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	Project Operations PARTNERS AND SUPPORT (WORK MANAGEMENT GUIDANCE AND PROCEDURES)	
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TABLE OF CONTENTS

	Paragraph	Page
CHAPTER 1 - Introduction		
Purpose	1-1	1-1
Applicability	1-2	1-1
References	1-3	1-1
Glossary	1-4	1-3
CHAPTER 2 - Project Manuals		
Reserved.		2-1
CHAPTER 3 - Major Rehabilitation Program		
Purpose	3-1	3-1
Background	3-2	3-1
Rehabilitation Categories	3-3	3-1
Guidance	3-4	3-1
CHAPTER 4 - Program Evaluation Through a Peer Review Process		
Reserved		4-1
CHAPTER 5 - Project Maintenance		
Reserved.		5-1
CHAPTER 6 - Sign Standards Program for Civil Works Projects		
Purpose	6-1	6-1
Background	6-2	6-1
Guidance	6-3	6-1

	Paragraph	Page
CHAPTER 7 - Plant		
Purpose	7-1	7-1
Guidance	7-2	7-1
Section I. Design, Acquisition, and Construction		
Purpose	7-3	7-1
Background	7-4	7-1
Guidance - Improvement Programs and Authorities	7-5	7-1
Guidance - Designs, Plans, and Specifications	7-6	7-5
Guidance - Standards and Inspection of Construction	7-7	7-7
Section II. Floating Plant Identification and Record Information		
Purpose	7-8	7-9
Guidance	7-9	7-9
Descriptive Data	7-10	7-14
Photographs of Plant	7-11	7-19
Vessel Registration	7-12	7-20
Section III. Floating Plant Inspection, Maintenance, Operation, and Repair		
Purpose	7-13	7-20
Guidance	7-14	7-20
Authorities for Acquisition and Repair	7-15	7-25
Section IV. Corps of Engineers Marine Engineering Board		
Purpose	7-16	7-25
Background and Composition	7-17	7-25
Functions of the Board	7-18	7-26
Responsibilities	7-19	7-26
CHAPTER 8 - Corps of Engineers Energy Program (CEEP)		
Reserved.		8-1
CHAPTER 9 - Cooperating Associations Program		
Purpose	9-1	9-1
Guidance - General	9-2	9-1
Guidance - Administration	9-3	9-1
CHAPTER 10 - The Corps of Engineers Volunteer Program		
Purpose	10-1	10-1
Background	10-2	10-1

	Paragraph	Page
Guidance	10-3	10-1
Protection and Benefits	10-4	10-3
Identification	10-5	10-4
Reports	10-6	10-4
Forms	10-7	10-4
CHAPTER 11 - Contributions Program		
Purpose	11-1	11-1
Background	11-2	11-1
Guidance	11-3	11-1
Accounting and Reports	11-4	11-2
Promotion	11-5	11-3
Recognition and Publicity	11-6	11-3
CHAPTER 12 - Challenge Cost-sharing Program		
Purpose	12-1	12-1
Background	12-2	12-1
Guidance	12-3	12-1
Accounting and Reports	12-4	12-2
Promotion	12-5	12-2
Recognition	12-6	12-2
CHAPTER 13 - Civil Works Housing		
Reserved		13-1
CHAPTER 14 - Aquatic Plant Control Program		
Purpose	14-1	14-1
Background	14-2	14-1
Guidance	14-3	14-1
Management Operations	14-4	14-3
Reviews and Reports	14-5	14-3
CHAPTER 15 - Acquisition of Plant, Ownership, and Financial Management		
Reserved.		15-1
CHAPTER 16 - Accessibility		
Reserved.		16-1
APPENDIX A - References		A-1
APPENDIX B - Rehabilitation Evaluation Report		B-1

APPENDIX C - Conceptual Approach for Analyzing Rehabilitation. C-1

APPENDIX D - Introduction to an Assessment of Structural Reliability D-1

APPENDIX E - Benefits Evaluation Procedures E-1

APPENDIX F - Example of Combining Risks and Consequences F-1

APPENDIX G - Examples of Potential Entries and Descriptive Footnotes to Support Table 3-1 of Appendix B. G-1

APPENDIX H - Hydropower Evaluations Considerations H-1

APPENDIX I - Outline of a Typical Design Memorandum for a Hopper Dredge I-1

APPENDIX J - Typical Plant Identification Illustrations J-1

APPENDIX K - Size and Spacing of Identification Designations K-1

APPENDIX L - Agreement Between USACE and US Coast Guard L-1

APPENDIX M - COE Motorboat License- General Requirements M-1

APPENDIX N - Coast Guard Approved Personal Floatation Devices N-1

APPENDIX O - Corps of Engineers Marine Engineering Board Membership O-1

APPENDIX P - Sample Agreement P-1

APPENDIX Q - Sample Cooperating Association Articles of Incorporation and By-Laws Q-1

APPENDIX R - ENG Forms 4880-R, 4881-R, 4882-R and 4883-R
R-1

APPENDIX S - Sample Certificate of Appreciation S-1

APPENDIX T - Sample Challenge Cost-Sharing Financial Work Sheet T-1

APPENDIX U - Sample Challenge Cost-Sharing Agreement U-1

APPENDIX V - Reconnaissance Reports Information Requirements V-1

APPENDIX W - Model Detailed Study Cost-Sharing Agreement W-1

APPENDIX X - Model Local Cooperation Agreement X-1

APPENDIX Y - Information Requirements for Environmental Assessments and Impact Statements Y-1

APPENDIX Z - Minimum Work Requirements Z-1

APPENDIX AA - Annual Work Plans AA-1

CHAPTER 1 - INTRODUCTION

1-1. Purpose. This operations and maintenance (O&M) pamphlet establishes guidance and procedures for the management of activities at U.S. Army Corps of Engineers water resource development projects and supplements Engineer Regulation (ER) 1130-2-500.

1-2. Applicability. This pamphlet is applicable to all USACE commands having responsibility for civil works functions.

1-3. References. See Appendix A.

1-4. Glossary.

a. Accepting official. The accepting official is the Corps staff member designated to accept the services of volunteers and responsible for the proper observance of regulations while services are performed.

b. Hosted worker. A hosted worker is an individual who performs services for the Corps of Engineers for no compensation, but is compensated in some way by another organization or agency. A hosted worker is considered a volunteer.

c. Incidental expenses. Incidental expenses are those out-of-pocket expenses which a volunteer may incur in performing a service for the Corps. Incidental expenses are different from the expenses the Corps would accrue in providing materials or overhead associated with the service a volunteer performs.

d. Voluntary Service. Voluntary service is official Government business, having some value to the Corps, conducted by volunteers under the direction of a paid Corps staff member.

e. Volunteer. A volunteer is any person who performs work for the Corps of Engineers for which he or she receives no pay from the Corps. A volunteer is not an employee of the United States Government except for the purposes of Chapter 171 of Title 28 of the United States Code, relating to tort claims, and Chapter 81 of Title 5 of the United States Code, relating to compensation for work injuries.

CHAPTER 2 - PROJECT MANUALS

Reserved.

CHAPTER 3 - MAJOR REHABILITATION PROJECTS

3-1. Purpose. This chapter establishes guidance for preparation and submission of Major Rehabilitation Project Evaluation Reports for annual program and budget submissions.

3-2. Background. Major rehabilitation projects began to be budgeted under Construction, General and Flood Control, Mississippi River and Tributaries (construction element) appropriation accounts in FY 1993. Major rehabilitation new starts have to compete with other types of new construction starts for scarce resources. To successfully compete as new starts, Rehabilitation Evaluation Reports and supplemental information sheets will have to provide a level of detail and evidence of criticality commensurate with other Civil Works new starts.

3-3. Rehabilitation Categories. Major rehabilitation shall consist of either one or both of two mutually exclusive categories - Reliability or Efficiency Improvement.

a. Reliability:

(1) Rehabilitation is major project feature restoration consisting of structural work on a Corps operated and maintained facility such as a lock, dam, hydropower plant, etc., intended to improve reliability of an existing structure, the result of which will be a deferral of capital expenditures to replace the structure.

(2) Rehabilitation will be considered as an alternative when it can significantly extend the physical life of the feature and can be economically justified by benefit-cost analysis. The work will extend over at least two full construction seasons and will require over $5.0 million in capital outlays; for Inland Navigation Projects initially funded in FY 1994, the reliability threshold will be over $8.0 million.

b. Efficiency Improvement: The Efficiency Improvement category will enhance operational efficiency of major project components. Operational efficiency will increase outputs beyond the original project design. Efficiency Improvements will require over one million dollars funded in FY 1994 in capital outlays on a component which does not exhibit reliability problems.

c. The dollar amounts referred in paragraphs above shall be adjusted annually according to the economic assumption published each year as guidance in the Annual Program and Budget Request for Civil Works Activities of the Corps of Engineers.

3-4. Guidance.

a. Required document preparation. Features recommended for new starts will be complete with PB-2a, project map, and an approved Rehabilitation Evaluation Report. Fifteen copies of the Major Rehabilitation Evaluation Report will be submitted for approval to CECW-AR by 15 March of the BY-2. Preparation guidance for the Rehabilitation Evaluation Report is contained in Appendix B.

b. Rehabilitation will not consist of routine or deferred maintenance, which will continue to be considered in the U.S. Army Corps of Engineers Operation and Maintenance, General budget appropriations.

c. In determining whether project work falls within the dollar thresholds set forth in paragraphs 3-3., the dollar value of work on separate projects shall not be aggregated, even if within the same river or waterway system.

CHAPTER 4 - PROGRAM EVALUATION THROUGH A PEER REVIEW PROCESS

Reserved.

CHAPTER 5 - PROJECT MAINTENANCE

Reserved.

CHAPTER 6 - SIGN STANDARDS PROGRAM FOR CIVIL WORKS PROJECTS

6-1. Purpose. This chapter establishes guidance for the management of the Corps Sign Standards Program.

6-2. Background. The Corps of Engineers Sign Standards Program is designed to provide consistency in signing at Corps Civil Works projects and allow the Corps to present a national image which is easily recognized by the public. The materials, size, typeface, color and legends were adopted after extensive study and testing for distance viewing and clarity of content. Use of the specified signs is intended to result in significant cost savings, enhance visitors' aesthetic experience, and provide additional safety protection.

6-3. Guidance.

a. The U.S. Army Corps of Engineers Sign Standards Manual (EP 310-1-6a and b) is to be used in the planning, design, fabrication, and maintenance of all signs installed at Corps Civil Works projects. The sign legends and formats shown in the Sign Standards Manual have been chosen for ease in understanding, visual appeal, economy of scale, and to comply with legal standards governing tort liability.

b. All caution, warning, and danger signs should be used exactly as shown in the Sign Standards Manual with no changes whatsoever in the wording. Legends for restricted area signs may be approved at the district level. This tight constraint is necessary to provide a safer environment for public use, to reduce overall costs, and to provide national consistency. Requests for exceptions will be considered on a case by case basis with the final decision being made by CECW-ON. All requests will be placed on the "Request Procedure for Non-Standard Safety Signs" form (page 1.13 in the Sign Standards Manual) and must include the proposed new wording, complete justification describing the situation and the reasons the proposed new wording is needed, photographs of any existing signs currently used to solve the problem, maps showing the proposed locations of the signs, and any other materials deemed appropriate. Any requested variation and accompanying justification along with other appropriate materials will be submitted through the chain of command and must be accompanied by concurrences from the district and division sign program managers. These submittals will be made to HQUSACE (CECW-ON).

c. Safety messages will not be placed on "Notice" signs.

d. All signs ordered directly by the Corps, except wood routed signs, flexible sign posts, and porcelain/enamel signs must be ordered from Federal Prison Industries (FPI) or fabricated at in-house sign shops. In those rare instances where FPI grants a waiver, signs may be ordered from a private sector fabricator who can meet Corps standards. Contractors may order signs from Federal Prison Industries or from private sector fabricators who meet Corps standards. Wood routed signs, flexible sign posts and porcelain/enamel signs may be ordered through the normal procurement process from a private sector fabricator or fabricated at in-house sign shops.

e. All signs will be mounted in accordance with the Corps Sign Standards Manual.

f. In those rare instances where it is deemed inappropriate to replace existing identification signs for historical or other reasons, a request for exception must be submitted

through the normal chain of command to HQUSACE (CECW-ON) for consideration. Concurrences from both the district and division sign program managers must accompany the request.

g. Recommended changes to the manual will be submitted through the chain of command with justification by the District Sign Program Manager to the Division Sign Program Manager who is responsible for consolidating and recommending changes to HQUSACE (CECW-ON).

h. The Corps Sign Standards Manual will be updated periodically using the Corps standard change procedure for regulations.

i. Additional copies of the Corps Sign Standards Manual may be obtained from the USACE Publications Depot.

j. The Corps Sign Manager Software should be used as a tool in managing the Corps sign program at the project level.

k. The Corps Sign Standards Manual allows flexibility in selecting low maintenance/low cost substitutes, mounting materials, and anti-theft mounting hardware.

CHAPTER 7 - PLANT

7-1. Purpose. This chapter is comprised of three subchapters and establishes guidance for appropriate aspects of Civil Works plant.

7-2. Guidance.

a. Section I addresses Design, Acquisition, and Construction of USACE plant.

b. Section I addresses Floating Plant Identification and Record Information.

c. Section III addresses Plant Inspection, Maintenance, Operation and Repair.

Section I. Design, Acquisition, and Construction

7-3. Purpose. This section establishes guidance for the design, acquisition, construction, and alteration of all Civil Works plant.

7-4. Background.

a. Design of Civil Works plant and equipment is limited by HQUSACE to those major items which are not readily available on the commercial market or for which manufacturers' standard designs are not suitable for use.

b. Designs for the construction, or alteration of all types of dredges and for other floating plant requiring acquisition authority of HQUSACE, will be submitted to the Marine Engineering Board for a recommendation to the Director of Civil Works and will be prepared by the USACE Marine Design Center, unless an exception is obtained from CECW-OD.

c. General criteria for design and construction, and for maintenance and operation of floating plant of the Corps of Engineers are outlined on sections 7-6 and 7-7 (following) and ER 1130-2-500, Chapter 7, Section 3, Inspection, Maintenance, Operations and Repair, respectively.

7-5. Guidance - Improvement Programs and Authorities.

a. Programs for the Improvement of Plant and Operations Procedures.

(1) Hopper Dredge Improvement Program.

(a) Request for authority to initiate and proceed with development and improvement projects relating to hopper dredges and their operation procedures, including comments and recommendations as to necessity and feasibility, method of accomplishment, financing and suggested assignment, will be submitted to the Commander, HQUSACE (CECW-OD) for approval. All projects and engineering investigations on hopper dredges and dredging requiring the procurement of equipment or fund expenditure for additions and betterments or alteration of plant, will be scheduled in the applicable Acquisition of Plant, Ownership, and Financial Management Program (see ER 1130-2-500, Chapter 15), and authorities will be obtained as outlined in paragraph 8 of that regulation.

(b) MSCs and districts, in carrying out their assigned projects, will make all detailed studies, procure the necessary equipment, conduct all tests, evaluate the results and prepare the necessary reports. The final report will include the design criteria, guide plans, specifications and other information as necessary to facilitate dissemination of the findings. Drafts of all final reports will be coordinated with the Marine Design Center for review and comments. Final reports will be submitted to CECW-OD for review approval prior to publication of the final reports.

(c) The Marine Design Center will provide the necessary technical assistance and will disseminate pertinent findings relating to hopper dredge improvement projects to the applicable MSCs and districts of the Corps. Periodic visits to the work sites by representatives of the Marine Design Center will be made as necessary. Reports by that staff on the scope of proposed tests, design of proposed models, progress of the work and other appropriate technical and informative subjects will be furnished to the Marine Engineering Board and the applicable MSC and district.

(d) Each suggested study and request for authority for the accomplishment of a hopper dredge improvement project shall include at least the following, as applicable:

- A statement of the objective in terms of use, effect to be accomplished, information to be obtained, and other related results anticipated.

- A statement regarding the limitation and deficiencies of present practices.

- An experience record including reports, references, photographs, maintenance, and/or repair costs and other information which will adequately outline related efforts to date and deficiencies of previous attempts at improvement.

- A firm justification for the proposed project based on improvements in hopper dredging efficiency, economic benefits and safety considerations.

- A program outline suggesting an approach to the problem, tests to be conducted, availability of qualified contractors, availability of qualified field personnel, etc.

- Recommendations regarding the proposed method of financing.

- Upon receipt of assignment of a hopper dredge or dredging improvement task, the District Engineer will prepare a plan and schedule which shall include the complete description of salient details, scheduled commencement and completion dates of the principal phases of the assignment and an estimate of quarterly expenditures.

- Quarterly status reports for all projects will be prepared by the Marine Design Center in accordance with the reporting procedures established by the Marine Engineering Board for project management.

(2) Other Plant Improvement Programs (excluding hopper dredges). Any study or investigation of an innovation, experiment, modification, alteration or betterment which is proposed to provide a significant improvement or change in a recognized concept relating to the subject plant will be submitted to CECW-OD for approval. The initial report after authorization will contain sufficient information to describe the nature, purpose, benefits expected, and the

basis for considering the feasibility of the improvement undertaken. After completion or trials and/or tests of the improvement, a completion report will be furnished CECW-OD describing the

results obtained, whether favorable or unfavorable. In selected cases, the reports will be distributed by CECW-OD to all MSCs which may have a requirement for the improvement developed.

b. Corps of Engineers Marine Engineering Board. The policy and guidance for the Marine Engineering Board are contained in Chapter 8 of ER 1530-2-520, and EP 1130-2-520.

c. Authority for the Acquisition of Land, Structures, Aircraft, Floating Plant, Land Plant, Tools, Automatic Data Processing Equipment (ADPE), Office Furniture and Equipment. Delegations of authority for acquisition by purchase, construction, and transfer or loan from other Federal agencies are tabulated below. All requests for acquisition of Revolving Fund equipment not included in an approved Plant Replacement and Improvement Program will be submitted to the Commander, HQUSACE (CECW-OM-B) for approval. Cost computations for this purpose should be based on total charge to the asset account. No additional authorities are required for acquisition of project owned equipment which is listed as an approved item in a DETAILED PROJECT SCHEDULE ENG Form 2201a (PB-2a).

(1) Land. No delegation of authority.

(2) Structures.

(a) MSC Commander. If cost is $25,000 or more, but less than $400,000 for any building or structure.

(b) District Commander. Up to fifty percent (50%) of the MSC Commander's delegated authority.

(3) Airplanes. No delegation of Authority.

(4) Dredges. No delegation of authority.

(5) Other Floating Plant.

(a) MSC Commander. If cost is $25,000 or more but less than $400,000 per unit.

(b) District Commander. Up to fifty percent (50%) of the MSC Commander's delegated authority.

(c) Plant Acquired on a Loan Basis from Other Federal Agencies. MSCs acquiring floating plant on a loan basis from other Federal Agencies shall assure that the borrowed units are operated, maintained and reported in accordance with the provisions of the loan agreements covering this plant, and that all major modifications thereto are coordinated in advance with the owning agency through CECW-OD. CECW-OD will be notified annually of floating plant items on loan from another agency. (Exempt report, paragraph 7-20, AR 335-15).

(d) Renewal of Loan Agreements. When the provisions of a loan agreement with another Federal agency require periodic renewal of that loan, the renewal request shall be forwarded directly to the owning agency, with a copy to CECW-OD, at least 60 days prior to the end of the load period established by the owning agency. The request shall include the name of the District processing the plant; date of expiration of the loan period; and proper type designation, using descriptive nomenclature utilized by the owning agency, as well as name or number assigned.

(6) Land Plant and Facilities. Mobile and Fixed Land Plant & Equipment.

(a) MSC Commander. If cost is more than $25,000 but less than $200,000 per unit.

(b) District Commander. Up to fifty percent (50%) of the MSC Commander's delegated authority.

(7) Tools, Office Furniture and Equipment for General District use for Continuous Assignment to Plant and Facilities.

(a) Definition. General Office Use. See Paragraph 15-5b, ER 37-2-10.

(b) Delegation of Authority.

- MSC Commander. If cost is more than $25,000 and less than $200,000 per unit.

- District Commander. Up to fifty percent (50%) of the MSC Commander's delegated authority.

d. Authority for Additions and Betterments.

(1) Definition. See Chapter 15, ER 37-2-10.

(2) General. Except as delegated herein, authority will be obtained from the Commander, HQUSACE (CECW-O) for additions and betterments to Revolving Fund owned Land, Structures, and Operating Equipment such as airplanes, floating plant, mobile land plant, fixed land plant (see Chapter 15, ER 37-2-10), including the purchase and installation of equipment and machinery which is in the nature of an addition and betterment and not a replacement.

(3) Operating Equipment Under the Revolving Fund. (Airplanes, Dredges, Other Floating Plant, Mobile Land Plant, and Fixed Land Plant, ADP, etc.)

(a) Dredges. Authority is delegated to MSC Commanders, if the total cost of all additions and betterments per dredge is less than $200,000 per year.

(b) Other Operating Equipment. Authority is delegated to MSC Commanders, if cost per item of plant is less than $200,000 per year or fifty per cent (50%) of the current book value of the plant, whichever is less.

(c) Redelegation of Authority. MSC Commanders are authorized to redelegate to District Commanders up to fifty percent (50%) of the foregoing authorities.

(d) Additions and Betterments. All requests for additions and betterments to dredges and floating plant will be accompanied by properly executed ENG Form 1475 (and 1475A) either

independently or with information incorporated on the forms used for authorization of repairs and replacements. Additions and betterments accomplished during the preceding fiscal year will also be shown on the form in the same manner required for reporting repairs and replacements. Request for authority will be coordinated with the Acquisition of Plant, Ownership, and Financial Management, ER 1130-2-500, Chapter 15.

(4) Land, Structures and Utilities.

(a) MSC Commander. Authority is delegated to MSC commanders, if the cost of improvement and betterment is less than $200,000 for any one building or structure.

(b) District Commander. Authority is delegated to district commanders, up to fifty percent (50%) of the MSC Commander's delegated authority.

7-6. Guidance - Designs, Plans, and Specifications.

a. In the design and construction of all types of plant, applicable provisions of the Safety and Health Requirements Manual, EM 385-1-1, will be complied with unless an exception is granted by HQUSACE.

b. Submission of Requests for Acquisition, Alterations or Additions or Betterment Authority.

(1) Requests for authority for the acquisition or alteration or Revolving Fund owned aircraft, floating and land plant, and equipment, when required, will be submitted to the Commander, HQUSACE (CECW-OM-B), with the following information:

(a) Acquisition of Plant, Ownership, and Financial Management Program reference or recommended adjustment to the Plant Program.

(b) Proposed method of acquisition (construction, purchase or transfer).

(c) A complete description of the plant to be acquired or the alteration to be made will be furnished. If acquisition is to be by procurement or transfer, description will include basic characteristics, descriptive literatures, estimated cost, proposed use, and economic justification. If acquisition is to be by construction, the general characteristics, design criteria, preliminary estimate of cost, and economic justification will be furnished. Design of major floating plant by other than Marine Design Center will be fully justified.

(2) Design Memorandums will be submitted through the Marine Engineering Board to HQUSACE for approval of all plant to be acquired by construction, unless otherwise specified in the HQUSACE correspondence authorizing construction. Design memorandums for major alterations will be prepared when requested in HQUSACE construction authorizations. All design memorandums will be prepared by the Marine Design Center unless a waiver is obtained. The scope and coverage of each Design Memorandum will be determined by the design organization, in coordination with the procuring office, to adequately reflect the complexity of the plant involved. Attached as Appendix I is an outline of a typical design memorandum for a Hopper Dredge to be used as a format guide. Design memorandums for smaller items of plant need not be so detailed but should follow the applicable sections of Appendix I and contain the following:

(a) Authorization

(b) Proposed service and use, including number of shifts and number of months plant will be worked.

(c) Pertinent physical data.

(d) Special construction requirements and equipment.

(e) Design and Construction Cost Estimates.

(f) Design and Construction Schedules.

(g) Normal and special performance requirements.

(h) Estimated monthly operating costs.

(i) Recommendations, including justification data.

(3) Requests for authority for the acquisition of land and acquisition and/or major alterations of structures will include or be accompanied by:

(a) Site map.

(b) General plans and description.

(c) Estimate of cost, to include all appurtenances except tools and shop equipment.

(d) Proposed dates for preparation of detailed plans and specifications.

(e) Approximate date desired to commence construction, and total estimated construction period.

(f) Availability of funds for completion of plans and for construction.

c. Preparation and Approval of Plans and Specifications.

(1) The preparation and approval of plans and specifications for the construction and/or alteration of all plant and equipment will be in accordance with the provisions stated below. Where design memorandums are required, plans and specifications will be based upon the provisions of the approved design memorandums.

(2) Plans and specifications for floating plant within the MSC Commander delegation of authority (paragraph 7-5.d) will be prepared by, or under the jurisdiction of the using District and approved by the MSC Commander having jurisdiction. However, all designs incorporating inboard mounted internal combustion engines will be forwarded to the Marine Design Center for review and comment prior to advertising. Vessels less than 26 feet in length may be excepted from this review provided certification can be furnished that construction will be in compliance with applicable standards of the American Boat and Yacht Council (ABYC). This review will include evaluation of safety equipment and requirements along with the mechanical, electrical,

and structural details of the plant. A copy of the final plans, specification, and shop drawings will be furnished directly to the Marine Design Center for information and record purposes.

(3) Plans and specifications for floating plant for which an exception has been granted under (2) above will be prepared by, or under the supervision of the using District and approved by the MSC Commander having the jurisdiction. A copy of the approved plans and specifications will be furnished the Marine Design Center for review and comment prior to advertising. A copy

of final plans and specifications as issued for advertising purposes will be furnished the Marine Design Center for information and record purposes.

d. Structures. Plans and specifications for structures to be constructed or modified, within MSC Commander delegation of authority (paragraph 7-5.d. above) will be prepared by, or under the jurisdiction of, the using District and approved by the MSC Commander having jurisdiction. HQUSACE will review plans and specification for structures requiring approval for acquisition, construction or modification.

e. Disposal of Floating Plant. No item of floating plant, having an original cost of $50,000 or more, shall be sold, transferred, declare excess, or otherwise disposed of, without obtaining prior authority from HQUSACE, CECW-OD.

7-7. Guidance - Standards and Inspection of Construction.

a. Construction of new floating plant and replacements and alterations to existing plant will be in accordance with the applicable current rules of the American Bureau of Shipping, the rules and regulations of the U.S. Coast Guard, the rules of the U.S. Public Health Services, and the American Boat and Yacht Council, as applicable.

(1) All major floating plant will comply with U.S. Coast Guard rules and regulations and other applicable regulations as contained in Title 46 Code of Federal Regulations.

