. Accordingly, its formula driven assessment of past performance would not be appropriate for use in major system procurements. The two programs were designed to satisfy different needs in different areas of Government contracting. Therefore, neither should be considered as a replacement for the other.

C. BLUE RIBBON CONTRACTOR PROGRAM

The Blue Ribbon Contractor program at NAC Indianapolis has five unique features. First, it is an automated system created by NAC using data collected by NAC. Second, the criteria used to define a Blue Ribbon contractor and the programs included in the program were chosen to focus attention on the critical and problem materials procured by NAC. Third, contractors must apply for Blue Ribbon status to be included in the program, and NAC performs the analysis to determine whether these contractors qualify for the benefits of the program. Fourth, the program concentrates on commodities important to NAC's mission, and a contractor must make a delivery to NAC at least once each year to be included in the program. Therefore, the contractors designated as Blue Ribbon will generally be the contractors NAC deals with on a regular basis. Fifth, use of the program in source selection requires judgment. Unlike RYG, it is not a formula-driven program. The decision to award to a Blue Ribbon contractor over a lower-priced offeror (not included in the program) requires an assessment by both contracting and quality assurance personnel. Therefore, the two groups must communicate with each other to use the program effectively.

Like RYG, the Blue Ribbon Contractor program is appropriate for use in field contracting. However, a Blue Ribbon program requires that an activity devote many more resources than does RYG. First, the activity would need the

capability to automate. Second, it would have to devise the criteria to be used in designating Blue Ribbon contractors. NAC chose delivery, but other commands might be more interested in quality or reliability. Third, it would have to decide which commodities are important enough to its mission to justify inclusion in the program. Fourth, it would need to devote resources to the program to evaluate applicants and maintain the Blue Ribbon Contractor list. Finally, the contracting and quality assurance personnel in the command would have to be willing and able to work together to implement the program.

Some commands would be unable to take the five steps discussed in the previous paragraph. They might lack the automation necessary to implement the program. Or, contracting personnel might be physically located away from quality assurance personnel. This would be the case for a Navy Regional Contracting Center procuring goods and services for many of its Navy field activities. In either case, implementation of a Blue Ribbon Contractor program would be impractical. Therefore, a Blue Ribbon program does not seem to be a viable option for every field contracting activity.

The question then is whether RYG and Blue Ribbon Contractor programs could co-exist at activities capable of implementing both programs. This researcher believes the answer to that question is yes--the programs are compatible and can enhance each other. If used together, the Blue Ribbon

program would be used when procuring goods and services that the command considers critical to the performance of its mission. The Blue Ribbon program would allow the command to concentrate its attention on those parameters that it considers important. RYG could be used for all other procurements. By definition, RYG procurements would be for less critical and less frequently purchased materials. These items would not justify the resources needed to apply the Blue Ribbon program. In addition, the command may not have been able to generate enough local data on critical items to assess contractor past performance. RYG would allow the command to consider past performance in source selection while employing a very simple system.

Selected field activities could benefit from using both RYG and a tailored Blue Ribbon Contractor program. The most likely evolution would be to first implement RYG since it is less complex. Use of RYG should help personnel involved in the source selection process become comfortable with using an automated system. In addition, implementation of RYG should force contracting and quality assurance personnel to work together. RYG requires quality assurance personnel to use past performance to evaluate offerors and determine the quality assurance actions required of each. They must then provide this assessment to contracting. Therefore, RYG involves quality assurance more deeply in the source evaluation process. Both will help pave the way for

introduction of a Blue Ribbon Contractor program concentrating attention on the area of the command's specialization. [Ref. 27]

D. TOTAL QUALITY MANAGEMENT

The discussion in this section will focus on whether RYG furthers the goals of TQM. The purpose of this discussion is to evaluate whether RYG is consistent with DOD's TQM initiative or whether RYG hinders this initiative. This section will first consider RYG's conformance to the general goals of TQM as outlined in Chapter III. Second, it will relate RYG to the goals in the DOD TQM Master Plan.

1. TQM and RYG--General

Two of Dr. Deming's 14 principles were determined to directly impact the Government procurement process and, therefore, apply to the comparison of TQM and RYG. These two principles are:

1. Number 3. "Cease dependence on mass inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place." [Ref. 20:p. 23]

2. Number 4. "End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust." [Ref. 20:p. 23]

The first concept addresses the requirement for contractors to practice statistical process control (SPC). The second addresses the relationship between buyers and suppliers.

Implementation of it involves considering total cost when awarding contracts by ensuring that suppliers practice TQM.

RYG does not satisfy all of the requirements of these two principles, nor does it require contractors to practice all of Deming's 14 principles. It does, however, help the Government end the practice of awarding business on the basis of price tag by considering the total cost of a procurement when the cost of poor quality is added to the source selection formula. Therefore, in a limited way, RYG helps to further the goals of TQM.

This researcher believes that a limited implementation of TQM in field contracting is probably a more realistic undertaking for DOD. Even the third and fourth Deming principles will be very difficult to implement since they require two resources that may not be available to field contracting officers--time and personnel.

Time is required to ensure that the supplier practices TQM. Contracting personnel would have to examine the TQM programs of offerors in detail. They would need to ensure that the contractors practice SPC as well as other Deming principles. Implementation of the management principles is more difficult and more time consuming because it involves evaluating the firm's daily management style. Field contracting requires the processing of many procurement actions in a relatively short period of time. Contracting

offices do not devote the time necessary to perform such an on-going evaluation.

In addition to time, personnel are required to perform a vendor TQM assessment. As discussed in Chapter III, the buying activity must be able to evaluate whether the supplier is taking the correct measurements at the critical points in production and if the sampling technique is proper. This requires an in depth knowledge of both the production process and statistics. Someone with technical knowledge of the item being purchased, perhaps an engineer, would have to be a permanent member of the evaluation team. Additionally, a statistician would probably be needed. It is unlikely that a contracting office would have either the number of personnel or skill levels required for the task.

2. TQM and RYG--DOD

With the exception of its short-term goals, the segments of the DOD TQM Master Plan relating to procurement seem to focus on procurement of major systems. This is probably due to the dollar values involved in major system procurements as well as the degree of management attention focused on each program. The expected returns from using TQM for major system acquisitions would be greater than for smaller procurements. In addition, the time schedule of a major system acquisition would more easily allow the contractor evaluation required by TQM. Procurements made in the field do not involve such high dollar values. Neither do

they allow the degree of management attention required by procurement of a major system. However, in spite of the fact that the Master Plan does not specifically address contractor quality programs intended for field contracting, this researcher believes that RYG can still be shown to conform to the intent of the Master Plan.

In the short term, the Master Plan discusses enlisting defense industry commitment to TQM by using programs already in existence within DOD. Additionally, it hopes to employ recognition and reward systems based on TQM goals and behaviors. [Ref. 26:p. 10] RYG is consistent with both these objectives.

First, RYG employs an existing system, the Product Deficiency Reporting and Evaluation Program (PDREP), to improve the quality of material received by the Navy. It expands the application of this system to allow greater consideration of contractor past performance in the source selection process. Second, RYG could be used to reward contractors who provide good quality material to the Government. It accomplishes this by considering the cost of poor quality when making source selection decisions. Since proposals from contractors with good quality history are not assessed a Technical Evaluation Adjustment, these contractors have a competitive advantage over those with a poor quality history.

The Master Plan's procurement goal for the mid term addresses only major system procurements. It involves getting a commitment from DOD's top 25 contractors to implement TQM. These contractors receive more than 50 percent of DOD's procurement dollars and most of its major system contracts. [Ref. 26:p. 6] This goal is not related to RYG since RYG neither helps nor hinders its implementation.

In the long term, the Master Plan seeks employment of TQM by all DOD prime and subcontractors [Ref. 26:p. 4]. As discussed earlier in this section, it is difficult for field contracting offices to require and verify employment of TQM by the vast number of contractors dealt with at this level. However, RYG at least allows them to consider improved quality, which is the result of continuous process improvement, in their source selection decisions. Therefore, use of RYG is at least a step toward TQM implementation in field contracting. Additionally, implementing a Blue Ribbon Contractor program in conjunction with RYG can move field contracting activities even closer to the goals of TQM.

As described in the Blue Ribbon Contractor Program section of this chapter, the RYG and Blue Ribbon Contractor programs can enhance each other. RYG is necessary for procurement of infrequently used and non-critical materials that do not justify a great deal of management attention. It is also needed by commands incapable of implementing a Blue Ribbon Contractor program. RYG focuses on the negative

aspects of poor performance to improve quality. A Blue Ribbon Contractor program requires more resources to implement than does RYG and so would be used in the procurement of materials an activity considers critical. Blue Ribbon programs focus on the positive aspects of past performance to improve quality.

Because of its simplicity and focus on the negative, RYG could be considered a first step toward implementing TQM in field contracting. The program will always be needed when a Blue Ribbon program is either unavailable or inappropriate. Since the Blue Ribbon Contractor programs are more complex and focus on the positive, they are a logical second step toward implementing TQM in field contracting.

E. SUMMARY

This chapter evaluated the three DOD quality programs described in the previous chapter--CPARS, the Blue Ribbon Contractor program, and the TQM initiative. It compared and contrasted these programs to RYG and discussed whether RYG should co-exist with them. The next chapter will assess the strengths and weaknesses of the RYG program. The analysis will include a discussion concerning the program's ability to withstand a protest. It will also assess the current status of the RYG test.

V. STRENGTHS AND WEAKNESSES OF RED YELLOW GREEN

A. INTRODUCTION

This chapter will attempt to assess the strengths and weaknesses of the Red Yellow Green (RYG) program. First, the four areas of the program most open to contractor protests will be addressed. The first area considered will be whether RYG results in de facto debarment of Red and Yellow contractors. The second consideration is whether the Technical Evaluation Adjustments (TEAs) could be regarded as penalties and whether it is fair for the Government to consider costs of quality (a basic premise of RYG) in the source selection decision in the first place. The third to be discussed will be whether consideration of past performance, as an evaluation factor, constitutes a responsibility determination. The fourth area addressed in this chapter will be the accuracy of the data base used to rate contractors Red, Yellow, or Green. The overall discussion will include an evaluation of the program's ability to withstand a contractor protest.

Next, the progress of the RYG program test will be examined. This discussion will first involve an assessment of test implementation at each of the five test activities. It will then provide data documenting the results of the test to date and discuss the significance of these data.

