



**US Army Corps
of Engineers**

Water Resources Support Center
Institute for Water Resources

**CUSTOMER SATISFACTION
MONITORING SYSTEM:
APPLICATION IN MOBILE DISTRICT (1986)**

July 1987

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**Customer Satisfaction Monitoring System:
Application in Mobile District (1986)**

**Institute for Water Resources
Casey Building
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**Prepared for
Corps of Engineers
Mobile District**

July 1987

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Preface

This report documents the initial application of the Customer Satisfaction Monitoring System in the Mobile District. Since this effort an additional round of questionnaires and workshops has taken place.

Information on these continued efforts can be obtained from Dr. Claudia Rogers, Mobile District (202) 694-3875.

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Chapter 1

EXECUTIVE SUMMARY

Introduction

The Customer Satisfaction Monitoring System (CSMS) has been designed by the Institute for Water Resources to help Corps offices improve the delivery of engineering and construction management services to military customers. The CSMS consists of customer satisfaction questionnaires and customer interaction workshops. Questionnaires are used to identify problem areas in the delivery of engineering and construction management services, while the workshops provide a means for resolving problems. Appendix 1 of this report describes the CSMS and its development in greater detail.

This report documents the application of the CSMS in the Mobile District. The remainder of this chapter summarizes the information developed through the questionnaires, and the nature of the solutions developed in the workshops. Chapter 2 presents a more in-depth analysis of customer satisfaction questionnaires answered by Directors of Engineering and Housing (DEH) and Air Force Base Civil Engineers (BCE) at Army and Air Force installation served by Mobile District. Chapter 3 describes the customer care workshops held to resolve several key customer care problems highlighted by the questionnaires, while Chapter 4 describes future actions the District will undertake to continue to enhance its customer satisfaction program.

Customer Satisfaction Survey Findings

Are Mobile District Customers Satisfied? The answer is generally yes — with Army customers reporting somewhat higher satisfaction than Air Force customers. Overall, 86 percent of DEHs and 67 percent of BCEs reported they were satisfied with Corps performance. A majority of DEHs were satisfied with Corps performance in 17 out of 28 engineering and construction service areas surveyed. A majority of DEHs felt Corps performance was substandard in two of the 28 areas. A majority of BCEs felt that Corps performance was satisfactory in nine out of 28 areas, while a majority felt that performance was substandard in six of the 28 areas surveyed. Substantial majorities of both DEHs and BCEs would continue to use the Corps as a design and construction agent even if they had a choice (86% and 78% respectively).

Where Are the Problems? Problems in providing engineering and construction management services reside in the following areas:

-Responsiveness to Customer Input. There is a perception that the Corps does not pay as much attention as it should to customer comments on designs, and also to a lesser extent to customer requested changes once construction is underway.

-Design Quality. There is a concern that Corps designs do not reflect "lessons learned" from past mistakes, and instead, too often replicate past problems.

-Accuracy of Cost Estimates.

-Adequacy of On-Site Construction Inspection. Some feel that too much responsibility is placed on Contractor QA/QC, and not enough resides with Corps inspections.

-Timeliness of Corps Response. There is a widespread perception that the Corps takes too long to perform some of its services. In particular, processing change orders, correcting punch list items, and providing as-built drawings were seen as problem areas.

Customer Care Workshops

Customer care workshops were held in conjunction with the Mobile District 1986 DEH/BCE conference. The objectives of the workshops were to enable Mobile District personnel and DEH/BCE representatives to discuss and clarify their perceptions about problems in district performance, and to develop ways for improving district performance that were mutually agreeable to the district and DEH/BCEs. The workshops focused on several performance areas identified in the DEH/BCE survey as being most important to the successful completion of projects, and which had received low satisfaction ratings by respondents. These performance areas were:

-Responsiveness to recommended design changes as a result of user/customer review of design

-Accuracy of cost estimation

-Adequate on-site inspection during construction

-Response to customer and/or user requested changes during construction

-Design reflects "lessons learned"

Participants at the conference self-selected into workshops focusing on one of the topics. In the workshops, participants developed solutions to address problems in the above performance areas that were acceptable to both Mobile district and to DEH/BCEs.

After the workshops, the district developed specific actions for implementing the agreed upon solutions. Table 1-1 presents the outputs of each problem solving workshop, identifying the problems considered in the workshop, the consensus solutions developed, and the district's actions for implementing the solutions.

Future Actions

The ultimate success of the a customer satisfaction program depends on the "follow through" of the district in devoting energy and resources to its program of customer care. The following actions are planned:

-Selection of "Champions" with responsibility for overseeing implementation of the specific actions undertaken by the district to improve Corps performance.

-Progress reports by Champions to the District Commander on a periodic basis, and in turn, by the District Commander to DEH/BCEs.

-A periodic replication of the CSMS to assess customer perceptions of Corps improvement in performance, to identify other areas in need of improvement, and to develop additional solutions to performance problems as appropriate.

Table 1.1 Customer Interaction Workshop Outputs

<u>Workshop</u>	<u>Problem</u>	<u>Solutions</u>	<u>Implementing Actions</u>
1	Responsiveness to recommended design changes as a result of used/customer review of design	<p>Conduct on-board reviews with all parties.</p> <p>Early user involvement to develop criteria.</p> <p>Involve construction Division in early design.</p>	<p>District will emphasize O/B Reviews, but will limit to large and complex projects.</p> <p>District will offer programming assistance to installations and involve users.</p> <p>District will reemphasize furnishing project books to Resident Engr and inviting RE to predesign meetings.</p>
2	<p>Response to Customer-Requested Changes During Construction</p> <p><u>Problem Restatement:</u> Improve response to customer-requested changes during construction in a timely manner by minimizing user changes and responding</p>	<p>Respond yes/no/other to requests within 14 days</p> <p>Provide periodic updates to customer</p> <p>Inform customer of Final Change Order Commitments</p> <p>Streamline system to expedite orders</p>	<p>Construction Div will implement during 2nd qtr FY 87</p> <p>District will study possible solutions during 2nd qtr FY 87</p>
3	<p>Adequate On-site Construction Inspection</p> <p><u>Problem Restatement:</u> Improve construction inspection to ensure:</p> <p>a. project performs required functions</p> <p>b. user can see that inspector is interested and alert to his needs</p> <p>c. inspector identifies problem in a <u>timely</u> manner</p>	<p>Indicate facility was inspected with signs/tags</p> <p>Inspection reports to customer</p> <p>Pre-construction mtgs with Base Engr and customer</p> <p>Train Corps inspectors to deal with public</p>	<p>District will activate construction info mgmt system (INCOME)</p> <p>District will implement monthly status mtgs with customer</p> <p>District will hold additional mtgs and inspections with customer participation</p> <p>District will schedule additional inspector training</p>

Table 1.1 (Con't.)

<u>Workshop</u>	<u>Problem</u>	<u>Solutions</u>	<u>Implementing Actions</u>
4	<p>Accuracy of Programming Cost Estimates</p> <p><u>Problem Restatement:</u></p> <p>a. Final budget does not meet original requirement</p> <p>b. Original budget does not meet final requirements to legitimate user changes</p>	<p>Initiate project sooner</p> <p>Better communication early in design</p> <p>Address additive alternatives early</p> <p>Better programming</p> <p>Recognize some projects don't fit the mold</p> <p>Analyze past successes and failures</p>	<p>District will offer programming assistance to installations and early design release emphasized</p> <p>District will visit installations to remain current on factors influencing costs</p>
5	<p>Design Reflects Lessons Learned from Past Mistakes</p> <p><u>Problem Restatement:</u></p> <p>Design reflects "lessons-learned" from past mistakes in order that design can be perfect</p>	<p>Develop feedback system of mistakes</p> <p>Post-construction evaluation to determine suitability of facility for mission</p> <p>Better design quality control</p>	<p>District will continue to enhance data base</p> <p>District will evaluate possible solution during 2nd qtr FY 87</p> <p>District will conduct "redicheck" seminars for EN/CO personnel in 2nd qtr FY 87</p> <p>District will emphasize use of CADD system to improve design coordination and drafting quality</p>

Chapter 2

ANALYSIS OF CUSTOMER CARE SURVEY

Introduction

This chapter presents an analysis of the results of a customer satisfaction survey sent to installation DEH/BCEs. The objective of the customer satisfaction survey was to capture the perceptions of DEH/BCEs about Mobile District performance in providing engineering design and construction products and services to its customers.