(2) In board mounted internal combustion engines on Corps of Engineer vessels whether for propulsion or auxiliary power requirements shall not be of the type requiring gasoline or other highly volatile fuels for operation unless authorized by the Commander, HQUSACE (CECW-OD).

b. District Commanders will make arrangements direct with representatives of the U.S. Coast Guard for the time, place and other details of inspection and certification of floating plant. Any deficiencies reported by the inspectors shall be corrected without delay in order that the required certificate may be issued. Difference in interpretation of the rules and regulations which cannot be resolved at local level shall be referred to CECW-OD for coordination with the Commandant, U.S. Coast Guard.

c. The color scheme as set forth below will be used for the exterior painting of all Corps of Engineers major floating plant. Skiffs, rowboats, launches, small boats and other similar craft which are mass produced in standard colors and which would require substantial additional costs to comply with the Corps' color scheme, are exempt from these requirements. Numbers in parentheses refer to color spots and supplemental color chips as shown in Federal Standard No. 595, COLORS, and are included in order to define the particular shade and intensity of color desired. Slight variations in the shades shown, resulting from standards determined and approved at Division level, utilization of existing stocks, or local procurement practices, are acceptable. However, in the interest of uniformity, efforts will be made to comply as closely as practicable with the colors as defined in this regulation.

(1) Hull above water-line: Black (17038).

(2) Steel decks: Deck Red. (10076) Except that where special types of deck coatings have been approved for use, the resultant color will be acceptable.

(3) Deck Fittings: Yellow (13655).

(4) Houses: Deck house will be old ivory (17855) with red (11136) margin facings. As an option, a band of slate grey (16187) may be applied on the deck house extending 36 inches above deck or along the line of bottom window frames.

(5) Interior of cowls: Red (11136).

(6) Smoke and exhaust stacks: Black (17038) (heat-resisting paint) with red (11136) band, trimmed with aluminum, and with castle in aluminum. The width of the red band will be twice the height of the castle with 6-inch aluminum bands above and below the red. The communication mark (castle) should be mounted on the outboard side of the stack(s).

(7) Galley Stack: Black (17038) (heat-resisting paint).

(8) Masts, kingposts, ventilators, cowls, boat davits, deck tanks, "A" frames, gallows frames, spud frames and back legs, derricks and cranes. Old ivory (17855) to match deckhouse exterior. An optional band of slate grey (16187) can be used as specified in para 7-7c(4) above.

(9) Staffs and booms: Old ivory (17855) except as noted in (8) above.

(10) Life rafts and lifeboats: Old ivory (17855) and red (11136) margin facings.

(11) Parts of plant as specified in (8), (9), and (10) above may be painted black or slate gray if experience has proved that the old ivory causes reflection of light and attendant glare upon the vision of the navigator or operator. Some parts may also be painted black or slate gray if on hurricane deck, or in locations where experience has proved that frequent scrubbing and painting will not keep these clean or present an appearance similar to the remainder of the plant due to soot and smoke from stacks and exhausts.

(12) Booms, "A" frames, and other parts of dipper dredges, derrick-boats and similar plant, likely to be discolored by oil and grease from operating cables or chains: Black (17038).

(13) Forward and after davits for drag pipes on hopper dredges: Black. (Option: Due to discoloration by oil and grease from operating cables: slate gray or aluminum).

(14) Wheel shafts and flanges for paddlewheel boats. Old ivory with wooden parts black.

(15) Suction pipes and sponsons on pipeline and seagoing hopper dredges: Black.

(16) Name board: See ER 1130-2-500, Chapter 7, Section II, Floating Plant Identification and Record Information.

(17) Interiors: Colors of interiors, including interior decks, are optional.

(18) Coaming of hoppers on hopper dredges: Old ivory.

(19) The prescribed coloring will be applied in such a manner as to obtain the most attractive appearance with due regard to serviceability.

(20) The information contained in EM 1110-2-3400 and other pertinent publications should be used to assist in the selection of an appropriate paint system. Paint ingredients may be varied as experience dictates because of climate conditions but final color should match the referenced color spots and supplemental color chips.

Section II. Floating Plant Identification And Record Information

7-8. Purpose. This section establishes guidance for naming, marking, and recording items of Corps of Engineers floating plant.

7-9. Guidance.

a. Names, Numbers or Other Identifications of Floating Plant.

(1) Recommendations for proposed identification will provide at least one and preferably two alternate selections. Adequate basic biographical or other data will be furnished for each selection submitted. Without exception, no item of floating plant will be named in honor of a living person. Ordinarily, only numerical designations will be assigned to barges, scows, flats and minor item of plant such as small boats, skiffs, etc.

(a) Preference will be given to names of deceased officers and employees of the Corps of Engineers, or to waterways or other geographical features of regions in which the items of floating plant are to operate, or historical names directly connected therewith.

(b) Ordinarily, when the name of a deceased person is to be assigned, the use of the surname only is desirable. This view is based on the facts that the surname usually identifies adequately the person so memorialized, simplifies correspondence, reduces upkeep, is easier to comprehend, and assigned full names are rarely utilized in references. Also, the military title held by the deceased person so honored may differ at the time of his/her death from that held when he/she was associated with the locality in which the craft is to be employed.

(2) Historical or geographical names for items of floating plant will be confined to single words wherever practicable. Names which are unwieldy or uncommonly long or which consist of combinations which include physical features such "River", "Bay", "Point", etc., will be avoided.

(3) Whenever an item of floating plant is renamed or renumbered, all official correspondence referring to the vessel will include both the revised and former name or number for a period of 5 years following date of redesignation. One copy of the approving or assigning

document, or the notification of assignment of each vessel designation will be furnished the Commander, HQUSACE, Attention: CECW-OD.

(4) When a newly acquired floating plant item is to carry a name identical to that of the plant which it replaces, the name will be followed by a dash and appropriate Roman Numeral to indicate that it is a replacement, i.e., IOWA-II would be the name for a vessel replacing one named IOWA.

(5) Duplications or close similarities with existing names will be avoided. District Commanders are authorized to assign numbers or combinations of numbers and letters consistent with a uniform numbering procedure for minor items of plant.

b. Standards for Marking Floating Plant.

(1) All floating plant will be appropriately marked for easy identification with only the authorized designation. Acceptable markings for various types of floating plant can be found in Appendix J. Markings may be adjusted for acceptable locations based on vessel design and arrangement as appropriate. Colors that contrast with background coloring will be used for marks. All lettering will be Gothic block capitals and all numbers will be Arabic. Lettering may be painted on, stenciled, inlaid, burned in, welded, attached with studs, etc., to suit. The sizing and spacing of the lettering will preferably be as indicated in Table K-1, Table K-2, and Table K-3 in Appendix K. However, smaller size lettering may be used where the table size results in an impractical or disproportionate arrangement. In no case, will the lettering size be reduced to less than one half the table size, or less than four inches.

(a) Name Boards - General. Name or number of vessel, of suitable size and with at least a one-inch margin at top, bottom and ends of board(s). Name boards will normally have blue background with gold lettering. The material used for this purpose may be patent gold leaf letters with a Prussian blue smalt preparation background, or appropriate modern blue and gold reflective or illuminating paint.

(b) Letters of a color that contrasts with background coloring will universally be used on the hull, life rings, etc.

(c) An uninterrupted appearance of the vessel identification will be obtained by considering all interfering or projecting structural members or fittings, such as port-holes, stanchions, rubbing stakes, fenders, etc.

(2) The Classes of Corps of Engineers floating plant are designated as follows:

Class	Determination
A	vessels under 16'-0" in length overall
1	vessels 16'-0" or over in length overall but less than 26'-0"
2	vessels 26'-0" or over in length overall but less than 40'-0"
3	vessels 40'-0" or over in length overall but less than 65'-0"
4	vessels 65'-0" or over in length overall

c. Class 3 and Class 4 Self-Propelled Plant.

(1) Name Boards. Names of vessels will be displayed on name boards located above the weather deck on both port and starboard sides preferably abreast of, or on top of, the pilothouse at the outboard rails. Name boards shall be wood or steel or other acceptable product for exterior use and shall be rectangular in shape. The vertical dimension shall be twice the height of the lettering used. The designation marking shall be as indicated in Fig. K-1, Table K-1, page K-1, except that if the resulting name board would be disproportionately large, the lettering may be reduced in height to not less than one-half that specified. The board should have a Prussian blue background with gold color letters, or modern blue background with gold color letters.

(2) Port and Starboard Bows. Identification designation will be displayed on both sides of the bow in the following preferred manner:

CORPS OF ENGINEERS
U.S. ARMY

See Fig. K-2 and Table K-1, page K-1, for preferred six lettering and spacing. Where the above arrangement is not practical, a single line may be used as follows:

CORPS OF ENGINEERS U.S. ARMY

See Fig. K-3, Table K-1, page K-1, for preferred size lettering.

(3) Stern. Identification on, or on the port and starboard sides near the stern will be as indicated below. The preferred method of indication is three lines with letters centered on the stern of the hull. See Fig. K-4, Table K-2, page K-2, for size lettering and spacing.

NAME OF VESSEL
CORPS OF ENGINEERS
U.S. ARMY

An acceptable alternate lettering arrangement will be as indicated below.

NAME OF VESSEL
CORPS OF ENGINEERS U.S. ARMY

See Fig. K-5, Table K-2, page K-2, for size lettering and spacing.

In cases where the above identification on the hull at the stern is impractical, a name board facing aft mounted above the weather deck or above the next highest deck in the vicinity of the stern may be used.

(4) Plaques. Self-propelled plant 65'-0", or more, in length (Class 4 vessels), may be equipped with a plaque mounted inside the deckhouse in a conspicuous place such as a main passageway, recreation room or mess room, etc. The plaque should be not less than 8" x 10 ½" minimum dimensions and include the name of the vessel and biography of the person for whom the vessel is named, or a brief historical statement of the geographical location, when so named.

d. Class 3 and Class 4 Non-Propelled Plant. Non-propelled vessels with ship-shaped hulls shall have exterior designation markings as specified for Class 3 and Class 4 self-propelled plant.

e. Class A, Class 1 and Class 2 Plant.

(1) With Pilothouse.

(a) Name or Number Designation. Small plant with a pilothouse shall have name boards on top of the pilothouse, port and starboard, with the name or number as required. See Fig. K-1, and Table K-1, page K-1, for size lettering and spacing.

(b) Port and Starboard Bows. Small plant with a pilothouse shall have the designations on each side of the bow as follows:

CORPS OF ENGINEERS
U.S. ARMY

See Fig. K-4, Table K-2, page K-2, for size lettering and spacing. An alternative acceptable method will be as follows:

CORPS OF ENGINEERS U.S. ARMY

See Fig. K-5, Table K-2, page K-2, for size letters.

The name, number of Corps of Engineers, U.S. Army designation shall be placed three-fourths of the height between the loaded waterline and the top of the forward gunwale, deck or bulwark and approximately 18 inches or more back from the stern or forwardmost part of the hull, will be as indicated below.

(c) Stern Designation. Identification, centered on the above water portion of the vertical or sloping stern of the hull, will be as indicated below. The preferred method is three lines.

NAME OR NUMBER
CORPS OF ENGINEERS
U.S. ARMY

See Fig. K-4, Table K-2, page K-2, for size lettering and spacing.

NAME OR NUMBER
CORPS OF ENGINEERS U.S. ARMY

See Fig. K-5, Table K-2, page K-2, for size lettering and spacing.

(2) Without Pilothouse.

(a) Name or Number Designation. Small plant with no distinct pilothouse shall have the name or number of the vessel on the bow, port and starboard in letters not less than 4" high.

(b) Stern Designation. See 7-9.e.(1)(c), above.

(3) In those cases where the above identification on the stern is impractical, a name board facing aft mounted above the deck in the vicinity of the stern will be used, or in the case of a tug, the designation may be centered on the aft bulkhead of the house.

(4) Vehicles designated by numbers rather than names shall not use the prefix "No" or "CE" ahead of the number.

(5) Launches and small boats on Class 3 and Class 4 plant will have the name of the plant on the port and starboard bows applied with the procedure noted in 7-9.e.(1)(b) above, and across the stern, or on the port and starboard sides, the designation shall be as stated in 7-9.e.(2)(a), above. Where more than one boat exists on the plant, they will be designated after the name with a Roman numeral dash I and dash II.

f. Barges.

(1) Barges with Long Deckhouses. When the length of the deckhouse is more than one-half the length of the hull of a double or single raked barge, the numerical designation of the barge will be indicated on the house sides port and starboard near the ends. The size of the barge numbers will be indicated in Fig. K-7, Table K-3, page K-3. On the longitudinal center of the

house above the doors and/or windows the markings will preferably be in two lines as follows with the size and spacing of the lines as shown in Fig. K-8, Table K-3, page K-3.

CORPS OF ENGINEERS
U.S. ARMY

An accepted alternative will be a single line as follows with the size lettering as indicated in Fig. K-6, Table K-3, page K-3.

CORPS OF ENGINEERS U.S. ARMY

No designation will be applied to the hull proper.

(2) Barges with Deckhouse One-Quarter to One-Half Barge Length. When the length of a deckhouse is one-quarter to and including one-half of the overall length of the hull of a double or single raked barge, the designation will be as shown below:

BARGE NUMBER
CORPS OF ENGINEERS
U.S. ARMY

Size of lettering and spacing will be as indicated in Fig. K-7, Table K-3, page K-3, and shall be centered longitudinally on the port and starboard sides of the house and athwartship at the forward and aft sides of the house. No markings will be applied to the hull proper.

(3) Barges with Deckhouses Less Than One-Quarter Barge Length. When the length of the deckhouse is less than one-quarter of the overall length of a double or single raked barge, the barge number and markings similar to those of Fig. K-7, Table K-3, page K-3, will be centered on the aft end of the house only. In addition, the hull of the barge will have the number and designation markings similar to those for a single or double raked hull as applicable. The size of the lettering will be as indicated in Fig. K-6, Table K-3, page K-3.

(4) Flat Deck Barges. Barges with a rake at each end of the hull and without any appurtenances above the deck such as cargo bins, bulwarks, deckhouses, etc., will have the number of the barge on the sides at each end port and starboard. One line designation "CORPS OF ENGINEERS, U.S. ARMY" will be centered longitudinally at amidships, port and starboard. The markings will be centered vertically preferably at 12 inches below the deck at side. Identification designations will not be applied to rubbing strips or fenders. The size of the designation will be as shown in Fig. K-6, Table K-3, page K-3. If sufficient space is not available on the sides at the ends for the number designation, the size of the number designation may be reduced to not less than one-half the size of the markings at amidships, but not less than 4" in height.

- Barges with a single rake at one end of the hull shall have the number designation on the side at the bow, port and starboard. One line designation "CORPS OF ENGINEERS, U.S. ARMY" shall be on the side, port and starboard at the stern. See Fig. 6, Table 3, page K-3, for size of the designations.

- No designation markings shall be applied to the transverse forward or aft ends of either a single or double raked barge hull.

(5) Barges with Cargo Bins and/or Bulwarks. Barges with a rake at each end of the hull and cargo bins or bulwarks above the deck shall have designation markings similar to that for flat deck barged with a rake at each end, except that the markings shall be located near the top of the cargo bin or bulwarks in lieu of on the hull proper. See Fig. K-6, Table K-3, page K-3, for size lettering. In addition, the designation in a single line "CORPS OF ENGINEERS, U.S. ARMY" with size lettering as shown in Fig. K-6, Table K-3, page K-3, shall be located on the forward and aft transverse ends of the cargo bins and/or bulwarks. In lieu of the single line designation a double line markings may be used of the forward and after transverse ends of the bins and/or bulwarks with size lettering and spacing to be as shown on Fig. K-8, Table K-3, page K-3.

(6) Barges with a rake at one end of the hull and with a cargo bin and/or bulwark on the deck, will have the designation markings as specified for single-rake flat deck barges with a rake at one end except that the markings shall be located port and starboard near the top of the longitudinal sides of the bin or bulwark. See Fig. K-6, Table K-3, page K-3. In addition, the forward and after transverse ends of the bins or bulwarks will have the designation markings as specified above for the double raked barges with bins or bulwarks.

(7) Crane Barges. The crane with no deckhouse will have number and designation markings as specified for double or single raked hulls of flat deck barges as applicable. In addition, the designation shown below and as in Fig. K-7, page K-3, will be centered on both sides of the crane cab.

NUMBER OF BARGE
CORPS OF ENGINEERS
U.S. ARMY

Crane barges with deckhouses will have number and designation markings as specified under preceding paragraph for barges with long or short deckhouses as applicable plus the crane markings indicated above on both sides of the crane.

(8) Fuel Barges. Oil barges will have number and designation markings similar to those specified for flat deck barges with single or double rakes as applicable.

7-10. Descriptive Data.

a. Whenever items of floating plant, both Revolving Fund and Project owned, of the types indicated below are constructed or otherwise acquired, data thereon will be compiled on the applicable ENG Form 33A through E, "Description of Plant", and a copy thereof shall be transmitted to HQUSACE, Attention: CECW-OD within 30 days after the plant is placed in service. In the event alterations made to plant require correction of data previously submitted, copies of revised forms will be transmitted within 30 days after completion of the alterations.

b. Applicable forms for submission of data are as follows:

ENG Form 33A - Seagoing hopper dredges, sidecaster dredges and vessels resulting from the conversion of hopper dredges.

ENG Form 33B - Hydraulic pipeline dredges and booster barges.

ENG Form 33C - Dipper and bucket dredges, derrickboats, maneuver boats, piledrivers, graders, drill boats and jet probing barges.

ENG Form 33D - Towboats, tugs, tenders, survey boats, patrol boats, launches, snagboats, fireboats, and hyacinth plant.

ENG Form 33E - Dump scows, quarterboats, and barges.

c. Stocks of ENG Forms 33A through E will be requisitioned from the Corps of Engineers Publications Depot as needed.

d. In order that the information entered on the forms may be directly comparable for evaluation and design purposes, the following definitions are provided for those items where differences in interpretation may occur. Where definitions of terms are not provided, entries required are considered to be self-explanatory. Information entered on "Description of Plant" cards for new or altered plant requiring resubmission of data shall be in accordance with the following definitions, with local entry of supplemental wording as necessary.

(1) DATE: In lieu of single line entry at top of card to show date of submittal, show two line items as follows:

Date of Original Submittal _____19___
Date of Revised Submittal _____19___

(2) LENGTH OVERALL: ENG Forms 33A and 33E - The overall length of the hull proper from bow to stern measured from outside to outside of plating, fenders, or other permanently installed structure which is part of the hull.

ENG Form 33B - Same as for 33A and E above, except that where vessel is fitted with sternwheel, dustpan, or cutter head and ladder or other such appurtenance, the distance from the forwardmost end of the cutter or dustpan head, when the ladder is in stowed position, to the aftermost fixed hull structure, sternwheel, or wheel support.

ENG Form 33C - Same as for 33B above, except that for vessels fitted with a fixed A-frame or boom which overhangs the hull, the distance from the forwardmost point of this structure, in stowed position, to the aftermost fixed hull structure.

ENG Form 33D - Same as for 33A and E above except that where cutting blades are installed as in the case of hyacinth plant or where towing knees are installed, the overall length shall include these items or other like items which are an integral part of the vessel.

(3) LENGTH BETWEEN PERPENDICULARS: ENG Forms 33A and 33D, as applicable - The distance between the forward perpendicular and the after perpendicular defined on the lines plan as the LBP, or the molded length.

(4) LENGTH OF HULL: ENG Forms 33B through 33E - The length of the hull proper, from inside to inside of hull plating on metal boats, or from outside to outside of planking on wood boats, but not including fenders, towing knees or other appurtenances on the wood hull.

(5) BEAM, MOLDED: ENG Form 33A - The maximum hull width, amidship, measured from inside to inside of shell plating.

(6) BEAM, OVERALL: ENG Forms 33B through 33E - The maximum width of the vessel measured from the outside to outside of plating, planking, fenders or other permanently installed structure which is part of the hull.

(7) DEPTH AMIDSHIP, MOLDED: ENG Forms 33A through 33E - The depth of the hull, amidships, measured from the underside of the bulkhead deck plating (or planking) to the molded base line.

(8) DISPLACEMENT, LIGHT - LONG TONS:

(a) ENG Forms 33A - The weight, in long tons (2240 pounds), of the vessel complete and ready for service. It includes: water in boilers to steaming level; lubricating oil, fuel oil and water in machinery, fire, sanitary, and fuel lines; and water in suction pipes, dredge pumps, and hopper discharge system, as would obtain after the dredge had stopped pumping water, the drags raised to the stowed position, and the hoppers completely unwatered. It also includes the weight of all engine room spare parts, boatswains and deck stores, mattresses and bedding, the weight of all life boats, rafts and floats fully provisioned, and the weight of any permanently installed ballast. The light ship weight does not include the weight of fuel oil or lubricating oil in settling or storage tanks, fresh water in potable, culinary or feed water tanks, consumable refrigerated dry stores, the crew, nor their personal effects.

(b) ENG Form 33B - Same as 33A, except that in the case of hydraulic pipeline dredges, booster barges, the light ship weight will include the weight of residual water in the suction and discharge lines and in the pumps to a level which would obtain upon shutting down after pumping water. Spuds should be considered raised and, in the case of dredges, the ladder shall also be considered raised to the stowed position.

(c) ENG Forms 33C through 33E - Same as 33A or 33B, as applicable.

(9) DISPLACEMENT, LOADED:

(a) ENG Form 33A - The weight in long tons (2240 pounds) of the ship in light condition, plus the normal loading of fuel oil, lubricating oil, water, consumables, crew and effects, and hopper spaces filled to normal overflow capacity with material considered to have a density of 125#/cu. ft.

(b) ENG Form 33B - The weight, in long tons, of the light ship plus the normal loading of fuel oil, lubricating oil, water, crew and effects. Spuds and ladder shall be considered lowered to maximum working positions.

(c) ENG Form 33C through 33E - Same as 33B, except that in the case of water, oil, and cargo barges, the loaded displacement shall include the weight of cargo based on the design capacity of the vessel.

(10) KEEL, DRAFT, LIGHT, FORWARD, F.W. OR S.W.:

(a) ENG Form 33A - The light draft forward shall be reported as the mean of the port and starboard drafts as read from the forward draft marks to the nearest ½ inch with the vessel in the condition as reported under DISPLACEMENT, LIGHT. Show by deletion of non-applicable designation whether drafts as read apply to fresh (F.W.) or salt water (S.W.).

(b) ENG Forms 33B through 33E - Same as for ENG Form 33A.

(11) KEEL, DRAFT, LIGHT, AFT, F.W. OR S.W.:

(a) ENG Form 33A - The light draft aft shall be reported as the mean of the port and starboard drafts as measured from the after draft marks to the nearest ½ inch with the vessel in the condition as reported under DISPLACEMENT, LIGHT. Show by deletion of non-applicable designation whether drafts as read apply to fresh or salt water.

(b) ENG Forms 33B through 33E - Same as for ENG Form 33A.

(12) KEEL, DRAFT, LOADED, FORWARD, F.W. OR S.W.:

(a) ENG Form 33A - The loaded draft forward shall be reported as the mean of the port and starboard drafts as read from the forward draft marks to the nearest ½ inch with the vessel in the condition as reported under DISPLACEMENT, LIGHT. Show by deletion of non-applicable designation whether drafts as read apply to fresh or salt water. Show normal capacity in cubic yards of 125#/cu. ft. material in hoppers.

(b) ENG Forms 33B through 33E - Same as for ENG Form 33A as applicable.

(13) KEEL, DRAFT, LOADED, AFT, F.W. OR S.W.:

(a) ENG Form 33A - The loaded draft aft shall be reported as the mean of the port and starboard drafts as read from the after draft marks to the nearest ½ inch with the vessel in the condition as reported under DISPLACEMENT, LIGHT. Show by deletion of non-applicable designation whether drafts as read apply to fresh or salt water. Show normal capacity in cubic yards of 125#/cu. ft. material in hoppers.

(b) ENG Forms 33B through 33E - Same as for ENG Form 33A as applicable.

(14) MATERIAL OF HULL:

(a) ENG Form 33A - Show the principal structural material, or combination of principal structural materials, used in the fabrication of the house or superstructure.

(b) ENG Forms 33B through 33E - Same as for ENG Form 33A as applicable.

(15) WHEN BUILT: ENG Forms 33A through 33E - Show month and year of completion of original construction and also show, as necessary, month and year of completion of major conversion.

(16) WHERE BUILT: ENG Forms 33A through 33E - Show city and state of site of original construction.

(17) BUILDER: ENG Forms 33A through 33E - Show name of contractor, or indicate if built with Government plant and hired labor.

(18) PURCHASED OR ACQUIRED FROM: ENG Forms 33B through 33E - Show builder if vessel was contracted for, or show previous owner or owning district if vessel acquired by direct purchase, transfer, or loan. Show date (month and year) of transaction.

(19) CONSTRUCTION COST: ENG Forms 33A through 33E - For vessels acquired as a result of a construction contract, show total of funds paid to the contractor for vessel as delivered.

(20) PURCHASE PRICE: ENG Forms 33B through 33E - For vessels acquired by other than construction contract, show total of funds expended for the vessel as acquired.

(21) OTHER FIRST COSTS: ENG Forms 33A through 33E - Show total of all costs, other than construction or purchase costs, expended to date the plant was put into productive service. The total of construction cost or purchase price plus other first costs will equal the figure shown under Item 3, Original Cost, on Form 22 (Costs).

(22) COST TO DATE: ENG Forms 33A through 33E - Show total of construction or purchase costs, other first costs, and all other costs of additions and betterments or alteration costs to date of latest submittal of Description of Plant card.

(23) GROSS TONNAGE: ENG Forms 33A through 33D - Show U.S. gross tonnage.

(24) NET TONNAGE: ENG Forms 33A through 33D - Show U.S. net tonnage.

(25) CREW REQUIRED:

(a) ONE SHIFT OPERATION: ENG Forms 33A through 33E - Show total number of personnel formally required for a nominal eight-hour day, five-day week operation while vessel is utilized in its normal function.

(b) THREE SHIFT OPERATION: ENG Forms 33A through 33E - Show total number of personnel formally required for a 24 hour day, seven-day week operation while vessel is utilized in its normal function.

(26) ACCOMMODATIONS OF VESSEL:

(a) OFFICERS: ENG Forms 33A through 33E - Show number of berths provided for and assigned specifically for use by officers. Also show in parentheses the additional officer berths provided as spares.

(b) CREW: ENG Forms 33A through 33E - Show number of berths provided for and assigned specifically for use by members of the crew. Also show in parentheses the additional crew berths provided as spares.

(27) UNWATERING: ENG Form 33A - Indicate "yes" or "none" whether hopper unwatering system is installed on vessel.

(28) DEGASSING: ENG Form 33A - Indicate by type of system or "none" whether degassing system is installed on vessel.

(29) RADIO CALL LETTERS: ENG Forms 33A through 33E - Show assigned radio call letters.

(30) RADAR: ENG Forms 33A through 33E - If vessel is equipped with radar, show manufacturer's name and equipment designation; if no radar, so indicate.

(31) HOPPERS, NUMBER: ENG Form 33A - Show number of individual hopper spaces as defined by the principal longitudinal and transverse hopper bulkheads.

(32) TOTAL CAPACITY IN CUBIC YARDS: ENG Form 33A - Show both normal capacity without flash boards, and show in parentheses the total capacity with flash boards in place.

(33) DRAGS:

(a) NUMBER: ENG Form 33A - Self-explanatory.