B. PROTEST ISSUES

1. De Facto Debarment

The discussion concerning de facto debarment will center around whether designating a contractor as Red or Yellow has the same effect as debarment. The effect of debarment as described in the Federal Acquisition Regulation (FAR) is:

> (a) Debarred or suspended contractors are excluded from receiving contracts, and agencies shall not solicit offers from, award contracts to, or consent to subcontracts with these contractors, unless the acquiring agency's head or a designee determines that there is a compelling reason for such action.... [Ref. 28]

Cibinic and Nash provide a similar description of the effect of debarment:

> The second broad sanction is debarment of the contractor or its employees from taking any Government contracts for a stated period of time....Debarment precludes contracts with any agency of the federal government for a period of up to three years.... [Ref. 29]

Based on the above definition, it is clear that debarment of contractors excludes them from competing for any Government contract. This means that the Government must avoid both soliciting offers from and awarding contracts to debarred contractors.

Application of the RYG test procedures neither stops the Government from soliciting offers from nor awarding contracts to Red and Yellow contractors [Ref. 30]. It merely allows the Government to consider the costs it expects to incur based on the quality of material it is most likely to

receive from an offeror. If, after considering the costs related to additional quality assurance requirements, a Red or Yellow contractor is the lowest-priced responsible offeror, the Red or Yellow contractor will be awarded the contract.

Since the Government will be soliciting proposals from, and awarding contracts to, Red and Yellow contractors, application of the RYG test procedures is not considered a de facto debarment in the analysis of the researcher. It is expected that the RYG program will be able to withstand any protest in this area.

2. Use of TEAs

The second area for potential protest is the use of TEAs. The propriety of using TEAs will be considered first by discussing whether TEAs could be considered penalties and, therefore, unenforceable, and second by discussing whether it is fair for the Government to consider costs of quality when evaluating proposals. In order to assess the reasonableness of the values assigned as TEAs, the researcher considered precedent associated with the reasonableness of liquidated damages amounts.

Regulations and precedent applying to liquidated damages were used to determine whether the TEAs (as calculated in the RYG test procedures) could be considered penalties. The FAR states that "liquidated damages fixed without any reference to probable actual damages may be held to be a penalty, and therefore unenforceable." [Ref. 28:para. 12.202]

Based on this regulation, the question then becomes whether the TEAs are related to actual costs that the Government would expect to incur when forced to carry out additional quality assurance requirements.

Cibinic and Nash state, "The Government contract rule is that the reasonableness of the forecast of liquidated damages is evaluated by looking at the situation at the time the contract is made...." [Ref. 29:p. 802] They further explain that even liquidated damages calculated at a fixed rate of dollars per day have been upheld by the courts because they are considered to cover the Government's administrative expenses, "i.e., inspection, superintendence or engineering costs, which the Government will incur if a delay is encountered." [Ref. 29:p. 803] In the case of Young Associates, Inc. v. United States, 200 Ct. Cl. 438,471 F.2d 618 (1973) the court stated:

> The answer is, we think, that the regulation does not require a liquidated-damage schedule to be tailor made for each individual contract. It is enough if the amount stipulated is reasonable for the particular agreement at the time it is made. [Ref. 29:p. 804]

In summary, amounts of liquidated damages are considered reasonable if they are a fair estimate (calculated when the contract is made) of the administrative costs the Government would expect to incur during a delay. Further, the estimate need not be tailored to each contract. Based on this, amounts of TEAs should be considered reasonable if they are truly a fair estimate of the administrative costs the

Government expects to incur because a contractor has poor quality history.

The TEAs furnished as examples in Chapter II and Appendix D were calculated using Navy Material Quality Assessment Office (NMQAO) historical data. These data include labor hours required for the quality assurance actions, labor rates, and costs of testing. [Ref. 2] They are, however, provided only as examples. Each test activity has used these examples and their own quality assurance history and labor rates to calculate local TEAs. Therefore, the TEAs assessed in the test of RYG are tailored to the expected costs of each activity. Since the TEAs represent a fair estimate of the costs each activity expects to incur because of increased quality assurance requirements (calculated at the time of contract award), this researcher believes that they would be considered reasonable in the event of a protest. In addition, since the TEAs assessed correspond to the specific quality assurance actions required in the contract, they could be considered to be tailored to each contract. Based on the case law concerning liquidated damages, a tailored assessment might not be necessary, however, it probably strengthens the argument justifying the reasonableness of assigned TEAs.

The second consideration in the assessment of the propriety of using TEAs is whether it is fair for the Government to consider the costs of additional quality assurance requirements in source selection. There is

precedent for considering costs similar to TEAs in the source selection decision. Specifically, the FAR discusses the consideration of first article test and transportation costs in the source selection process.

Regarding first article testing, the FAR states, "Solicitations containing a testing and approval requirement shall...include, when the Government is responsible for first article testing, the Government's estimated testing costs as a factor for use in evaluating offers...." [Ref. 28:para. 9.306] In addition, the FAR requires that the solicitations "inform offerors that the requirement may be waived when supplies identical or similar to those called for have previously been delivered by the offeror and accepted by the Government...." [Ref. 28:para. 9.306] These two statements suggest that not only should the Government consider the costs of testing in the source selection decision, but that the decision concerning the requirement of first article testing should be based on the performance history of the offerors. Both support the use of TEAs when evaluating past performance.

Regarding transportation costs, the FAR states, "Solicitations, when appropriate, shall specify that offers may be f.o.b. origin, f.o.b. destination, or both; and that they will be evaluated on the basis of the lowest overall cost to the Government." [Ref. 28:para. 47.305-2] The FAR further states, "When evaluating offers, contracting officers shall consider transportation and transportation-related

costs..." [Ref. 28:para. 47.306] These statements strengthen the argument that it is fair for the Government to use TEAs based on differences in the costs it will incur because of quality differences.

3. Use of Responsibility-Related Factors

The argument against use of past performance as a factor in source evaluation states that since past performance is one of seven responsibility factors listed in the FAR, its use in source evaluation constitutes a responsibility determination [Ref. 28:para. 9.104-1]. In the case of small businesses, a determination of non-responsibility must be referred to the cognizant Small Business Administration (SBA) Regional Office [Ref. 28:para. 19.602-1]. Therefore, if use of past performance in source evaluation were considered to constitute responsibility determination, any negative impact the RYG test procedures had on small business would have to be referred to the SBA. Failure to comply with FAR Part 19.602-1 would violate statute and regulation. In order to determine whether the responsibility argument is valid, several pertinent General Accounting Office (GAO) protest decisions have been examined. The cases and their implications are summarized below.

Three of the cases evaluated indicate that responsibility factors may be used in source evaluation provided that negotiated procurement practices are used, and

the selecting activity uses these factors to make a comparative evaluation of offerors.

In the matter of B & W Service Industries, Inc. (B & W), B & W contended that responsibility factors (i.e., company experience, past performance, and the experience of key personnel) should not have been used in the Department of Housing and Urban Development's evaluation of their proposal. GAO denied the protest. [Ref. 31] In its decision, GAO stated:

> Contracting officers evaluate prospective contractors to determine their responsibility, that is, their capability to perform the work....COC (Certificate of Competency) referrals to SBA are only required where contracting officers find small businesses to be nonresponsible. In this case, the agency did not find the protester nonresponsible, but considered its proposal to be weak under some evaluation factors listed in the solicitation.
>
> With regard to these factors, it is not improper in a negotiated procurement to include traditional responsibility factors among the technical evaluation criteria....As long as the factors are limited to areas which, when evaluated comparatively, can provide an appropriate basis for a selection that will be in the government's best interest, COC procedures do not apply to a technical proposal deficient in those areas. [Ref. 31]

In the case of Utah Geophysical Inc. (UGI), UGI contended that the Nuclear Regulatory Commission (NRC) failed to refer a non-responsibility determination to the SBA. They argued that because source evaluation included responsibility factors (i.e., experience and level of effort for key personnel assigned to the project), the NRC's finding that their proposal was unacceptable constituted a determination of

non-responsibility. [Ref. 32] GAO denied the protest and stated in its decision:

> Matters which are normally considered in responsibility determinations may properly be considered in evaluation of proposals when negotiation procedures are used and agency makes relative assessment of competing offerors' ability to meet contract requirements. [Ref. 32]

In the matter of Electrospace Systems, Inc. (ESI), ESI protested the Army's use of offerors' experience in source evaluation. This evaluation criterion impacted ESI's exclusion from the competitive range. They argued that use of responsibility-related factors in source evaluation violated the SBA's statutory authority to certify the responsibility of small businesses. [Ref. 33] In its decision, GAO cites a previous case involving SBD Computer Services Corporation, B-186950, December 21, 1976, 76-2 CPD 511. In its 1976 decision, GAO stated:

> In many other cases, we have recognized that contracting agencies may properly utilize evaluation factors which include experience and other areas that would otherwise be encompassed by offeror responsibility determinations when the needs of those agencies warrant a comparative evaluation of those areas. [Ref. 33]

In its decision to deny ESI's protest, GAO stated:

> Since neither 10 U.S.C. 2304(g) nor applicable regulation in any way restrict the "other factors" that may be used by agencies in selecting the proposal having the greatest value to the Government, we have not prohibited procuring agencies from using responsibility-related factors in making relative assessments of the merits of competing proposals. [Ref. 33]

The cases cited above all support use of responsibility factors in source evaluation. However, care must be exercised to ensure that, if such factors are used,

the Government makes a comparative evaluation of offerors, not a pass/fail determination. If a responsibility factor is used to ascertain the technical acceptability of a proposal, its use will be considered to constitute a responsibility determination. Two cases providing examples of this distinction are described below.

In the case of Sanford and Sons Company (Sanford), Sanford protested the Army Corps of Engineers' determination that their proposal was technically unacceptable. The request for proposals (RFP) stated that the contract would be awarded to the lowest-priced, technically-qualified offeror. Two of the six criteria for source evaluation detailed in the RFP were: (1) organization and administration; and (2) satisfactory performance record. The Army found Sanford's proposal to be technically unacceptable in both organization and administration and past performance. Both of these areas are considered responsibility factors. GAO sustained the protest. [Ref. 34] In its decision GAO stated:

> We have cautioned that an agency may not find that a small business is nonresponsible under the guise of a relative assessment of responsibility factors and thus avoid referring the matter to the Small Business Administration. [Ref. 34]

The decision further states:

> Although an agency may use traditional responsibility factors, like prior performance, as technical evaluation factors where its needs warrant a comparative evaluation of proposals, an agency's rejection of a small business firm's offer as unacceptable under such factors was improper where the agency's decision did not reflect a relative assessment

of the offer but instead effectively constituted a finding of nonresponsibility. [Ref. 34]

In the matter of Siems International Electron Microscope Service (Siems), Siems protested the cancellation of a RFP by the National Institutes of Health (NIH). NIH had determined that Siems was non-responsible under the RFP, but Siems was subsequently issued a Certificate of Competency by the SBA. NIH stated that the solicitation was cancelled because the specification in the RFP was inadequate, not whether or not Siems was responsible. NIH determined, therefore, that the requirement should be resolicited. Under the new RFP, Siems proposal was determined to be technically unacceptable. This determination was based on a responsibility factor--contractor capacity. [Ref. 35] GAO sustained the protest, stating:

> Where offerors were not required to submit technical proposals to service electron microscopes but only to offer to conform to the best practices of the industry, and the factors making up the technical criteria were evaluation of capacity factors, the determination an offeror was technically unacceptable amounted, in essence, to a determination of nonresponsibility for reasons of capacity that required a referral to the Small Business Administration.... [Ref. 35]

The conclusion that can be drawn after examination of the above five cases is that responsibility factors may be used in source evaluation, but that activities must be careful not to use such factors to determine the technical acceptability of a proposal. If implemented as written, the RYG test procedures do not use past performance to determine

technical acceptability. It will be used, however, to better determine the true cost to the Government of doing business with each offeror. In fact, the test procedures specifically state that a contractor's status under the test is not to be used as a substitute for the requirement to make a responsibility determination [Ref. 1:encl. (1), p. 4]. The test activities, however, must exercise care in administering the RYG procedures to ensure that they do not use a contractor's past performance to judge his technical acceptability.