Customer Satisfaction Survey Results

Findings from the customer satisfaction survey should be interpreted with two caveats in mind. First, the data consist of responses from sixteen DEH/BCEs. As such, the data represent a general, but limited "baseline" to which future data can be compared. By periodically surveying DEH/BCEs it will be possible to monitor changes in customer perceptions and test the way in which policies and procedures implemented by Mobile District affect customer satisfaction. Second, the data represent the objective reporting of the subjective perceptions of Mobile district customers. These perceptions may or may not be factually "correct". The chief utility of the questionnaires is their ability to surface these perceptions, and to permit the underlying issues to be explored in greater depth in the customer interaction workshops.

Who Was Surveyed

Each of the DEHs or BCE at installations served by SAM was sent a survey. Of the surveys sent, 19 surveys were returned. One installation made multiple copies of the questionnaire and returned four surveys. For purposes of the analysis only the surveys completed by the DEH are reported.

Analysis

The analysis below addresses the following questions:

- (1) How satisfied are customers with SAM produced products and services?
- (2) What are customers most satisfied about?
- (3) What are customers least satisfied about?
- (4) What areas of SAM performance would customers most like to see improved?

Satisfaction with SAM Products and Services. Respondents were asked to rate their satisfaction with the overall performance of the Corps on a 9 point scale where "9" indicated very high satisfaction and "1" indicated very high dissatisfaction. The number "5" was used to indicate the respondent had no strong feeling of either satisfaction or dissatisfaction. Table 3-1 shows the overall satisfaction expressed with Corps performance by respondents. As the table shows the majority of both Army and Air Force respondents were satisfied with the overall performance of the Corps. See Figure 1 for an illustration of the results.

Table 2-1. Overall Satisfaction With Corps Performance in Percentages

<u>Customer</u>	<u>Satisfied</u>	<u>No Opinion</u>	<u>Dis-Satisfied</u>	<u>Total %</u>	<u>Number</u>
Army	86	0	14	100	7
Air Force	67	11	22	100	9
Total	75	6	19	100	16

A majority of Army respondents (57%) felt that Corps performance on current projects was better than it used to be, while the remainder of the Army respondents felt that Corps performance has stayed about the same (Question A-3). Forty-four percent of Air Force respondents felt current Corps performance was better, with 33% rating current performance about the same, and 22% rating current performance as being not as good as in the past.

Another measure of overall satisfaction with Corps performance is provided by question D-6 which asks customers to respond to the statement "If my installation had the choice in choosing a design/construction agent, we generally would use the Corps of Engineers." The majority (81%) of respondents indicated that they would choose the Corps as a design/construction agent. As Figure 2 indicates, the Army customers were slightly more likely than Air Force respondents to choose the Corps (86% versus 78%).

Satisfaction With Corps Performance in Specific Areas of Design, Construction and Post-Construction Project Phases. Questions B-1 through B-28 asked about satisfaction with Corps performance in providing specific products and services in the design, construction and post-construction phases of project execution. Table 2-2 highlights those factors about which 50 percent or more of customers expressed satisfaction or dissatisfaction.

FIGURE 1: OVERALL SATISFACTION WITH CORPS PERFORMANCE

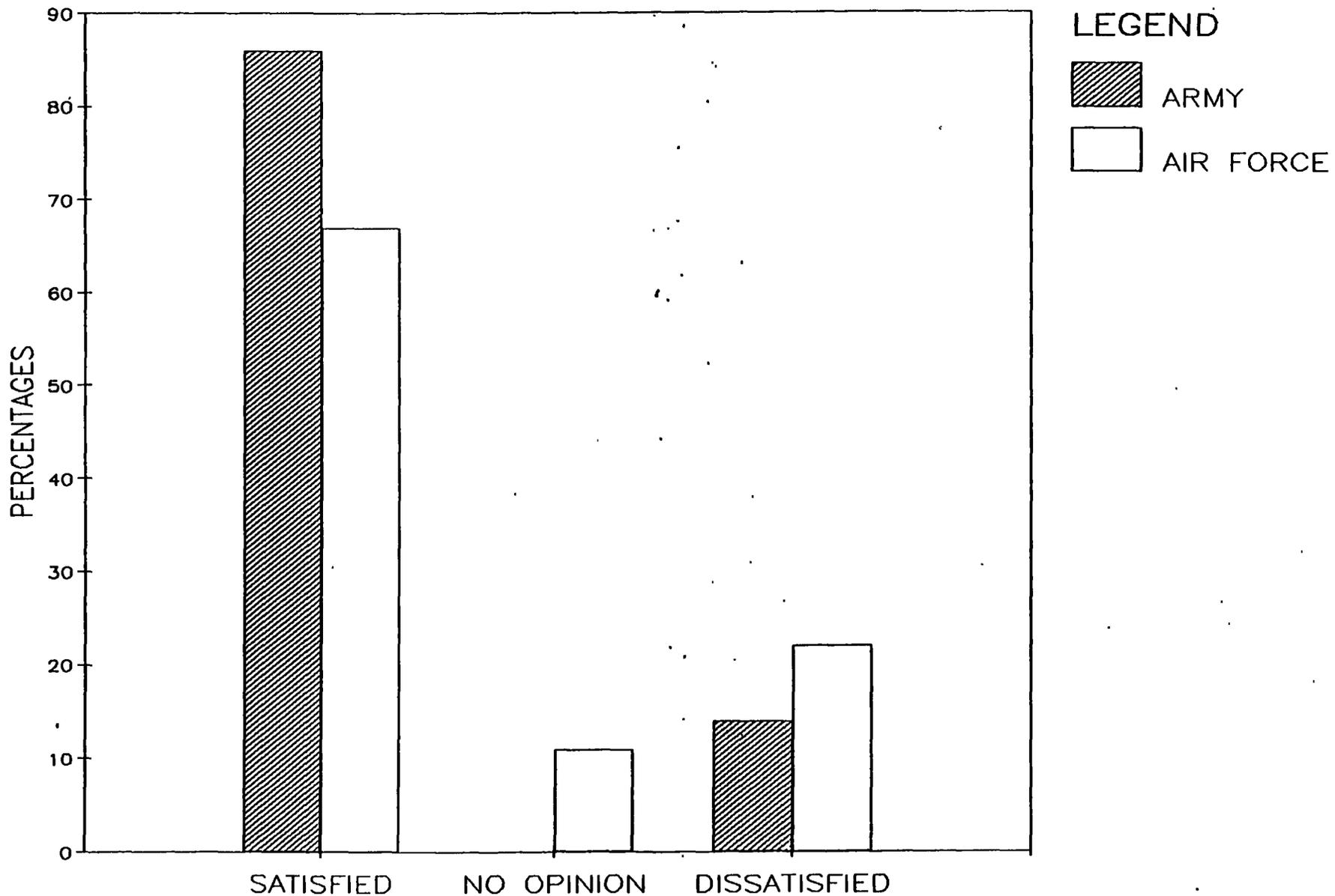
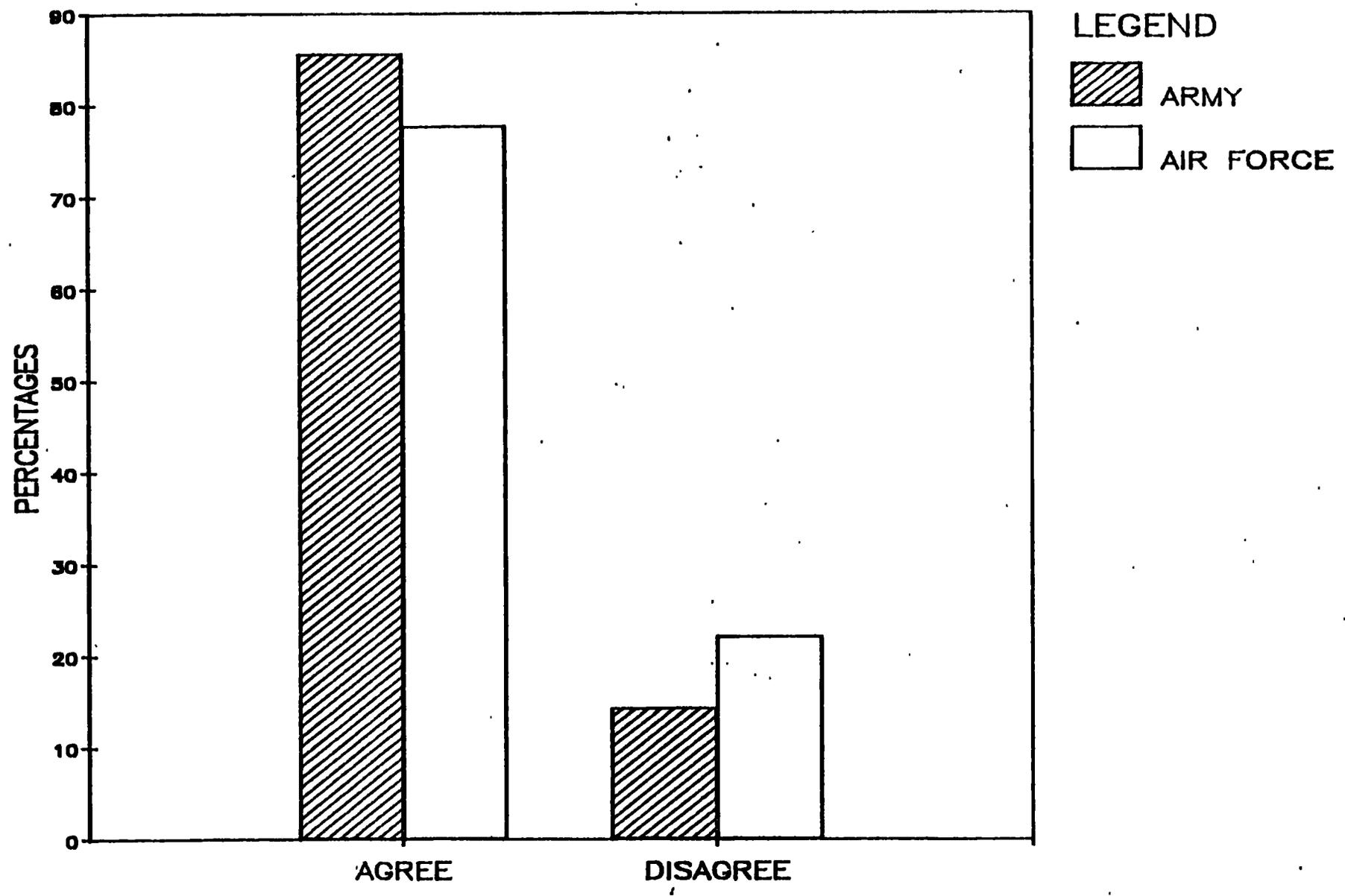