(b) LOCATION: ENG Form 33A - Show distance from amidships to center line of trunnion in feet.

(c) TYPE: ENG Form 33A - Show type of draghead used in normal service in the owning district.

(34) CRUISING RANGE: Show the estimated maximum distance, in status miles, that the vessel can run on its full bunker capacity.

(35) TYPE OF PLANT - OWNERSHIP: ENG Forms 33B through 33E - In addition to defining the type of plant, show in same space either ownership under Revolving Fund or ownership by specific project, identified by project name.

(36) VERTICAL CLEARANCE REQUIRED: The maximum height of a vessel, above the waterline, for bridge clearance purposes. This height shall be measured to the highest fixed point of the vessel in the light condition. Moveable masts, A-frames, booms, antennae, etc. shall be in a lowered position in determining this figure.

NOTE: All other information required on both front and back of all ENG Forms 33 Series is factual to the extent that no definition of terms appears necessary. The information entered should, however, be as complete as possible and should show horsepower, voltage, amperage, dimensions, etc. as rated and shown by the equipment manufacturer of the device installed.

7-11. Photographs of Plant. Whenever items of floating plant, Revolving Fund and Project owned, of the types listed in para. 7-12 below are constructed or otherwise acquired, record photographs shall be made and submitted to HQUSACE, Attention: CECW-OD.

7-12. Vessel Registration. When a vessel is purchased or otherwise acquired, the District Commander shall determine the requirements for registering the vessel with the United States Coast Guard (USCG), American Bureau of Shipping (ABS), and the United States Public Health Service (USPHS).

Section III. Floating Plant Inspection, Maintenance, Operation, and Repair

7-13. Purpose. This section establishes guidance for the inspection, maintenance, operation, and repair of Civil Works Revolving Fund and Project-owned floating plant.

7-14. Guidance.

a. Inspection.

(1) District Commanders shall arrange for inspection and certification by the U.S. Coast Guard (USCG) Officer in Charge of Marine Inspection (OCMI) of all vessels in accordance with applicable provisions of 46 CFR and the provisions of the Inspection Agreement found in Appendix L unless a waiver is obtained from CECW-OD. Any deficiencies reported by Coast Guard inspectors shall be corrected without delay so that required documents may be obtained. When plant is not in use, inspection and certification is at the option of the District Commander.

(2) All floating plant not covered in paragraph 7-14.a.(1) above, and those for which a waiver has been obtained shall be maintained and operated in accordance with the regulations of the USCG. This requirement does not contemplate registry of such craft with the USCG, American Bureau of Shipping (ABS), and the U.S. Public Health Service (USPHS), nor inspection by the Coast Guard. In lieu of such registry or inspection, each vessel in this category will be initially inspected by a representative of the District Commander to develop the equipment required for safe operation and the permissible number of persons that may be carried on board. This information will be included on an ENG Form 3579, Certification of Inspection, which will be posted near the operating controls of the vessel. An annual inspection of vessels in this category will also be made by a representative of the District Commander to assure conformance with the cited criteria. In cases where it is not practical to post the certificate on the vessel, such as skiffs propelled by outboard motors, the ENG Form will be available at the resident or project office operating the vessel or aboard the major floating plant to which the small craft is assigned.

(3) Floating plant steam boilers and unfired pressure tanks shall be inspected in accordance with USCG Regulations and ASME code. A record of such inspections shall be posted, under glass, in the engine room.

(4) When a major conversion or rehabilitation is accomplished which involves the safety of the vessel, the District Commander shall determine whether an inspection by the Coast Guard is warranted.

(5) All floating plant on which employees are quartered or subsisted, and for which no standards of safety and sanitation are otherwise prescribed, shall be maintained with proper regard for the safety, health and comfort of the employees. All floating plant where persons are quartered or subsisted will be inspected annually by a representative of the District Commander and any deficiencies in maintenance, operation, construction, and equipment will be recorded and corrected promptly. When in operation, such plant will have at least one employee assigned at all times who is directly responsible for protection against fire, theft, or sinking.

(6) Differences which cannot be resolved between the District and the OCMI over Coast Guard inspection regulations or requirements will be referred to the Commander, HQUSACE (CECW-OD) with adequate detail to justify an exemption from inspection or development of a solution with the Commandant, U.S. Coast Guard.

b. Maintenance and Repairs.

(1) All floating plant shall be maintained and repaired to meet the requirements imposed by HQUSACE, applicable provisions of 46 CFR, and the laws of the United States, and any State in which it is operated. Additions, betterments and repairs will be performed in accordance with applicable rules or regulations of HQUSACE, ABS, USCG, and the USPHS.

(2) Survey of Repairs Required.

(a) Floating plant will be evaluated annually to determine which units will require repairs or replacements and/or additions and betterments during the next repair period.

(b) The annual evaluation prescribed in paragraph 7-14.b.(2)(a) above should not be considered a requirement for dry-docking or overhauling a vessel every year. District Commanders should establish varying repair cycles for different items of plant which are based on the location, type of utilization, and the degree of maintenance required for an economical and efficient operation. In order to avoid extended shipyard-repair periods and minimize overhaul--repair costs, crew members should be regularly assigned maintenance and repair duties within their respective capabilities whenever they are in a duty status. Division Commanders will closely supervise the plant-repair programs of their Districts with a view to accomplishing repairs on an as-needed basis to the fullest extent practicable. Insurance or extensive preventive repairs, in anticipation of possible breakdowns during operations, should be kept to a minimum.

(c) In connection with the above annual evaluation, group and nongroup plant estimates will be prepared on ENG Form 1475, Plant Repairs, and ENG Form 1475A, Plant Repairs Continuation Sheet, only for those items of plant for which repairs or replacements are scheduled and/or additions and betterments are programmed for the next repair season and for which approval by higher authority is required. At their discretion, MSC Commanders may arrange for the temporary detail of especially qualified personnel from their staff, other MSCs, or from HQUSACE, for assistance in making these estimates. For comparative purposes, a description of the repairs and/or additions and betterments accomplished on non-group plant, along with actual costs, will be shown on each required ENG Form 1475, for the most recent repair period. Requests for authority for additions and betterments will be coordinated with the Acquisition of Plant, Ownership, and Financial Management Program as outlined in Chapter 15 of ER 1130-2-500, and requests for approval for additions and betterments will be made as outlined in Chapter 7 of ER 1130-2-500.

(d) ENG Form 1475 will be submitted promptly for review and approval by appropriate higher authority in accordance with the limitations outlined in Chapter 7, Section 3 of ER 1130-2-500. Repair factors included in Plant Rate Computations, ENG Form 22 (Costs), and Plant Record Card-Grouped Items, ENG Form 2438, will be reviewed and analyzed in accordance with EM 1125-2-306 and Chapter 7 of ER 1130-2-500. The original of each ENG Form 22 (Costs) and ENG Form 2438, or revision thereof, will be furnished CECW-OM-B.

(e) MSC commanders will issue instructions for adapting ENG Form 1475 for use in connection with repair estimates for Group Plant indicating the manner and frequency of submission, the detail required, whether prior year total group costs are to be shown, and whether submission is to be on a group or individual item basis.

(f) Any repair or addition and betterment item of work accomplished which would significantly improve the efficiency of similar existing plant or the design of future plant applicable to other MSCs should be reported to CECW-OD for evaluation and direction by the Marine Engineering Board. The report should include sufficient details and, if appropriate, drawings or other data which could be readily disseminated. (Exempt report, para 7-2y, AR 335-15).

c. Operations.

(1) Operators of uninspected self-propelled floating plant, up to and including vessels 65 feet in length, will be qualified and licensed by the USCG, or the District Commander as required by ER 385-1-91. If a Corps of Engineers licensing program is established in a District, a Corps of Engineers Motorboat Operators License, ENG Form 3962 and an Operators identification, Optional Form 346, will be issued to all qualified operators in accordance with the instructions in Appendix M of this pamphlet.

(2) Hopper dredge allowable draft is limited to ABS loadline limits

(3) Officers and crewmen of self-propelled floating plant, inspected and certificated by the U.S. Coast Guard will be licensed and/or documented by the U.S. Coast Guard.

(4) The operation of all floating plant shall be in accordance with the requirements of EM 385-1-1, Safety and Health Requirements Manual. Also see ER 1130-2-500, Chapter 7, Section 4, Use, Loan, Lease, and Hire of Plant regarding the limitation of floating plant to official business.

(5) Recognized, industry-accepted procedures will be followed so that the efficiency of boilers may be increased by reducing the amount of time lost in cleaning boilers resulting from deterioration of tubes, shells, and other parts by the action of impurities in boiler water. Required analysis and corrective action as a result of tests and treatment will be carried out in accordance with manufacturers' recommendations.

(6) The following ENG Forms will be utilized as required on major items of floating plant:

(a) ENG Form 2198, Operating Log

(b) ENG Form 3398, Hopper Dredge Log Book

(c) ENG Form 3702, Engine Room Log-Major Floating Plant

(d) ENG Form 3703, Operating Record of Main Engines and Other Equipment (Diesel Electric with 2 main engines)

(e) ENG Form 3703-A, Operating Record of Auxiliary Diesel Engine Generator

(f) ENG Form 3703-B, Operating Record of Main Engines and Other Equipment (Diesel Electric with 4 main engines)

(g) ENG Form 3735-A, Daily Report of Operations-Sidecasting Dredge

(h) DA Form 5273, Harbor Boat - Deck and Engine Log for Class “B” Vessels.

(7) EM 1125-2-312, Manual of Instructions for Hopper Dredge Operations and Standard Reporting Procedures, was issued for the purpose of developing data and reports that will reflect accurately the performance of hopper dredges and for making evaluations of the effectiveness of hopper dredges.

(8) Minimum Fleet Dredge Location Reports. District Commanders shall report in the Dredging Information System database, the annual schedule and each significant change in location of the Corps Minimum Fleet dredges.

(9) Reports of Plant Operations. Reports of operation of Corps Minimum Fleet dredges will be prepared and submitted as follows:

(a) When the work schedule indicates a continuous assignment of 60 calendar days or more on one project, a Status Report will be submitted monthly. A Completion Report will be submitted, in lieu of Status Reports, in those cases when the dredging or drilling work on a project is completed in less than 60 days.

(b) Status or Completion Reports and the Annual Reports of Operations for Hopper and Sidecasting Dredges, will be prepared in accordance with instructions contained in EM 1125-2-312, Manual of Instructions-Hopper and Sidecasting Dredge Operations and Standard Reporting Procedures. Hopper Dredge reports will be prepared on ENG Form 27, Report of Operations-Hopper Dredges. Sidecasting Dredge reports will be prepared on ENG Form 3735A, Report of Operations - Sidecasting Dredges. An annual report will be furnished to CECW-OD.

(c) Status or Completion Reports and the Annual Report of Operations Pipeline, Dipper or Bucket Dredges, ENG Form 4267 will be submitted to the MSC Commander for review. An annual report will be furnished to HQUSACE (CECW-OD).

(10) In accordance with Chapter 9 of ER 1130-2-520, Navigation and Dredging Operations and Maintenance Policies, foul-weather gear consisting of trousers, coats, headgear, boots, and gloves may be issued to personnel on floating plant whose duties require frequent and extended exposure to the elements. All of the foul weather gear, shall meet the requirements of 46 CFR for retroreflective material. This gear will be issued on a personal basis and the individual to whom custody is given will be held responsible for its care and availability. The use of foul weather gear will be restricted to duties connected with the dredge operation, repair, and maintenance. The equipment will be turned in for salvage or reissue whenever personnel are transferred or are otherwise separated from the vessel. Replacement of worn or damaged equipment for permanent personnel will also require the turn-in of previously furnished gear.

(11) During a hopper dredge port watch, one licensed deck officer and one licensed engine room officer will be required to remain aboard the dredge. The Chief Electrician or an Assistant Electrician may also be required to remain aboard the dredge. These personnel will perform regularly assigned duties during daylight hours, preferably during their normal scheduled tour. During this period, the employees involved will be responsible for supervision of required maintenance and repair work. These employees will remain aboard during the port watch, but will not normally be assigned any regular duties outside the specified scheduled tour and will be free to remain in quarters or elsewhere aboard the dredge. If they are required to perform any routine duty or emergency work outside their specified tour, they will be compensated in accordance with normal overtime regulations. A minimum number of unlicensed personnel, consistent with work requirements, will be assigned to a port watch, but will normally be permitted to leave the dredge after their specified tour. Other unlicensed personnel will also normally be permitted to leave the dredge; however, if an emergency exists, or if convenient and safe access to the shore is not available, or if their absence will jeopardize the safety of the plant, the Master or Senior Deck Officer may require them to remain aboard.

(12) Launch service will normally be provided to and from hopper dredges once each day during daylight hours, weather, sea conditions, locations, and other conditions permitting. Off-duty crew members may avail themselves of this service on a space available basis, if they are not required to be on board to meet the minimum-staffing requirements. The District Commander or his authorized representative, at his discretion, may provide additional launch service, the extent

of which will depend upon distances, costs, weather and sea conditions, safety, and other pertinent factors involved. Since residence aboard the dredge is a condition of employment, launch service is an auxiliary benefit and not a right of the employee. This service is in addition to launch transportation to and from the plant to be provided personnel before the beginning and after the end of their weekly or bi-weekly tours of duty in instances where the dredge does not dock for repairs, supplies, or lay periods. When possible, a single launch will provide all services on crew change days.

(13) Manning and Licensing.

(a) Hopper dredges of the Corps of Engineers shall be staffed with the following positions with U.S. Coast Guard license requirements as indicated. Future assignees to these positions must hold the licenses shown below:

POSITION	LICENSE REQUIRED
Master	Master
Assistant Master	Master
Chief Mate (for 7-day /week operation)	Chief Mate (1st class Pilot for Great Lakes)
2nd Mate	2nd Mate (1st class Pilot for Great Lakes)
3rd Mate (As required)	3rd Mate (1st class Pilot for Great Lakes)
Chief Engineer	Chief Engineer
Assistant Chief Engineer	Chief Engineer
1st Assistant Engineer (for 7-day/week operation)	1st Assistant Engineer
2nd Assistant Engineer	2nd Assistant Engineer
3rd Assistant Engineer (as required)	3rd Assistant Engineer

(b) Assignments will not be made to Assistant Master or Assistant Chief Engineer jobs unless the individual proposed holds the required license and, in fact, is required to assume the duties of the Master or Chief Engineer in his absence. The license requirement and the requirement to "act for" will be clearly stated in applicable job description.

(c) Jobs involving the full duties and responsibilities of Assistant Master or Assistant Chief Engineer will be evaluated in accordance with an approved personnel ladder diagram.

(d) Sidecasting dredges and other major floating plant engaged in ocean and coastwise service may be staffed in accordance with the position alignment indicated in paragraph 7-14c(13)(a).

d. General.

(1) The permissible number of passengers in skiffs of the Corps of Engineers will be in accordance with EM 385-1-1.

(2) The use and procurement of personal flotation devices will be in accordance with the applicable provisions of 46 CFR and EM 385-1-1 and the procedures outlined in Appendix D.

(c) ER 840-1-1 describes the procedures for flags for vessels.

(d) Equipment and Stores for Vessels.

(1) Masters, superintendents, launchmen, or others designated in charge of Corps of Engineers vessels will be held responsible that the equipment required by law or safety of the vessel and its crew is always on board when their vessels are in use.

(2) The Department of the Navy has authorized Commandants of Navy Yards to issue from stock such marine stores as naval fittings and equipage, as may be required for use on Corps of Engineers vessels.

7-15. Authorities for Acquisition and Repair. See ER 1130-2-500, Chapter 7, Section 1, Plant Design, Acquisition, and Construction; ER 1130-2-500, Chapter 7, Section 3, Plant Inspection, Maintenance, Operation and Repair; and ER 1130-2-500, Chapter 15, Acquisition of Plant, Ownership, and Financial Management.

Section IV. Corps of Engineers Marine Engineering Board

7-16. Purpose. This section establishes guidance for the USACE Marine Engineering Board.

7-17. Background and Composition of the Board.

a. The Marine Engineering Board was initially established as a continuing body on 25 February 1944 under the title Hopper Dredge Board. The title was changed to Dredge Board on 18 March 1963 and subsequently changed to its present designation, Marine Engineering Board, on 26 July 1974.

b. The Marine Engineering Board was established by the Director of Civil Works and is administered by the Operations, Construction and Readiness Division, HQUSACE.

c. Membership of the Board is shown in Appendix P. The Chairperson shall be Chief of the Dredging and Navigation Branch, Operations, Construction and Readiness Division, HQUSACE.

7-18. Functions of the Board. The Board is responsible for the following functions which are applicable to all USACE marine plant. Findings and recommendations are to be submitted through the Chief, Operations, Construction and Readiness Division, to the Director of Civil Works, HQUSACE for approval.

a. Establishes fundamental principles for the design, construction, and operation of marine plant.

b. Recommends policies and major design features for new construction and major alterations to marine plant.

c. Reviews requests for waivers to standard designs.

d. Reviews innovative design concepts and objectives for major items of floating plant.

e. Recommends policies for acquisition, replacement, or rehabilitation of major items of floating plant.

f. Reviews requests for waivers for Major Subordinate Commands/District Commands design of major items of floating plant (ER 1130-2-500, Chapter 7, Section I, Design, Acquisition, and Construction).

g. Performs program review and establishes project priorities for the USACE Marine Design Center.

h. Performs other functions in connection with dredges and other marine plant, dredging techniques, work practices, and operational procedures as assigned by the Director of Civil Works, HQUSACE.

7-19. Responsibilities.

a. The Chairperson of the Board will report through the Chief, Operations, Construction and Readiness Division to the Director of Civil Works, HQUSACE.

b. The Chairperson will convene meetings as required to accomplish the Board objectives, normally semi-annually. The minutes and transactions of the Board will be agreed upon by voting members, and forwarded to HQUSACE for approval.

c. The Chief, Operations, Construction and Readiness Division will implement the Board transactions once approved by the Director of Civil Works.

d. Appropriate staff from the USACE Marine Design Center will attend meetings and will serve as the technical representatives and provide recommendations to the Board.

e. An executive assistant will be appointed by the Chairperson to serve as Secretary to the Marine Engineering Board to provide functional and administrative support for the Board.

CHAPTER 8 - CORPS OF ENGINEERS ENERGY PROGRAM (CEEP)

Reserved.

CHAPTER 9 - COOPERATING ASSOCIATIONS PROGRAM

9-1. Purpose. This chapter establishes guidance for the USACE Cooperating Associations Program.

9-2. Guidance - General.

a. Cooperating Associations are encouraged at Civil Works water resource projects, fee owned lands and other areas for which the Corps has administrative and management responsibilities.

b. Associations are non-profit, tax-exempt corporations whose partnership with the Corps results in the enhancement of and contributions to the Corps mission, particularly in regard to natural resource management. Agreements will be entered into as determined appropriate by the District Commander.

c. Associations are encouraged at all levels within the Corps Headquarters, Districts, MSCs and Laboratories to accomplish broad goals, natural resource management, interpretation, and visitor service activities.

d. Corps facilities are provided to the Association at no cost if such use is incidental to the normal operation of the facility. This is in recognition of the services that the Association is contributing to the public. If the Association's use of the Corps facility is over and above normal Corps operation costs for the facility, the Corps will be reimbursed at an agreed upon, but nominal cost in recognition of the services that the Association is contributing to the public. Any necessary real estate instruments will be a separate document from the cooperative agreement.

e. Associations encompass organizations which have a wide variety of objectives. Therefore, at any one location the Corps may determine that multiple Cooperative Agreements with an assortment of suitable organizations would be in the public interest.

f. A wide range of programs may be pursued under Agreements, for example; special event planning and sponsorship, habitat improvement, staff and volunteer training, scientific research, membership activities, publications, archeological activities, trail construction and maintenance, interpretive programming, support, and technical assistance. This list should be used as an indicator of possibilities, not as all inclusive.

9-3. Guidance - Administration. An Agreement is required for each Association working with a Corps Civil Works element (see Appendix P). Appendix P is a typical example; however, Agreements should be designed to reflect the specific nature of the activities and/or programs for each Association. At a minimum, the Agreement should provide for the following:

a. Associations will follow all appropriate state and federal laws and regulations to establish and maintain their nonprofit and tax-exempt status. Appendix Q is a sample of a typical Association's articles of incorporation and by-laws.

b. All Agreements will contain provisions for termination, should an Association fail to acquire or maintain its non-profit, tax-exempt status, or to fulfill its purpose as stated in the Agreement.

c. Associations will carry appropriate liability insurance which indemnifies, saves, holds harmless and defends the United States against all fines, claims, damages, losses, judgements and expenses arising out of, or from any omission, or activity of the Association in connection with their Agreement with the Corps.

d. The Association will exercise reasonable care to prevent damage to any government property used, or occupied during its operation and shall, insofar as possible, protect all such property.

e. Donations of services by Associations to the Corps may be accepted consistent with Section 203 of the reference in paragraph o. of Appendix A.

f. The Association will not sell any original artifacts, sacred items, or antiquities to which the Archeological Resources Protection Act, as amended, would apply whether or not such items were discovered on lands owned or controlled by the United States.

g. Corps personnel may not:

(1) serve as voting members of the Board of an Association.

(2) serve as the Treasurer of an Association.

(3) act as the official representative of an Association in any matter with the Corps.

h. Corps personnel may assist the board of an Association, but only in an advisory capacity. However, if an Association has a membership program, Corps personnel may join and participate in membership activities.

i. The Agreement will designate where the Associations may conduct their activities. (Cooperating Associations are encouraged at Civil Works water resource projects, fee owned land, and other areas for which the Corps has administrative and management responsibilities.

j. Associations may provide educational programs and materials that further public understanding of the Corps and/or project mission and its relationship to archeological, natural, historical, cultural, environmental and recreational resources.

k. Associations may conduct activities, special events, or programs which assist the Corps in fulfilling their responsibilities for natural resources management.

l. If any revenues are collected from the Association's activities, memberships, or sales of publications and materials as part of their Agreement with the Corps, they will be used to support the continued operation of the Association and the Corps management effort as detailed in the Agreement.

m. Associations will conduct their fiscal operations in accordance with accepted business practices. This includes the appropriate use of a funds accountability system, purchase orders, receipts, invoices and inventory records. The Corps may review and audit any and all fiscal records at any time during the term of the agreement.

n. As applicable, all activities, special events, programs, hours of operation, logistics, prices, standards of service, and merchandise to be sold are subject to prior approval by the

District Commander, or an authorized representative. Approval should be based upon maximum benefit and service to the public, and if appropriate, quality, suitability and fair-market value of the merchandise.

o. The responsibilities of the Corps and the Association will be clearly and distinctly maintained throughout the life of the Agreement. Specifically:

(1) Principal and alternate points of contact for the Corps and the Association at each location will be established, identified and maintained. The principal point of contact for the Corps should be the individual most directly related with coordinating the Association's activities. For example, at a field project, the Operations Project Manager, or Park Ranger could be the principal point of contact.

(2) Development and management of sales activities, if any, are the responsibility of the Association. However, all aspects of sales activities are subject to prior approval by the District Commander.

(3) Association employees or volunteers will not wear the Corps uniform, nor items of clothing that resemble the uniform.

(4) The Corps will provide the information, support and training necessary to ensure that all Association activities are in compliance with the Corps safety standards, EM 385-1-1. The Association is responsible for conducting all its activities and ensuring that all its personnel comply with all Corps safety requirements.

p. The Association may be granted a license, easement or lease, as appropriate in accordance with ER 405-1-12 for the use of government owned property. (See also paragraph 9-3.d. above.)

CHAPTER 10 - THE CORPS OF ENGINEERS VOLUNTEER PROGRAM

10-1. Purpose. This chapter establishes guidance on accepting the services of volunteers.

10-2. Background.

a. PL 98-63 authorizes the Chief of Engineers to accept the services of volunteers and to provide for their incidental expenses to carry out any activity of the Army Corps of Engineers except policy making or law/regulatory enforcement. The Corps objective is to utilize voluntary services having some value to the Corps in a manner mutually beneficial to the volunteer and the public interest. MSC offices have the responsibility for the coordination of volunteer programs within their MSC, including monitoring and evaluating volunteer programs within their districts, providing assistance to district counterparts, and acting as a liaison between the districts and HQUSACE. Administration of each district's volunteer program is the responsibility of a designated Coordinator.

b. Volunteers may carry out many activities for the Corps of Engineers. Voluntary service may include work that would not otherwise be accomplished because of funding or personnel limitations. Volunteers may produce products for the Corps at off-site locations.

10-3. Guidance.

a. A successful volunteer program requires a step-by-step approach to assess Corps needs, develop a plan to accomplish those needs, and evaluate program success. The program should also tailor Corps needs to the volunteer talents available in the local area. The major steps in this procedure are:

(1) Assess overall needs. Define the tasks that need to be done at the individual project or office.

(2) Evaluate costs and benefits. This program is not "free." It will require staff time and administrative support. Regulate the size of the program to match individual organizational capability.

(3) Refine task descriptions. The supervisor will develop simple descriptions for the tasks that need to be accomplished. Existing information will be used to the greatest extent possible. The level of work described will be used to establish a value of the service performed. This replacement cost classification determination, as well as the number of hours volunteered, will give the accepting official the means to determine the value of each volunteer's work effort.

(4) Recruit and select. Advertise the volunteer program through public service announcements, news releases, personal contact and brochures. Screen all applicants and identify the talents that are available. Match the volunteer applicants with the tasks identified and finish the acceptance process.

(5) Provide orientation (training). Provide initial orientation and follow-up training commensurate with the type of job, length of proposed service and the requirements for safety.

(6) Provide supervision. Identify supervisory channels for the volunteer and clearly describe the work to be accomplished. Follow up on the job as you would with a paid staff member.

(7) Keep records. The supervisor will monitor the hours worked by each volunteer.