In summary, the Government faces a risk that GAO may sustain a protest arguing that use of the RYG test procedures constitutes a responsibility determination. However, if the test procedures are implemented as intended, the Office of General Council (OGC) in the Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics) (ASN(S&L)) believes that the Government has a good argument to support its case that use of past performance under the RYG test constitutes a comparative evaluation of offerors, not a responsibility determination [Ref. 30].

4. Accuracy of the Data Base

The validity of the Contractor Evaluation System (CES) data base presents the greatest potential for protest since they are the basis of categorizing contractors as Red, Yellow, or Green. The data are maintained very well by the Naval Material Quality Assessment Office (NMQAO). Therefore, the

CES is an accurate portrayal of the data received by NMQAO from the sources described in Chapter II. [Ref. 36] Problems will occur, however, if the data are inaccurate when they are submitted to NMQAO. Culpability (Government or contractor) for rejects and deficiencies is assigned before the data are submitted to NMQAO. Because of the volume of data received, it would be impossible for NMQAO to verify each item [Ref. 36]. If an activity submits inaccurate data, a contractor could be mistakenly classified Red or Yellow. If a contractor were to lose a contract because of an incorrect classification, he would have a strong argument to support filing a protest.

Two issues arise in evaluating the probability that the RYG test procedures will survive a protest based on inaccurate data. First, the current accuracy of the data base must be considered. Prior to NMQAO classifying contractors Red, Yellow, or Green, letters were mailed to all Red and Yellow contractors informing them of their status and the reasons for the classification. With each monthly update of the data base, contractors are notified of any change in their status under the test. Contractors were advised to contact NMQAO if they had any questions about the program or their color classification. NMQAO mailed 2037 notification letters and has received 247 oral and written responses to the classifications assigned. Thirteen of these responses resulted in changes to the data base. In three cases, data

corrections resulted in a change of color classification. [Ref. 37] Thirteen corrections out of 2037 would suggest a 0.56 percent error rate. However, such an assumption would be invalid since only a small percentage of the contractors notified provided a response.

The only way to estimate the accuracy of the data base is to draw a representative sample of contractors and verify the data leading to their color classification. Such an undertaking would require more resources than are currently available to NMQAO. Additionally, even if such an evaluation were to be made, there is no yardstick available to determine what would be an acceptable level of accuracy. [Ref. 36] Therefore, the validity and acceptable accuracy level of the data base can only be determined during the test.

One of the benefits of gaining approval from the Defense Acquisition Regulatory Council for the one-year test of the RYG program is that GAO has traditionally declined to hear protests on other test programs [Ref. 38]. It is hoped that a test period free of protests will allow NMQAO to assess the validity of the data and resolve inaccurate data, and hopefully expand the program to all of DOD.

The second issue pertaining to the accuracy of the data base concerns the notification letters sent to contractors informing them of their status in the program. These letters inform contractors of their current color classification based on documented performance history. In

the opinion of Ms. Sandra Desbrow-Jensen of the OGC at ASN(S&L), if a contractor does not respond within a reasonable period to correct errors in the data base, he will be estopped from later protesting the validity of the data base [Ref. 30]. If GAO supports this position, the contractor notification letters should help eliminate protests based on the accuracy of the data.

C. PROGRESS OF RYG TEST

1. Implementation

In order to assess the progress of the RYG program implementation, the researcher conducted interviews with personnel at each of the five test activities. The purpose of the interviews was to gain the perspective of both contracting and quality assurance personnel involved in RYG implementation. Therefore, interviews were conducted with individuals from both areas at each activity.

The following paragraphs summarize the comments received during the interviews. The perspective of contracting personnel are presented first, followed by comments from the quality assurance community. Finally, the researcher discusses similarities and differences between these comments and their implications.

a. Contracting

(1) Naval Supply Center (NSC) Pensacola. The researcher interviewed CDR Walsh, Contracting Officer at NSC

Pensacola when the RYG implementation began. He explained that the NSC had begun RYG implementation with a small number of Federal Supply Classes (FSCs). The Contracting Department chose 20 FSCs from a list given to them by the Naval Aviation Depot (NADEP) Pensacola. Initially, they have applied the RYG test procedures to ten of the 20 FSCs and small purchases. They intend to later expand the program to all 20 FSCs and major procurements. The test has not generated a great deal of activity to date, but CDR Walsh anticipates a greater impact when the program is expanded. [Ref. 39]

The test procedures have not yet resulted in significant extra work. Quality assurance personnel at the NADEP have helped absorb some of the extra burden. The NSC has not received much negative feedback from contractors. [Ref. 39]

CDR Walsh expressed concern about the accuracy of the data base used for the RYG test. Additionally, he worries about the affect the program will have on distributors who are also small businesses. Although theoretically distributors should be responsible for the quality of material they sell, small businesses may not have the capability to properly test their stock. He fears that the RYG program may hurt these small businesses. [Ref. 39]

(2) NSC Charleston. Mrs. Davidson, Deputy Director, Purchase Division, Regional Contracting Department, NSC Charleston, was interviewed to gain the perspective of

contracting personnel at the other NSC involved in the RYG test. She explained that the RYG test procedures are being applied to procurements of Controlled Industrial Material (CIM) for the Charleston Naval Shipyard. All solicitations for CIM are done in writing, including small purchases, so it takes 30 days to receive proposals. As a result, no awards have yet been made using the RYG test procedures. [Ref. 40]

Mrs. Davidson believes that evaluation of proposals using the test procedures will involve extra work for contracting personnel. However, since no evaluations have yet been performed, she does not know how burdensome this extra requirement will be. She thinks the program will be beneficial because it will allow the NSC to resolve quality problems before contract award; therefore, she expects RYG to reduce contract administration activities. [Ref. 40]

Mrs. Davidson expressed concern that application of the RYG procedures would have a negative impact on the department's Productive Unit Resourcing System (PURS) statistics because it adds work before contract award which will not be given appropriate credit. Time savings are not realized until the contract administration phase of the procurement process. Therefore, although she anticipates benefits from the program, she wonders whether they will outweigh the program's negative impacts. [Ref. 40]

(3) Ships Parts Control Center (SPCC). The researcher interviewed Mr. Minahan, Director of the Hull,

Mechanical, and Electrical Contracting Department, SPCC. He explained that SPCC has applied the RYG test procedures to five FSCs. So far, his department has not been burdened with much extra work. [Ref. 41]

Mr. Minahan indicated that the procurements included in the RYG test at SPCC involve fairly high dollar values. As a result, he does not believe the application of TEAs will have much impact on their source selection decisions. He thinks the TEAs may have a greater effect at other activities making smaller dollar value procurements. [Ref. 41]

(4) Naval Air and Engineering Center (NAEC). Mr. Fackenthal, Supervisory Contract Specialist at NAEC Lakehurst, was interviewed. He explained that NAEC is applying the RYG small purchase method as outlined in the test procedures. However, they requested and received approval to follow the Fixed Price-Greatest Value procedures instead of the procedures using TEAs for their major procurements. NAEC made this request after reviewing a sample of the contractors they have done business with during the last two years. Their review indicated that only ten percent of the contractors in the sample were in the CES data base. NAEC attributes this to the nature of their procurements. They make very few repetitive buys. Many of their procurements have production lead times of up to one year. Therefore, the performance history generated is too old to classify a contractor as Red,

Yellow, or Green. NAEC believes that the more subjective Fixed Price-Greatest Value procedures will better suit their procurements. [Ref. 42]

Mr. Fackenthal indicated that it is difficult to assess the results of the program yet because they only began using the small purchase procedures in October 1989 and have not yet made a contract award using the major purchase procedures. However, he stated that all the comments he has received about the program, including those from contractors, have been positive. He indicated that the contracting personnel at NAEC are positive about the RYG program. They like the idea of being able to use past performance in source evaluation. He foresees that the program will encourage contractors with poor performance records to improve the quality of the material they deliver to the Government. [Ref. 42]

(5) Naval Avionics Center (NAC). The researcher interviewed Mr. Wilson, Manager of Acquisition and Improvement at NAC. He commented that the RYG test was progressing very well at NAC, and that they are considering expanding the number of FSCs procured under the program. They are trying to tailor the test procedures to their operation. [Ref. 43]

Mr. Wilson indicated that the RYG test has not resulted in a great deal of extra work for contracting personnel at NAC. He believes that the ease with which they implemented the program is due in part to the culture at NAC

which welcomes innovation. He would like to see the CES expanded to the Buyer Information System described in Chapter II. He hopes that the validity of the data base can be proven during the test so that in the future it can be used by contracting personnel to perform responsibility determinations. [Ref. 43]

Mr. Wilson explained that most of NAC's contractor quality problems have been eliminated by implementation of the Blue Ribbon Contractor program. Therefore, they have not been able to determine whether the RYG test program has caused contractors to improve the quality of the material they supply to NAC. He also indicated that field activities can make errors impacting on a contractor's color classification. In one instance at NAC, some test equipment was improperly programmed. The error resulted in the erroneous rejection of material supplied by a vendor on NAC's Blue Ribbon Contractor list. The rejects at NAC caused the contractor to be classified Red in the RYG data base. The contractor did not lose any contracts because of his incorrect color classification. However, it took NAC a couple of months to investigate and correct the problem after the contractor questioned his color classification. [Ref. 43]

b. Quality Assurance

(1) NADEP Pensacola. Mr. Hargett, Quality Developmental Project manager at NADEP Pensacola, was interviewed to gain perspective on the progress of the RYG

test implementation in Pensacola. Mr. Hargett explained that Pensacola had purposely limited the initial application of the RYG test procedures to allow personnel involved to become accustomed to them. Their slow start has resulted in little activity from the test to date. However, involvement in the test program has caused them to increase the amount of quality data submitted to NMQAO. As a result, they have added approximately 1000 vendors to the CES data base. He expects this increase to cause more activity under the test in the future. [Ref. 44]