FIGURE 2: IF HAD A CHOICE
WOULD CHOOSE CORPS



(DEH/BCE Satisfaction With Corps Performance on 28 Performance Factors*)

	PERFORMANCE FACTORS	ARMY	AIR FORCE
DESIGN	1. Assistance with program development when requested (1391, PDB, etc.)	●	●
	2. Concept design development and review	●	●
	3. Design reflects "lessons learned from past mistakes"	○	○
	4. Adequately addressing safety concerns and features in design	●	●
	5. Use of standard items vs outdated "nonstandard items"		
	6. Timely provisions of design documents	●	●
	7. Responsiveness to recommended design changes as a result of user/customer review of design		○
	8. Responding to DEH/BCE review comments		
	9. Accuracy of cost estimation	○	
	10. Cost effectiveness of project design		●
	11. Conformance of facility to project requirements as originally stated in the program document	●	●
CONSTRUCTION	12. Preconstruction conferences	●	●
	13. Quality of materials & workmanship	●	
	14. Adequate information about project status during construction	●	
	15. Adequate on-site inspection during construction	●	●
	16. Staying on schedule	●	○
	17. Adequate explanation of schedule charges		
	18. Balancing concern for quality with concern for timeliness & cost	●	
	19. Adequacy of coordination between design and construction	●	
	20. Speed in processing change orders		○
	21. Response to customer and/or user requested changes	●	●
	22. Timely correction of punch list items	●	○
23. Acceptance and turnover	●		
POST-CONSTRUCTION	24. Adequate explanation for cost overruns		
	25. Providing as-built drawings to installation engineer in a timely manner		○
	26. Transferring of O&M Manuals	●	
	27. Corps of Engineers support during warranty period	●	
	28. Contractor warranty execution		

*LEGEND: ● 50% or more are satisfied
○ 50% or more are dissatisfied

As the table shows, the majority of both Army and Air Force respondents were satisfied with the way the Corps performed in the following areas:

- (B- 1) Assistance with program development
- (B- 2) Concept design and review
- (B- 4) Addressing safety in design
- (B- 6) Timely provision of design documents
- (B-11) Design conforms to project requirements
- (B-12) Pre-construction conferences
- (B-15) Adequate on-site inspection during construction
- (B-21) Response to user/customer requested changes (during construction)

A majority of Army respondents also rated Corps performance as satisfactory in several other areas:

- (B-13) Quality of materials & workmanship
- (B-14) Adequate information about project status during construction
- (B-16) Staying on schedule in construction
- (B-18) Balancing concern for quality with concern for timeliness and cost
- (B-19) Adequacy of coordination between design and construction
- (B-22) Timely correction of punch list items
- (B-23) Acceptance and turnover
- (B-26) Transferring of O & M manuals
- (B-27) Corps support during warranty period

A majority of Air Force respondents also rated Corps performance as satisfactory in the cost effectiveness of project design (B-10).

Corps performance was rated as being unsatisfactory by a majority of Army respondents in two areas: design reflects "lessons learned" (B-3), and accuracy of cost estimation (B-9). In contrast, Corps performance in six areas was rated as unsatisfactory by Air Force customers. These were:

- (B- 3) Design reflects lessons learned "from past mistakes"
- (B- 7) Responsiveness to user/customer recommended design changes
- (B-16) Staying on schedule in construction
- (B-20) Speed in processing change orders
- (B-22) Timely correction of punch list items
- (B-25) Providing as-built drawings in a timely manner

It is particularly significant that several of the areas rated as being unsatisfactory by a majority of Air Force respondents were the same areas that a majority of Army respondents expressed satisfaction about. For example, 56 percent of Air Force respondents were dissatisfied with the ability of the Corps to keep on schedule while seventy-one percent of Army respondents were satisfied with Corps performance in this area (item B-16). Similarly, 56 percent of Air Force respondents were dissatisfied with Corps responsiveness to timely correction of punch list items, while fifty-seven

percent of Army respondents were satisfied (item B-22). Other areas where there were major differences in satisfaction ratings include items B-3 (Design reflects lessons learned "from past mistakes" - Army, 43% satisfied; Air Force, 11% dissatisfied); and B-20 (Speed in processing change orders - Army, 43% satisfied; Air Force, 11% dissatisfied). Clearly, there are major perceptual differences between Army and Air Force clients in these areas.

Importance of Specific Products and Services in the Design, Construction and Post-Construction Project Phases. While respondents can either be satisfied or dissatisfied about Corps performance on items B-1 through B-28, not all of the areas are likely to be of equal importance in influencing the level of customer satisfaction. This section identifies those areas in the design, construction and post-construction phases that appear to be most important in influencing customer satisfaction. In section C of the questionnaire, respondents were asked to identify the five areas that were most important to successful project completion. Table 2-3 shows the summed importance ratings of all 28 areas for Army and Air Force respondents.