(8) Develop a volunteer plan. A volunteer plan is a synopsis of the information resulting from paragraphs 10-3a(1) through (7) above. Such a plan should be included as an appendix to the project "Operational Management Plan." A Corps Volunteer Coordinator's Handbook (EP 1130-2-429), has been developed to assist coordinators in the formation of the volunteer plan and the overall operation of the volunteer program.

b. Most individuals can qualify to become volunteers for the Corps. It doesn't matter if the person is receiving pay, academic credit, or other types of compensation from sources other than the Corps; if the Corps is not paying for the work that is done, the person can be considered a volunteer. Individuals convicted of crimes and participating in court-approved probation, work release, or alternate sentencing programs may serve as volunteers at the discretion of the accepting official; however, no person referred from a court-approved program, who has been convicted of any violent crime, crime against person, or crime involving the use of a weapon shall be utilized in the Corps of Engineers volunteer program in any manner.

c. Volunteers must be qualified to perform the work assigned. Additionally, they must be physically able to do the work. The accepting official may request the volunteer to complete a Standard Form 256, Self-identification of Handicap, or obtain a medical examination if there is a question regarding the volunteer's ability to perform assigned work. In special circumstances, the cost of medical examinations may be considered incidental expenses of the volunteer. These circumstances should reflect the need for medical examination and the value of the voluntary services that the Corps would receive.

d. Volunteers will not be used to displace any personnel of the Corps of Engineers. They may, however, perform duties which once were, or are presently, performed by Corps personnel or contractors. Volunteers should not be required to perform any type of work that he or she does not feel comfortable doing or does not willingly agree to do. Volunteers who are assigned to operate machinery or equipment (such as chain saws, power shop tools, or specialized equipment) must first have demonstrated their proficiency in the operation of that equipment and their understanding of safety requirements to the satisfaction of the supervisor and the accepting official.

e. Voluntary service may be accepted by any official designated by Commanders or their representatives.

f. Voluntary service may be accepted from individuals or from members of organized groups. Volunteers will be recruited and service accepted without regard to race, creed, religion, age, sex, color, national origin, or handicap.

g. Whenever possible, volunteers will be provided a work environment which is equivalent to that provided for Corps personnel performing similar duties. Volunteers will not normally be used in work assignments in which Corps personnel would receive hazardous duty pay. The same safety training and briefings provided to Corps personnel in a given circumstance will also be provided to volunteers. This should include the review of an "Activity Hazard Analysis." Injuries to volunteers will be reported in the same manner as those involving Corps personnel. The reporting procedures will be the same except that item 17 of ENG Form 3394,

U.S. Army Corps of Engineers Accident Investigation Report, will be checked "other-volunteer." The activity will also report all hours of volunteer work (reported as USACE personnel work-hours) for accident statistical analysis purposes.

h. Volunteers will not be used for policy making or law or regulatory enforcement.

i. Voluntary service is to be carried out in conformance with Federal, State and local laws and standards regarding the employment of minors.

j. The agreement for volunteer services may be terminated at any time by the accepting official or the volunteer.

k. A large event which is sponsored and coordinated by multiple organizations and attracts large numbers of participants may be considered a volunteer activity when the overall event is coordinated by the Corps and the requirements of this guidance are met.

10-4. Protection and Benefits.

a. Volunteers receive the same benefits and protection as federal employees under the Federal Employees Compensation Act (5 USC, Chapter 81) and the Tort Claims Act (28 USC, 2671-2680) and are considered to be federal employees for only those purposes. Since volunteers are considered the same as paid personnel for the purpose of this Act, they are offered the protection of the Act for personal liability as long as the volunteer is within the scope of his/her responsibilities.

b. Federal Employees Compensation Act. Volunteers are entitled to first aid and medical treatment for on-the-job injuries, as well as hospital care when necessary. When travel for receiving medical care is necessary, transportation may be furnished or travel expenses reimbursed.

c. If death results from an on-the-job injury, burial and funeral expenses may be paid. Burial and funeral payment, however, as well as other possible compensations are regulated by the Office of Worker Compensation Programs. Volunteers do not receive compensation for lost wages. (Note: This paragraph does not apply to any prisoner work program. Such programs would be covered by a separate formal agreement and other regulations and statutes.)

d. Federal Tort Claims Act. This Act provides a means whereby damages may be awarded as a result of claims against the Corps for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the Corps. Such damages could be awarded if a private person would be liable to the claimant in accordance with the law of the place where the act or omission occurred.

e. Incidental Expenses. PL 98-63 grants the Corps authority to provide for the incidental expenses of volunteers. Reimbursement of incidental expenses is not to be understood as salary. Many volunteers do not want or need reimbursement for their out-of-pocket expenses; others could not volunteer without some financial assistance. Reimbursement should be handled on a case-by-case basis. Accepting officials and volunteers should enter into volunteer agreements with the understanding that reimbursement is not mandatory. Volunteers may be reimbursed for actual out-of-pocket expenses they incur in performing voluntary service when approved in advance.

f. Long distance travel expenses may be reimbursed in cases where it can be shown that the services of the volunteer will be of exceptional value to the Corps, and then only with the approval of the commander.

g. The rate at which volunteers may be reimbursed for incidental expenses will not exceed the amount authorized by the Joint Travel Regulation for Government employees under similar circumstances.

h. Volunteers may be housed in Government provided quarters. They will not normally be charged for such occupancy. Volunteers may also be provided campsites at Civil Works projects where their voluntary service occurs and not be required to pay a user fee.

10-5. Identification. Individual volunteers who are likely to come into contact with the public must be recognizable as volunteers. To do this, three kinds of identification may be used:

a. A 3" x 1" name tag showing the individual's name and the word "volunteer".

b. The Corps of Engineers volunteer emblem, which will be available as either a patch for garments or decal for hardhats. A baseball cap (color optional) with a patch or other suitable identifying garment. Otherwise, regular personal clothing which is neat and appropriate for the work performed is acceptable. Volunteer emblems will be available through central procurement.

c. A white uniform shirt with the volunteer patch on the left shoulder may be provided to volunteers in special situations when the value of the volunteer being recognized by the public outweighs the cost of the uniform. District commanders will authorize such procurement on a case-by-case basis. The shirt may be similar in design to the authorized Class B Park Ranger gray uniform shirt, however, under no circumstances shall a volunteer wear the authorized Corps patch or any other item of the official Natural Resources Management Class A-B-C Park Manager/Ranger uniform, or the Operations/Maintenance uniform.

10-6. Reports.

a. It is important to maintain accurate records regarding the number of volunteers utilized, and the cost to the Government of this volunteer service. This information will be tracked by project and reported via the Natural Resources Management System annually (RCS: CECW-0-39). Letter reports may be required more frequently by district or division offices.

b. For the purpose of determining the value of volunteer services, the following rates will be used at the comparable base rate (not to include overhead).

Laborer - Minimum wage or WG-3

Skilled Maintenance - WG-9

Student/Clerical - GS-4

Technical Specialist - GS-7 or GS-9

Consultant - GS-11 or GS-13

10-7. Forms.

a. Optional Form 301, Volunteer Application for Natural Resources Agencies. This form should be provided to all people who request information about the volunteer program. It is designed to gather pertinent information on a potential volunteer's background and areas of interest and skills. It can be used to screen applicants, to develop a file of potential volunteers or to refer volunteers to other areas or agencies. Optional Form 301 can be obtained locally from GSA sources.

b. ENG Form 4880-R, Agreement for Individual/Group Voluntary Services. This form is the official document that legally enrolls an individual in the program and provides him or her with federal protection in case of injury or tort claim. It must be completed and signed prior to commencement of work by both the volunteer or organized group representative and the accepting official for all volunteers, even for work projects of only a few hours duration. This form is to be used when dealing with individual volunteers or sponsored groups. A list, containing the name, address and signature of each group member who will be participating must be attached. Also a complete, detailed description of the duties, conditions, and responsibilities should be attached to this form. This is important in case questions arise on whether the volunteer was acting within the scope of his/her assigned responsibilities. The document can be modified at any time by mutual consent, but it must accurately reflect the duties of the volunteers at all times. The acceptance/termination line at the bottom of the form serves two purposes. It provides the accepting official with a means of officially terminating an agreement, if appropriate, and it provides a legal record of when an agreement was terminated in case of a law suit or injury claim. A copy of the agreement along with any revisions or amendments should be given to the volunteer for his/her records. The original should be retained by the accepting official for a three-year period. The inactive file is to protect against possible law suit or injury claim.

c. ENG Form 4881-R, Parental Approval. This form must be completed, signed, and attached to the volunteer agreement of all volunteers under the age of eighteen years. This requirement also applies to volunteers of organized groups. However, if the group leader has already obtained a signed parental release, this can be used in place of ENG Form 4881-R.

d. ENG Form 4882-R, Volunteer Service Record. This form may be used to record information regarding the service of individual volunteers.

e. ENG Form 4883-R, Certificate of Appreciation. This form may be used to recognize the efforts of volunteers. Locally designed certificates may also be used.

f. Standard Form 1164, Claim for Reimbursement for Expenditures on Official Business. Claims for reimbursement of a volunteer's incidental expenses should be submitted on Standard Form 1164, and, when practicable, paid from imprest funds. Claims for travel expenses such as per diem, lodging or air fare should be submitted on DD Form 1351-2, Travel Voucher or Subvoucher.

g. Appendix R contains illustrations of the ENG Forms prescribed by this guidance. Procedures for the use of these forms will be found in the Volunteer Coordinator's Handbook, EP 1130-2-429. Reproducible copies of ENG Forms 4880-R, 4881-R, 4882-R and 4883-R may be obtained through the local forms management officer (FMO).

CHAPTER 11 - CONTRIBUTIONS PROGRAM

11-1. Purpose. This chapter establishes guidance on accepting contributions.

11-2. Background. The contributions program, authorized by Section 203 of the Water Resources Development Act of 1992, authorizes the Corps to accept contributions from groups and individuals in connection with carrying out water resources projects for environmental protection and restoration or for recreation.

11-3. Guidance.

a. Although Section 203 of the Water Resources Development Act authorizes contributions of services, the acceptance of service from volunteers was previously authorized by Section 569C of the Supplemental Appropriations Act of 1983. The guidance contained in ER 1130-2-500, Chapter 10, Volunteer Program, should be used to accept contributions of services.

b. Locations that are not required to prepare a Master Plan, such as district offices, division offices, and HQUSACE, should prepare a contributions plan that describes the work that will be accomplished with any potential contributions that are received. Contributions supplement budget allocations as another means to accomplish approved work.

c. Prior coordination with Logistics Management should occur before contributed personal property is accepted. Personal property is property of any kind except lands and improvements that are permanently attached and ordinarily regarded as real estate. Recording, accounting, and management of property items will be in accordance with ER 700-1-1.

d. Major Subordinate Commands are responsible for the coordination of the contributions program within their command. The Commander may accept or decline contributions. The Commander may assign coordination of these duties to a command coordinator within the Civil Works operations element. The coordinator will monitor and evaluate the district contributions programs, provide assistance to the district counterparts, and act as a liaison between the districts and HQUSACE.

e. District commanders are responsible for administering the contributions program within their district. The Commander may accept or decline contributions. The Commander may delegate responsibilities of the program at his/her discretion and assign coordination of these duties to a district coordinator within the Civil Works operations element. The district coordinator is responsible for keeping the district program running smoothly and efficiently, and ensuring that it meets the needs of the Corps of Engineers and the participants. The coordinator helps in assessing needs and identifying work that can be accomplished with contributions, provides guidance, handles inquiries regarding the program, and keeps the district and project staff current on ideas and procedures for using contributions.

f. Contributions may be used to provide brochures or other publications for the Corps. Periodicals or pamphlets intended primarily for distribution outside the Corps must be approved by the HQUSACE Publications Advisory Committee before printing or reprinting. Requests for publications should go through channels to be reviewed by the HQUSACE committee. The request should include the text, intended audience, plan for distribution, estimated total cost to produce the publication, partner's contribution, and benefit to the public and the Corps.

g. Materials and Equipment. For record-keeping purposes, the value of materials and equipment should be determined using the local market value that comparable items could be purchased, or rented if for short-term use.

h. Expenditure. All contributions received at the project will be available for expenditure at the water resource development project where they are collected. Contributions received at the district, MSC, and headquarters offices will be distributed as is deemed best to meet the goals described in the contributions plan.

i. Earmarked Contributions. Commanders may, at their discretion, accept a contribution earmarked for a particular project purpose providing the purpose is consistent with the project Master Plan or Operational Management Plan.

j. Contribution Box. A contribution box may be set up at field offices, visitor centers, and other appropriate locations. The installation of a contributions box is optional, at the manager's discretion. The box should be of a similar design used in many museums. The contribution box should be locked and have a sign stating the use of the contributions. It should be clear to the visitor that any money collected is a voluntary contribution and is not required for touring the visitor center, receiving brochures or pamphlets, or any other services.

k. Cooperating associations may accept contributions to the association but shall not handle Corps funds or accept contributions given to the Corps. The association may accept contributions and use them for the continued operation of the association or donate the funds for the Corps management effort, as detailed in their cooperative agreement. The Corps may permit the association to install a contributions box provided the sign states that the funds received go to the association and their use.

l. Tax Information. The Corps does not provide tax advice. If a contributor asks for tax information, the Corps representative should ask the contributor to consult their tax advisor. If requested, a receipt should be furnished to contributors for their contribution. A letter acknowledging the acceptance of a contribution should be written for any contribution over $100.

11-4. Accounting and Reports.

a. Revenue. Revenue collected from contributors will be deposited into account 96x8862 of U.S. Treasury according to the requirements outlined in ER 37-2-10, Chapter 4. Collections will be transmitted not later than Friday of each week, or each day the total amount collected but not transmitted exceeds $1,000. ENG Form 3313 (Remittance Register) or DD Form 1131 and a copy of the SF 215 (Deposit Ticket) are the authorized forms for transmittal to the finance and accounting officer. These funds are immediately available to the collecting installation for obligation and expenditure without further action by HQUSACE after the confirmed receipt is received from the Federal Reserve Board. All funds will be accounted for and disbursed under the same standards of accountability as appropriated funds.

b. Authorized Collectors. Appointment of authorized collectors for receiving contributions must be made in writing by the finance and accounting officer in accordance with ER 37-2-10, Chapter 4.

c. Reports. Each water resources project office will maintain accurate records on contributions according to ER 37-2-10. The project office will annually report the total amount

of contributions via the Natural Resources Management System (RCS: CECW-O-39). Division or district offices may require more frequent reports of greater detail.

11-5. Promotion. The Corps may encourage participation in the contributions program by informing potential partners in a diplomatic manner of the opportunities that are available. The potential for participants is tremendous and includes civic organizations, conservation clubs, cooperating associations, local business, corporations, and individuals.

11-6. Recognition and Publicity.

a. Recognition. Recognition is encouraged as a way to express appreciation to contributors and acknowledge the public support that has been received. The Corps will acknowledge its appreciation in a manner consistent with the mission and goals of the Corps and the standards of ethical conduct. This may include letters or certificates of appreciation (ENG Form 4883-R as in Appendix S or a locally designed certificate), news releases, photo opportunities, ribbon cutting ceremonies, articles in the project news briefs, or other appropriate means. Recognition will avoid any suggestion of commercialization, advertising, endorsement of a product, service or organization. Corps personnel may recommend exceptional contributors to HQUSACE (CECW-ON) for possible special recognition.

b. On-site Recognition. The Corps will avoid on-site recognition that might clutter, detract or interfere with the scenic value of the environment or project facilities. Limited use of small markers or plaques may be appropriate on some locations as a way to provide recognition of a contributor, express gratitude, and encourage others to contribute.

c. Contributor's Publicity. The Corps should advise contributors to appraise the Corps of any publicity they initiate.

CHAPTER 12 - CHALLENGE COST SHARING PROGRAM

12-1. Purpose. This chapter establishes guidance for challenge cost-sharing agreements.

12-2. Background. The challenge cost-sharing program, authorized by Section 225 of the Water Resources Development Act of 1992, provides opportunities for public and non-Federal groups and individuals to contribute to and participate in the operation and/or management of recreation facilities and natural resources at Corps water resource development projects. Partnering with others provides a way to stretch the Corps of Engineers budget by sharing the cost of operating and managing recreation facilities and natural resources.

12-3. Guidance.

a. A sample financial work sheet that itemizes the monetary value of each party's contribution is in Appendix T and will be completed as part of the agreement. A sample challenge cost-sharing agreement is included in Appendix U.

b. Discretion to Decline. Challenge cost-sharing opportunities may, due to the nature of the proposal; its use; conditions imposed; profit motive or the character or notoriety of the contributor; appearance contrary to, compromising or inconsistent with the laws, regulations, purposes, principles, integrity, standing, or reputation of the Corps of Engineers, the United States Army or the Government, be declined at the discretion of the Commander or a designated representative. Challenge cost-sharing opportunities that would create or give the appearance of a conflict of interest or have conditions inconsistent with the Corps mission must be declined.

c. Services. Services that the partner performs as a part of the challenge cost-sharing program are to be carried out in conformance with Federal, State and local laws and standards. For the purpose of determining the value of the partner's services, the actual labor cost will be used.

d. Materials and Equipment. The value of materials and equipment should be determined using the local market value of comparable items for purchase, or rent if for short-term use.

e. Operation of Vehicles, Vessels and Equipment. Partners may be authorized to operate Government-owned or leased vehicles, vessels or other equipment if deemed appropriate and beneficial. In such cases, the same licensing policies and procedures that apply to Corps personnel in similar situations will apply to partners. Partners who are assigned to operate machinery or equipment (such as chain saws, power shop tools, or specialized equipment) must first have demonstrated proficiency in the operation of that equipment and understanding of safety requirements to the satisfaction of the Corps.

f. Safety. All safety rules and regulations apply to work accomplished with challenge cost-sharing agreements. Safety training provided to Corps personnel will also be provided to partners performing services, including review of the "Activity Hazard Analysis." Injuries to partners performing services will be reported in the same manner as those involving Corps personnel. The reporting procedures will be the same except that item 17 on ENG Form 3394, U.S. Army Corps of Engineers Accident Investigation Report, will be checked "other - partner."

g. Quality of Work. Challenge cost sharing agreements are a means of completing a task. These accomplishments will be of the same quality as if carried out under any other Corps program. Challenge cost-sharing agreements should be administered according to good business practices and sound financial controls. The activities and products should be inspected, and the schedule and specifications monitored, to assure that they are accomplished as indicated in the agreement.

h. Tax Information. The Corps does not provide tax advice. If solicited, Corps representatives should suggest partners consult their tax advisors to determine if their share of a challenge cost-sharing agreement is charitable for tax purposes or deductible for any other reason.

i. Procurement and Contracting Requirements. Challenge cost-sharing agreements will not be used as a substitute for contracts or procurements subject to the Federal Acquisition Regulations and other applicable procurement statutes and regulations.

12-4. Accounting and Reports.

a. Revenue. Revenue collected from challenge cost-sharing partners will be deposited into account 96x8862 of the U.S. Treasury according to the requirements outlined in ER 37-2-10, Chapter 4. ENG Form 3313 (Remittance Register) or DD Form 1131 and a copy of the SF 215 (Deposit Ticket) are the authorized forms for transmittal to the finance and accounting officer.

b. Funds Availability. These funds are immediately available to the collecting installation for obligation and expenditure without further action by HQUSACE after the confirmed receipt is received from the Federal Reserve Board. All funds will be disbursed under the same standards of accountability as appropriated funds.

c. Accepting Officials. Appointment of authorized collectors and accepting officials for receiving funds from challenge cost-sharing agreements must be made in writing by the Finance and Accounting Officer in accordance with ER 37-2-10, Chapter 4.

d. Reports. Each water resources project office will maintain accurate records on challenge cost-sharing agreements according to ER 37-2-10 and Chapter 12 of ER 1130-2-550. Reports will consist of the name of the partner(s), the project undertaken, the total amount of challenge cost-sharing agreements, the partners' amount, and the Corps amount. This information will be reported annually via the Natural Resources Management System (RCS: CECW-0-39). Divisions or districts may require more frequent reports of greater detail.

12-5. Promotion. The Corps may encourage participation in the challenge cost-sharing program by informing prospective partners of the opportunities that are available. Potential participants include non-Federal public and private entities such as civic organizations, conservation clubs, cooperating associations, local businesses, universities, corporations, state and local governments, and individuals.

12-6. Recognition.

a. Recognition. The Corps will express its appreciation in a manner consistent with the mission and goals of the Corps and the standards of ethical conduct. This may include letters or certificates of appreciation, (ENG Form 4883-R or a locally designed certificate), news releases, photo opportunities, ribbon cutting ceremonies, articles in the project news briefs, or other appropriate means.

b. Recognition will avoid any suggestion of commercialization, advertising, or endorsement of a product, service, or organization. Corps personnel may recommend exceptional partners to HQUSACE (CECW-ON) for possible special recognition.

c. On-site Recognition. On-site recognition that might clutter, detract or interfere with the scenic value of the environment or project facilities is not permitted. An honor roll of challenge cost-share partners may be placed in the project visitor center. Other on-site recognition may be done on a limited basis to provide recognition for special partners. This on-site recognition may be a small plaque, marker, or sign that blends with the environment and project facilities.

d. Partner's Publicity. Partners should be advised to keep the Corps appraised of any publicity that they initiate. All publicity will be a joint effort by the partner and the Corps to include review and change authority.

CHAPTER 13 - CIVIL WORKS HOUSING

Reserved.

CHAPTER 14 - AQUATIC PLANT CONTROL PROGRAM

14-1. Purpose. This chapter establishes guidance for research, planning and operations for the USACE Aquatic Plant Control Program.

14-2. Background.

a. An Aquatic Plant Control (APC) Program is maintained by the Corps to control specific types of aquatic plant infestations of major economic significance, or weed infestations that have, or potentially may, reached such economic significance, in navigable waters, tributaries, streams, connecting channels and all allied waters. The APC Program is authorized under Section 104 of the Rivers and Harbors Act of 1958 (PL 85-500), as amended, and Sections 103, 105, and 712 of the Water Resources Development Act of 1986 (PL 99-662).

b. Initial problem appraisal is to be directed toward investigation of the specific aquatic plant problem, not generalized surveys of aquatic vegetation. The common indigenous submersed, floating, and emergent species do not generally meet the program criteria merely because they may qualify as "obnoxious aquatic plants" under the language of the authorizing legislation.

c. Work Not Eligible Under This Program. The APC Program authorized by Section 104 of PL 85-500, as amended, and as modified by Sections 103, 105, and 712 of PL 99-662, is not an Operation and Maintenance (O&M) program. Aquatic plant control necessary for O&M of authorized reservoirs, channels, harbors, or other water areas under the jurisdiction of the Corps of Engineers or other Federal agencies, will not be undertaken as part of this program except as such areas may be used for experimental purposes. Subordinate commands will fund aquatic plant control work required for O&M of Corps operating projects through the normal O&M budget process.

d. Intergovernmental Review. The APC Program is specifically included under the purview of EO 12372, Intergovernmental Review of Federal Programs (para 3). This executive order requires Federal agencies to provide opportunities for consultation by those State and local governments which provide non-Federal funds for, or that would be directly affected by, proposed Federal financial assistance or direct Federal development.

14-3. Guidance.

a. Authorization of Planning Studies. The Office of the Assistant Secretary of the Army (Civil Works) authorizes reconnaissance and feasibility studies. Upon authorization, HQUSACE (CECW-ON) approves work allowances and allocates funds based on district requests. Districts may request funds for these studies in annual budget submissions or by special request through division to HQUSACE (CECW-ON).

b. Planning Studies. Planning studies determine if sufficient justification exists for Federal (Corps) involvement with an aquatic plant problem and identify the most efficient means of aquatic plant management. Consult ER 1105-2-100, Guidance for Conducting Civil Works Planning Studies, for specific details on policies and procedures for conducting these planning studies. The three planning studies and associated reports are (1) initial appraisal (Letter

Report); (2) reconnaissance studies (Reconnaissance Report); and (3) feasibility studies (Detailed Study Report).

(1) Initial Appraisal. Conducted at 100 percent Federal cost, the initial appraisal is a brief analysis conducted in response to the receipt of a State request for investigation of a new aquatic plant problem or additional problems not covered by previously approved control agreements. The district identifies the type, location, magnitude and impact(s) of the aquatic plant problem and documents the district determination of need for further study. If further study is justified, a request for authorization and funding for a reconnaissance study is forwarded through division and HQUSACE (CECW-ON) to the OASA(CW) in the Letter Report.

(2) Reconnaissance Studies. Conducted at 100 percent Federal cost and cost normally restricted to no more than $15,000, reconnaissance studies are limited to 12 months in duration, with possible extension to 18 months under unusual circumstances. Studies are confined to readily available information required to determine Federal interest and should include, but not be limited to, the information described in Appendix V. These studies also determine the potential for an environmentally and economically feasible management program, and identify a sponsor willing to cost-share the feasibility studies. Where findings and conclusions of the reconnaissance study are unfavorable to undertaking feasibility study, a brief follow-up to the Letter Report summarizing the problem and findings will be submitted through division and HQUSACE (CECW-ON) to the OASA(CW). If the findings indicate advancement to the feasibility study phase, the report is submitted through division and HQUSACE (CECW-ON) to the OASA(CW) for review and approval. Reconnaissance Reports will include an analysis of the cost of preparing the Detailed Study Report (DSR), a negotiated Detailed Study Cost-Sharing Agreement (DSCSA) wherein the sponsor agrees to contribute 50 percent of the study cost of the DSR, and a letter from the local sponsor indicating willingness and intent to sign the agreement upon approval. The model DSCSA is at Appendix W. If the model is utilized as a form contract, the District Commander may execute it without additional HQUSACE clearance provided no modifications, additions, or deletions are made to the form contract. If the conditions of the agreement vary from the form contract, review and approval by HQUSACE and the OASA(CW) must take place prior to execution by the District Commander. The DSCSA shall identify the time necessary to complete the DSR.

(3) Feasibility Studies. When authorized by the OASA(CW), the district will conduct a feasibility study addressing details of the aquatic plant problem and a proposed plan of action. Conducted at 50 percent Federal/50 percent sponsor cost (at least half of which must be cash), the study determines whether an APC program is justified; if so, plans of sufficient detail will be developed to assure a comprehensive management program. Feasibility studies will consider physical, mechanical, chemical, biological and integrated control technology. Priority will be given to biological control where feasible. A negotiated Local Cooperative Agreement (LCA) for Operations wherein the local sponsor agrees to contribute 50 percent of the cost of control operations, and a letter from the sponsor indicating willingness and intent to sign the agreement upon approval will accompany the findings in the Detailed Study Report (DSR). Upon completion, the DSR will be reviewed by the division and then forwarded to HQUSACE (CECW-ON) for review and approval.

(4) National Environmental Policy Act (NEPA) Requirements. The feasibility study phase includes preparation of an Environmental Assessment (EA) and, if needed, an Environmental Impact Statement (EIS). These studies are also cost-shared. The EA will conclude with either a Finding of No Significant Impact (FONSI) or a recommendation for preparation of an EIS. The EA or EIS may either be a self supporting document combined with and bound within the feasibility report (Detailed Study Report) or integrated into the text of the

feasibility report. The EIS should be integrated into the text unless complex environmental impacts preclude this alternative. Appendix Y contains information that must be addressed in the EA or EIS.

(5) Criteria for Recommending Federal Involvement. A recommendation favorable to initiation of an APC program under legislative authority will be warranted when:

(a) There is a clear and definite Federal interest for participation under the purview of Section 104 of PL 85-500, as amended, as modified by Sections 103, 105, and 712 of PL 99-662.

(b) Analysis based on sound ecological principles clearly indicates that the program will effect satisfactory management of the target aquatic plants.

(c) Each separable element of the project, as well as the entire project, is economically justifiable.

(d) The state is legally and financially able and willing to fully meet all local cooperation requirements.

(e) The work involved is not the type normally provided by local entities or private interests as a local responsibility.