Mr. Hargett indicated that the RYG test procedures increase the workload of the quality assurance personnel, but they do not mind devoting the required time. Because of the test, Mr. Hargett has become deeply involved with the contracting personnel at NSC Pensacola. He said this is the first time the two organizations have worked together. Mr. Hargett has been involved with the RYG program since its conception. Although he was positive about the test at the outset, he stated that he is even more positive about the program now. [Ref. 44]

(2) Charleston Naval Shipyard. The researcher interviewed Ms. Cassell, Supervisory Quality Assurance Engineer at the Charleston Naval Shipyard. She indicated that the test is beginning slowly there. She believes that most of the delay has been caused by unrealistically low cost estimates placed on purchase requests by the Shipyard's

material planners. She explained that often the planners estimate costs to be less than $2500. As a result, the purchase requests are not included in the RYG test. When material is procured, however, the actual costs are usually greater than $2500. Therefore, procurements that should qualify for the RYG test are not included because of inaccurate cost estimates. She indicated that the Quality Assurance Department at the Shipyard has been working with the Planning Department to correct this problem. [Ref. 45]

Ms. Cassell is positive about the RYG program. She believes it highlights the Shipyard's quality assurance problems to the contracting personnel at NSC Charleston. She also thinks, however, that the location of contracting and quality assurance in different commands causes the Contracting Department at the NSC to be out of touch with the quality problems experienced by the Shipyard. She believes this separation may hinder the implementation of the RYG test. [Ref. 45]

(3) SPCC. The researcher interviewed Mr. Jornov, Quality Assurance Specialist, Level 1/SS Section, SPCC. He indicated that SPCC has used the RYG procedures in approximately 30 solicitations, but has not yet received any material under the program. So far, they have not received any complaints from contractors. He explained that they have limited the implementation to cover only spare parts. They

later expect to expand the program to include valves, their major commodity. [Ref. 46]

Mr. Jornov said that the increased work load has not been burdensome for them, involving approximately one hour each day. However, the work load will increase if the program is expanded. He thinks the RYG program is worthwhile. He believes it needs some fine tuning, but that eventually it will encourage vendors to improve the quality of their material. He indicated that he has misgivings about the data base. He is concerned that some activities may not send data to NMQAO and that NMQAO may not enter all the data received. He fears that an incomplete data base may distort contractor color classifications. [Ref. 46]

(4) NAEC. Mr. Robert Armitage, Quality Assurance Specialist, Procurement Division, Quality Assurance Department, NAEC, was interviewed. He indicated that the extra work required by the RYG test has not been too burdensome for quality assurance personnel at NAEC. He is very positive about the program. He believes it is a useful, viable tool for NAEC. He would like to see the impact the program has on contractors with poor quality history strengthened. However, he is glad that the program allows NAEC to consider quality history to a greater degree than they had in the past. He said that any new tool that helps them do their job better is welcome. [Ref. 47]

(5) NAC. The researcher interviewed Ms. Powell, Electronics Engineer, Quality Assurance Department, NAC. She indicated that the bulk of the extra work created by the RYG test has been related to handling contractor complaints. Investigating complaints generally takes between one and two weeks. Ms. Powell believes the program is an excellent concept. It forces commands to correct their data. In addition, before the RYG test, contractors did not know (or care) whether their quality history was good. Now they do. Implementation forces Government activities to communicate with contractors. [Ref. 48]

Ms. Powell indicated that some of the contractor complaints have proven to be valid. Therefore, she believes the weakest part of the program is the data base. Specifically, she thinks problems may occur in placing liability (Government or contractor) for quality deficiencies. [Ref. 48]

c. Analysis of Interviews

None of the people interviewed exhibited a negative attitude concerning the RYG test program. In general, quality assurance personnel appeared to be more positive about the program than contracting personnel. Although the test requires extra work of both communities, quality assurance personnel seemed more convinced that the benefits derived from the program would outweigh the extra effort. Perhaps their perspective results from a feeling that

for the first time they have a tool to influence the quality of material before it is received. The amount of inspection and documentation quality assurance performs varies inversely with the quality of material received. Therefore, they probably perceive that improved quality will simplify receipt inspection and reduce documentation of quality deficiencies. This will make their job easier.

Two of the people involved in contracting, however, were as positive about the program as were quality assurance personnel. These two people work at the two Navy Industrial Fund activities involved in the test, NAC Indianapolis and NAEC Lakehurst. The two contracting people from the NSCs at Pensacola and Charleston were the two most concerned about the program. One of the reasons for the difference in opinion on this program was based on the PURS used at NSCs. As explained by Mrs. Davidson of NSC Charleston, this system rewards the NSC for the speed with which they award contracts and purchase orders. The RYG test procedures slow down the award process, promising improved quality at the end of the procurement process. Therefore, implementation of the RYG program may penalize activities subject to PURS guidelines. A second reason for the difference in attitudes may be the location of the contracting and quality assurance personnel at each test site. Contracting personnel at NSC Pensacola must work with quality assurance personnel at NADEP Pensacola; contracting personnel

at NSC Charleston must work with quality assurance personnel at the Charleston Naval Shipyard. The NSCs and industrial activities they support have different missions and different commanding officers. These distinctions probably make it more difficult for the two functional areas to understand the other's concerns and to make the RYG program succeed.

Aside from helping the activities receive better quality material, the interviewees foresee two peripheral consequences of the RYG program that are positive. First, they expect the program to encourage Red and Yellow contractors to improve the quality of material they supply to the Government. Second, they indicated that implementation of the test procedures has forced contracting and quality assurance personnel to work together The increased contact is expected to help the two groups better understand each other's problems. The end result should be that both groups are able to do their jobs more effectively.

The biggest area of concern voiced by the test activities is the validity of the data base. This worry was expressed by NSC Pensacola, both quality assurance and contracting at NAC Indianapolis, and quality assurance at SPCC. This concern corresponds to the assessment of personnel at the Naval Supply Systems Command and OGC at ASN(S&L) (described earlier in this chapter) that the greatest potential for protest of the program lies with the accuracy of the data base.

2. Test Results

The one-year test of the RYG program began 1 August 1989. Not all of the five activities began using the RYG test procedures on this date, however. Moreover, when they began the test, several of the activities limited the initial number of procurements included in the test. Limited implementation allows the activities to fine tune their internal procedures before attempting full-scale implementation. Although this approach is based on sound judgment, it has the peripheral effect of limiting the amount of available data documenting the results of the RYG test.

The researcher has collected the data that are currently available; they are summarized below. Although the data are scant, an attempt has been made to analyze them and assess their implications on the progress of the RYG test. The data pertaining to the number of Red (R), Yellow (Y), Green (G), and Insufficient Data (I) contractors will be presented first. Next, data concerning the status of procurements under the program will be reported.

Table 1 summarizes the numbers of letters sent to contractors advising them of their initial color classification and subsequent status changes and the responses received by NMQAO. The data in Table 1 indicate that the initial color classification resulted in 1033 Red and Yellow contractors. Subsequent monthly updates to the RYG data base

TABLE 1

RED YELLOW GREEN NOTIFICATION AND RESPONSE

Month	Notification Sent	Response Received
May	1033	179
July	653	23
August	348	35
September	273	10
Total	2307	247

Source: [Ref. 37:p. 9]

changed contractor color classifications. Each update has resulted in fewer contractors changing status.

Table 2 describes the categories into which the responses fell and the action taken by NMQAO in reaction to them. The data in Table 2 indicate that contractors disagreed with the data or their color classification in 49 cases (40 disputed the data and nine disagreed with their color classification). NMQAO determined that their disagreements were valid and changed the data in 13 cases. Three of the 13 data base corrections resulted in a change in color classification. Although 2307 contractors were notified, only 247 (or 10.7 percent) responded. Therefore, the errors discovered because of these responses cannot be used to estimate the accuracy of the data base.

TABLE 2

RESPONSES--CATEGORIES AND ACTION TAKEN

Category of Response	Quantity
Information	141
Unaware of Rejects	52
Disputed Data	40
Classification Disagreement	9

Action Taken	Quantity
No Action	83
Forwarded Data Profiles	108
Referred to Other Command	48
Conducted/Scheduled Meeting	5
Changed Data	13
Changed Classification	3

Source: [Ref. 37:p. 9]

The first group of procurements made under the RYG test are summarized in NMQAO's September 1989 status report. The data relating to these procurements are detailed in Table 3. The data in Table 3 indicate that in most cases the lowest-priced proposals were submitted by Green and Insufficient Data contractors. Of the 77 procurements made under the RYG test, Red and Yellow contractors submitted the lowest-priced proposals in only ten instances (seven displacements of Red and Yellow contractors plus three awards to

TABLE 3

RED/YELLOW/GREEN PROCUREMENTS

	Awards to RYGI Contractors				Contractor Displacements	
Activity	R	Y	G	I	R	Y
NAEC Lakehurst	0	0	0	0	0	0
NAC Indianapolis	0	3	27	17	0	5
SPCC Mechanicsburg	0	0	18	0	2	0
NSC Charleston	0	0	0	0	0	0
NSC Pensacola	0	0	0	12	0	0
Total	0	3	45	29	2	5

Source: [Ref. 37:pp. 1-6]

Yellow contractors). These ten cases represent 13 percent of the 77 procurements. The awards made to Yellow contractors indicate that the Government's consideration of the costs of quality does not preclude contractors with poor quality histories from receiving Government contracts. In other words, a contractor's color classification does not eliminate him from the competitive range.

It is too early to determine whether the RYG program will improve either the quality of material the Government receives or contractors' motivation to deliver high quality material. It is also impossible to judge the reaction contractors will have to displacements caused by the program. The data do show, however, that the program is having some

affect on contract awards; Red and Yellow contractors have lost contracts to higher priced contractors with better performance histories. The data also show that the test activities are not using the RYG data base to eliminate contractors from the competitive range. This should support the Government's position that application of the RYG formula in source evaluations does not constitute a responsibility determination.

D. SUMMARY

This chapter assessed the strengths and weaknesses of the RYG program. To accomplish this, it first discussed the ability of the RYG program to withstand protests based on four arguments--de facto debarment, TEAs as penalties, responsibility determination, and validity of the data base. Second, it discussed the progress of RYG test implementation at the five test activities. Interviews were conducted with personnel involved with the test at each of the activities and data related to the test were analyzed. Interviewees generally felt that the RYG program would yield positive results. However, several of them expressed concern about the validity of the data in the CES. The final chapter will present the conclusions and recommendations of the thesis.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

This chapter will discuss the conclusions and recommendations resulting from the thesis research. After presenting the conclusions and recommendations, the research questions will be answered. Finally, recommendations will be made concerning areas for further research.