When examining the factors mentioned most often as either first, second, third, fourth or fifth in importance, the top four items that were chosen by the Army were:

- (B- 7) Responsiveness to recommended design changes
- (B-21) Response to user/customer requested changes
- (B-13) Quality of materials or workmanship
- (B-19) Adequacy of coordination between design and construction

Air Force respondents identified the following as the most important items:

- (B-15) Adequate on-site inspection during construction
- (B- 7) Responsiveness to recommended design changes
- (B- 6) Timely provisions of design documents
- (B- 9) Accuracy of cost estimation
- (B-11) Conformance of facility to project requirements

(Summed Importance Rating)

PERFORMANCE FACTORS		RATINGS	
		ARMY/1	AIR FORCE/2
DESIGN	1. Assistance with program development when requested (1391, PDB, etc.)		
	2. Concept design development and review	1	1
	3. Design reflects "lessons learned from past mistakes"	1	
	4. Adequately addressing safety concerns and features in design		
	5. Use of standard items vs outdated "nonstandard items"	1	
	6. Timely provisions of design documents	2	4
	7. Responsiveness to recommended design changes as a result of user/customer review of design	3	5
	8. Responding to DEH/BCE review comments	1	2
	9. Accuracy of cost estimation	2	4
	10. Cost effectiveness of project design		
	11. Conformance of facility to project requirements as originally stated in the program document	2	4
CONSTRUCTION	12. Preconstruction conferences		
	13. Quality of materials & workmanship	3	2
	14. Adequate information about project status during construction		
	15. Adequate on-site inspection during construction	1	8
	16. Staying on schedule		3
	17. Adequate explanation of schedule charges		
	18. Balancing concern for quality with concern for timeliness & cost	1	2
	19. Adequacy of coordination between design and construction	3	2
	20. Speed in processing change orders	2	
	21. Response to customer and/or user requested changes	3	2
POST-CONSTRUCTION	22. Timely correction of punch list items	2	2
	23. Acceptance and turnover		
	24. Adequate explanation for cost overruns		
	25. Providing as-built drawings to installation engineer in a timely manner	1	1
	26. Transferring of O&M Manuals	1	
	27. Corps of Engineers support during warranty period		1
	28. Contractor warranty execution		2

*LEGEND: Number of times mentioned as being important to successful project completion

The items identified as being most important to successful project completion also showed moderately strong association with the overall satisfaction rating provided in question A-1. Table 2-4 shows the correlations between satisfaction ratings of specific design, construction and post-construction products and services, and the overall satisfaction rating with Corps performance. It is likely that overall satisfaction with the Corps will be heavily influenced by the manner in which the Corps delivers service to its customers in these areas. Table 2-5 shows that significant proportions of Air Force respondents are dissatisfied with Corps performance on several of these areas. In particular, for Air Force customers Corps performance in responding to customer/user recommended design changes (B-7) is an area of great dissatisfaction. Table 3-6 presents Army satisfaction with the most important performance factors identified by DEHs. As can be seen, Army customers are generally satisfied with Corps performance in these areas. The area of responsiveness (B-7) does, however, show substantial room for improvement. Since these areas have been indicated as being most important to customers it is likely that resources targeted to addressing problems in these areas would yield greatest gains in customer satisfaction.

Respondent Comments. Respondents were invited to provide written, comments to expand upon their answers in the survey. In general, the comments reflect the findings already presented. A number of DEHs, BCEs or representatives praised the district's performance:

- District motivations for customer care is very high;
- The Corps has been responsive to our needs by reacting positively to any request for work;
- Overall, the general performance is good.

However, several areas of concern were apparent in many of the comments. These areas were, first, that the district was not as responsive as it should be to its customers' needs and priorities:

- The Corps does not seem to be as responsive to the needs and desires of the installation as they should be. The Corps exists to support the installation - not vice versa.
- Failure to recognize customer input during design review and use of "designer's choice" as rationale for not accommodating needs.
- We have consistently requested air conditioning equipment installation be easily accessible for maintenance and repair. Response is too often negative.
- You make a mistake and customer pays. There is no incentive for a good product.

TABLE 2-4

(Correlation of Performance Factors with Overall Satisfaction Rating)

	PERFORMANCE FACTORS	CORRELATION WITH OVERALL SATISFACTION
DESIGN	1. Assistance with program development when requested (1391, PDB, etc.)	.32
	2. Concept design development and review	.55
	3. Design reflects "lessons learned from past mistakes"	.25
	4. Adequately addressing safety concerns and features in design	.45
	5. Use of standard items vs outdated "nonstandard items"	-.14
	6. Timely provisions of design documents	.39
	7. Responsiveness to recommended design changes as a result of user/customer review of design	.53
	8. Responding to DEH/BCE review comments	.70
	9. Accuracy of cost estimation	.14
	10. Cost effectiveness of project design	.12
	11. Conformance of facility to project requirements as originally stated in the program document	.88
CONSTRUCTION	12. Preconstruction conferences	.28
	13. Quality of materials & workmanship	.62
	14. Adequate information about project status during construction	-.01
	15. Adequate on-site inspection during construction	.04
	16. Staying on schedule	.18
	17. Adequate explanation of schedule charges	.24
	18. Balancing concern for quality with concern for timeliness & cost	.14
	19. Adequacy of coordination between design and construction	.38
	20. Speed in processing change orders	.43
	21. Response to customer and/or user requested changes	-.12
	22. Timely correction of punch list items	.44
23. Acceptance and turnover	.08	
POST-CONSTRUCTION	24. Adequate explanation for cost overruns	-.09
	25. Providing as-built drawings to installation engineer in a timely manner	.48
	26. Transferring of O&M Manuals	.03
	27. Corps of Engineers support during warranty period	-.01
	28. Contractor warranty execution	.38

Another concern expressed by respondents was that the Corps was not as fast as it should be in responding to customer needs.

- Delete some of the bureaucracy. Faster reaction to problem solving.
- Expedite your review and subsequent actions. A simple change should not take two weeks to approve.
- COE has been slow in furnishing required close-out documents (e.g. DD 1354, warranties, manuals, as-builts).

Finally, a concern with Corps QA/QC procedures was noted:

- Construction projects inspection has been inadequate.
- Use less dependence on contractor quality control and perform more on-site inspections during construction.
- Hire more COE inspections and place inspection responsibilities on the COE rather than the contractor.

A complete listing of all comments is presented in Appendix 3.

Conclusions

The analysis suggests that Mobile District customers are generally satisfied with the performance of the district. However, there is room for improvement in customer satisfaction. In particular, Air Force customers, while generally satisfied with Corps performance, have several significant areas of dissatisfaction. For Air Force customers, the most important area of such dissatisfaction concerns the responsiveness of the Corps to customer/user recommendations and views. While dissatisfaction with Corps responsiveness does not appear as widespread among Army customers, there is substantial room for improving Corps performance in its responsiveness to its Army customers as well.

Table 2-5. Air Force Satisfaction With Most Important Engineering and Construction Management Services in percentages

		No	Dis-	
	<u>Satisfied</u>	<u>Opinion</u>	<u>Satisfied</u>	<u>Number</u>
B-15 Adequate on-site inspection during construction	56	22	22	9
B-7 Responsiveness to recommended design changes as a result of user/customer review of design	22	22	56	9
B-6 Timely provisions of design documents	78	11	11	9
B-9 Accuracy of cost estimation	22	44	33	9
B-11 Conformance of facility to project requirements as originally stated in the program document	56	33	11	9

Table 2-6. Army Satisfaction With Most Important Engineering and Construction Management Services in percentages

		No	Dis-	
	<u>Satisfied</u>	<u>Opinion</u>	<u>Satisfied</u>	<u>Number</u>
B-7 Responsiveness to recommended design changes as a result of user/customer review of design	29	57	14	7
B-13 Quality of materials and workmanship	71	14	14	7
B-19 Adequacy of coordination between design & construction	57	29	14	7
B-21 Response to customer and/or user requested changes	57	14	29	7

Chapter 3

CUSTOMER CARE WORKSHOPS

Introduction

Customer care workshops were held in conjunction with the Mobile District 1986 DEH/BCE conference. The objectives of the workshops were to enable Mobile District personnel and DEH/BCE representatives to discuss and clarify their perceptions about problems in district performance, and to develop ways for improving district performance that were mutually agreeable to the district and DEH/BCEs. The workshops focused on several performance areas identified in the DEH/BCE survey as being most important to the successful completion of projects, and which had received low satisfaction ratings by respondents. These performance areas were:

- Responsiveness to recommended design changes as a result of user/customer review of design (B-7)
- Accuracy of cost estimation (B-9)
- Adequate on-site inspection during construction (B-15)
- Response to customer and/or user requested changes (B-21)

In addition, the performance area of "Design reflects 'lessons learned' from past mistakes" (B-3) was also selected as a workshop topic.