14-4. Management Operations.

a. Where Federal involvement is indicated, management operations are cost-shared 50/50 with the sponsor in accordance with an approved DSR, LCA and Annual Work Plan (AWP). The LCA for management operations shall be for a duration of one year. District Commanders may amend the LCA for the succeeding year without resubmission to HQUSACE for approval provided there are no changes in the basic LCA conditions. Each amendment will be for one year duration and shall include an AWP and cost estimate for the period covered by the amendment. Appendix Z provides information guidelines for the AWP. The State will be the signatory on the LCA; however, the State may, by separate agreement, delegate its financial responsibilities to local governmental interests. Operations can be done by Federal, state, and/or private sector entities, under an AWP specifying the details and standards of work to be performed and requiring compliance with all applicable Federal and State laws and regulations.

b. Herbicide Applications. All herbicide applications are to be performed in compliance with applicable Federal and state laws, including the Federal Insecticide, Fungicide and Rodenticide Act of 1972, as amended, and the Occupational Safety and Health Act of 1970. All Federal pesticide applicators and their supervisors must comply with the reporting requirements, safety provisions, training and certification requirements outlined in ER 1130-2-540, Chapter 3, Pest Control Management for Civil Works Projects. Questions concerning the safe application of herbicides should be referred to the District Safety Officer.

14-5. Reviews and Reports.

a. A research and operations review will be held each year to provide for professional presentation and review of current research projects and operations activities, conduct of the Civil Works R&D Program Review, and to review new research proposals to provide input for planning the future APC Program. APC Program managers of operating districts and divisions are authorized to attend the meetings.

b. The APCOSC will present an annual report of operations at the Annual Research and Operations Review (paragraph 14-5.a. above). The report will describe the activities of the Center by major categories (planning, operations, research, and training), the Center's function and overall APC program trends.

c. The APC Program is a continuing activity funded under Construction, General, and subject to an annual expenditure ceiling of $12,000,000. Recommendations and supporting data will be submitted in accordance with ER 11-2-240 (RCS CECW-B-13). The amounts requested should be the minimum necessary to meet essential program needs. Funds should be within the district's capability to utilize within the budget year, taking into account the foreseeable availability of local cost-sharing funds for planning purposes or management operations.

CHAPTER 15 - ACQUISITION OF PLANT, OWNERSHIP, AND FINANCIAL MANAGEMENT

Reserved.

CHAPTER 16 - ACCESSIBILITY

Reserved.

FOR THE COMMANDER:

OTIS WILLIAMS
Colonel, Corps of Engineers
Chief of Staff

27 APPENDIXES
See Table of Contents

APPENDIX A

REFERENCES

a. 16 USC 4601-13, Federal Water Project Recreation Act, (79 Stat. 213, PL 89-72).

b. 16 USC 460d, The Flood Control Act of 1944, as amended, (58 Stat. 887, PL 78-534).

c. 31 USC 6301, Currency and Foreign Transactions Reporting Act, (96 Stat. 1003, PL 97-258).

d. 33 USC 2325, 2328, Sec. 203, 225, Water Resources Development Act, 1992 (106 Stat. 4838, PL 102-580).

e. PL 85-500, Section 104, Rivers and Harbors Act of 1958, as amended.

f. PL 89-298, Section 302, Rivers and Harbors Act of 1965.

g. PL 89-665, The National Historic Preservation Act, as amended, (80 Stat. 915).

h. PL 91-190, The National Environmental Policy Act, (83 Stat. 852).

i. PL 91-596, Occupational Safety and Health Act of 1970, as amended.

j. PL 92-516, Federal Insecticide, Fungicide and Rodenticide Act of 1972, as amended.

k. PL 93-112, Section 504, 29 U.S. Code 706, Rehabilitation Act of 1973.

l. PL 96-95, The Archeological Resource Protection Act, as amended, (102 Stat. 2983).

m. PL 98-63, Supplemental Appropriations Act of 1983, (97 Stat. 312).

n. PL 99-662, Water Resources Development Act of 1986.

o. PL 102-580, Water Resources Development Act of 1992.

p. PL 208-75, War Department Civil Appropriations Act of 1938 (50 Stat. 518).

q. PL 291-63, The Rivers and Harbors Act of 1915, (38 Stat. 1053).

r. EO 12372, 14 July 1982.

s. 33 CFR, Chapter II, Sec 208-10.

t. 46 CFR, Shipping.

u. 48 CFR 29156, 24 June 1983, Appendix A, Aquatic Plant Control, List of Programs Subject to EO 12372.

v. AR 335-15, Management Information Control System (USACE Suppl. 1).

w. ER 5-7-1(FR), Project Management.

x. ER 11-2-240, Civil Works Activities Construction & Design.

y. ER 25-1-90, Visual Information Management.

z. ER 37-2-10, Accounting and Reporting- Civil Works.

aa. ER 56-2-1, Administrative Vehicles Management - Civil Works.

ab. ER 200-2-2, Policy and Procedures for Implementing NEPA.

ac. ER 200-2-3, Environmental Compliance.

ad. ER 360-1-1, Public Affairs.

ae. ER 385-1-40, Safety - Occupational Health Program.

af. ER 385-1-91, Training, Testing, and Licensing of Boat Operators.

ag. ER 405-1-12, Real Estate Handbook.

ah. ER 840-1-1, Use and Display of Flags by the U.S. Army Corps of Engineers.

ai. ER 1105-2-100, Guidance for Conducting Civil Works Planning Studies.

aj. ER 1110-2-109, Hydroelectric Design Center

ak. ER 1110-2-400, Design of Recreation Sites, Areas and Facilities.

al. ER 1130-2-500, Partners and Support (Work Management Policies).

am. ER 1130-2-510, Hydroelectric Power Operations and Maintenance.

an. ER 1130-2-520, Navigation and Dredging Operations and Maintenance Policies.

ao. ER 1130-2-530, Flood Control Operations and Maintenance Policies.

ap. ER 1130-2-540, Environmental Stewardship Operations and Maintenance Policies.

aq. ER 1130-2-550, Recreation Operations and Maintenance Policies.

ar. ER 1140-2-301, Acceptance and Return of Contributed or Advanced Funds.

as. ER 1165-2-30, Acceptance and Return of Required, Contributed or Advanced Funds for Construction or Operation.

at. ER 1165-2-131, Local Cooperation Agreements for New Start Construction Projects.

au. ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects.

av. ER 1165-2-400, Recreational Planning, Development, and Management Policies.

aw. ER 1180-1-6, Construction Quality Management.

ax. EP 310-1-6, Graphic Standards Manual.

ay. EP 310-1-6A, Sign Standards Manual, Vol. 1.

az. EP 310-1-6B, Sign Standards Manual, Vol. 2.

ba. EP 690-1-11, Command -wide recruitment and Outreach Materials.

bb. EP 1130-2-434, Interpretive Services and Outreach Program, Volumes 1-5, JS, DI, and FS.

bc. EM 385-1-1, Safety and Health Requirements Manual

bd. EM 1125-2-312, Manual for Instructions - Hopper Dredge Operations and Standard Reporting Procedures.

be. "Guidance for Major Rehabilitation Projects for Fiscal Year 1998," issued with the letter (same subject) from Mr. Daniel R. Burns, P.E., Chief, Operations, Construction, and Readiness Division, Directorate of Civil Works, dated 29 September 1995.

bf. Interpreter's Handbook Series - Contact: Dr. Michael Gross, College of Natural Resources, University of Wisconsin - Stevens Point, Stevens Point, WI, 54481.

bg. Interpreting Our Heritage, Tilden, Freeman; The University of North Carolina Press, 1967.

bh. The Great Outdoors Funbook, U.S. Army Corps of Engineers, 1993.

bi. Interagency Agreement of Operations and Guidelines Between Federal Prison Industries, U.S. Bureau of Prisons and U.S. Army Corps of Engineers, October 27, 1992.

APPENDIX B

REHABILITATION EVALUATION REPORT

B-1. Study Procedures and Reports. Major Rehabilitation Evaluation Reports will include engineering, environmental, and economic studies. Studies should be undertaken and the reports prepared in coordination with the Planning, Engineering, Operations and Project Management elements. Early coordination should occur with the potential cost sharing partners and other affected agencies. Engineering reliability studies should be prepared in consultation with CECW-E. However, a coordinated team effort among all functional elements will be utilized throughout the entire study process.

a. Report Name. The evaluation report will be called by the project's authorized name followed by the words Major Rehabilitation Evaluation Report.

b. Funding. The Rehabilitation Evaluation and report preparation will be funded under the Operation and Maintenance, General, appropriation.

c. Illustrations. The use of color photographs in the reports to illustrate features for proposed rehabilitation and to highlight specific problems is highly recommended. Photographs should be accompanied by narrative description that explain what is being depicted.

B-2. Study Objectives. The rehabilitation study requires rigorous analysis and reporting. The level of detail should be commensurate with the proposed action. The objectives of the study are as follows:

a. Establish the overall engineering condition and reliability of the project and all major project features at the current time. Analyses should identify reliability problems associated with critical project features as well as identify those project features which are not unreliable. This analysis should be conducted given the current and anticipated future "without project" condition of the features to establish a base condition. The results of the reliability analysis will be considered in conjunction with the economic and environmental studies to establish priorities for funding and to establish the objectives of the rehabilitation project.

b. Identify and define the operational and/or potential reliability problems and/or opportunities for efficiency improvement.

c. Identify alternative methods to resolve or manage the problem.

d. Develop cost estimates for the proposed solutions.

e. Determine if the proposed project is eligible for funding under the major rehabilitation program and if so under which categories.

f. Estimate the total economic cost and benefits of the base condition and alternative solutions.

g. Identify cost sharing requirements, if applicable.

h. Identify all environmental concerns and complete all environmental reporting requirements.

i. Identify the recommended plan. The recommended plan will identify the optimum investment, both in terms of proposed actions and timing of proposed actions, given the risk and uncertainty identified during the study. There may be circumstances where the risk and uncertainty is such that more than one plan of action may be considered to reasonably maximize net benefits. There may also be circumstances where priorities for Federal investments and alternative financing may be an appropriate mechanism to obtain full NED level of development. These should also be identified and fully described in the report.

j. For the recommended plan of action, develop a M-CACES cost estimate.

k. Prepare a proposed draft Project Cooperation Agreement (PCA) with a non-Federal cost-sharing partner if required.

1. Prepare a Project Management Plan (PMP) for the recommended alternative. The project manager, in coordination with Planning, Engineering, Operations and other functional elements will develop a PMP in accordance with ER 5-7-1 (FR). The plan will identify the timing of proposed investment, outlays and physical completion through the implementation period.

B-3. Format and Content of Rehabilitation Evaluation Reports.

a. Project Authorization. Provide pertinent information on the project authorization, including any modifications.

b. Location and Description. Describe the project location and provide a vicinity map, plan and elevation of the structure as an enclosure. Provide a narrative description of the current operation and use of the project, the associated project benefits and the recipient of project benefits.

c. Identification of Problems and Opportunities. Describe the physical characteristics of all significant project features. Special attention should be given to features which have experienced unsatisfactory performance and which receive special emphasis in the report. In the case of efficiency improvement, describe the opportunity for efficiency improvement (Reference ER 1105-2-100, Section 5-4, Summary of the Planning Process\.

d. Project History.

(1) Current and Historical Conditions, Maintenance, Repairs and Modification.

(a) Describe the physical condition of the project and project features including an assessment of the engineering condition and reliability of each. Table 3-1 provides an example for summarizing this information. The current condition review should include a narrative description of the condition and reliability of each feature. The purposes of the narrative and Table 1 are to support special attention to the feature or features proposed for major rehabilitation by this report. Of particular importance is the role of the feature in the performance of the project and the feature’s function in the operation of the project. Diagrams, drawings and photographs in sufficient detail to portray the project and proposed rehabilitation features in their

current condition, should be included in this description. High quality color photographs are especially important to enable the reviewer to visualize and appreciate the features and their condition. The reviewers are normally unfamiliar with the project and are relying solely on the content of the report to make investment decisions.

(b) Provide a history of project cost. Describe and display on an annual basis the operation, maintenance, repair and rehabilitation cost history of the project. The maintenance, repair and rehabilitation costs for the feature(s) proposed for rehabilitation should be shown separately. Include a description of the important repair and maintenance activities on the project.

(c) Describe and display instances of service disruption and emergency repairs. This should include all significant episodes of service disruption. Describe the consequences to the system (i.e., describe the socioeconomic effects of the disruption in service). The description of each event should contain all the conditions that are relevant to the disruption of service, not only those that are related to the feature's physical condition. These might include ice build-up, impact damage from barges or debris, or rare natural events. The description and display should include length of time the project and/or project feature was out of service and the costs associated with each event. These costs are the emergency repairs and increased O&M after the event, but attributable to the event, and project benefits which would be lost if this disruption of service occurred under current conditions. State all figures in current dollars. The repair may also change (reduce or increase) the frequency of future service disruptions and may reduce future O&M costs. These possibilities should be considered and included in the analysis, if warranted.

(d) Describe and document quantitatively historical changes in the service level capable of being provided by the project. This should provide documentation on any chronic decline in the capability of the project to produce beneficial outputs due to deterioration or other factors related to a feature's physical condition. This information should be provided for at least the last 10 years. Special attention should be paid to the contribution of the feature(s) proposed for rehabilitation, and to the degradation in service level.

e. Economic Considerations.

(1) Federal Interest. For the majority of cases, the Federal interest in an existing project will be obvious. However, reasonable argument which shows a Federal interest, and in some cases, a non-Federal interest (i.e., proposed cost sharing), will be provided in the report. Emphasis shall be placed on project outputs and whether they serve priority purposes as defined in the Annual Program and Budget request for Civil Works Activities, Corps of Engineers.

(2) Base Condition. The base condition is the alternative which all other plans will be measured against. In comparison to other Corps planning studies, the base condition is synonymous with the "without project" condition. The base condition assumes that the project will be operated in the most efficient manner possible without the proposed rehabilitation. Should the project benefit stream be interrupted due to unsatisfactory feature performance, it is assumed that emergency funds will be available to fix the feature. For the economic analysis, allowance must be made for the effect of the repair on the reliability of the feature. Considerable risk and uncertainty is inherent in the base condition. The timing, frequency, and consequences of system disruption are all unknown and must be estimated. The analysis should explicitly

show the effects of reasonable alternative assumptions concerning these variables. Portray the base condition in the following manner.

Table B-1
BASE CONDITION - SUMMARY[1]

No.	Description[2]	RELIABILITY					UNSATISFACTORY PERF.			ASSESSMENT				
		Summary Assessment	Basis for Assessment	Current	Cause	Future	Mode	Immediate	Consequence	Probable	Estimated	Cost	Benefits	Environment
	tru													
	W													
	M													
	Ga													
0253	Spillway Channels													
0299	Associated General Items													

[1] See Enclosure 5 for examples of potential entries, descriptive footnotes, and potential supporting narrative description.
[2] Description of Item - Although there is no specific list, the M-CASES work breakdown structure could be used to assist in organizing he data.

Step 1. Based upon the reliability index (see paragraph f, Engineering Considerations) calculated for the current physical condition, select the probability of unsatisfactory performance for each feature, or component, from Table D-1 of Appendix D. If the probability of unsatisfactory performance is due to a combination of events, provide the method used to determine these probabilities. Both the probability of unsatisfactory performance of a feature and the probability of occurrence of an event which results in load conditions causing the unsatisfactory performance shall be explicitly discussed and displayed. Reporting requirements to support the reliability analysis are addressed in Appendix D.

Step 2. Based on the existing physical condition of, and the current and forecasted demands on the features, estimate the frequency of service disruption and the physical consequences resulting over the planning period. Frequencies and consequences should be expressed in terms which are unambiguous and which facilitate analysis. For example, estimate the percent chance of disruption per year (annual probability) or probability of disruption per event (per event probability).

Step 3. Develop an event tree. A useful way of presenting information of alternative future pathways is an event tree diagram. The event tree is used to display the possible outcomes from some initiating event. Figure C-1 is an event tree for a hydroelectric generating facility.

Step 4. Estimate all costs necessary to correct the service disruption. The repair should be the least cost fix necessary (as considered reasonable for the circumstances) to continue service.

Step 5. Estimate the economic cost for each disruption. (See Appendix E)

Step 6. Combine the frequency of service disruption with the consequences of disruption. Monte Carlo simulation is one technique for combining risks and determining expected values. This technique is especially useful when the arithmetic of the expected value calculation is highly complex or intractable. Under some, perhaps many situations, the standard statistical procedure of summing the products of the probabilities and corresponding consequences is sufficient. That is, calculating the value analytically may be more expedient and transparent than estimating by simulation. An advantage of the Monte Carlo approach is that it yields both the expected value and the variance. The fundamental point of the analysis however, is to explicitly consider the likelihoods and consequences of the base condition. See Appendix F for further consideration of this approach.

(3) With Rehabilitation Condition.

(a) General. As previously stated, the base condition should@ describe an immediate or certain failure. Nor is the only project alternative immediate and full scheduled rehabilitation. There are a variety of intermediate strategies that should be evaluated. In addition, the rehabilitation decision must give consideration to the choice of timing and extent of rehabilitation. Therefore, the approach is to develop alternatives to solve the problems. This does not predetermine that one major rehabilitation scenario is the only alternative.

(b) Alternatives Considered. Discuss the alternatives considered. The narrative should address the level of detail developed for each alternative, the data available, assumptions made and the level of reliability y, risk and uncertainty associated with the alternative. Present the

results of the analysis for each alternative. The following represent some potential alternative plans that should be evaluated and compared.

- Advance maintenance strategy. Advance maintenance consists of expenditures in excess of routine O&M that reduces the likelihood of some emergency repairs and temporary service losses, or the rate of service degradation. Under this scenario, one must evaluate the effect that probabilities and consequences of the strategy have on expected service disruptions and reliability.

- Scheduled repair strategy. Assess the components of the feature in terms of the service disruption probabilities and consequences to the reliability of the structure. Based on this assessment, stockpile replacement parts and make other preparations on this assessment to reduce the time of expected project service disruption.

- Scheduled rehabilitation strategy. The scheduled rehabilitation strategy requires that the “optimum” rehabilitation timing be identified based on service disruption rates, service degradation and their economic cost.

- Immediate rehabilitation strategy.

(4) Summary Statistics. Provide a table to illustrate the cost, benefits, net benefits and benefit to cost ratios of the base condition and each alternative considered.

f. Engineering Considerations.

(1) Reliability Analysis

(a) General. Present a summary of the reliability analysis for the base condition and each alternative. The reliability of the various alternatives must be investigated in order to evaluate the relative merit of each alternative with respect to the base condition. In addition, if the base condition assumes that emergency repairs will be made to unreliable components or features, a post emergency repair reliability analysis must be made of the component or feature. Enclosure 2 provides an introduction to the principles and procedures to follow in conducting a reliability analysis, and the reporting requirements. Additional considerations are provided below.

(b) Probability of Unsatisfactory Performance. The reliability of a component or structure shall be stated in terms of the probability y of unsatisfactory performance of the feature. Unsatisfactory performance of a component maybe indicated at various levels of performance, depending upon the consequences of that performance level, from minor deflections to complete collapse of a structure. Probabilities of unsatisfactory performance should be calculated for a range of performance levels, however, failure scenarios which indicate threats to public safety should not be assigned probabilities using the procedures outlined herein. While these situations may be identified using reliability analysis techniques, they should be considered to be emergency situations and remediated outside to the major rehabilitation program. Probabilities of unsatisfactory performance must be calculated using the analytical procedures outlined in Appendix D, using one of four methods;(1) Reliability Indices; (2) Hazard Functions; (3) Historical Frequency of Occurrence Analyses and (4) Expert Elicitation. Expert Elicitation should only be used to establish subjective probabilities of unsatisfactory performance for preliminary screening purposes to determine the components or features which need further study, or when there is insufficient data to develop the probabilities from historical frequencies

of occurrence or analytical procedures. Expert Elicitation should only be used in consultation with CECW-E.

(c) Calibration of Reliability Models. Performance function models used to evaluate the project component or feature reliability should be calibrated by applying the model to at least two similar components whose performance is known. Reliability should be calculated for a similar component known to have suffered distress, and for another similar component known to meet current design criteria. If the performance function model does not accurately predict the known structural performance levels, the assumptions, conditions, simplifications and parameters used in the model should be reexamined and adjusted to realistically provide an accurate prediction.

(d) Time Dependent Reliability. The reliability of a component or feature varies with time due to many factors including environmental conditions, component stress history, corrosive resistance of the materials, as well as maintenance history. Therefore, a time-dependent reliability analysis must be conducted in order to consider the impact of these factors on project performance and service life. Projections of future changes in reliability should be based upon the calculation of performance functions using the procedures outlined in Appendix D. Rates of degradation in random variable properties should be based upon available existing data, industry practice and experience at similar projects. If available project data is scarce or non-existent, then estimating rates of degradation will require that considerable engineering judgement be exercised in consultation with CECW-ED.

(e) Engineering Characterization of Structural Features. The complex nature, time and cost of reliability analyses require that the number of elements analyzed for any project or feature be reduced to the critical elements, or to representative groups or sections. In some cases this can be done by grouping together elements or components which are similar and can be represented by a single element, or a small portion of a large element, i.e., the reliability of an entire length of lock wall might be represented by a typical one foot section of the wall. In other cases, it may be possible to group related elements together and represent the group by a single critical element. The reliability of the critical element (and its associated probability of unsatisfactory performance) would then be assumed to govern the reliability of the entire group of elements and they would then be considered as one element or component in the economic risk analysis. An example of this is in a steel miter gate or a steel truss which is dependent on the satisfactory performance of all members to resist loads. The unsatisfactory performance of one or more critical members would lead to the unsatisfactory performance of the entire structure.

(2) Engineering Consequences. The engineering, or physical, consequences of the expected level of performance should be described in detail for each performance function evaluated. The sequence of events caused by the unsatisfactory performance of a component should be reasonable, with consideration given to the importance of the component to the overall performance of the structure or feature. While “worst case” unsatisfactory performance scenarios need to be evaluated and described, lesser events should also be included since these higher probability events may have greater impact upon the service life of the structure and the economics of the project. If the unsatisfactory performance of components or features is expected to result in emergency repairs, provide an assessment of the impact of the repairs upon both the reliability of the repaired elements and those elements not included in the repairs.

(3) Engineering Evaluation of Alternatives. Alternative schemes for repair and rehabilitation must be fully investigated. Alternatives investigated should include the use of new

materials, new repair techniques and innovative designs as well as all reasonable alternative configurations. The schemes investigated must address and resolve concerns which have led up to the major rehabilitation proposal, such as declining reliability and consequences of unsatisfactory performance of the structure or component. Since complete reliability analyses must be conducted on all alternative schemes, only reasonable and technically feasible alternatives should be investigated. This requires a screening process to eliminate less reasonable schemes from consideration. Factors considered in the screening process should include, but not be limited to, technical feasibility, constructibility, and impacts upon appurtenant structures. Alternative schemes eliminated during this process for engineering reasons should be briefly described, along with the factors which resulted in elimination.

(4) Guidance.

(a) Basic reliability principles and an example for a steel miter gate are presented in ETL 1110-2-532, "Reliability Assessment of Navigation Structures", 1 May 1992. Additional guidance is also presented in ETL 1110-2-321 "Reliability Assessment of Navigation Structures, Stability of Existing Gravity Structures", 31 December 1993, and ETL 1110-2-354, "Reliability Assessment of Pile-Founded Navigation Structures", 31 August 1995.

(b) Hydropower. The reliability of turbines and generators, and other electrical/mechanical equipment may be determined by using "survivor curves. " Estimates of the initial reliability and the annual rate of change in reliability should be made for both the base condition and all rehabilitation alternatives. ETL 1110-2-337, Reliability Analysis of Hydropower Equipment, should be used and the Hydroelectric Design Center (HDC) should be contacted for guidance in the use of survivor curves and other reliability tools. (See Appendixes F and H for further discussion.) The reliability of appurtenant structures such as powerhouses, penstocks, gates, dams, etc. should be determined in accordance with Appendix D.

g. Environmental Considerations.

(1) Environmental Effects. Provide a brief description of the existing affected environment. Highlight significant resources that are likely to be affected as well as any that are covered by a specific law (e.g., endangered species, clean air, clean water, cultural and historical, etc). Identify potential hazardous and toxic wastes concerns, conduct studies and prepare appropriate reports in accordance with ER 1165-2-132. Identify the location and significance of impacts and justify any mitigation requirements including the mitigation cost estimate. Indicate the concurrence or nonconcurrence given by resource agencies on impact assessments and proposed mitigation plans. Identify any environmental constraints (project stoppers) that would render an alternative infeasible. Present a matrix of the alternative environmental considerations.

(2) Coordination and Correspondence. Provide a table indicating who was contacted, their affiliation, and a synopsis of their general concerns. Copies of all pertinent correspondence should be included in Appendix C of the report.

(3) Reports and Studies. This section summarizes the studies conducted to evaluate the environmental effects of the rehabilitation plan (e.g., biological, cultural, social, HTRW, studies, etc.).

(4) The reporting officer will be responsible for determining NEPA documentation (e.g., Environmental Assessment, Finding of No Significant Impact, Environmental Impact Statement)

based upon Corps regulations and 40 CFR Parts 1500-1508. All NEPA documents should be submitted with the Major Rehabilitation Report.

(5) Preparers. List who prepared which parts of the document report and their role.

h. Assessment of Alternatives.

(1) Critical Assumptions and Key Variables. For the Base Condition and each alternative considered, there are critical assumptions and key variables that are influential in estimating rehabilitation benefits and costs. In most instances these fall into the following categories:

(a) the initial risk (base condition and other alternatives),
(b) the annual rate of change in risk (base condition and other alternatives),
(c) the risk after repair,
(d) the cost of repair,
(e) the opportunity costs during repair and rehabilitation,
(f) the change in annual O&M cost with rehabilitation or other strategies, and
(g) the cost of each alternative.

The assessment should identify which of these variables is critical to reported economic evaluation of each rehabilitation alternative. The assessment should display the reasonable range for each of the critical variables identified and the sensitivity of the benefit-cost ratio and net benefits over these possible values.

(2) Reporting of Statistical Results. The output from the analysis of reliability based costs and benefits are statistics generated by analytical procedures or simulations involving probabilities. The resulting estimated benefits (and costs), therefore, are statistics in the form of means, variances, skews, etc. The reporting of the results of all alternatives should include a tabular display of the mean net benefits and standard errors. In addition, the display should provide a 90% confidence interval for the mean net benefits (mean+ 1.64x standard error) assuming that net benefits are normally distributed. Appendix F provides displays for a simplified example that can assist in developing the display of results for decision purposes.

i. Recommended Plan. Provide a recommendation supported by the engineering, economic and environmental analysis. Present the benefit to cost ratio and net benefits using the current Federal discount rate.

j. Major Rehabilitation Classification. Describe how the proposed project meets the requirements for Major Rehabilitation funding and the Reliability and Efficiency Improvement classification(s). Display benefits attributable to each classification and how costs are allocated to each classification.

k. Project Cost Estimate. Show a schedule of fully funded project costs and a breakdown of the Federal and non-Federal cost share, if applicable.