B. CONCLUSIONS

1. The Red Yellow Green (RYG) Program is Appropriate for Use in Field Contracting Only

The RYG test procedures incorporate a formula driven assessment of contractor past performance in source evaluation. The formula used in the test was designed to assess contractor quality history for groups of relatively simple commodities. The test procedures were intended to be easy to apply and, therefore, involve very little subjective input from contracting and quality-assurance personnel. Major system contracting would require a much more subjective assessment of contractor-quality history than allowed by the RYG program.

2. The Air Force Contractor Performance Assessment Reporting System (CPARS) is Appropriate for Major Systems Procurement Only

CPARS should not be expanded for use in field contracting. Maintenance of the data for CPARS is very labor

intensive. The personnel resources required to maintain an expanded CPARS would prohibit including enough contractors in the system to make it useful for field contracting. In addition, use of CPARS in source evaluation requires time and personnel not available in field contracting offices.

3. Blue Ribbon Contractor Programs are Appropriate for Use at Field Activities in Which Contracting and Quality Assurance Personnel are Able to Work Together

Unlike RYG, the assessment of contractor performance history under a Blue Ribbon program is not formula-driven. The decision to award to a Blue Ribbon contractor over a lower-priced offeror (not included in the program) requires an assessment by both contracting and quality-assurance personnel. Therefore, the two groups must communicate with each other to use the program effectively.

4. RYG and Blue Ribbon Contractor Programs Can Be Implemented Together and Can Enhance Each Other

A Blue Ribbon program would be used when procuring critical goods and services because it allows an activity to concentrate its attention on those parameters that it considers important. RYG would be used for all other procurements which do not justify devotion of the resources needed to apply a Blue Ribbon program.

5. The RYG Program (Especially if Implemented in Conjunction with a Blue Ribbon Contractor Program) is a Realistic Method for Initiating Total Quality Management (TQM) in Field Contracting

The time and personnel required to perform vendor TQM-assessments make complete TQM implementation in field

contracting impractical. However, the RYG and Blue Ribbon Contractor programs allow field contracting activities to consider contractor past performance in the source selection decision. Therefore, they allow activities to comply, at least partially, with one of Deming's 14 principles: "End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust." [Ref. 20:p. 23]

6. Application of the RYG Test Procedures Does Not Constitute De Facto Debarment

Use of the test procedures neither stops the Government from soliciting offers from nor awarding contracts to Red and Yellow contractors. If, after considering the costs related to additional quality assurance requirements, a Red or Yellow contractor is the lowest priced responsible offeror, the Red or Yellow contractor will be awarded the contract.

7. The Assessment of Technical Evaluation Adjustments (TEAs) Under the RYG Test is Reasonable and Does Not Represent a Penalty to Red and Yellow Contractors

There is precedent for considering costs similar to TEAs in source evaluation (i.e., consideration of first-article test and transportation costs). Therefore, it is reasonable for the Government to consider the costs of additional quality assurance requirements in source selection. TEAs are calculated using historical data for labor hours

required for quality assurance actions, labor rates, and costs of testing. Since their calculation is based on actual costs the Government would expect to incur when forced to carry out additional quality assurance actions, TEAs should not be considered penalties.

8. If the RYG Test Procedures are Implemented as Intended, the Government Should Be Able to Support the Argument that the Use of Past Performance Under the Test Does Not Constitute a Responsibility Determination

Precedent from cases in which contractors protested the use of responsibility-related factors in source evaluation indicate that responsibility factors may be used in source evaluation. However, activities must be careful to use such factors to perform a comparative evaluation of offerors, not to determine the technical acceptability of proposals. The RYG test procedures use past performance to better determine the true cost to the Government of doing business with each offeror, not to determine the technical acceptability of proposals.

9. The Validity of the Contractor Evaluation System (CES) Data Base Presents the Greatest Potential for Protest of the RYG Test Procedures

Personnel at the Naval Supply Systems Command and at several of the activities implementing the RYG test expressed concern regarding the accuracy of the data in the CES. Specifically, they fear that if an activity were to submit inaccurate data, a contractor could be mistakenly classified Red or Yellow. If a contractor were to lose a contract

because of an incorrect classification, he would have a strong argument to support filing a protest.

10. It is Possible that Red and Yellow Contractors Will Be Estopped from Protesting the Validity of the CES

Each Red and Yellow contractor is notified of his color classification and the performance history behind the designation. He is given an opportunity to challenge the data supporting his status under the RYG program. If a contractor is aware that the data justifying his classification are incorrect, and he does not respond to correct them within a reasonable period, he may give up the right to challenge these errors later during a protest.

C. RECOMMENDATIONS

1. Evaluation of RYG at the End of the Test Period

The benefits of the RYG program and its ability to withstand a protest should be evaluated at the end of the program test, currently scheduled for 1 August 1990. There are not enough data currently available to evaluate whether the benefits of the RYG program outweigh the costs of implementation. The positive comments expressed by personnel at the five activities involved in the test suggest that the program will be beneficial. However, an assessment concerning whether the program improves contractor performance must eventually be made. Such an evaluation should include reviewing quality records at the five test activities to determine whether the quality of incoming material has

improved. In addition, a sample of contractors should be evaluated to determine whether the RYG program has encouraged them to improve their performance.

2. Continuation of the RYG Program After Completion of the Test

If there are not enough data to adequately assess the value of the RYG program at the end of the test period, use of the test procedures should be continued until the program can be properly evaluated. Contractor evaluation, as described in the previous paragraph, will require the passage of enough time for contractors to become aware of the effects of the RYG program, change their performance, and deliver enough material to the Government to document that change in performance. The criteria used to designate contractors as Red, Yellow, and Green span periods up to two years. Therefore, it is probable that an accurate evaluation of the affect the RYG program has on contractors will require more than the one year of data that will be accumulated under the test. Since the program has the potential to yield such positive results, its use should be continued until the program can be evaluated properly.

3. Implementation of Blue Ribbon Contractor Programs with RYG

If the RYG program is determined to be beneficial, activities should be encouraged to implement a tailored Blue Ribbon Contractor program in conjunction with RYG. As discussed in the Conclusions section of this chapter, RYG and

Blue Ribbon Contractor programs can enhance each other. In addition, they both move field contracting offices toward implementation of TQM. Therefore, implementing them together should prove beneficial to the Department of Defense (DOD).

D. ANSWERS TO THE RESEARCH QUESTIONS

1. How is the Navy's Red Yellow Green Program Structured and How is it Intended to Improve the Quality of Material Procured by the Navy?

The RYG program uses contractor performance history in source evaluation. The program uses this history in one of two ways. The first approach uses a contractor's quality history to determine whether the Government will require additional quality assurance actions when doing business with the contractor. If the contractor's performance history is good, additional quality assurance actions will not be required; if his history is poor, additional actions will be required. If additional quality assurance is required, the costs of performance to the Government are added to the contractor's proposal using TEAs. The source selection decision is made using the proposed prices of Green contractors and the adjusted prices of Red and Yellow contractors.

The second approach involves a more subjective use of contractor performance history. A source selection plan is prepared by quality assurance personnel, specifying the criteria to be used in evaluating Red, Yellow, and Green

contractors. When proposals are received, quality assurance personnel assign ratings to each offeror based on the criteria outlined in the source selection plan. Contracting personnel award the contract based on the scores received by contractors, considering their quality and price ratings.

The RYG program is intended to improve the quality of material procured by the Navy in two ways. First, consideration of contractor quality history in source evaluation should result in a higher percentage of contract awards to contractors with good performance history. This is expected to improve the quality of material received. Second, the program should encourage contractors with poor quality histories to improve their performance in order to receive more Government contracts in the future.

2. How are Red, Yellow, and Green Contractors Defined?

A Red contractor is considered a high quality risk. His performance history is poor. It warrants requirement of special quality assurance actions and higher-level review before contract award. A Yellow contractor is considered a moderate quality risk. His performance history is poor enough to warrant requirement of special quality assurance actions. A Green contractor is considered a low quality risk. His performance history is good and, therefore, warrants no special quality assurance actions.

3. What are the Other Current Contractor Quality Initiatives within DOD?

The other current quality initiatives within DOD are the Air Force CPARS, the Naval Avionics Center (NAC) Indianapolis Blue Ribbon Contractor program, and the DOD TQM initiative.

4. How Does RYG Compare and Contrast to These Other Programs?

RYG and CPARS were designed to be used in different areas of procurement. RYG is intended to be employed by field contracting activities. CPARS is intended for major systems' procurement. RYG and NAC's Blue Ribbon Contractor program are both intended for use in field contracting. The Blue Ribbon program requires an activity to devote more resources to and employ more judgment in contractor performance evaluation than does RYG. It would be impractical for some activities to implement a Blue Ribbon Contractor program. However, implementation of such a program can enhance the results expected of the RYG program. The RYG program is consistent with the goals of the DOD TQM initiative. It helps field contracting offices to begin implementation of TQM.

5. What are the Strengths and Weaknesses Associated with RYG?

The RYG program has many strengths. It allows use of contractor performance history in the source selection decision and so should improve the quality of material received by the Government. It requires few resources to

implement and, therefore, can be used by field contracting offices. It forces contracting and quality-assurance personnel to work together. It forces Government activities to communicate with industry. The program does have some weaknesses, however. The data base used in the program is very large, and its accuracy cannot be currently assessed. If the data base proves inaccurate, the program is built on a weak foundation. The program's evaluation of contractor performance history is formula-driven. Therefore, it is only appropriate for procurement of relatively simple commodities.

6. How is the RYG Program Being Tested in the Market?

The RYG program is being tested at five Navy field activities. Interviews with personnel at the test activities indicate that the test began slowly but is progressing well. Both contracting and quality assurance personnel expressed positive opinions about the program. There are currently too few data, however, to assess the success of the test.

E. AREAS FOR FURTHER RESEARCH

One area for further research is to evaluate the benefits of the RYG program after the one-year test period. More data will be available at this point and, therefore, a researcher will be better able to assess the merits of the program. Another area for further research is to determine how NAC's Blue Ribbon Contractor program could be exported to other activities. The Blue Ribbon program has proven very

beneficial for NAC and could be expected to benefit other field contracting activities.