Procedures

Participants at the conference self-selected into workshops focusing on one of the topics. Workshops were professionally facilitated and employed the principles of collaborative problem solving. In the workshops, the following general sequence of steps was employed:

- Problem definition and clarification
- Interest identification
- Formulation of alternative solutions
- Evaluation of alternatives
- Selection of alternatives and implementation strategy

The paragraphs below describe these steps. Appendix 4 presents a listing of the products developed in each workshop.

Problem Definition and Clarification. Participants first discussed the overall topic statement and clarified its meaning. In some workshops, the topic statement was reformulated as a result of these discussions. Next, discussion focused on identifying the problems associated with district performance in this topic area. Installation participants clarified what in Corps performance created difficulties, while Corps participants presented the issue from their point of view, explaining the particular constraints and procedures under which they operated. The goal of this step was to enable participants to understand how each "side" perceived the issues.

Interest Identification. After discussing and clarifying the problems associated with performance, participants turned their attention toward finding solutions to problems that both the Corps and DEH/BCEs could support. As a first step, Corps and installation participants were asked to identify what a solution to a problem would need to provide in order for their "side" to be satisfied with the outcome. This approach identifies the "interests" — the underlying motivators of behavior and providers of satisfaction — that solutions must satisfy. Interest-based problem solving assumes that by identifying the range of underlying interests before specific solutions are developed, the group's discussion and energy can be focused on trying to find ways to meet the full complement of interests rather than those of just one side.

Formulation of Alternative Solutions. Participants brainstormed lists of solutions or partial solutions for solving the problems that might satisfy the range of interests that had been identified.

Evaluation of Alternatives. Corps personnel and DEH/BCE representatives then separated to evaluate how well the brainstormed solutions met their interests. After evaluating solutions separately, the groups met together and discussed their evaluations. Those solutions or partial solutions that met both sides' interests were used to develop a set of recommended final solutions.

Selection of Solutions and Implementation Strategy. Participants used the set of solutions that all could support to construct solutions to the performance problems. The solutions identified represent a consensus among both Corps and installation participants as to acceptable ways of addressing the problems considered in the workshops.

Table 3-1 presents the outputs of each problem solving workshop, identifying the problems considered in the workshop, and the consensus solutions developed. In addition, the table shows the district's planned actions for implementing the solutions.

Table 3.1 Customer Interaction Workshop Outputs

<u>Workshop</u>	<u>Problem</u>	<u>Solutions</u>	<u>Implementing Actions</u>
1	Responsiveness to recommended design changes as a result of user/customer review of design	<p>Conduct on-board reviews with all parties.</p> <p>Early user involvement to develop criteria.</p> <p>Involve construction Division in early design.</p>	<p>District will emphasize O/B Reviews, but will limit to large and complex projects.</p> <p>District will offer programming assistance to installations and involve users.</p> <p>District will reemphasize furnishing project books to Resident Engr and inviting RE to predesign meetings.</p>
2	<p>Response to Customer Requested Changes During Construction</p> <p><u>Problem Restatement:</u> Improve response to customer requested changes during construction in a timely manner by minimizing user changes and responding</p>	<p>Respond yes/no/other to requests within 14 days</p> <p>Provide periodic updates to customer</p> <p>Inform Customer of Final Change Order Commitments</p> <p>Streamline system to expedite orders</p>	<p>Construction Div will implement during 2nd qtr FY 87</p> <p>District will study possible solutions during 2nd qtr FY 87</p>
3	<p>Adequate On-site Construction Inspection</p> <p><u>Problem Restatement:</u> Improve construction inspection to ensure:</p> <p>a. project performs required functions</p> <p>b. user can see that inspector is interested and alert to his needs</p> <p>c. inspector identifies problem in a <u>timely</u> manner</p>	<p>Indicate facility was inspected with signs/tags</p> <p>Inspection reports to customer</p> <p>Pre-construction mtgs with Base Engr and Customer</p> <p>Train Corps inspectors to deal with public</p>	<p>District will activate construction info mgmt system (INCOME)</p> <p>District will implement monthly status mtgs with customer</p> <p>District will hold additional mtgs and inspections with customer participation</p> <p>District will schedule additional inspector training</p>

<u>Workshop</u>	<u>Problem</u>	<u>Solutions</u>	<u>Implementing Actions</u>
4	<p>Accuracy of Programming Cost Estimates</p> <p><u>Problem Restatement:</u></p> <p>a. Final budget does not meet original requirement</p> <p>b. Original budget does not meet final requirements to legitimate user changes</p>	<p>Initiate project sooner</p> <p>Better communication early in design</p> <p>Address additive alternatives early</p> <p>Better programming</p> <p>Recognize some projects don't fit the mold</p> <p>Analyze past successes and failures</p>	<p>District will offer programming assistance to installations and early design release emphasized</p> <p>District will visit installations to remain current on factors influencing costs</p>
5	<p>Design Reflects Lessons Learned from Past Mistakes</p> <p><u>Problem Restatement:</u></p> <p>Design reflects "lessons-learned" from past mistakes in order that design can be perfect</p>	<p>Develop feedback system of mistakes</p> <p>Post-construction evaluation to determine suitability of facility for mission</p> <p>Better design quality control</p>	<p>District will continue to enhance data base</p> <p>District will evaluate possible solution during 2nd qtr FY 87</p> <p>District will conduct "redicheck" seminars for EN/CO personnel in 2nd qtr FY 87</p> <p>District will emphasize use of CADD system to improve design coordination and drafting quality</p>

Chapter 4

FUTURE ACTIONS

The success of a program for enhancing customer satisfaction ultimately depends on the "follow through" of the district. Mobile District has already taken steps to implement the solutions developed in the customer interaction workshops.

This program of implementation provides for the following:

- assignment of "Champions" with the responsibility to ensure that the actions are implemented
- periodic review of performance in implementing actions by senior management within the district
- use of periodic information letters to DEH/BCE to inform them of district efforts in implementing solutions developed at the workshops.

Future actions will also include replicating the CSMS process in a year. Such a replication will involve the administration of the general survey to DEH/BCE to assess how and in what ways customer satisfaction has changed. The expectation is that general satisfaction levels and satisfaction in those particular areas focused on in district efforts will show improvement. After analysis of questionnaire data, customer care workshops will be held to discuss findings and to work on areas of district engineering and construction management services that need improvement.

Appendix 1
Description of Customer Satisfaction Monitoring System

The primary objective of the CSMS is to enable Corps offices to:

- (1) assess how satisfied its customers are with Corps-produced products and services, and
- (2) target specific areas for improvement to achieve the greatest gains in customer satisfaction.

The CSMS consists of several major components:

(1) Customer Care Survey for Installation Commanders. This survey can be sent to all installation commanders. Its purpose is to identify how installation commanders evaluated Corps performance in providing products and services to meet installation engineering and construction needs. It can be repeated on a yearly basis.

(2) Customer Care Survey for DEHs and BCEs. This survey is sent to all DEHs and BCEs at installations served by the Corps office. The survey asks the same questions as those contained in the Installation Commander Survey, and, in addition, asks for evaluations of Corps performance in 28 specific engineering design, construction and post construction areas.

(3) Project Questionnaire. A survey can be sent to DEHs and BCEs whenever a project has been completed. The survey measures satisfaction with the way in which the specific project was handled by the Corps office. As a data base of project satisfaction surveys develops, Corps can monitor its effectiveness in trying to improve its program of customer care.

(4) Customer Care Workshops. Results of questionnaires will be discussed at workshops attended by Corps personnel and customers. The purpose of workshops will be to discuss questionnaire findings, clarify problem areas that questionnaires identify, and to generate solutions and implementation plans to resolve the customer care problems that have been identified.

Instrument Development

Two surveys are used to measure the level of satisfaction of Corps customers with Corps-provided products and service. As indicated earlier, these surveys provide Corps offices with a way to monitor Corps performance over time and to identify those areas where service delivery needs to be improved. This section describes the procedures to be followed in developing the instruments for measuring customer satisfaction.