1. Cost Sharing Considerations. For navigation projects, major rehabilitation will be cost shared by the Inland Waterway Trust fund or the Harbor Maintenance Trust Fund in accordance with the WRDA 1986 as amended. Other cost sharing will be in accordance with any local (project) cooperation agreements related to the original project authorization. For hydropower rehabilitation, costs are reimbursed, over time, by the affected Power Marketing Agency (PMA). Some rehabilitation projects, in particular hydropower, may include both reliability and efficiency improvements. In this case, care must taken to clearly quantify the benefits and costs associated with each type of improvement. If efficiency improvement benefits are not incidental to a reliability based rehabilitation, special cost sharing maybe required. HQUSACE should be consulted early in the study process to clarify any cost sharing questions. See Appendix H for specific hydropower guidance.

m. As Appendix A to the report, present the results of the reliability analysis.

n. As Appendix B to the report, present detailed economic analysis.

o. As Appendix C to the report, present complete environmental documentation.

p. As Appendix D to the report, provide a M-CACES cost estimate of recommended plan.

q. As Appendix E to the report, provide a Project Cooperation Agreement with non-Federal cost-sharing partner, if applicable in accordance with paragraph 12 and tailored to the model shown in Appendix A of ER 1165-2-131.

r. As Appendix F to the report, provide a Project Management Plan. (Note: When the recommended plan has been identified and a M-CACES cost estimate prepared, a Project Management Plan must then be developed and submitted with the major rehabilitation report. Reports submitted without a Project Management Plan will not be considered for finding).

s. As Appendix G to the report, provide a schedule of fully funded project costs by fiscal year and a breakdown of the Federal and non-Federal cost share, if applicable.

APPENDIX C

CONCEPTUAL APPROACH FOR ANALYZING REHABILITATION

C-1. Background. In thinking about major rehabilitation it is important to remember that the evaluation considers alternative future streams of project services and costs and the reliabilities of those services and costs. Any rehabilitation plan results in a different stream of these variables. The purpose of a risk-based benefit-cost analysis is to determine the economic efficiency of alternative rehabilitation plans. The evaluation must account for the fact that each plan may differ in terms of its effects on project future service levels, O&M costs, and/or project reliability.

C-2. The Base Condition. A useful approach to describing the rehabilitation evaluation problem is to examine the time paths of project services under alternative rehabilitation scenarios. Figure C-1 shows time paths of the **expected value** of project services under 4 different scenarios. The expected value for each year is calculated by weighing the possible service level in each year by its reliability. As shown in Figure C-2, a frequency distribution is associated with each point on each path in Figure C-1.

a. Each time path begins at time **0** when the original project service flow begins. The straight line labeled **b** indicates the "as built" expected value of service flows. The curved solid line beginning at time **0** indicates a decline over time in either the level of service flows, their reliability or both. The straight line labeled **a** represents the current condition and for purposes of this discussion it also represents some "reliability" associated with condition **a** that could be used as a trigger to consider rehabilitation for reliability. Although the paths all begin at time **0** the rehabilitation analysis only considers path segments from **t** to **t+n**.

b. If a project is not rehabilitated it can still be expected to continue functioning albeit with possibly reduced service levels and reduced reliability. Under this condition maintenance is increased as needed (but within limits) and components or sub-features are repaired on an emergency basis. This essentially represents the current O&M practice. The solid curve in Figure C-1 labeled **I** shows the time stream of the expected value of services under this emergency repair scenario. For the evaluation of rehabilitation alternatives this time path is called the Base Condition. There is also some corresponding time stream of O&M costs in the Base Condition. The Base Condition is conceptually equivalent to the "without condition" for new project evaluation in the sense that the benefits and costs of all alternatives are measured by comparison with this condition. Notice that Path **I** indicates that the expected value of the service flow is permitted to fall and remain below the current condition but that the project continues to function. It is possible, however, that emergency repairs may restore the expected value of service flow to level **a** or it might even result in exceeding level **a**.

C-3. Rehabilitation Plans. Path **II** in Figure C-1 shows a rehabilitation alternative that returns the service flows and reliability to the current level, shown by line **a**. Notice that Path **II** does not return the expected service flows to the original project level but it does improve the reliability of the flows.

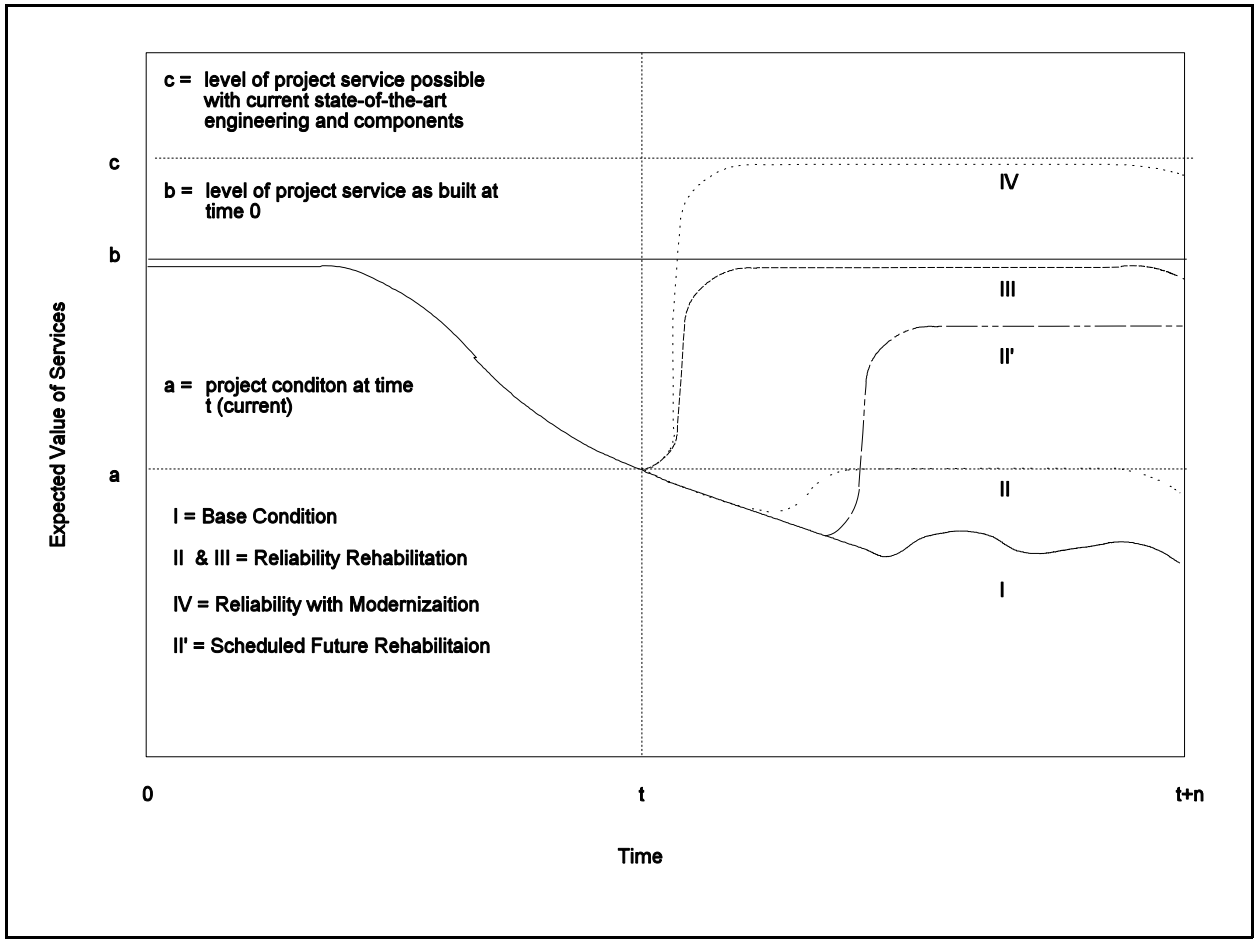


Figure C-1: Expected Value of Service Flows and Rehabilitation

a. Path **III** shows a different rehabilitation alternative that restores the expected service level to the original condition, shown by line **b**, realized when the project was built. This may be described as a full, in-kind replacement of the project feature or features.

b. Path **IV** shows a rehabilitation alternative that clearly "upgrades" the project in relation to the original condition denoted by line **b**. Thus, the service flows and reliability are improved compared to the Base Condition. This rehabilitation would be **Reliability** with **Efficiency Improvements**.

C-4. Reliability. Figure C-2 shows a clearer representation of a reliability rehabilitation. The figure represents the 3-dimensional aspects of service level, time, and probability in 2-dimensions. The vertical axis measures the actual service flow. The figure shows that for Path **I**, the Base Condition, the expected value of service level declines and the variance increases. At time **t** the reliability of service that triggers a rehabilitation study could be displayed in Figure C-2 by comparing the area under the probability distribution with service flow less than **a** with

some risk-based criteria. This comparison might result in an initiation of a rehabilitation study but would not be sufficient to recommend any rehabilitation. The distribution of services shifts from being positively skewed to negatively skewed so that the frequency of lower service levels increases over time. Service level **a** could still be produced under ideal circumstances, e.g. no break-downs, balky equipment functions properly, etc., but the likelihood of level **a** declines. Thus, the Base Condition shows a reduced level of reliability but does keep the project producing some services.

a. The dashed line in Figure C-2, labeled **II**, shows that the rehabilitation shifts the yearly distribution of project services, increasing the mean and reducing the variance (not shown). Notice, however, that the rehabilitation does not increase the "potential" service flow from the Base Condition since under ideal circumstances the Base Condition could still produce level **a**.

b. In fact, any rehabilitation that results in a time path between **II** and **III** in Figure 1 could be described as **Reliability** rehabilitation. Note also that reliability rehabilitation might consider a scheduled future, rather than an immediate, rehabilitation. The time path for this

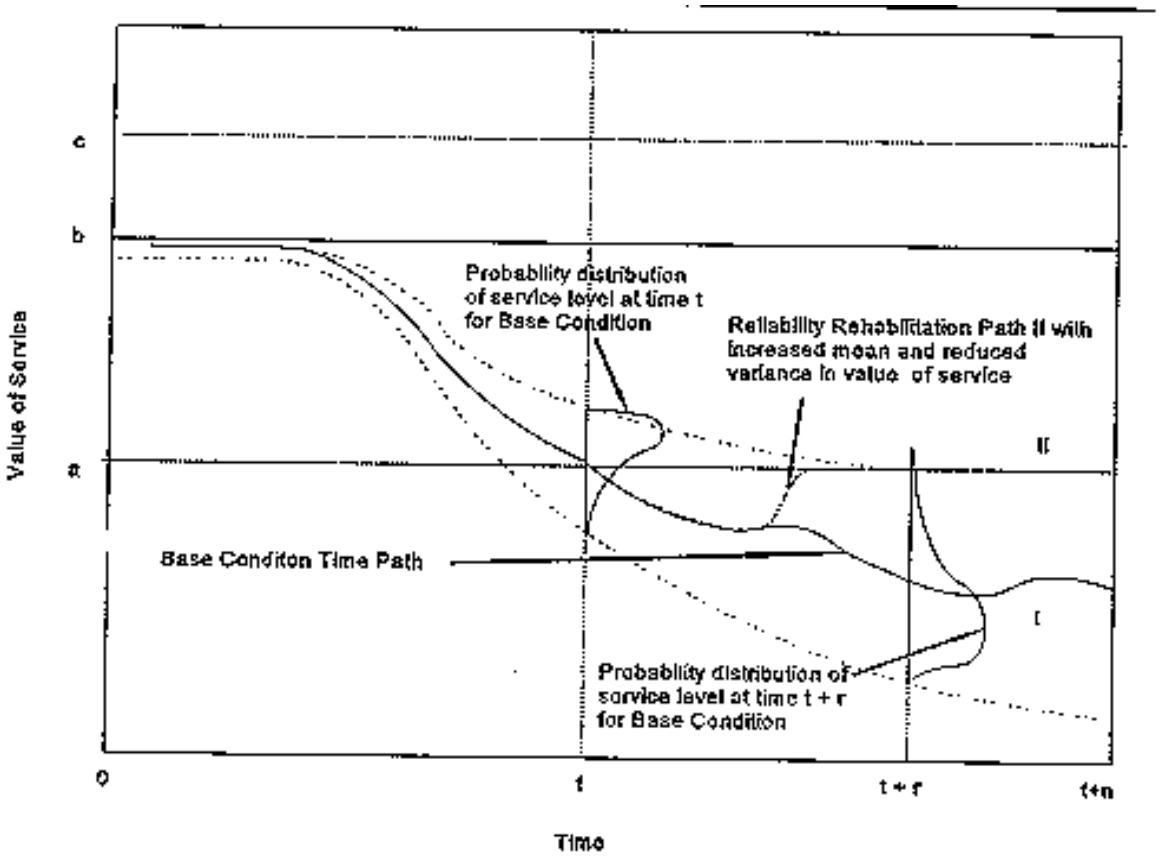


Figure C-2: Distribution of Service Level and Reliability

alternative would follow Path **I** until some point after time **t** then trace a path such as shown by **II** in Figure C-1. Thus, rehabilitation planning should consider the appropriate timing for implementation as well as an expected value of service less than provided by level **b** and more than provided by level **a**.

C-5. Costs. The foregoing description of rehabilitation focused exclusively on service flows in describing the Base Condition and the range of rehabilitation alternatives. O&M and repair costs also have time paths such as those shown in Figures C-1 and C-2. One would expect, however, that the cost path, at least for the Base Condition, would be increasing over time and would display increasing variance. The risk-based benefit-cost analysis must incorporate uncertainties in project costs in each year for the Base Condition and all rehabilitation alternatives.

C-6. Conclusion. All rehabilitation plans result in some time path between Path **II** and Path **IV**. Each plan contains elements that increase expected service levels by both increasing the reliability of a fixed service flow, (with reduced frequency of repairs and costs), and by increasing the level of "potential" service flows from the Base Condition. The analytical procedures for evaluating any rehabilitation plan are the same. The analyst must first be able to quantitatively describe the Base Condition in terms of service levels, costs and reliabilities both now and over the planning period. Correspondingly, any rehabilitation option must also be quantitatively described in these same terms.

APPENDIX D

INTRODUCTION TO AN ASSESSMENT OF STRUCTURAL RELIABILITY

D-1. Introduction. The objective is to introduce methodology to be used to evaluate the reliability of civil works structures for various modes of performance. These reliability measures are intended to be used in analyses for prioritizing structural rehabilitation. The results of a reliability analysis are used to provide a condition ranking of the structure or component. Basic references are provided herein. A decision making flow chart is provided as Figure D-1, and reporting requirements for reliability analyses are presented in paragraph D-8.

a. Traditionally, evaluations of structural adequacy have been expressed by safety factors. A safety factor can always be expressed as the ratio of capacity to demand. The safety factor concept, however, has shortcomings as a measure of the relative reliability of structures for different performance modes. A primary deficiency is that parameters (material properties, strengths, loads, etc.) must be assigned single, precise values when the appropriate values may in fact be uncertain. The use of precisely defined single values in an analysis is the **deterministic** approach. Thus, the safety factor reflects both the condition of the structure and the engineers' judgement and degree of conservatism in assigning values to parameters.

b. The **probabilistic** approach extends the safety factor concept to explicitly incorporate uncertainty in the parameters. This uncertainty can be quantified through statistical analysis of existing data or judgmentally assigned. Even if judgmentally assigned, the probabilistic results will be more meaningful than a deterministic analysis because the engineer provides a measure of the certainty of his or her judgement in each parameter.

D-2. Basic Principles.

a. Random Variables. In the probabilistic approach the parameters are treated as random variables. Random variables assume a range of values in accordance with a function termed a probability density function or probability distribution. Although the value of a parameter is uncertain or variable, the probability density function quantifies the likelihood that the value of the random variable lies in any given interval. When parameters are defined as random variables, functions of these parameters such as safety factor also become random variables and can be expressed in probabilistic terms.

b. Probability of Unsatisfactory Performance. An engineering reliability analysis determines the probability of unsatisfactory performance, Pr(u), defined as the probability that the value of a function which characterizes the performance of the system exceeds some limit state. These performance functions, or performance modes, are deterministic functions which are used in design or analysis and should define reasonable performance levels expected to occur over the service life of the project or component. Failure modes for civil works type structures are difficult to define deterministically, however, and describe a condition which is unacceptable for USACE projects, i.e., failure of a structure or component. Therefore, performance modes such as calculation of deflections, cracking or loss of section which can be more readily defined deterministically are used in order to detect adverse conditions prior to failure.

c. Limit States. Limit states define the point at which the performance function predicts that unsatisfactory performance will occur, or that the engineering consequences will have some adverse economic impact. Several limit states may apply to a particular performance function. For example, the limit state for deflection of a gravity lock wall monolith could be taken as the event representing excessive lateral movement which causes cracking, spalling or binding of operating equipment. Several loading conditions and the corresponding deflections may be required to be calculated to determine the range of deflections, their impact upon the operating equipment, barge traffic and stability, in order to establish limit states.

d. Reliability. The reliability, R, is the probability that the unsatisfactory performance, Pr(u), will not occur. Mathematically reliability is determined as follows:

$$R = 1 - Pr(u).$$

e. Safety Ratio. A concept used in the calculation of reliability is the safety ratio. Important parameters should be defined as random variables, then the total capacity, C, (resistance) and the total demand, D, (load) are also random variables. The safety ratio, SR, is the quotient of the capacity and demand; or of the resistance and load. The probability of unsatisfactory performance can then be expressed as the probability that the safety ratio will be less than one, or:

$$Pr(u) = Pr\ (SR<1) = Pr[(C/D) < 1]$$

D-3. Calculation of Probability of Unsatisfactory Performance.

a. Methods. Four methods are available to calculate the probability of unsatisfactory performance; (1) Reliability Index, (2) Hazard Function, (3) Historical Frequency of Occurrence, and (4) Expert Elicitation (or subjective probabilities). The selection of the method to be used to establish the probability of unsatisfactory performance will depend on the type of component or structure, availability of project specific data and the level of study. Each of these methods are briefly discussed below.

b. Reliability Index. In many applications of reliability analysis, the probability of unsatisfactory performance is discarded in favor of the reliability index, β, which is a measure of how much the expected average value of the safety ratio exceeds the limit state at a particular point in time. A β value of 3.0 implies that the expected value of the performance function lies three standard deviations above the limit state and structures, components and performance modes with higher indices are considered to be more reliable than those with lower indices. Expressing reliability in terms of the reliability index has several advantages:

(1) A reliability index can be calculated knowing only the means, standard deviations and correlation coefficients of the variables.

(2) Analysis of recurring events and replicate components (such as failure of mechanical parts or electric power), have a measurable and easily understood frequency of failure. Many features of navigation structures are uniquely adapted to site conditions and are not expected to fail due to foreseeable rare events, (i.e., observations and analyses can be made and some remedial action will be undertaken before the reliability drops below a tolerable value).

(3) Reliability index approach is consistent with recent structural design codes and techniques used for highway bridge evaluation.

The reliability index is converted to a probability of unsatisfactory performance for the assumed distribution of the performance function. The probabilities determined in this manner are relative probabilities considered to be adequate for ranking of investment priorities and should not be confused with absolute measures of probability required for making safety decisions, nor are the probabilities time-dependant. This procedure yields the reliability at a particular point in time, or a snapshot of the current reliability, and assumes that the component has survived up to that time. In order to determine the time-dependent nature of reliability as hazard function analysis must be conducted.

c. Hazard Function. The reliability of a component or structure changes with time due to environmental impacts, stress history and operational history. Therefore a time-dependent reliability analysis should be conducted. While the reliability index approach outlined above represents an approximation of the reliability at a point in, hazard functions more accurately predict the reliability of degrading structures. The hazard function, or conditional failure rate, is the probability that the component will survive in the next, or given, time period assuming it has survived up to that time. The hazard function h(t) is expressed mathematically as a function of the reliability function L(t) as follows:

$$h(t) = -\frac{\partial \ln L(t)}{\partial t}$$

d. Historical Frequency of Occurrence. Probabilities of unsatisfactory performance may be established by examining historical data and/or test data. If the historical record is of sufficient length and the sample size for the particular component and event under consideration is large enough, historical rates of unsatisfactory performance may be generated by statistical analysis of the data. Care must be exercised to ensure that the data used is applicable for the event and performance mode under consideration. This is generally not the case for civil engineering structures, i.e., the length of record is short and the sample size is small. Data and sample size may be sufficient, however, for smaller components such as motors, electrical parts and mechanical equipment, or industry data of testing on such items may be available. Survivor curves have also been used to establish probabilities of unsatisfactory performance based upon historical data. These curves are generated for specific types of electrical and mechanical equipment, and show the number, or percentage of the total population, surviving as a function of time. An analysis of the survivor curve for the particular type of equipment under consideration can yield the probability of unsatisfactory performance in the next time period and in future time periods. Care must be exercised in applying survivor curves to a particular piece of equipment to insure that the survivor curve chosen is based upon the same operating and maintenance conditions as have been experienced in the field. ETL 1110-1-337 and guidance on the application of survivor curves to hydropower equipment are available from the Hydroelectric Design Center (CENPD-PE-HD).

e. Expert Elicitation. Expert Elicitation is the use of expert judgement to establish subjective probabilities to measure an individual's degree of belief concerning the likelihood of the occurrence of an event. Subjective probabilities are generally used whenever there is insufficient data to develop the probability of an event from its historical frequency of occurrence

or to conduct an analytical assessment of the probability. The method is highly dependent upon the experience and skill of the panel of experts selected and the procedures used to avoid biases in the probabilities. The procedure is primarily used for events which have a probability of occurrence between 0.1 and 0.9 since rare events with very low probabilities are more vulnerable

to bias. Methods are available to reduce this bias; however, they increase number of events which must be analyzed and the time required by the expert panel. Guidance concerning the use of expert elicitation should be obtained in consultation with CECW-ED.

D-4. Analysis Procedures. Guidance for conducting reliability analyses using hazard functions, historical frequencies of occurrence and expert elicitation are available from various sources in the literature and upon consultation with CECW-ED. The reliability index provides a means to express reliability as a function of the means and standard deviations of C and D, where C and D are functions expressing the capacity and demand associated with the performance mode. A reliability index based analysis for a typical mode of performance should be conducted in accordance with ETL 1110-2-532.

D-5. Overall System Reliability. Reliability for a number of components or a number of modes of performance, may be used to estimate the overall reliability of a structure. To gain insight into this approach, consider two extreme cases, the series system and the parallel system.

a. Series System. In a series system, the system will perform unsatisfactorily if any one component performs unsatisfactorily. If a system has n components in series, the probability of unsatisfactory performance of the ith component is p_i and its reliability, $R_i = 1 - p_i$, then the reliability of the system, or probability that all components will perform satisfactorily, is the product of the component reliabilities:

$$R = R_1R_2R_3....R_n = (1-p_1)(1-p_2)(1-p_3)...(1-p_n)$$

b. Simple Parallel System. In a parallel system, the system will only perform unsatisfactorily if all components perform unsatisfactorily. Thus, the reliability is unity minus the probability that all components perform unsatisfactorily, or:

$$R = 1 - p_1p_2p_3....p_n$$

c. Parallel and Series Systems. Solutions are available for systems requiring r-out-of-n operable components, which may be applicable to problems such as dewatering with multiple pumps, or closing a gate bay with emergency bulkheads. Subsystems involving independent parallel and series systems can be mathematically combined by standard techniques.

(1) Upper and lower bounds on system reliability can be determined by considering all components to form parallel and series systems, respectively; however, the resulting bounds may be so broad as to be unpractical. A number of procedures are found in the references to narrow the bounds.

(2) Civil engineering systems such as locks and dams (or even building frames) are complex and may have many performance modes. Some of these may not be independent; for instance several performance modes may be correlated to the occurrence of a high or low pool level. Earth pressures, sliding, and overturning performance are all correlated to shear strength. Rational estimation of the overall reliability of a lock and dam is a topic that is undergoing further research.

d. A Practical Approach. In many systems, the reliability of a few subsystems or components may govern the reliability of the entire system; navigation systems and hydropower plants are no exception. Thus, developing a means to characterize and compare the reliability of these components as a function of time are sufficient to make engineering judgements to aid in prioritizing O&M expenditures.

(1) For steel design, major structural components are designed to a constant value of the reliability index, typically about 3.0; however, connections are designed to higher reliability index values, perhaps 5.0, as engineers have always desired to avoid problems at connections. A complex steel frame is designed such that each component meets a target reliability index value, which may vary, but a "system reliability" calculation is not routinely done in building design. However, target reliability indices may be established for critical lock and dam or hydropower components and performance modes, and O&M priorities will be directed at ensuring that these targets are met or exceeded.

(2) For initial use in reliability assessment, the target reliability values presented in Table D-1 should be used. A hazard function plot of reliability vs time for major performance modes should be developed. The objective of the Operation and Maintenance program would be to keep the reliability for each significant mode above its target value for the foreseeable future.

D-6. Target Reliability Values. Reliability indices are a relative measure of the current condition and provide a qualitative estimate of the structural performance. Structures with relatively high reliability indices will be expected to perform their function well. Structures with low reliability indices will be expected to perform poorly and present major maintenance problems. If the reliability indices are very low, the structure may be classified as a hazard. Working from a sufficiently large experience base, it should be practical to make some estimates of expected structural performance with some engineering judgement. A large experience base exists within USACE and studies are planned to collect, organize and analyze these operation and maintenance records. The target reliability values shown in Table 1 should be used in general. Case-by-Case refinements should be conducted in consultation with and approved by CECW-ED.

D-7. References.

a. AISC, Load & Resistance Factor Design, Manual of Steel Construction, 1st Edition 1986, AISC.

b. Beim, G.K. and Hobbs, B.F., June, 1995, Development and Use of Subjective Probabilities and Event Trees for Water Resources Investments, Draft report to CEIWR, Ft. Belvoir, VA.

c. Benjamin, J. and C.A. Cornell, (1970) Probability and Statistics, and Decision for Civil Engineers, McGraw-Hill, New York.

d. Ellingwood, Bruce R., Engineering Reliability and Risk Analysis for Water Resources Investments: Role of Structural Degradation in Time-Dependent Reliability Analysis, Contract Report ITL-95-3, July 1995, Waterways Experiment Station, Vicksburg, MS.

e. Wolff, Thomas F. and Weijun Wang, Jan. 1992, Engineering Reliability of Navigation Structures, Report prepared under DACW 39-91-C-0041.

Table D-1

TARGET RELIABILITY INDICES

EXPECTED PERFORMANCE	BETA	PROBABILITY OF UNSATISFACTORY	POTENTIAL PHYSICAL

LEVEL	1/	PERFORMANCE 2/	CONSEQUENCES
HIGH MAINTENANCE	5.0	0.0000001	NORMAL
GOOD	4.0	0.00003	MAINTENANCE WITH TRAFFIC MAINTAINED
ABOVE AVERAGE	3.0	0.001	DOWNTIME FOR REPAIRS
BELOW AVERAGE	2.5	0.006	FREQUENT OUTAGES FOR REPAIRS
POOR	2.0	0.023	FREQUENT AND EXTENDED OUTAGES FOR REPAIRS
UNSATISFACTORY REHAB	1.5	0.07	EXTENSIVE REQUIRED
HAZARDOUS	1.0	0.16	EMERGENCY ACTION TO ALLEVIATE HAZARDS

1/ Beta = Reliability Index determined using a lognormal distribution of the performance function.

2/ Probability of unsatisfactory performance is the probability that the value of the performance function will exceed the limit state, or that an unsatisfactory event will occur. For example, if the performance function is defined in terms of miter gate impacts, and the probability of unsatisfactory performance is .023, then 23 of every 1000 impacts will result in damage which causes a shutdown.