APPENDIX A

RED YELLOW GREEN CLASSIFICATION CRITERIA

COLOR	CODE	CLASSIFICATION CRITERIA
RED	A	ON CURRENT NAVY VDAR
	B	METHOD C, D, AND/OR E CURRENTLY IN EFFECT
	C	QUALITY INFO ON LATEST PRE-AWARD SURVEY (PAS) WITHIN LAST YEAR--NO AWARD
	D	LATEST PRODUCT-ORIENTED SURVEY (POS) IN LAST TWO YEARS UNACCEPTABLE
	E	LATEST QUALITY SYSTEM REVIEW (QSR) IN LAST TWO YEARS UNACCEPTABLE
	F	LATEST SPECIAL SURVEY IN LAST TWO YEARS UNACCEPTABLE
	G	REJECT RATE 15% OR MORE IN LAST TWO YEARS FOR FIVE OR MORE LOTS
	H	TWO OR MORE UNSAT FIRST ARTICLE TESTS (FAT) IN LAST YEAR
	J	TWO OR MORE CATEGORY "I" QDRS IN LAST YEAR
	K	SIX OR MORE CATEGORY "II" ACTION QDRS IN LAST YEAR
	L	SIX OR MORE CONTRACTOR LIABLE RODS IN LAST YEAR*
	M	SIX OR MORE CONTRACTOR LIABLE WAIVERS/ DEVIATIONS IN LAST YEAR*
	N	ON DLA CONTRACTOR ALERT LIST FOR MAJOR DEFICIENCIES*

*Classification criteria L, M, N for "Red" and "Yellow" have not yet been incorporated.

COLOR	CODE	CLASSIFICATION CRITERIA
YELLOW	A	ISSUED VDAR LETTER OF CONCERN
	B	PREVIOUSLY CLASSIFIED "RED"
	C	LATEST PAS IN LAST TWO YEARS--AWARD WITH FINDINGS
	D	LATEST POS IN LAST TWO YEARS ACCEPTABLE WITH CORRECTIONS
	E	LATEST QSR IN LAST TWO YEARS ACCEPTABLE WITH CORRECTIONS
	F	LATEST SPECIAL SURVEY IN LAST TWO YEARS ACCEPTABLE WITH CORRECTIONS
	G	REJECT RATE 6-14% FOR FIVE OR MORE LOTS/ANY REJECT RATE FOR LESS THAN FIVE LOTS IN LAST TWO YEARS
	H	ONE UNSAT FAT IN LAST YEAR
	J	ONE CATEGORY "I" QDR IN LAST YEAR
	K	THREE-FIVE CATEGORY "II" ACTION QDRS IN LAST YEAR
	L	THREE-FIVE CONTRACTOR LIABLE RODS IN LAST YEAR*
	M	THREE-FIVE CONTRACTOR LIABLE WAIVERS/ DEVIATIONS IN LAST YEAR*
	N	ON DLA CONTRACTOR ALERT LIST FOR MINOR DEFICIENCIES*

*Classification criteria L, M, N for "Red" and "Yellow" have not yet been incorporated.

COLOR	CODE	CLASSIFICATION CRITERIA
GREEN	C	LATEST PAS IN LAST TWO YEARS--AWARD WITH NO FINDINGS
	D	LATEST POS IN LAST TWO YEARS ACCEPTABLE
	E	LATEST QDR IN LAST TWO YEARS ACCEPTABLE
	F	LATEST SPECIAL SURVEY IN LAST TWO YEARS ACCEPTABLE
	G	REJECT RATE LESS THAN 6% IN LAST TWO YEARS FOR FIVE OR MORE LOTS
	H	ALL FAT IN LAST YEAR SATISFACTORY
	K	ONE-TWO CATEGORY "II" ACTION QDRS IN LAST YEAR
	L	ONE-TWO CONTRACTOR LIABLE RODS IN LAST YEAR*
	M	ONE-TWO CONTRACTOR LIABLE WAIVERS/ DEVIATIONS IN LAST YEAR*

*Classification criteria L and M for "Green" have not yet been incorporated.

APPENDIX B

CLAUSES FOR SIMPLIFIED SMALL PURCHASE PROCEDURES

NOTICE TO PROSPECTIVE OFFERORS (NOV 1988)

(a) This procurement is subject to a test of the Navy's Contractor Evaluation System (CES), "Red/Yellow/Green" (R/Y/G) program. The test is authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics) for the acquisition of specific commodities within designated Federal Supply Classes (FSCs) by participating test activities.

(b) The Government reserves the right to award to the contractor whose offer represents the best overall purchase value to the Government. As such, the basis for contract award will include an evaluation of proposed contractors' past quality performance history on the particular commodity or commodities, identified below, as recorded in the CES. The price to be considered in determining best value will be the evaluated price after Technical Evaluation Adjustments (TEAs) for related quality assurance actions, as applicable, are applied to the offered price.

(c) The procedures described in the clause of this solicitation entitled "ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988)" will be used by the contracting officer to assist in determining the best purchase value for the Government--price, past quality performance, and other factors considered.

(d) The commodities included in this test, as currently solicited, are:

FSC No.	FSC Nomenclature	CLIN

ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988) (SIMPLIFIED SMALL PURCHASE PROCEDURES)

(a) This procurement is part of a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (R/Y/G) Program, authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics), for the acquisition of specific commodities by participating activities. At the end of the test, data concerning awards made during the period will be evaluated to assess the program's effectiveness and impact on the acquisition process.

(b) The purpose of R/Y/G is to assist contracting personnel during source selection to determine the best value for the Government--price, past quality performance, and other factors considered. The test program uses accumulated contractor quality performance data to classify contractor's performance on select commodities as either "Red" (high risk), "Yellow" (moderate risk), "Green" (low risk), or "Insufficient Data," based on the degree of risk to the Government of receiving poor quality products. Such classifications are then used to apply a Technical Evaluation Adjustment (TEA) during source selection.

(c) A TEA is a monetary assessment added to the price of selected commodities that have been classified as either "Red" or "Yellow" for specific contractors, and is based on the cost to the Government for effecting additional quality considerations that would otherwise not be required if award were made to a contractor with a satisfactory performance history. For purposes of requirements using the simplified small purchasing procedures, standardized TEAs have been established for the "Red" and the "Yellow" classifications. During evaluation of quotations, the applicable TEA is added to the quoted price of the "Red" and/or "Yellow" commodity, and after consideration of any other pertinent price-related factors (e.g., transportation charges, First Article Testing, discount terms, etc.), becomes the basis for determining award of the purchase order. A commodity's classification may change over time as new or revised quality performance data become available.

(d) Classifications for the test program are summarized as follows:

"Green"--Low risk. No extraordinary quality requirements or additional actions required; satisfactory quality history.

"Yellow"--Moderate risk. History of quality problems; special quality requirements/actions needed; Technical Evaluation Adjustment (TEA) applied to offered price.

"Red"--High risk. Special alert to history of poor quality performance; TEA applied to offered price(s), and contract award requires higher level approval.

"Insufficient Data"--Generally, may be commodities of first-time offerors or offerors for whom current, up-to-date quality performance history is unavailable; additional quality actions may be needed and invoked; however, a TEA is not assessed.

(e) Prospective offerors may address questions with regard to their assessment classification on particular commodities to: Naval Sea System Command Detachment, Naval Material Quality Assessment Office (NMQAO), Federal Building, Room 423, 80 Daniel Street, Portsmouth, NH 03801-3884, (Telephone) 608-431-9460.

APPENDIX C

CLAUSES FOR MAJOR PURCHASE PROCEDURES

NOTICE TO PROSPECTIVE OFFERORS (NOV 1988)

(a) This procurement is subject to a test of the Navy's Contractor Evaluation System (CES), "Red/Yellow/Green" (R/Y/G) program. The test is authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics) for the acquisition of specific commodities within designated Federal Supply Classes (FSCs) by participating test activities.

(b) The Government reserves the right to award to the contractor whose offer represents the best overall purchase value to the Government. As such, the basis for contract award will include an evaluation of proposed contractors' past quality performance history on the particular commodity or commodities, identified below, as recorded in the CES. The price to be considered in determining best value will be the evaluated price after Technical Evaluation Adjustments (TEAs) for related quality-assurance actions, as applicable, are applied to the offered price.

(c) The procedures described in the clause of this solicitation entitled "ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988)" will be used by the contracting officer to assist in determining the best purchase value for the Government--price, past quality performance, and other factors considered.

(d) The commodities included in this test, as currently solicited, are:

FSC No.	FSC Nomenclature	CLIN

ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988) (MAJOR PURCHASE PROCEDURES)

(a) This procurement is part of a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (R/Y/G) Program, authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics), for the acquisition of specific commodities by participating activities. At the end of the test, data concerning awards made during the period will be evaluated to assess the program's effectiveness and impact on the acquisition process.

(b) The purpose of R/Y/G is to assist contracting personnel during source selection to determine the best value for the Government--price, past quality performance, and other factors considered. The test program uses accumulated contractor quality performance data to classify contractor's performance on select commodities as either "Red" (high risk), "Yellow" (moderate risk), "Green" (low risk), or "Insufficient Data," based on the degree of risk to the Government of receiving poor quality products. Such classifications are then used to apply a Technical Evaluation Adjustment (TEA) during source selection.

(c) A TEA is a monetary assessment added to the price of selected commodities that have been classified as either "Red" or "Yellow" for specific contractors, and is based on the cost to the Government for effecting additional quality considerations that would otherwise not be required if award were made to a contractor with a satisfactory performance history. During evaluation of quotations, the necessity for any additional quality assurance requirements will be determined, and the applicable TEA will be assessed onto the quoted price of the "Red" and/or "Yellow" commodity. After consideration of any other pertinent price-related factors (e.g., transportation charges, First Article Testing, discount terms, etc.), this adjusted price becomes the basis for determining award of the purchase order. A commodity's classification may change over time as new or revised quality performance data become available.

(d) Classifications for the test program are summarized as follows:

"Green"--Low risk. No extraordinary quality requirements or additional actions required; satisfactory quality history.

"Yellow"--Moderate risk. History of quality problems; special quality requirements/actions needed; Technical Evaluation Adjustment (TEA) applied to offered price.

"Red"--High risk. Special alert to history of poor quality performance; TEA applied to offered price(s), and contract award requires higher level approval.

"Insufficient Data"--Generally, may be commodities of first-time offerors or offerors for whom current, up-to-date quality performance history is unavailable; additional quality actions may be needed and invoked; however, a TEA is not assessed.

(e) Prospective offerors may address questions with regard to their assessment classification on particular commodities to: Naval Sea System Command Detachment, Navy Material Quality Assessment Office (NMQAO), Federal Building, Room 423, 80 Daniel Street, Portsmouth, NH 03801-3884, (Telephone) 608-431-9460.