Measurement Procedure

Satisfaction. Satisfaction is defined as the sum of individual feelings or attitudes about Corps performance in providing a range of products and services which are expected or desired by customers. This definition corresponds to those commonly used in customer satisfaction studies (see, for example, Bailey and Pearson, 1983; Lebow, 1983). Since satisfaction is measured in terms of a set of performance factors, it is quite important to ensure that the set of factors be comprehensive in enumerating the products and services which customers expect or desire. For the surveys, a set of 33 performance factors have been identified. The factors were derived on the basis of the following operations:

a. A Corps Blue Ribbon Panel (BRP) investigating construction quality management was convened in 1983. As part of this study a series of workshops with Corps resident engineers was held. During these workshops participants identified problems related to maintaining construction quality on Corps projects. These workshops yielded an enormous amount of detail on topics having to do with customer satisfaction.

b. For the BRP, the information generated through the workshops was used to create a survey measuring customer satisfaction with Corps construction quality management practices. The BRP questionnaire was sent to all DEHs, AFRCEs, and Army MACOMs and Air Force MAJCOMs. A total of 190 questionnaires were returned. Numerous open-ended responses to a question asking for specific information about satisfaction with Corps performance were received. These responses were content analyzed and used to create additional factors.

c. A list of items important in insuring greater customer satisfaction with Corps products developed by a work group composed of customers and Corps personnel was consulted in the development of performance factors.

d. A draft survey has been reviewed by Corps personnel. Several additional factors were included on the basis of these reviews.

e. A pretest of the surveys was conducted with Army MACOMs. Respondents had the opportunity to suggest additional performance factors during the pretest.

In summary, it is felt that the surveys have a comprehensive set of factors that represent expected or desired outcomes and processes.

Customers. Customers are defined in two ways. For the project level survey, customers are defined as the DEH or BCE or designated representatives of these individuals. For the general survey, customers consist of Installation Commanders, DEH, AFRCE, Army MACOM or Air Force MAJCOM commanders or representatives of any of these individuals. The broader inclusiveness of the latter survey was felt to be warranted given the more general, program-oriented focus of the instrument. That is, it was felt that installation or major command commanders would likely have

opinions about Corps performance in general; however, these individuals would not be as likely as DEH and BCE to have detailed knowledge about Corps performance on specific projects.

Reliability and Validity of Instruments

Reliability of response was a particular reason for recommending that a project specific survey form be the basis of the Customer Satisfaction Monitoring System. By asking respondents to focus on a particular situation in describing their attitudes about Corps performance there is less chance that recent experiences (which may not even be related to Corps concerns at all) may affect responses. Additional reliability checks will be incorporated into data analysis procedures.

Content validity of the measurement of satisfaction is felt to be high. This conclusion rests on the extensive amount of input by customers used to develop the performance factors.

Analysis of Data

Satisfaction with Corps performance is measured using a seven item scale having the values of +3 to -3, where +3 indicates high satisfaction, +2 the respondent is quite satisfied, +1 the respondent is slightly satisfied, 0 neither satisfaction nor dissatisfaction, -1 slight dissatisfaction, -2 the respondent is quite dissatisfied, and -3 high dissatisfaction. Satisfaction ratings for individual performance factors will be reported in a manner to permit easy visual inspection. For example, factors receiving positive satisfaction ratings would be shown by one symbol; while those factors receiving dissatisfaction ratings would be shown by another symbol.

In addition to a project-by-project inspection of satisfaction, analysis can be tailored to address specific questions - such as how does satisfaction vary by installation, District, type of project, \$ cost of project, etc.

Satisfaction and Resource Management

One of the goals of the monitoring system is to enable managers to identify areas where the application of resources would yield the greatest gain in customer satisfaction. This objective will be addressed by performing an importance/performance analysis. This analytical procedure is often used in marketing research to help plan and deliver the right mix of customer services (Martilla and James, 1977).

The procedure involves the construction of a table showing the covariation of the satisfaction rating given to a performance factors and the importance attached to the factor by the customer. Such a table is shown below. As can be seen, the table can be divided into four quadrants. Each quadrant of the table has different implications for managers. Area I indicates those factors in which Corps performance is satisfactory and which are important to the client. Current efforts should be continued. Area II shows factors which receive satisfactory performance ratings but on

which the client does not place much importance. Resources being used to focus on these factors could probably be reduced and reallocated. Area III shows factors of high importance to the client, but having low satisfaction. Factors in these areas need additional support and resources. Area IV shows factors of low importance to clients where performance is not considered adequate. Improvement on these items should wait until higher priority factors in quadrant III are addressed.

The importance of factors will be estimated by using questions B-1 through B-28 to construct a frequency distribution of the percentage of cases in which the factor is mentioned as being important. This continuum can range from 0 to 100. This continuum will be combined with the satisfaction scores to form the table.

Sample Importance/Performance Table

		Importance	
		High 100.....0	Low
High	3	I	II
	2		
	1		
	0	<hr/>	
	-1		
	-2		
Low	-3	III	IV

Importance/Performance analyses can be done for the aggregated set of all projects, or can be broken down by installation, District, particular type of projects, etc.

References

Bailey, J. E. and S. Pearson. 1983. "Developing a Tool for Measuring and Analyzing Computer User Satisfaction." Management Science 29 (5): 530-545.

Lebow, J. 1983. "Client Satisfaction with Mental Health Treatment." Evaluation Review 7(6): 729-752.

Martilla, J. and J. James. 1977. "Importance/Performance Analysis." Journal of Marketing 41: 77-79.

Appendix 2
CUSTOMER CARE SURVEY¹

A. Overall Satisfaction of Corps Performance

1. Generally, how do you feel about the overall performance of the Corps on those projects with which you have been involved? (Please circle a number on the following scale).

I Am Highly Satisfied	I Have No Strong Opinion	I Am Highly Unsatisfied
19 32 19 6	13 6	
----- ----- ----- ----- ----- ----- ----- -----		
9 8 7 6 5 4 3 2 1		

2. Brief explanation of your answer to the above question, A-1 (if you so desire):

(See Appendix 3)

3. In your opinion, how does current Corps performance on projects compare to past performance? (Please check the one most appropriate box).

- 1[50] Current performance is better than it used to be
- 2[12] Current performance is not as good as it used to be
- 3[38] Current performance is about the same as it used to be
- 4[] I have no opinion

4. Do you feel that there are major problems in the way the Corps interacts with its customers? (Please check the one most appropriate box).

- 1[44] Yes
- 2[56] No
- 3[] I Have No Opinion

If you answered "yes", what are the one or two most important problems that come to mind? (Please briefly describe).

- a. (see Appendix 3)
 - b.
-
-

¹Responses reported are percentages, computed on total of 16 responses, unless otherwise noted.

5. If you feel revision in Corps procedures and/or regulations is needed, what do you think the Corps should do? (Please briefly describe). (see Appendix 3)

6. Can you suggest other techniques that the Corps could use to obtain feedback on your satisfaction with Corps performance? (Please briefly specify.)

(see Appendix 3)

Please indicate your branch of service.

- 1[44] Army
- 2[56] Air Force

B. Satisfaction with Corps Performance in Selected Areas

Please indicate how satisfied you are with the Corps performance in the following areas. (Place a check in the one box which best corresponds to your feelings).