D-8. Outline for Reliability Analysis Report. The probability based Reliability Analysis Report (RAR) should be presented in enough detail to fully substantiate the recommended plan. It should contain complete checked computations and should contain the information described in the following paragraphs.

a. Pertinent Information. The RAR should contain all data pertinent to the project or component being evaluated. Pertinent data includes the following:

(1) Color photographs of the component being evaluated. These photographs should be of sufficient detail to clearly indicate the problem being addressed and should be easily identified with respect to the location on the structure.

(2) Repair data including cause of damage, method of repair, cost of repair, and the time in which the structure was out of service to accomplish the repair.

(3) Survey data indicating any observed changes in alignment, and movement of the component being investigated. The movement should be documented to indicate the changes

with respect to time. Is the movement increasing with time? The survey data should also indicate changes in the surroundings such as scour, changes in the backfill elevation, or changes in the pool elevation.

(4) Instrumentation data indicating results of pressure meters, inclinometers, joint movement indicators, and piezometers should be included.

(5) Information gathered during the life of the project that indicates a more exact determination of loading than that used in the original design.

(6) Any other data pertinent to the component being investigated; concrete crack mapping, condition index, etc.

b. Analysis. A probability based reliability analysis should be included for the existing (or base) condition of the structure or component and the reliability reported. This should be based on the available pertinent data described above. Also provide the following information:

(1) Tables showing the random variables and constants for each component or feature analyzed.

(2) Tables showing the mean and coefficients selected for each random variable.

(3) Sample calculations showing the modes of performance, reliability calculations, etc. If computerized spread sheets are utilized in the analysis, provide sufficient description of column and row headings to allow for an understanding of the equations used in the spreadsheet.

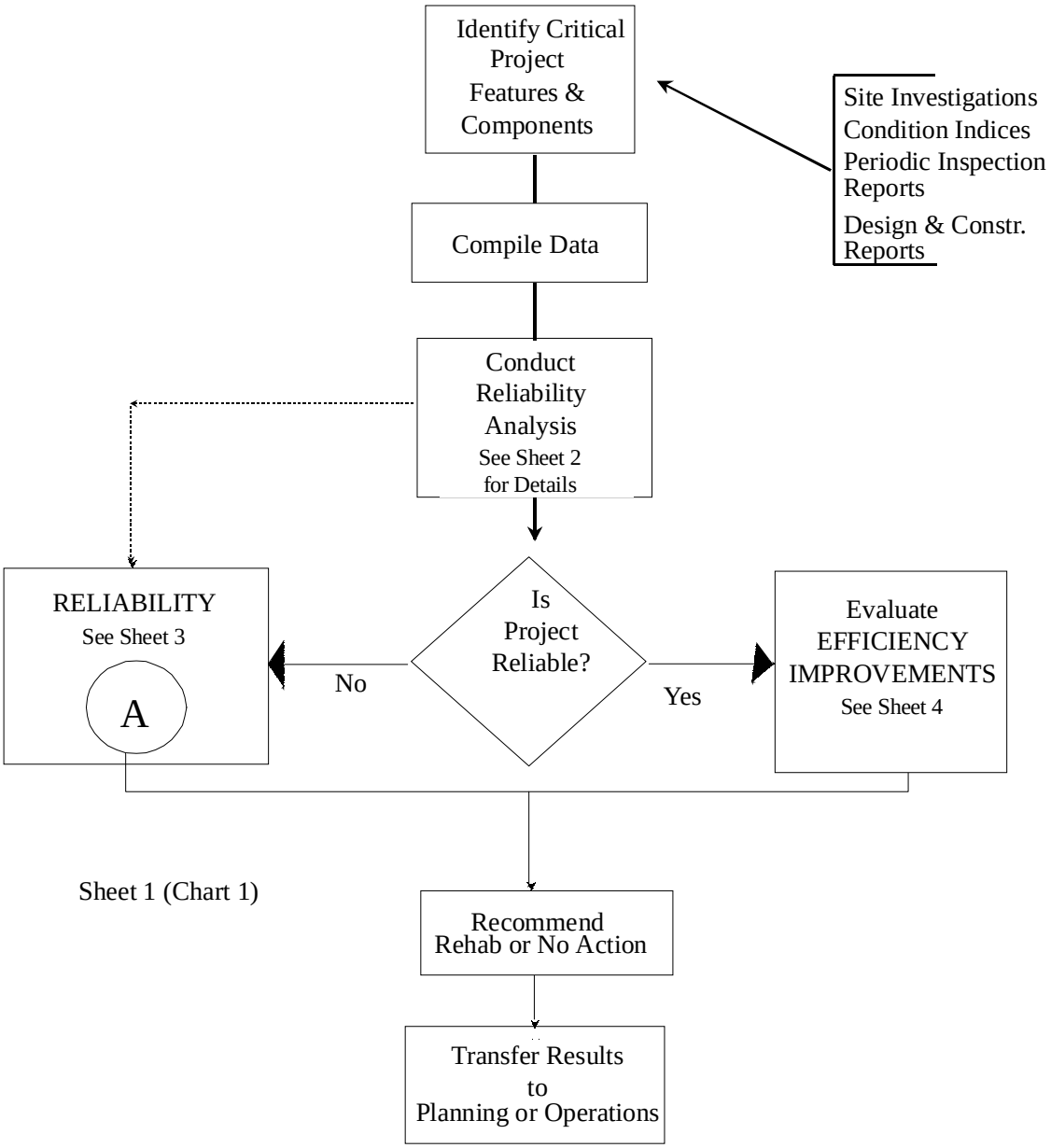
(4) Tables showing the calibration of the performance functions. Show reliability calculated for the distressed and design components used to calibrate the performance in accordance with paragraph D-3.f(2).

(5) Provide an event tree showing the probabilities of unsatisfactory performance for each mode of performance.

c. Alternative Studies. Alternative schemes for repair and rehabilitation must be fully investigated. Alternatives investigated should include the use of new materials, new repair techniques and innovative designs as well as all reasonable alternative configurations. The schemes investigated must address and resolve concerns which have led up to the major rehabilitation proposal, such as declining reliability and consequences of unsatisfactory performance of the structure or component. Since complete reliability analyses must be conducted on all alternative schemes, only reasonable and technically feasible alternatives should be investigated. This requires a screening process to eliminate less reasonable schemes from consideration. Factors considered in the screening process should include, but not be limited to, technical feasibility, constructibility, and impacts upon appurtenant structures. Alternative schemes eliminated during this process for engineering reasons should be briefly described, along with the factors which resulted in elimination.

d. Recommended Plan. The recommended plan should be selected based upon the results of the alternative studies and should be the plan which offers the greatest benefit to the project not only with respect to economic, but also to restoring project reliability. A copy of the complete reliability analysis for the selected plan should be included in the report.

Reliability Analysis Decision Making Flow Charts



Sheet 1 (Chart 1)

Figure D-1

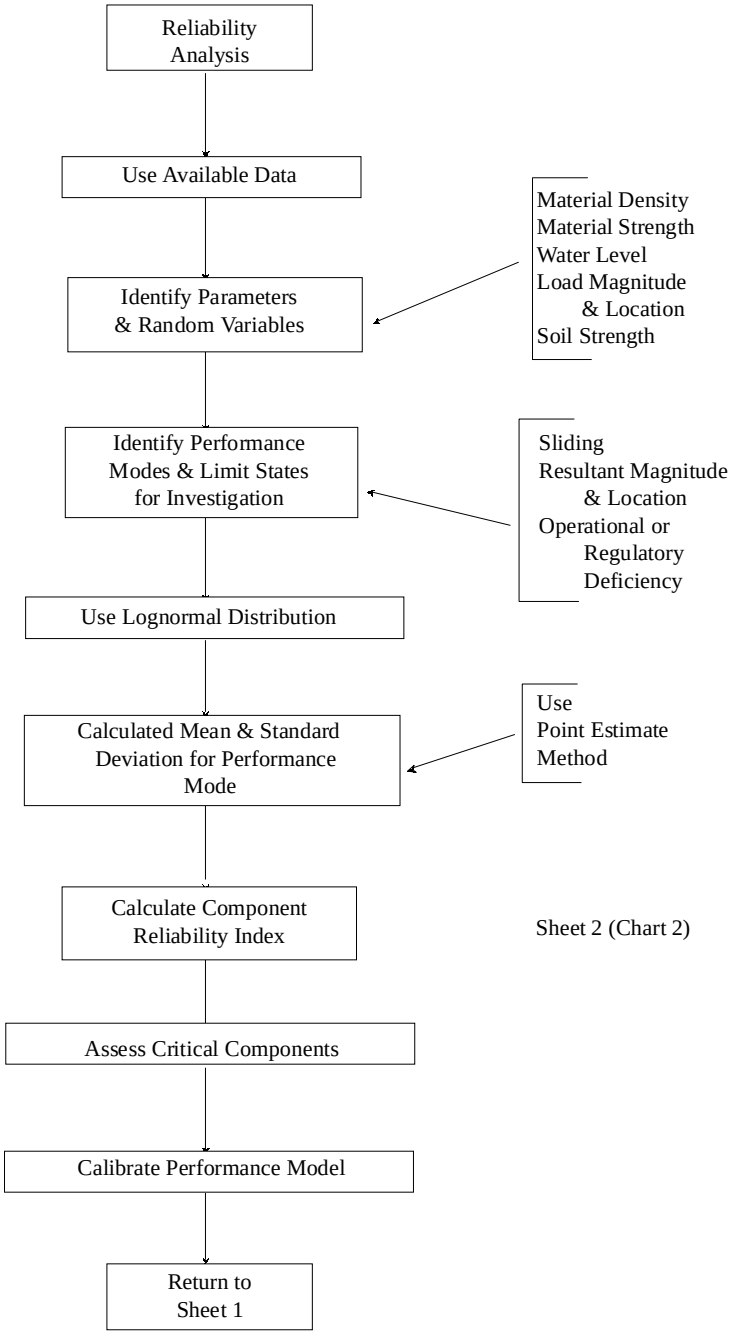
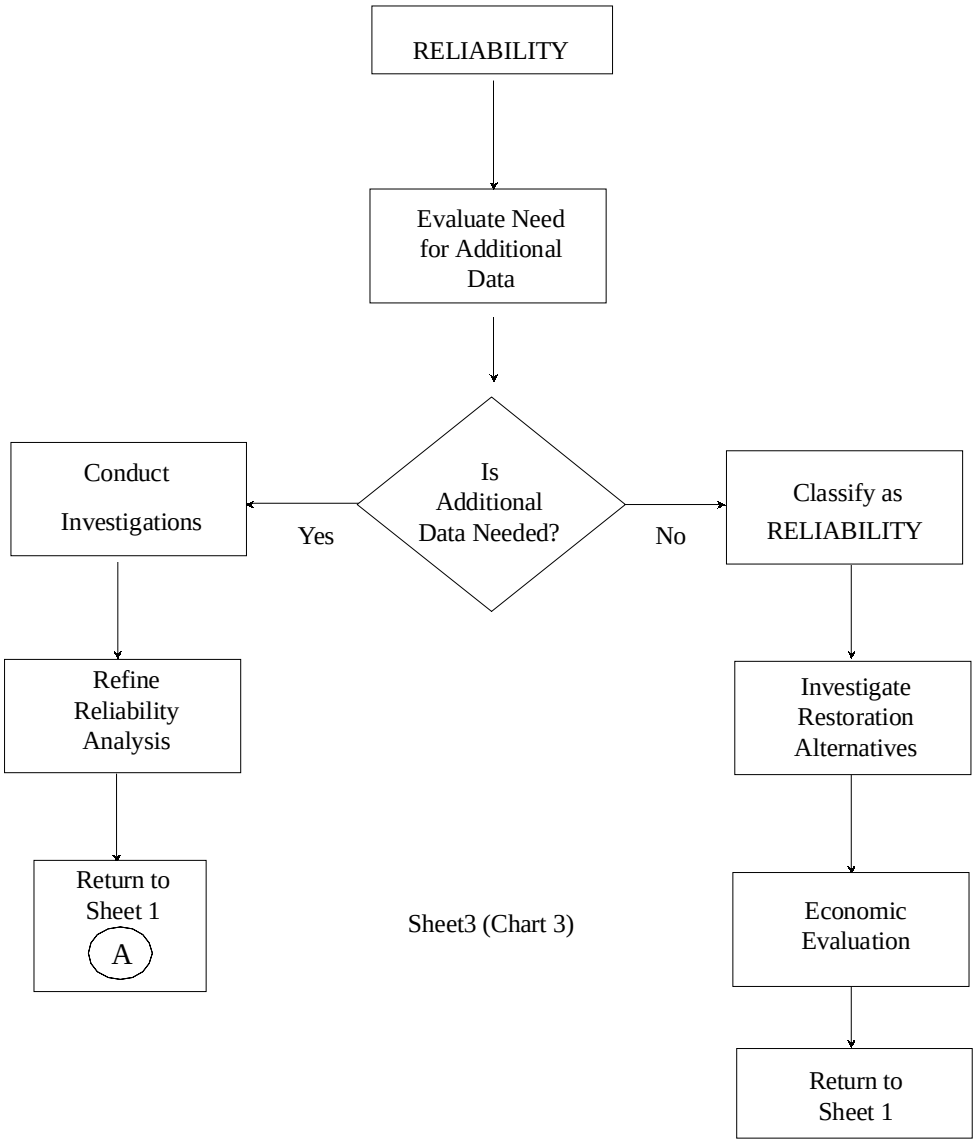


Figure D-1 continued



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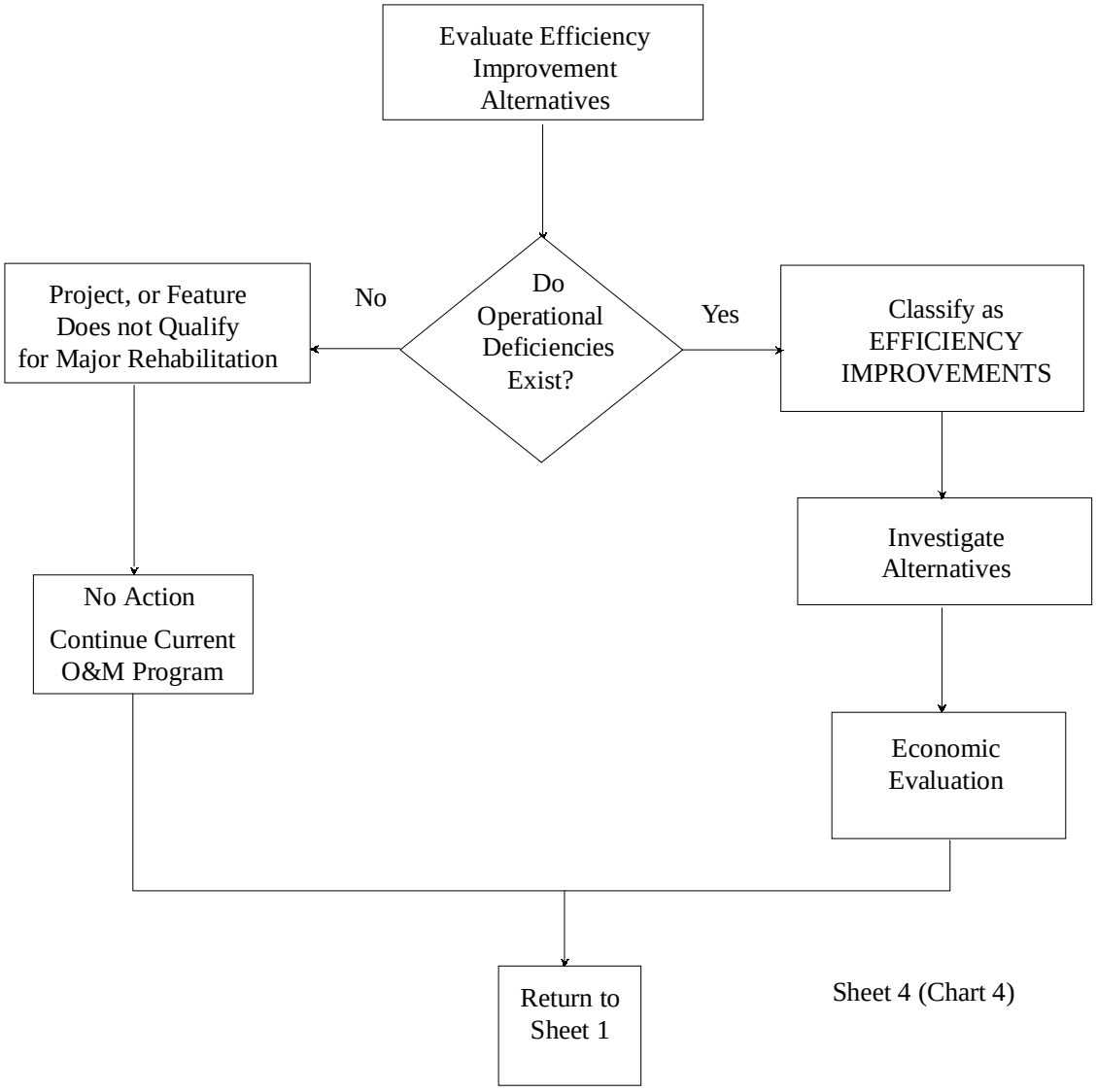


Figure D-1 continued

APPENDIX E

BENEFITS EVALUATION PROCEDURES

E-1. It is expected that the majority of rehabilitation studies analyzed under this guidance will be for navigation and hydropower projects. The following steps outline basic procedures that can be used to evaluate rehabilitation for these project purposes. Deviation from these steps is encouraged when other techniques are more appropriate.

E-2. Hydropower Analysis. The conceptual basis for evaluating the benefits from energy produced by hydroelectric power plants is society's willingness to pay for these outputs.

Step 1. Determine the Energy and Capacity Values for the Project.

The energy and capacity values are based on the cost of the next best alternative. The energy value is the measure of the systems energy production cost. When there exists a demand for electric energy, adding a hydropower facility to a system instead of a thermal power source typically results in reduced system production cost. The capacity value of a hydroelectric facility reflects the greater reliability and operating flexibility of the hydropower system. The energy and capacity values are estimated using systems analysis. This analysis should only be attempted by those trained in hydroelectric benefit evaluation. Complete consideration of this technique is found in ER 1105-2-100. For small facilities, previously calculated energy and capacity values may be used. In the report *Power Benefits Forgone Due to Water Supply Withdrawals White River Basin Projects*, by North Pacific Division, dated 22 June 1990, for Area 25 the capacity value was estimated at $117,000 per megawatt of capacity annually and the energy value was estimated at $35.40 per megawatt hour. For the Missouri River System, in the Institute for Water Resources' report *Economic Value Functions for Missouri River System Analysis Model*, the capacity value was estimated at $154,000 per megawatt annually and the energy value at $18 per megawatt hour. The value used for major rehabilitation analysis should reflect conditions in the project area.

One particular issue in economic evaluation is the industry response to temporary versus permanent interruptions due to the unsatisfactory performance on individual hydropower units. The question to be answered is whether temporary losses in generating capacity will result in the electric generating industry building permanent replacement capacity. If so, there is a "capacity loss" without major rehabilitation; if not, there is no capacity restoration as a source of benefit from rehabilitation. The issue arises since the system contains some percentage of excess capacity to compensate for unplanned outages. This issue is currently the subject of research. Until procedures are established for calculating capacity losses due to unreliable performance, care should be taken in including a capacity loss avoidance as a benefit from major rehabilitation.

Step 2. For the period of analysis determine the annual capacity and annual energy outputs.

For each alternative, estimate the annual firm capacity and annual energy generation. This should reflect planned outages, plant reliability, modernization and power loss during rehabilitation or repair.

Step 3. Calculate the value of Hydropower.

This is the simple multiplication of step 1 and step 2. For each alternative, multiply the capacity value times the estimated firm capacity and the energy value times the annual energy produced.

Step 4. Calculate the average annual equivalent value (benefits).

Discount to the base year the future hydropower values using the Federal discount rate. Sum the discounted values for energy and capacity. Amortize this sum over the period of analysis using the Federal discount rate. Total annual benefits should also include benefits during construction.

Step 5. Calculate the annual cost of each alternative.

Show a schedule of cost over the period of analysis for each alternative. Discount the expenditures to the base year and amortize the present worth of the estimated cost over the period of analysis using the Federal discount rate. For each alternative these costs should include operation and maintenance, emergency repairs, interest during construction and scheduled rehabilitation.

Step 6. Compare the benefits and cost and rank the alternatives.

Provide a table showing the annual benefits, cost, benefit-to-cost ratio and the net benefits for each alternative.

Note: The treatment of capacity values and benefits when considering hydropower rehabilitation for reliability is unsettled. In general, you must be able to demonstrate that the power grid does not have sufficient flexibility to adapt to the reduced reliability of the project and that the continuation of the base condition would result in the capital investment of a thermal facility to replace the capacity lost due to unreliability. A small project will have a more difficult time satisfying this criteria than a large project.

E-3. Navigation Analysis. The basic economic benefit of a navigation project is the reduction in the value of resources (cost) required to transport commodities.

Step 1. Identify the commodities currently flowing through the waterway and those expected to flow through the waterway over the period of analysis. This should be done for each commodity, by origin and destination for all alternatives.

Step 2. Forecast the quantity of each commodity expected to pass through the waterway by year for the planning period.

Step 3. Identify the current fleet using the waterway and forecast the future fleet. Identify current and future fleet operating cost.

Step 4. Using the forecasted commodity flows and the future fleet analysis, estimate the average annual cost of transporting the forecasted flow of commodities passing through the waterway for each alternative.

Step 5. Estimate the average annual cost of transporting the forecasted flow of commodities by the least cost alternative route.

Step 6. Compute benefits. The benefits of the waterway will be equal to the transportation savings over the next best alternative.

Provide a table showing the annual benefits, cost, benefit-to-cost ratio and the net benefits for each alternative.

APPENDIX F

EXAMPLE OF COMBINING RISKS AND CONSEQUENCES

F-1. Introduction. The evaluation procedures for major rehabilitation require the Districts to use risk-based benefit-cost analysis incorporating the existing and future risk of "unsatisfactory performance" of structures and equipment. These risks are then combined with estimates of the costs of unsatisfactory performance to generate an expected reliability based cost. Alternative rehabilitation strategies are then proposed to reduce this cost. Each alternative can either change the risk, change the cost of unsatisfactory performance or both. A complicating difficulty is that the analysis must be carried out over the "life-cycle" to the project, up to 50 years. That is, the cost estimated is the present value of all costs associated with the operation, maintenance, and repair of the facility where each cost is weighted by the probability of occurrence.

F-2. Description of Simplified Evaluation Problem. Suppose that the rehabilitation problem is the potential unsatisfactory performance of a hydropower plant. For simplicity, assume that the plant is composed of two generating units. Each of these units, in turn, is composed of two components: a turbine and a generator. The information available for each component of each unit is shown in Table F-1. Table F-2 shows the system energy and capacity opportunity costs as a function on the number of units out of service simultaneously. It is assumed that all the units provide the same contribution to system energy and capacity. Sometimes, the energy and capacity contributions will differ across the units. In addition, a rehabilitation strategy may include efficiency improvements on a unit by unit basis.

Table F-1: Example Hydropower Rehabilitation Assumptions

	Unit 1		Unit 2	
	Turbine 1	Generator 1	Turbine 2	Generator 2
Initial Risk	.01360	.01176	.01510	.02520
Annual rate of change in risk	.00017	.00042	.00017	.00042
Risk after repair	.00017	.00042	.00017	.00042
Risk after rehabilitation	.00017	.00042	.00017	.00042
Number of months to repair	24	12	24	12

a. As noted in Appendix E, the calculation of system energy and capacity values should be undertaken only by individuals trained in hydroelectric benefit evaluation. One particular issue in economic evaluation is the industry response to temporary versus permanent interruptions due to the unsatisfactory performance on individual hydropower units. The question to be answered is whether temporary losses in generating capacity will result in the electric generating industry building permanent replacement capacity. If so, there is a "capacity loss avoidance benefit" from major rehabilitation; if not, there is no capacity restoration as a source of benefit from rehabilitation. The issue arises since the system contains some percentage of excess capacity to compensate for unplanned outages. This issue is currently the subject of research. Until procedures are established for calculating capacity losses due to unreliable performance, care should be taken in including a capacity loss avoidance as a benefit from major rehabilitation. For the purposes of this example, Table F-2 shows the assumed opportunity costs of unsatisfactory performance.

Table F-2: Energy and Capacity Opportunity Costs

Units Down	Opportunity Cost per Year
0	0
1	300,000
2	10,000,000

b. At any point in time, either or both of the components of each unit could perform unsatisfactorily or satisfactorily. The probability of the first occurrence of unsatisfactory performance for a component is dependent on the initial risk, the degradation in reliability (increase in risk), and the number periods since the beginning of the analysis. Following this initial event for each component, the probability of unsatisfactory performance for the component is dependent on the risk of the repaired component, the degradation in reliability and the number of periods since the last episode of unsatisfactory performance.

c. If the turbine or generator performs satisfactorily, deterioration or degradation occurs and is represented by the annual rate of change in the risk. This degradation rate may be a constant added to the risk each year the component doesn't fail. The level of risk over the life-cycle could be a linear or nonlinear function of time.

d. Figure F-1 shows the level of risk over the life-cycle of a component assuming a linear degradation pattern. Figure F-2 shows the level of risk for the same component assuming a nonlinear degradation. There are more than 1.1259×10^{15} (2^{50}) possible risk based life-cycles for a single component.

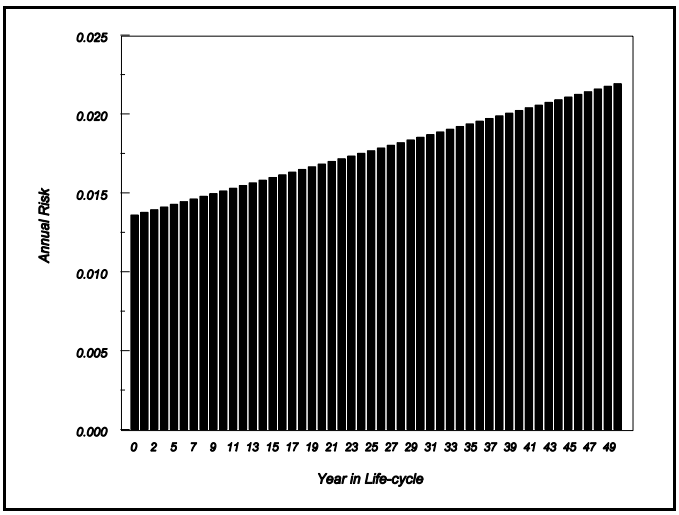


Figure F-1: Linear Risk Function

e. At the end of each period, the unit is either in service, or is out of service due to the failure of one or both of the components. The number of units out simultaneously is important in terms of the cost of energy losses and possibly system capacity losses. These losses are generally increasing functions of the number of

units out simultaneously since all units are typically not in operation simultaneously even when all are available. Values assumed for this example are shown in Table F-2.

f. Since the repair costs and opportunity costs can occur in future years, the analysis requires discounting the costs in each year to the base year. A discount rate of 8.5% is used in this example. The current year Federal discount rate should be used in an actual evaluation, (8.00% in FY94).

g. The evaluation problem is modeling the possible pathways or sequences of performance that each component for each unit can take, including resetting of the risk after failure of a component. In addition, the model must be flexible to deal with situations with multiple power units and multiple components. The model must account for:

(1) the change in reliability of a component (increases in risk) over time from the start of the analysis,

(2) the changed reliability of a repaired component, (see Figure F-3),

(3) the possible change in degradation rate of the repaired component,

(4) the present value of component repair costs when a component fails,

(5) the present value of foregone project outputs (energy and capacity) when some units are out of service due to component unsatisfactory performance,

(6) the time necessary to repair components,

(7) the present value of regular O&M costs while repairs are undertaken, and

(8) the present value of regular O&M costs after repairs are made.