APPENDIX D

GUIDELINE FOR TEA ASSIGNMENT

RED CLASSIFICATION

CODE	CLASSIFICATION CRITERIA	ADDITIONAL QA REQ'TS
A	On Current Navy VDAR (Time Frame--Six Months)	1A or 1B 2A or 2B 3 4 5 or 6 7
B	DLA Corrective Action Methods C, D, or E Currently in Effect (Time Frame--Within Two Months)	1A or 1B 2A or 2B 4 5 or 6 7
C	Latest Pre-Award Survey (Negative Quality) (Time Frame--Two Years)	1A or 1B 4 5 or 6 7
D	Latest Product Oriented Survey Rated Unsat--Could Impact Product Quality (Time Frame-Two Years)	1A or 1B 4 5 or 6 7
E	Latest Quality System Review Rated Unsat--Could Impact Product Quality (Time Frame--Two Years)	1A or 1B 2A or 2B 4 5 or 6 7
F	Latest Quality Audit/Special Survey Rated Unsat--Could Impact Product Quality (Time Frame--Two Years)	1A or 1B 4 5 or 6 7

CODE	CLASSIFICATION CRITERIA	ADDITIONAL QA REQ'TS
G	Material Inspection Records	1A or 1B
	Reject Rate 15% or Greater	3
	Indicated	4
	(Minimum Five Lots in Two Years)	5 or 6
		5 or 6
		7
H	First Article Test	1A or 1B
	Two or More Unsat	2A or 2B
	(Time Frame--One Year)	4
		5 or 6
		7
J	Quality Deficiency Reports--Cat I	1A or 1B
	Two or More Unsat	2A or 2B
	(Time Frame--One Year)	3
		4
		5 or 6
		7
K	Quality Deficiency Reports--	1A or 1B
	Cat II	3
	Six or More "Action" Cat II	4
	(Time Frame--One Year)	5 or 6
		7
L	Report of Discrepancy	2A or 2B
	Six or More Contractor Liable	4
	RODs	5 or 6
	(Time Frame--One Year)	7
M	Waivers/Deviations	2A or 2B
	Six or More Contractor Liable	4
	Requests	5 or 6
	(Time Frame--One Year)	7
N	DLA Contractor Alert List	1A or 1B
	Listed for Major Deficiencies	2A or 2B
	Which Could Impact Product	3
	Quality	4
	(Time Frame--Six Months)	5 or 6
		7

YELLOW CLASSIFICATION

CODE	CLASSIFICATION CRITERIA	ADDITIONAL QA REQ'TS
A	VDAR Discussion Contractor or Letter of Concern Issued (Time Frame--Six Months)	1A or 1B 3 4 5 or 6 7
B	Previously Classified "Red" (Time Frame--Six Months)	1A or 1B 3 4 5 or 6 7
C	Latest Pre-Award Survey Positive for Quality but Negative in One or More Other Categories (Time Frame--Two Years)	1A or 1B 4 5 or 6
D	Latest Product Oriented Survey Unsat for Minor Problems--No Impact on Product Quality (Time Frame--Two Years)	4 5 or 6
E	Latest Quality System Review Unsat For Minor Problems on Product Quality (Time Frame--Two Years)	4 5 or 6
F	Latest Quality Audit/Special Survey Unsat for Minor Problems--No Impact on Product Quality (Time Frame--Two Years)	4 5 or 6
G	Material Inspection Reports Reject Rate Greater Than 5% but less than 15% Indicated (Based on Minimum of Five Lots in Two Years)	4 5 or 6 7
H	First Article Test One Unsat (Time Frame--One Year)	2A 4 5 or 6 7

CODE	CLASSIFICATION CRITERIA	ADDITIONAL QA REQ'TS
J	Quality Deficiency Reports--Cat I	4
	One Cat I	5 or 6
	(Time Frame--One Year)	7
K	Quality Deficiency Reports--Cat II	4
	More Than Two but Less Than Six	5 or 6
	Cat II	7
	(Time Frame--One Year)	
L	Report of Discrepancy	2A
	More than Two but Less Than Six	4
	Contractor Liable RODs	7
	(Time Frame--One Year)	
M	Waivers/Deviations	2A
	More Than Two but Less Than Six	4
	Contractor Liable Requests	7
	(Time Frame--One Year)	
N	DLA Contractor Alert List	2A
	Listed for Minor Deficiencies--	4
	No Impact on Product Quality	5 or 6
	(Time Frame--One Year)	

ADDITIONAL QUALITY ASSURANCE REQUIREMENTS

Code and Description		TEA
1.	Pre-Award Survey	
	A. DCAS--Quality Survey	$ 500
	B. With procurement representative participation	
	(1) Local[1]	775
	(2) Intermediate[2]	1,380
	(3) Distant[3]	2,095
2.	Post-Award Orientation Conference	
	A. DCAS--Quality	550
	B. With procurement representative participation	
	(1) Local[4]	1,075
	(2) Intermediate[5]	2,110
	(3) Distant[6]	3,590
3.	Product Oriented Survey--Procurement Representative with DCAS participation	
	(1) Local[7]	800
	(2) Intermediate[8]	1,500
	(3) Distant[9]	2,215
4.	Government Source Inspection[10]	500
5.	Receipt Inspection at Source--Navy representative with DCAS participation	
	(1) Local[11]	650
	(2) Intermediate[12]	1,360
	(3) Distant[13]	2,182
6.	Receipt Inspection at Destination--Navy representative	
	(1) Low[14]	597
	(2) Medium[15]	1,194
	(3) High[16]	2,332
7.	Quality Assurance Letter of Instruction[17]	755
8.	Purchase Referrals[18]	640

TEA CALCULATIONS

[1]Calculated $30/hr x 8 hrs = $240 + $35 mileage = $275 + 500.

[2]Calculated $30/hr x 8 hrs = $240 + $240 (8 hrs travel @ $30/hr) + $200 (2 days per diem @ $100/day) + $200 travel costs = $880 + $500.

[3]Calculated $30/hr x 8 hrs = $240 + $480 (16 hrs travel @ $30/hr) + $300 (3 days per diem @ $100/day) = $575 travel costs = $1,595 + $500.

[4]Calculated $30/hr x 16 hrs = $480 + $45 mileage = $525 + $550.

[5]Calculated $30/hr x 16 hrs = $480 + $480 (16 hrs travel @ $30/hr) + $400 (4 days per diem @ $100/day) + $300 travel costs = $1,660 + $550.

[6]Calculated $30/hr x 16 hrs = $480 + $960 (32 hrs travel @ $30/hr) + $600 (6 days per diem @ $100/day) + $1,000 travel costs = $3,040 + $550.

[7]Calculated $30/hr x 12 hrs = $360 + $40 mileage = $400 + $400 (DCAS costs).

[8]Calculated $30/hr x 12 hrs = $360 + $240 (8 hrs travel @ $30/hr) + $300 (3 days per diem @ $100/day) + $200 travel costs = $1,100 + $400 (DCAS costs).

[9]Calculated $30/hr x 12 hrs = $360 + $480 (16 hrs travel @ $30/hr) + $400 (4 days per diem @ $100/day) + $575 travel costs = $1,815 + $400 (DCAS costs).

[10]Calculated $34.18/hr x 14 hrs.

[11]Calculated $43/hr x 8 hrs = $344 + $31 mileage = $375 + $275 (DCAS costs).

[12]Calculated $43/hr x 8 hrs = $344 + $344 (8 hrs travel @ $43/hr) + $200 (2 days per diem @ $100/day) + $200 travel costs = $1,088 + $275 (DCAS costs).

[13]Calculated $43/hr x 8 hrs = $344 + $688 (16 hrs travel @ $43/hr) + $300 (3 days per diem @ $100/day) + $575 travel costs = $1,907 + @275 (DCAS costs).

[14]Calculated $43/hr x 4 hrs = $172 + $100 material handling + $325 test.

[15]Calculated $43/hr x 8 hrs = $344 + $200 material handling + $650 test.

[16]Calculated $43/hr x 24 hrs = $1,032 + $500 material handling + $800 test.

[17]Calculated DCAS @ $34.18/hr x 8 hrs = $275 + $480 (procurement representative @ $30/hr x 16 hrs).

[18]Calculated procurement representative @ $40/hr x 16 hrs.

APPENDIX E

CLAUSES FOR FIXED PRICE--GREATEST VALUE PROCEDURES

NOTICE TO PROSPECTIVE OFFERORS (NOV 1988)

(a) This procurement is subject to a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (R/Y/G) program. The test is authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics) for the acquisition of specific commodities within designated Federal Supply Classes (FSCs) by participating test activities.

(b) The Government reserves the right to award to the contractor whose offer represents the best overall purchase value to the Government. As such, the basis for contract award will include an evaluation of proposed contractors' past quality performance history on the particular commodity or commodities, identified below, as recorded in the CES.

(c) The procedures described in the clause of this solicitation entitled "ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988)" will be used by the contracting officer to assist in determining the best purchase value for the Government--price, past quality performance, and other factors considered.

(d) The commodities included in this test, as currently solicited, are:

FSC No.	FSC Nomenclature	CLIN

ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988) (FIXED PRICE-GREATEST VALUE PROCEDURES)

(a) This procurement is part of a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (R/Y/G) Program, authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics), for the acquisition of specific commodities by participating activities. At the end of the test, data concerning awards made during the period will be evaluated to assess the program's effectiveness and impact on the acquisition process.

(b) The purpose of R/Y/G is to assist contracting personnel during source selection to determine the best value for the Government--price, past quality performance, and other factors considered. The test program uses accumulated contractor quality performance data to classify contractor's performance on select commodities as either "Red" (high risk), "Yellow" (moderate risk), "Green" (low risk), or "Insufficient Data," based on the degree of risk to the Government of receiving poor quality products. A commodity's classification may change over time as new or revised quality performance data become available.

(c) For purposes of source evaluation and selection, both the color classification of an offeror's commodity and the proposed price(s) shall be evaluated in accordance with weighted evaluation criteria established by the Government prior to the receipt of proposals. Price-related factors, such as transportation charges, discount terms, the cost of First Article Test, etc., will also be considered; however, no score or rating shall be applied.

(d) Offerors are advised that, although price is of significance in determining the successful offeror, past quality performance on the proposed commodity (as classified with the R-Y-G database) is essentially more important, and shall be evaluated accordingly. Each of the R-Y-G classifications and its relative order of importance is summarized as follows:

"Green"--Low risk. No extraordinary quality requirements or additional actions required; satisfactory quality history. Commodities within this classification are apportioned a greater weight or value in the evaluation than those classified as either "Yellow" or "Red."

"Yellow"--Moderate risk. History of quality problems; special quality requirements/actions may be needed. Due to the additional quality assurance considerations that may be necessary, commodities within this classification are weighted

less than those classified as "Green", but are of greater value than those within the "Red" category.

"Red"--High risk. Special alert to history of poor quality performance; contract award requires higher level approval. These commodities are apportioned the least available weight or value for past quality performance relative to commodities within the "Green" or "Yellow" classifications.

"Insufficient Data"--Generally, may be commodities of first-time offerors or offerors for whom current, up-to-date quality performance history is unavailable; additional quality actions may be needed and invoked; however, commodities within this classification shall be evaluated solely on the basis of price and related factors. Past quality performance will not be a consideration in the evaluation of commodities for which current quality performance data is not set forth within the database.