Please check one box per line:

	I Am Highly Satisfied	I Am Satisfied	I Have No Strong Feelings	I Am Unsatisfied	I Am Highly Unsatisfied	Not Applicable
	5	4	3	2	1	9
*** DESIGN ***						
1. Assistance with program development when requested (1391, POB, etc.)	[25]	[42]	[33]	[]	[]	[]
2. Concept design development and review	[20]	[53]	[13]	[13]	[]	[]
3. Design reflects "lessons learned from past mistakes"	[]	[25]	[19]	[56]	[]	[]
4. Adequately addressing safety concerns and features in design	[19]	[56]	[19]	[6]	[]	[]
5. Use of standard items vs outdated "nonstandard items"	[]	[37]	[44]	[6]	[13]	[]
6. Timely provisions of design documents	[6]	[63]	[6]	[25]	[]	[]
7. Responsiveness to recommended design changes as a result of user/customer review of design	[12]	[12]	[6]	[25]	[13]	[]
8. Responding to DEH/BCE review comments	[7]	[13]	[53]	[13]	[13]	[]
9. Accuracy of cost estimation	[]	[31]	[31]	[25]	[13]	[]
10. Cost effectiveness of project design	[]	[33]	[40]	[20]	[7]	[]

11. Conformance of facility to project requirements as originally stated in the program document	[13]	[56]	[25]	[6]	[]	[]
*** CONSTRUCTION ***						
12. Preconstruction conferences	[19]	[62]	[19]	[]	[]	[]
	I Am Highly Satisfied	I Am Satisfied	I Have No Strong Feelings	I Am Unsatisfied	I Am Highly Unsatisfied	Not Applicable
	-----	-----	-----	-----	-----	-----
	5	4	3	2	1	9
13. Quality of materials and workmanship	[6]	[50]	[19]	[25]	[]	[]
14. Adequate information about project status during construction	[13]	[31]	[25]	[25]	[6]	[]
15. Adequate on-site inspection during construction	[19]	[44]	[12]	[12]	[12]	[]
16. Staying on schedule	[6]	[31]	[25]	[25]	[13]	[]
17. Adequate explanation of schedule changes	[6]	[31]	[38]	[19]	[6]	[]
18. Balancing concern for quality with concern for timeliness & cost	[6]	[38]	[56]	[]	[]	[]
19. Adequacy of coordination between design and construction	[12]	[19]	[38]	[25]	[6]	[]
20. Speed in processing change orders	[]	[25]	[31]	[31]	[13]	[]
21. Response to customer and/or user requested changes	[13]	[50]	[13]	[13]	[13]	[]
22. Timely correction of punch list items	[]	[38]	[19]	[12]	[31]	[]
23. Acceptance and turnover	[6]	[38]	[25]	[19]	[12]	[]
*** POST CONSTRUCTION ***						
24. Adequate explanation for cost overruns	[6]	[31]	[44]	[19]	[]	[]
25. Providing as-built drawings to installation engineer in a timely manner	[]	[36]	[21]	[29]	[14]	[]
26. Transferring of O&M Manuals	[]	[50]	[31]	[13]	[6]	[]
27. Corps of Engineers support during warranty period	[13]	[31]	[31]	[19]	[6]	[]
28. Contractor warranty execution	[6]	[25]	[38]	[25]	[6]	[]

C. Importance of Performance Items

Please look back over the items in Section B above. Regardless of how satisfied you were with Corps performance in any of these areas, please select the five areas which you feel are generally the most important to successful project completion. (Select by writing the number of the area on the blank lines below).

First in importance is item number ____.

Second in importance is item number ____.

Third in importance is item number ____.

Fourth in importance is item number ____.

Fifth in importance is item number ____.

D. General Background Information

1. Looking over your experience with the Corps, how would you characterize the percentage distribution of your experience among the following areas?

16 % New construction

16 % Rehabilitation

16 % Engineering design

15 % Other (please specify) _____

100% TOTAL

2. Which of the following best characterizes your role? (Please check the one most appropriate box).

1[] I am an Installation Commander or an Assistant Commander

2[38] I am a DEH/Base Civil Engineer

3[] I am a MACOM Commander or representative of a MACOM Commander

4[25] I am a Project Manager and/or Planner for a DEH

5[38] Other (please briefly specify) _____

3. How long have you been at this present installation? 12 years 2 months.

4. How would you characterize your involvement with Corps projects? (Please check the most appropriate box).

1[87] I am involved continuously from the beginning (Master Planning thru to completion)

2[13] I am periodically involved

3[] I become involved after the project is completed

5. During your career, what has been your involvement with Corps projects? Approximately 170 projects over 14 years.

6. How do you feel about the following statement? (Please place a check in the one most appropriate box)

If my installation has a choice in choosing a design/construction agent, we generally would use the Corps of Engineers.	Strongly		No		Strongly
	<u>Agree</u>	<u>Agree</u>	<u>Opinion</u>	<u>Disagree</u>	<u>Disagree</u>
	5	4	3	2	1
	[19]	[63]	[]	[12]	[6]

Please briefly describe why you answered question 6 as you did.

(see Appendix 3)

7. Are there other comments or suggestions you would like to share?

(see Appendix 3)

Thank you for your time and assistance

Appendix 3

CUSTOMER SATISFACTION SURVEY FOR DEH/BCEs
VERBATIM COMMENTS FROM SURVEY

2. *Brief explanation of your answer to the above question A-1 (if you so desire):*

1. District motivation for customer care is very high. Regulatory constraints and possibly resource limit detract from needed service.
2. No answer.
3. The Corps has a bad reputation here because of poor quality materials and lousy workmanship.
4. Construction projects inspection has been inadequate. Changes are made in project designs without coordination with the DEH. Inadequate designs making numerous field changes necessary occur frequently.
5. Need more interaction between A&E and Corps at the installations to understand the needs/requirements.
6. No answer.
7. The Corps does not seem to be as responsive to the needs and desires of the installation as they should be. The Corps exists to support the installation - not vice versa.
8. No answer.
9. No answer.
10. No answer.
11. The Corps has been responsive to our needs by reacting positively to any request for work.
12. Performance has been spotty from excellent to poor. No consistent performance.
13. Overall the general performance is good.
14. COE have been slow in furnishing required close-out documents (e.g. DD1354, warranties, manuals, as-builts,).
15. MCP-generally good. O&M - our personnel had to spend too much time in review (both technical and administrative) of the design.
16. In the past five years we have not had a project completed on time. The designs and construction have been substandard.

17. Major construction generally OK - major problems with mechanical plant construction; CWP/EWI aftercooler; inadequate fire alarm installation.

18. No answer.

19. No answer.

4. *Do you feel that there are major problems in the way the Corps interacts with its customers? If you answered "yes", what are the one or two most important problems that come to mind?*

1.a No answer.

2.a No answer.

3.a Impersonal - depend too much on contractor's QA plan.

4.a There is inadequate coordination with and information provided to the DEH when design changes are made before and during construction.

5.a No answer.

6.a No answer.

7.a No answer.

8.a No answer.

9.a No answer.

10.a Identifying (in the case of the Air Force) who the customer really is. The Corps of Engineers may be blamed unjustly on this one.

11.a No answer.

12.a No answer.

13.a No answer.

14.a We have consistently requested air conditioning equipment installation be easily accessible for maintenance and repair. Response is too often negative.

15.a Not enough feedback, especially on changes to schedules and commitment dates.

16.a You make a mistake and the customer pays. There is no incentive for a good product.

17.a Failure to recognize customer input during design review and use "designer's choice" as rationale for not accommodating needs.

18.a No answer.

19.a Customers are still being treated as burdens rather than customers by many individuals.

1.b No answer.

2.b No answer.

3.b Obvious dislike of small contracts.

4.b Proper concern for the DEH maintenance requirements on projects design is not used.

5.b No answer.

6.b No answer.

7.b No answer.

8.b No answer.

9.b No answer.

10.b No answer.

11.b No answer.

12.b No answer.

13.b No answer.

14.b COE have been slow in furnishing required close-out documents (e.g. DD1354, warranties, manuals, as-builts). Also COE needs to ensure all utility locations are shown on the site plans and not rely on the base to locate underground utilities during construction.

15.b Costs for the administration of design.

16.b You need to listen and enforce the customer technical and functional comments and not let your contracts dictate what is best for the customer.

17.b Overly protective of contractor vs. use requirements with respect to schedule requirements.

18.b No answer.

19.b Working for the Corps. This problem is more relevant in the Construction Division than in Engineering Division.

5. *If you feel revision in Corps procedures and/or regulations is needed, what do you think the Corps should do? (Please briefly describe).*

1. Heel and toe process of DEH AE support contractors needs changing to shorten the lead time. Construction times are much too long in comparison to commercial work. Cookie-cutter specs cost too much for the benefit derived. Deviation turn standard specs should be permitted where cost/quality benefit is not compromised. Example: multipage concrete spec for a support pad for an A/C compressor unit is ridiculous.

2. No answer.

3. Become more customer sensitive. Remember small projects require personal contact, patience and caring.

4. Use less dependence on contractor quality control and perform more on-site inspections during construction. Insure construction contract changes are coordinated with the DEH before implementing. In maintenance/repair projects, established design criteria used by the Corps creates problems involve instances and should not be followed.

5. Provide closer concern for the needs of the installation. i.e. long term maintenance.

6. Delegate more authority to districts.

7. Method of contract inspection. Contractor owned and paid for quality assurance is not working. The problems don't show up until later when they are very difficult and very expensive to fix.

8. Hire more COE inspections and place inspection responsibilities on the COE rather than contractor.

9. No answer.

10. Sell yourself (i.e., customer care). Promote positive attitude. Shorten "bureaucratic red tape" by coming up with ways to start design and construction sooner.

11. Accept warranty responsibility (at least the 1 year construction warranty).

12. Delete some of the bureaucracy. Faster reaction to problem solving.

13. More use of commercial standard specs or conversion of standards Corps specs to reflect local available/use of materials/methods.

14. Corps should not make final payment until all warranty/guarantee documents, O&M manuals, and as-built drawings are submitted. Corps needs to ensure all punch list items are corrected in a timely manner.

15. No answer.

16. Need to get more involved in your reviews of designs and shop drawings. Give your resident engineer more change authority for field changes. Additionally, you need to expedite your review and subsequent actions. A simple change should not take two weeks to approve.

17. No comment as I am not familiar with internal CE procedures.

18. Strive to make improvements in areas highlighted by the green ribbon panel.

19. No answer.

6. *Can you suggest other techniques that the Corps could use to obtain feedback on your satisfaction with Corps performance? (Please briefly specify).*

1. This is a good questionnaire - ask often.

2. No answer.

3. Listening.

4. No answer.

5. Closer review of projects at various stages of Project Design Review.

6. No answer.

7. Area and resident engineers could provide the DEH with a monthly status report. AMPRES is useless.

8. No answer.

9. No answer.

10. Ask the customer in field units.

11. Evaluations at contract completion similar to evaluation of contractor performance.

12. Use critique form after each project is completed.

13. AFRCE had good open communications with agents already.

14. No answer.

15. No answer.

16. District supervision visit field units and using agency at least quarterly.

17. No answer.

18. No answer.

19. No answer.

Appendix 4
Customer Care Workshops

Summary of Proceedings

Workshop 1:

Original Problem Statement: Responsiveness to recommended design change as a result of user/customer review of design.

Restatement of Problem: No restatement. Team determined problem was adequately stated.

Installation Interests:

- a. Air Force review (chain of command) is "Too Long"
- b. Response to user's comments are not provided or are inadequate
- c. Incorporation of recommended changes
- d. Meet the mission objective(s) in facility
- e. Proper feedback on comments (e.i., the same comment made at 35%, 65%, 95% but never resolved.
- f. Close involvement between user, A-E, installations and Corps during design
- g. Address known changes prior to construction

District Interests:

- a. Better project books/programming
- b. Early and more involvement by user/customer
- c. Better updating of as-built drawings by user
- d. Design costs must be maintained
- e. Design schedule must be maintained
- f. Eliminate known changes prior to construction
- g. Update District/master planning changes
- h. Satisfy customer

Recommended Solutions:

- a. On-board review by all parties at design submittal, with documented results.
- b. Early and committed involvement by user during development of project book. It is the Major Command's responsibility to get user involved. Get user involvement programmed into program documents.
- c. Educate user on project book, i.e., what it is and what it is used to accomplish.
- d. Emphasize early construction involvement in the design process.
- e. Furnish project book to Area Engineers so that they will know overall scope of project.

Workshop 2:

Original Problem Stated: Response to customer/user requested changes during construction.

Problem Restatement: Improve response to customer requested changes during construction in a timely manner by minimizing user changes and responding to legitimate user changes.

Installation Interests:

- a. Respond to customer in "x" number of days from request regardless of in/out scope, dollar value, etc.
- b. Once answer is given, meet the commitment date to implement change, then meet construction completion date.
- c. Satisfy the "ultimate" user. Close the loop on all actions rapidly and accurately if change can and will be made or not.
- d. Follow up on all actions to the customer's satisfaction: Don't make the customer do all the leg work!

District Interests:

- a. Provide Customer Satisfaction.
- b. Provide customer a quality facility on time and within budget.
- c. Communicate procedural requirements to user.
- d. User who understands impact of the change.

Recommend Solutions:

- a. Provide response to request within 14 days. Response could be yes, no or change need to go to corporate board, etc.
- b. Provide periodic updates to customer including estimate of dollars and time. (Don't leave customer in dark).
- c. Inform customer of final change order commitments.
- d. Seek changes in regulation to streamline system so that final change order commitment can be made sooner.
- e. Set up a "change order" unit whose sole function will be to process change orders expediently.

Group 3:

Original Problem Statement: Design reflects "lessons learned from past mistakes."

Restatement of Problem Statement: Design reflects "lessons learned from past mistakes" in order that design can be perfect.

Installation Base Interest:

- a. Improve maintainability.
- b. Prevent recurring design construction mistakes.
- c. Achieve optimum life cycle cost.
- d. Reduce cost and time growth.

District Interests:

- a. Enhance customer care.
- b. Reduce cost/time growth.
- c. Provide quality design and construction.
- d. Enhance District's reputation.
- e. Maintain credibility.

a. Develop and implement a feedback system of mistakes previously made involving the user, the designer, the builder and the management agencies (major commands).

b. Capture feedback on checklists (ready check) and distribute to appropriate parties.

c. Implement post-construction evaluations to determine how well a facility meets its mission.

d. Maintain better quality control coordination during design. In accomplishing better design QC, utilize above "checklist" and "feedback" making sure A-E firms are aware of and involved in process.

Group 4:

Original Problem Statement: Accuracy of cost estimation.

Restatement of Problem:

a. Final budget does not meet original requirements.

b. Original budget does not meet final requirements.

Factors Causing Problems:

a. Programming price guides

b. Programming documents--successful previous year documents are used as the primary guide in preparing documents.

c. Budget reductions from Congress after 35% design estimate is submitted.

d. Additional features added during design.

e. Reluctance to reprogram.

f. Architectural emphasis or features.

g. A-E doesn't design to scope.

h. Historical practices, "We've always done it this way" syndrome.

i. Design process.

Installation Interests:

- a. Give user project within scope and in a timely manner.
- b. Submit more accurate 35% design estimate. Provide feedback to user on whether scope is met.

District's Interests:

- a. Satisfied customers.
- b. Repeat business.
- c. Well defined scope and programming documents.
- d. Deliver project within budget.
- e. Special requirements and time restraints.

Recommended Solutions:

- a. Initiate project sooner to identify problems.
- b. Establish better and more communications early in design process.
- c. Address additive alternates early in design process.
- d. Achieve better programming effort through Corps DEH/BCE and user interface.
- e. Look at projects that were a success or failure and analyze the reasons for success or failure.
- f. Recognize unique projects that don't "Fit the Mold".

Group 5:

Original Problem Statement: Adequate on-site inspection during construction.

Restatement of Problem: Improve construction inspection to ensure:

- a. Project performs required function.
- b. User can see that inspector is interested and alert to his needs.
- c. Inspector identifies problems in a timely manner.

District Problems:

- a. Whole contract time is not available for construction.
- b. Poor tools available to force contractor's immediate attention.
- c. Limited supervision and inspection dollars.
- d. Variation between required function of facility and user's perception of need.
- e. Lack of understanding by ultimate user of the system used to provide facility (user does not have same perception as others involved in process).

Installation Interests:

- a. Facility has got to function as designed and as defined by DEH/BCE.
- b. User's perception that job is not being adequately inspected. (User doesn't see or believe the job was inspected).

District Interests:

- a. Integrity of contract must be maintained. (Items not in contract cannot be accomplished without contract modification).
- b. Resident Engineer decides allocation of resources.
- c. Integrity of the Corps/Contractor relationship must be maintained. (The installation should not negotiate directly with Contractor without Corps' knowledge).

Recommended Solutions:

- a. Provide sign/tags indicating facility was inspected.
- b. Provide inspection report to customer stating what was found wrong in facility and providing a time when corrections will be made.
- c. Train Corps inspectors on how to deal with customers who do not have understanding of how system works.
- d. Conduct separate pre-construction meeting with user/customer and explain in great detail when and how facility will be constructed.
- e. Put dated stickers with suspense for correction on deficient equipment, parts, etc.