(e) Prospective offerors may address questions with regard to their assessment classification on particular commodities to: Naval Sea System Command Detachment, Navy Material Quality Assessment Office (NMQAO), Federal Building, Room 423, 80 Daniel Street, Portsmouth, NH 03801-3884, (Telephone) 608-431-9460.

APPENDIX F

SAMPLE EVALUATION UNDER FIXED PRICE--GREATEST VALUE PROCEDURES

Source Selection/Evaluation Method

Total Points (Maximum) = 100 points (%)

Total Technical =60 points (%)
Price =40 points (%)

Classification	Adjective	Numerical Rating
Green	Excellent	55-60 points
"	Good	40-54 points
Yellow	Good	35-39 points
"	Average	25-34 points
"	Marginal	16-24 points
Red	Marginal	10-15 points
"	Unacceptable	0-14 points

Evaluation Measurements

Yellow Classification	Adjective	Numerical Rating
Reject Rate = 6%-8% (Code G)	Good	35-39 points
Reject Rate = 9%-11% (Code G)	Average	25-34 points
Reject Rate = 12%-14% (Code G)	Marginal	16-24 points
3 Category "II" action QDRs (Code K)	Good	35-39 points
4 Category "II" action QDRs (Code K)	Average	25-34 points
5 Category "II" action QDRs (Code K)	Marginal	16-24 points

LIST OF REFERENCES

1. Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics) Memorandum to Director, Defense Acquisition Regulatory Council, Subject: Navy Service Test of Red/Yellow/Green Concept under Contractor Evaluation System (CES), 16 March 1989.

2. Telephone conversaton between G. Elliott, Deputy Director, Naval Material Quality Assessment Office, Portsmouth, New Hampshire, and the author, 3 August 1989.

3. Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics), Navy Product Deficiency Reporting and Evaluation Program, Volume 1, Contractor Evaluation Data Entry Guide, p. 1-1, Office of the Secretary of the Navy, Washington, D.C., 1988.

4. Secretary of the Navy Instruction 4855.7, Subject: Department of the Navy Contractor Evaluation System, p. 1, 28 March 1988.

5. Secretary of the Navy Instruction 4855.3, Subject: Product Deficiency Reporting and Evaluation Program (PDREP), p. 1, 31 March 1987.

6. Secretary of the Navy Instruction 4855.6, Subject: Navy Quality Deficiency Reporting Program, encl. (1), p. 1-1, 3 February 1988.

7. Telephone conversation between R. Morris, Program Analysis Officer, Naval Material Quality Assessment Office, Portsmouth, New Hampshire, and the author, 6 October 1989.

8. Naval Supply Systems Command, Requirements Statement for Contractor Evaluation System for Naval Supply Systems Command, p. E-2, 27 May 1988.

9. Contract Administration, V. 2, pp. 23-24, The Air Force Institute of Technology, School of Systems and Logistics, Wright-Patterson Air Force Base, Ohio, undated.

10. Telephone conversation between S. DeWitt, Supervisory Quality Assurance Specialist, Naval Material Quality Assessment Office, Portsmouth, New Hampshire, and the author, 6 October 1989.

11. Contract Administration, V. 1, p. 62, The Air Force Institute of Technology, School of Systems and Logistics, Wright-Patterson Air Force Base, Ohio, undated.

12. Interview between R. Morris, Program Analysis Officer, Naval Material Quality Assessment Office, Portsmouth, New Hampshire, and the author, 28 September 1989.

13. Air Force Systems Command Regulation 800-54, Subject: Contractor Performance Assessment, p. 1, 11 August 1988.

14. Telephone conversation between S. Nippert, Major, USAF, Procurement Staff Officer, Headquarters Air Force Systems Command, Andrews Air Force Base, Washington, D.C., and the author, 5 October 1989.

15. Air Force Systems Command Form 125, Subject: Contractor Performance Assessment Report (CPAR), May 1988.

16. Demers, W.A., "Grading Contractor Performance," Military Forum, p. 41, May 1988.

17. Zimmerman, S., "Low Bids No Longer Enough at Naval Avionics Center," Navy News and Undersea Technology, p. 8, 25 January 1988.

18. Telephone conversation between J. Wilson, Manager of Acquisition and Improvement, Naval Avionics Center, Indianapolis, Indiana, and the author, 31 July 1989.

19. Naval Avionics Center Indianapolis Acquisition Information Memorandum (AIM 51), Subject: Naval Avionics Center (NAC) Blue Ribbon Contractor Program, p. 1, 22 December 1987.

20. Deming, W.E., Out of the Crisis, p. 1, Massachusetts Institute of Technology, Center for Advanced Engineering Study, 1986.

21. Mann, N.R., The Keys to Excellence: The Story of the Deming Philosophy, p. 12, Prestwick Books, 1985.

22. Ishikawa, K., Guide to Quality Control, pp. 117-118, Asian Productivity Organization, JUSE Press, Ltd., 1968.

23. Deming, W.E., Quality, Productivity, and Competitive Position, p. 25, Massachusetts Institute of Technology, Center for Advanced Engineering Study, 1982.

24. Ishikawa, K., What Is Total Quality Control? The Japanese Way, p. 163, Prentice-Hall, Inc., 1985.

25. Stuelpnagel, T.R., "Total Quality Managment in Business--and Academia," Business Forum, p. 5, Fall 1988/Winter 1989.

26. U.S. Department of Defense, Total Quality Management Master Plan, p. 1, August 1988.

27. Interview between C. Gates, Captain, USN, Naval Air Systems Command, Washington, D.C., and the author, 25 September 1989.

28. U.S. Federal Acquisition Regulation, para. 9.405.

29. Cibinic, J., Jr., and Nash, R.C., Administration of Government Contracts, 2d ed., 2d printing, p. 66, The George Washington University, 1986.

30. Interview between S. Desbrow-Jensen, Assistant to the General Counsel, Office of General Counsel, Department of the Navy, Washington, D.C., and the author, 26 September 1989.

31. The Comptroller General of the United States Decision, B-224392.2, Matter of: B & W Service Industries, Inc., 2 October 1986.

32. The Comptroller General of the United States Decision, B-201095, Matter of: Utah Giophysical, Inc., 18 November 1980.

33. The Comptroller General of the United States Decision, B-192574, Matter of Electrospace Systems, Inc., 13 April 1979.

34. The Comptroller General of the United States Decision, B-231607, Matter of: Sanford and Sons Company, 20 September 1988.

35. The Comptroller General of the United States Decision, B-174012, Matter of: Siems International Electron Microscope Service, 25 July 1972.

36. Interview between W. Mackinson, Assistant Deputy Commander Contracting Management, Naval Supply Systems Command, Washington, D.C., and the author, 25 September 1989.

37. Naval Material Quality Assessment Office Report, Subject: Red/Yellow/Green, p. 9, September 1989.

38. Telephone conversation between G. Kemp, Procurement Analyst, Naval Supply Systems Command, Washington, D.C., and the author, 16 August 1989.

39. Telephone conversation between D. Walsh, Commander, SC, USN, Naval Supply Center, Pensacola, Florida, and the author, 26 October 1989.

40. Telephone conversation between R. Davidson, Deputy Director Purchase Division, Regional Contracting Department, Naval Supply Center, Charleston, South Carolina, and the author, 31 October 1989.

41. Telephone conversation between J. Minahan, Director of Hull, Mechanical, and Electrical Contracting Department, Navy Ships Parts Control Center, Mechanicsburg, Pennsylvania, and the author, 10 October 1989.

42. Telephone conversation between J. Fackenthal, Supervisory Contract Specialist, Naval Air and Engineering Center, Lakehurst, New Jersey, and the author, 26 October 1989.

43. Telephone conversation between J. Wilson, Manager of Acquisition and Improvement, Naval Avionics Center, Indianapolis, Indiana, and the author, 26 October 1989.

44. Telephone conversation between L. Hargett, Quality Developmental Project Manager, Naval Aviation Depot, Pensacola, Florida, and the author, 27 October 1989.

45. Telephone conversation between S. Cassell, Supervisory Quality Assurance Engineer, Naval Shipyard, Charleston, South Carolina, and the author, 31 October 1989.

46. Telephone conversation between S. Jornov, Quality Assurance Specialist, Level 1/SS Section, Navy Ships Parts Control Center, Mechanicsburg, Pennsylvania, and the author, 6 November 1989.

47. Telephone conversation between R. Armitage, Quality Assurance Specialist, Procurement Division of Quality Assurance, Naval Air and Engineering Center, Lakehurst, New Jersey, and the author, 27 October 1989.

48. Telephone conversation between R. Powell, Electronics Engineer, Quality Assurance, Naval Avionics Center, Indianapolis, Indiana, and the author, 27 October 1989.

INITIAL DISTRIBUTION LIST

		No. Copies
1.	Defense Technical Information Center Cameron Station Alexandria, Virginia 22304 -6145	2
2.	Library, Code 0142 Naval Postgraduate School Monterey, California 93943-5002	2
3.	Defense Logistics Studies Information Exchange U. S. Army Logistics Management Center Fort Lee, Virginia 23801	2
4.	Department Chairman, Code 54 Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943-5000	1
5.	Dr. D.V. Lamm, Code 54Lt Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943-5000	5
6.	CDR E. Neil Hart, SC, USN, Code 54Hr Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943-5000	1
7.	RADM W. H. Hauenstein, SC, USN Competition Advocate General of the Navy Crystal Plaza 5, Room 310 2211 Jefferson Davis Highway Arlington, Virginia 22202	2
8.	Mr. W. Willoughby Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics) Reliability, Maintainability, and Quality Assurance Washington, D.C. 20360-5000	1

9. Mr. P. Thompson — 1
Office of the Assistant Secretary
of the Navy
(Shipbuilding and Logistics)
Reliability, Maintainability, and
Quality Assurance
Washington, D.C. 20360-5000

10. Mr. W. Mackinson — 1
Assistant Deputy Commander for
Contracting Management (NSUP-029)
Naval Supply Systems Command
Washington, D.C. 20376-5000

11. Mr. J. Eaton — 1
Naval Material Quality Assessment
Office
Federal Building, Room 400
80 Daniel Street
Portsmouth, New Hampshire 03801-3884

12. Mr. R. Morris — 1
Naval Material Quality Assessment
Office
Federal Building, Room 400
80 Daniel Street
Portsmouth, New Hampshire 03801-3884

13. Ms. S. Desbrow-Jensen — 1
Assistant to the General Counsel
Office of General Counsel
Department of the Navy
Washington, D.C. 20360-5110

14. Mr. J. Minahan, Code 021 — 1
Navy Ships Parts Control Center
5450 Carlisle Pike
Mechanicsburg, Pennsylvania 17055

15. LT K.A. Hagmann, SC, USN — 4
3346 S. Wakefield Street, #A-1
Arlington, Virginia 22206-1715