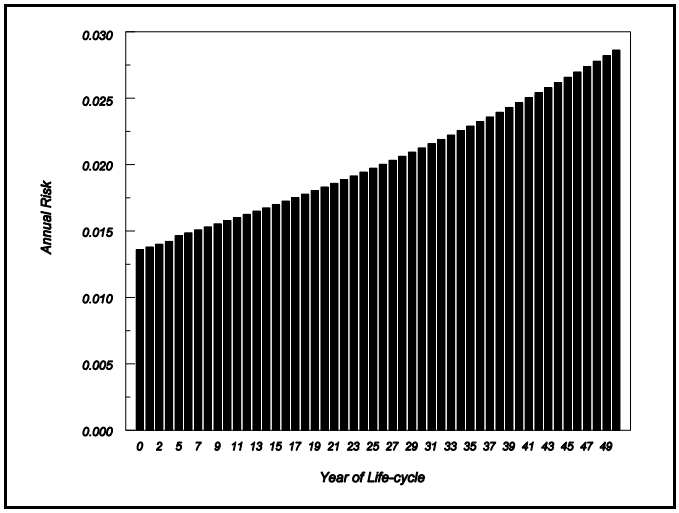


Figure F-2: Non-linear Risk Function

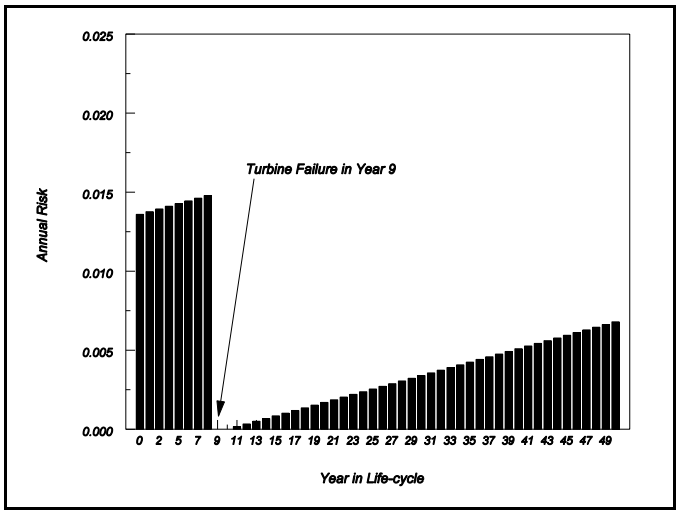


Figure F-3: Life-cycle Risk with One Repair

h. Once these values are determined, they can be used in a risk-

based model to estimate the base condition reliability costs. Any major rehabilitation strategy changes at least some of the above listed values. The risk-based model can be rerun with the revised values. Reductions in reliability costs resulting from the rehabilitation strategy represent reliability benefits of the rehabilitation investment.

F-3. Description of Monte Carlo Simulation. The values shown in Tables F-1 and F-2 were entered in a LOTUS macro written as a Monte Carlo simulation. In each year of the life-cycle, the simulation generates a single random number for each unit. If a random number for a unit falls between zero and the risk of Component 1 (between zero and .01360 for the turbine of Unit 1), the unit performs unsatisfactorily due to mode or Component 1. If the random number falls between the risk of Component 1 and the sum of the risks of Components 1 and 2 (between .01360 and .01360+.01176), the unit performs unsatisfactorily due to mode or Component 2. If the random number falls between the sum of the risk of Components 1 and 2 and one (between .01360+.01176 and 1) the unit performs satisfactorily.

a. The initial risk, the degradation rates, and the risk after unsatisfactorily performance determine the risk of Component 1 and 2 in each period. The risk in any period depends on what happened to each component in all the previous periods. If a unit performs unsatisfactorily, the present value of the repair costs is calculated. A running total of this value for each component of each unit is calculated over the life-cycle. In addition, the total number of units out simultaneously in a period, regardless of cause, is used to determine system energy losses using a simple lookup table. A running total of the present worth of this value is also calculated over the life-cycle. The length of the life-cycle can be changed but is assumed to be 50 years in the macro.

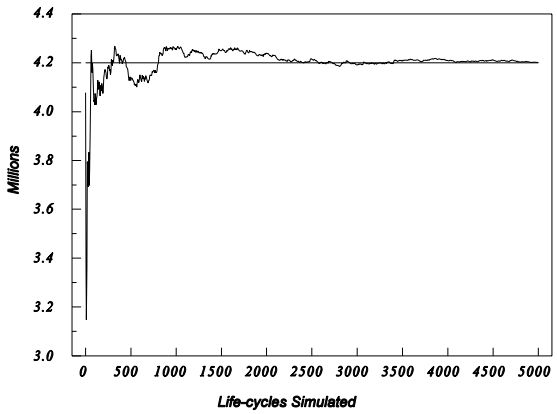


Figure F-4: Running Average Lifecycle Costs

[1] In this example, the joint occurrence of both components performing unsatisfactorily is ignored.

Table F-3: Base Condition Life-cycle Costs (Standard Errors in Parenthesis)

	Unit 1		Unit 2	
Reliability Cost	Turbine	Generator	Turbine	Generator
Expected Present value of Life-cycle Repair Costs	748,500 (16,119)	346,900 (7,241)	767,100 (15,876)	573,800 (8,728)
Expected Present value of Life-cycle Opportunity Costs	553,800 (17,180)			
Expected Present value of Life-cycle O&M Costs	1,210,156 (454)			
Total Life-cycle Costs	4,200,256 (30,590)			

Values in dollars.

b. As was noted above, the number of possible life-cycles is very large. To reasonably represent the distribution of possible life-cycle reliability costs, multiple life-cycles must be simulated. The number of life-cycles required depends on the complexity of the risks being modeled. The primary approach to deciding the required number of life-cycles to simulate is to increase the number of life-cycles until the statistic of interest (the mean of life-cycle costs), is stable. This statistic should asymptotically approach the "true" mean as the number life-cycles increase. Figure F-4 shows the running average of the base condition calculated total reliability costs. Table F-3 shows the results from 5000 life-cycles.

Table F-4: Immediate Rehabilitation Life-cycle Costs (Standard Errors in Parenthesis)

	Unit 1		Unit 2	
Reliability Cost	Turbine	Generator	Turbine	Generator
Expected Present value of Life-cycle Repair Costs	77,300 (3,700)	82,100 (2,600)	77,300 (3,700)	82,100 (2.600)
Expected Present value of Life-cycle Opportunity Costs	1,450,800 (30,400)			
Expected Present value of Life-cycle O&M Costs	179,000 (450)			
Total Life-cycle Costs	1,948,600 (31,069)			

Values in dollars.

F-4. Major Rehabilitation Strategy.

a. For the purposes of this example, only one rehabilitation strategy is considered, immediate rehabilitation of the turbines and generators in both units. In addition, construction activities are initiated immediately to rehabilitate Unit 1. After 2 years, Unit 1 construction and testing will be complete and Unit 2 will be rehabilitated. Both units will be available for service at the end of the fourth year. Table F-1 lists the revisions in risks and costs due to the rehabilitation. During the construction, only one unit is in operation so that the opportunity costs shown in Table F-2 are incurred. Additionally, no regular O&M expenditures take place for a unit that is out of service whether under repair or during rehabilitation construction. Table F-4 shows the reliability costs with this rehabilitation strategy. Note that the opportunity costs with rehabilitation, due to lost energy and capacity, exceed those that would have occurred without rehabilitation. This stems from the fact that during the rehabilitation construction (4 years), one of the units is out with certainty. Therefore, there is this certain loss plus the increased risk that both units will be out during the construction. After rehabilitation the risk of an outage is greatly reduced but the contribution to reducing the life-cycle present value is also less important due to discounting.

b. From the results from Tables F-3 and F-4, the expected present value of benefits from the proposed rehabilitation strategy are the difference in life-cycle costs. The summary statistics

for life-cycle benefits are presented in Table F-5. Note that this analysis does not include additional benefits accruing from restoring lost generating efficiency nor from increasing efficiency beyond the original design. These benefits can be approximated by the deterministic amount of the present value of these efficiency gains over the 50-year time horizon. This would only be approximate since there is still a chance that unsatisfactory performance could occur after rehabilitation. Because of the efficiency improvement, any unsatisfactory performance after rehabilitation results in larger opportunity costs. Therefore, the risk-based opportunity costs after rehabilitation would be larger than that shown in Table F-4.

Table F-5: Summary Statistics of Rehabilitation Strategy

	Base Condition	Immediate Rehabilitation	Benefits	Standard Error of Benefits
Expected Present Value of Life-cycle Costs	4,200,300	1,948,600	2,251,700	43,602
Confidence Interval for Benefits				
5%			2,180,200	
95%			2,323,200	

APPENDIX G

EXAMPLES OF POTENTIAL ENTRIES AND DESCRIPTIVE FOOTNOTES TO SUPPORT TABLE B-1 OF APPENDIX B.

RELIABILITY

SUMMARY ASSESSMENT

- HIGH -- normal maintenance
- GOOD -- Maintenance with traffic maintained
- ABOVE AVERAGE -- Downtime for repairs
- BELOW AVERAGE -- Frequent outages for repairs
- POOR -- Frequent and extended outages for repairs
- UNSATISFACTORY -- Extensive rehab required
- HAZARDOUS -- Emergency action to alleviate hazards

BASIS FOR ASSESSMENT

ANALYSIS
TESTING
RECORDS
SITE INSPECTION
JUDGMENT
ENGINEERING

CURRENT BETA

VALUE (report number)
NE (not calculated)

CAUSE

IMPACT
FATIGUE - STRESS
ENVIRONMENTAL CONDITIONS
CORROSION/DETERIORATION
PREVIOUSLY UNANTICIPATED LOADS

ESTIMATED FUTURE BETA (STATE YEAR)

VALUE
NE (not calculated)

UNSATISFACTORY PERFORMANCE

MODE

SUDDEN/NO WARNING TIME
WARNING TIME

-slow, progressive (years) no remedial action possible [rehab will be required at some time]
-slow, progressive, remedial actions possible [rehab may or may not be required at some time]
-slow, progressive, remedial actions possible but short lived
-rapid with sufficient warning to rationally plan and budget
-rapid without sufficient warning time to rationally plan and follow normal budget process

IMMEDIATE CAUSE

TOWBOAT IMPACT
FLOOD/PMF
ICE IMPACT/FLOATING DEBRIS
PIPING/ FOUNDATION DETERIORATION

CONSEQUENCE

LOW UNDER ANY CONDITION (progressive loss of efficiency)
LOW UNDER SPECIFIC CONDITION (valve breaks in open position)
HIGH UNDER ANY CONDITION (loss of pool)
HIGH UNDER THE SPECIFIC CONDITION (valve breaks in closed position)

ASSESSMENT

PROBABLE ACTION

- inspect annually
- set up monitoring/measurement program
- schedule detailed studies
- study in detail now
- emergency repairs

TIME FRAME

- immediately
- 2 years
- 10 years

COSTS

- annual costs (should be fairly well known)
- first cost (ballpark)
- emergency repairs costs

BENEFITS

ENVIRONMENTAL

Examples of narrative description that might be used to support the review of current condition summarized in Table B-1 in Appendix B.

LOCKS
STRUCTURE
CONCRETE:

RELIABILITY - High - Reliability is estimated to be high based on site and annual inspection records which do not identify any problem areas. Beta was not computed and no further analysis was performed.

****alternately****

RELIABILITY

SUMMARY ASSESSMENT - POOR - The lock wall concrete was identified as the critical problem and the assessment was supported by the reliability analysis. Records show deterioration, cracking, deflection, etc. Lab testing has/has not/can/cannot, etc. be/been done.

CURRENT BETA - a beta of __ was computed and is consistent with the records on this and similar structures.

CAUSE - the low reliability/deteriorated condition is due to freeze-thaw, alkaline reactivity and erosion due to barge impacts.

FUTURE BETA - the beta is expected to /remain constant/ decrease at a constant rate of ___/decline at an increasing rate of ___ due to the barge impacts over the next ___ years.

UNSATISFACTORY PERFORMANCE

MODE - the wall could exhibit unsatisfactory performance several ways: excessive deflection, deteriorate slowly requiring patching at an increasingly frequent rate, slide slowly or rapidly without warning.

IMMEDIATE CAUSE - a number of immediate causes are possible: tow impact, ice, loss of foundation materials. The immediate cause will be directly related to the mode of unsatisfactory performance and its likely consequences.

CONSEQUENCES - The possible consequences range from need for repair during low use periods to a complete loss of locking capability for up to 6 months.

ASSESSMENT

PROBABLE ACTION - continue annual inspection program/ intensify inspections/ schedule detail testing in 10 yr program because....

ESTIMATED TIME - immediately/ 2 years/ 10 years because of the high probability and low consequences .....

COSTS - same as current O&M/ $40 K for testing using the hyperbubble model...

BENEFITS - benefits of preventing a rapid catastrophic event are approximately $xxx,xxx with xxx,xxx people at risk from..../any benefits are expected to be minimal because everyone moved out of the floodplain 20 years ago....

ENVIRONMENTAL - failure could result in ____ barrels of toxic chemicals being spilled..../environmental impacts are minimal because complete failure would only change the water surface elevation by 3" which is less than the weekly fluctuation....

APPENDIX H

HYDROPOWER EVALUATIONS CONSIDERATIONS

H-1. The following provides additional information specifically for preparing hydropower major rehabilitation evaluation reports. The definitions provided in the guidance are general in nature. The terminology used in these definitions may have different meanings within the power industry.

H-2. Reliability. For a hydropower project reliability can be further defined as the extent that the generating equipment can be counted on to perform as originally intended. This includes (1) the confidence in the integrity of the equipment based on maintenance cost, availability and forced outage experience; (2) the output of the equipment in terms of energy, power output, and efficiency (restoration of lost output); and (3) the dependability of the equipment in terms of remaining service life (retirement of equipment).

H-3. Efficiency Improvement. This category is synonymous with uprating within the hydropower industry. This involves increasing the project's output, in terms of energy and/or capacity, beyond the original design. For reports submitted under this program and guidance, the efficiency improvement (uprating) category should be used in connection with correction of a reliability problem in that any proposed efficiency improvement (uprating) would be taking advantage of the economic opportunities available. In many cases a reliability driven rehabilitation project for a hydropower plant will have some incidental increase in outputs (capacity and/or energy) due to improvement in technology. Such incidental increases should be documented as to what additional costs, if any, are incurred, and what portion of the benefits are attributable to the efficiency improvement (uprate). Presently uprating of power plants in the absence of an identified and quantified reliability problem have low priority in this program.

H-4. Reliability/Risk Analysis. The reliability/risk analysis for hydropower (and other electro-mechanical) equipment takes a different form than what is used for structures. Much of the hydropower analysis is based on a function of equipment condition indices and survivor curves, instead of the β calculations discussed in this guidance. The reliability analysis for hydropower equipment should be prepared by the Hydroelectric Design Center (CENPD-PE-HD), in accordance with ER 1110-2-109.

H-5. O&M Costs and Test Data. As a part of the evaluation report all relevant O&M costs needs to be presented. The more historical cost data that is available the better the future projections. These costs are especially important for auxiliary equipment that may not have a major impact on power revenues or benefits.

a. Field test data for turbines and generators is mandatory to demonstrate the loss of efficiency and/or capability. Test data on each unit is desirable. However, if it is not practical to obtain individual data, an explanation of the rationale used to apply the assumed condition or performance of untested equipment is needed.

b. All test data must be presented in a format that will show the results, the go/no go values and the conclusions. A narrative on what tests were performed and the results will be useful for the non-technical reviewer. Where appropriate, the complete test data may be submitted with the report as an appendix or as a separate report.

H-6. Analysis of Existing Facilities. In order to fully develop an evaluation report, an analysis of the existing components that will be affected by the proposed work is to be performed. Even if the proposed work does not include an uprating of project capacity, a review of the existing facilities is necessary. The required power train analysis is commonly referred to as "water to wire." The economics of an uprating can be adversely affected by the necessity of replacing a main power transformer or a turbine shaft and bearings because of inadequate component capacities.

A partial list of items to be analyzed:

penstock water hammer
turbine and generator shafts and couplings
excitation equipment capacities
stator winding capabilities
equipment cooling requirements
power transformer rating
unit and switchyard switchgear

H-7. Economic Analysis. The economic analysis for hydropower major rehabilitation evaluation is based on losses or gains in capacity and energy and avoided repair and O&M expenses. By not doing the proposed rehabilitation, there will be a cost associated with the reduced reliability of the power unit. Benefits can be lost by not restoring lost efficiency or taking advantage of additional capacity and/or efficiency. A regional power benefits model must be used to reflect the value of energy and capacity for the project being evaluated.

a. Realistic increases in capacity and efficiency must be presented. The results of the power train analysis will show if there are additional modifications (and costs) associated with the proposed project. For turbine replacements a sensitivity analysis is needed to show the affects of a range of efficiencies, instead of assuming the highest possible value. Not all turbine replacements are going to achieve 95% efficiency.

b. At this point in the development of the hydropower evaluation guidance, not all types of equipment have well defined risk assessment methodologies. This, coupled with the issue of separable elements of a power plant, leaves many major auxiliary components without fully developed procedures. Efforts should be made to quantify NED benefits associated with the replacement of a voltage regulator, hydraulic governor, alarm system and the like. Also, give other justification if these benefits can not be economically quantified or justified.

APPENDIX I

OUTLINE OF A TYPICAL DESIGN MEMORANDUM FOR A HOPPER DREDGE

I-1. AUTHORIZATION - Cite authority for design, construction or both.

I-2. BASIC OBJECTIVES AND SCOPE

a. Proposed service and use

b. Pertinent physical data

(1) Length
(2) Breadth
(3) Depth
(4) Draft
(5) Hopper capacity
(6) Dredging depths
(7) Propulsion (type of drive, estimated horsepower)
(8) Speeds (light, loaded, dredging)
(9) Dredge pumps (number, size)
(10) Cruising radius and number of days vessel can operate with normal supply of fuel, water, etc.

I-3. HULL AND SUPERSTRUCTURE

a. General

(1) Rules and regulations (ABS, USCG, etc)
(2) Model Tests
(3) Special Requirements

b. Hull Proper

(1) Form
(2) Type of Construction
(3) Trim
(4) Compartmentation

c. Fuel and Water Tanks

(1) Number
(2) Capacity
(3) Location

d. Storage

(1) Ship and supplies

(2) Operating stores

e. House and Superstructure

(1) General arrangement
(2) Pilot house
(3) Quarters
(a) Number in crew
(b) Number and type of accommodations to be provided
(c) Furniture
(4) Mess facilities
(5) Shops and workspaces
(a) Boatswain and carpenter shop
(b) Machine shop
(c) Electrical shop
(d) Welding shop
(e) All other

f. Miscellaneous Hull and Deck Equipment

(1) Rudders and steering gear
(2) Hoists, cranes, booms, masts and kingposts
(3) Lifeboats, launch and davits
(4) Anchors, windlasses, winches, capstans and chain
(5) Bitts and cleats
(6) Fire fighting equipment

I-4. HOPPERS

a. Number
b. Capacity
c. Location
d. Shape and slopes
e. Dump doors (number, type)
f. Dump door operating gear (hydraulic, electric, etc.)
g. Unwatering system
h. Jetting (or Washout) system
I. Lower overflow or emergency discharge gates
j. Overflow system
k. Yardage (or load) measurement equipment

I-5. SUCTION AND DISCHARGE SYSTEMS

a. Number and size of suction and discharge pipes
b. Type of trunnion (fixed, sliding)
c. Type dragarm and operating gear and stowage
d. Type of distribution system
e. Discharge control
f. Drag depth indicating system
g. Dredge production instrumentation

h. Dragheads

i. Boom discharge - Type and dimensions (Where applicable)

I-6. MACHINERY

a. Propulsion

(1) Number and size of boilers, if any
(2) Number, size and type of engines, generators and/or motors
(3) Number and type of propellers
(4) Controls
(5) Instruments

b. Dredging

(1) Pump (Number, size, capacity, dynamic head, etc.)
(2) Pump motors (number, size, characteristic)
(3) Gas ejection system
(4) Instruments

c. Miscellaneous

(1) Auxiliary power
(2) Heating and ventilation
(3) Piping
(4) Electronic Equipment (Radio, Radar, Depthfinder, Electronic Positioning, etc.)

I-7. CONSTRUCTION COST ESTIMATE

I-8. SCHEDULES FOR DESIGN AND CONSTRUCTION (including summary of fund requirements)

I-9. ESTIMATED PRODUCTION (DREDGING)

I-10. ESTIMATED OPERATING COST

a. Estimated plant rental computation

b. Estimated monthly operating cost

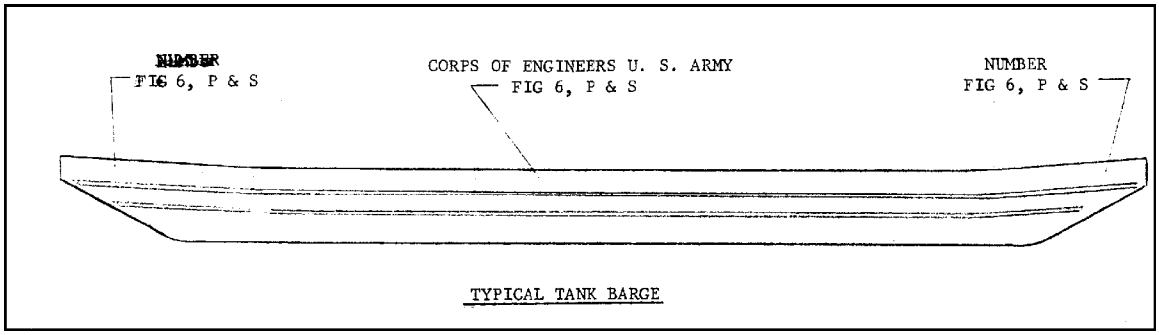
(1) Payrolls
(2) Subsistence
(3) Fuel
(4) Plant rental
(5) Other direct costs
(6) Indirect costs (supervision, inspection and overhead)
(7) Total

c. Estimated average unit costs

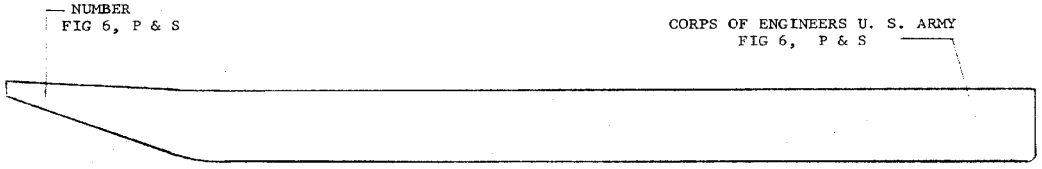
I-11. RECOMMENDATIONS

APPENDIX J

TYPICAL PLANT IDENTIFICATION ILLUSTRATIONS

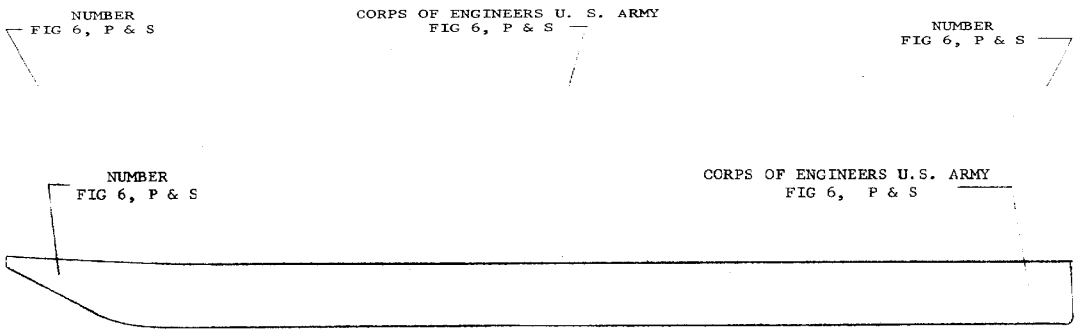


TYPICAL TANK BARGE

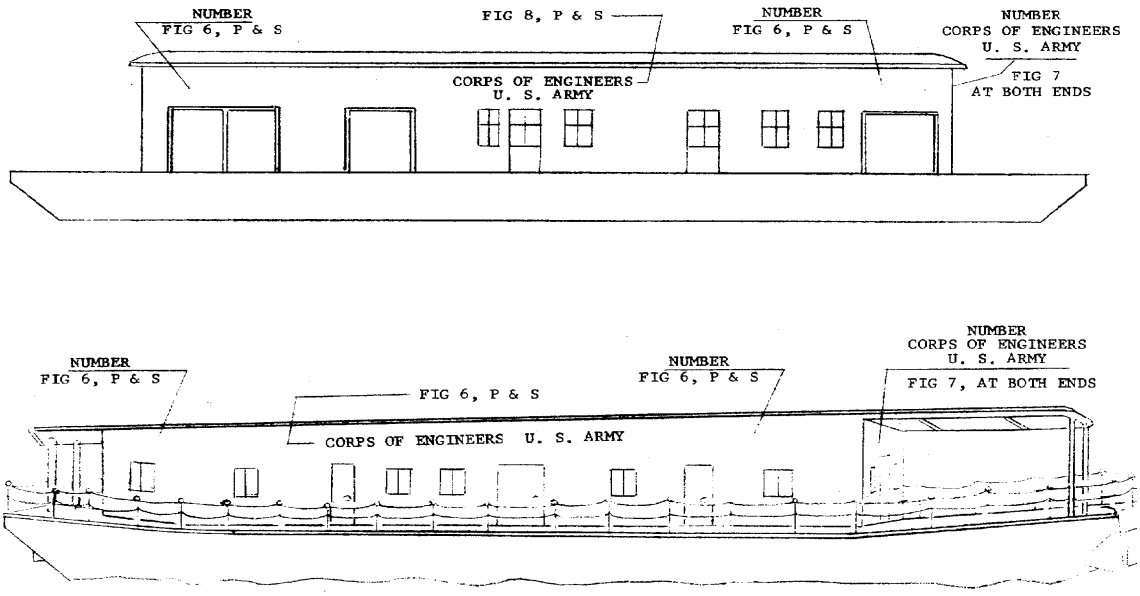


TYPICAL DECK CARGO BARGE

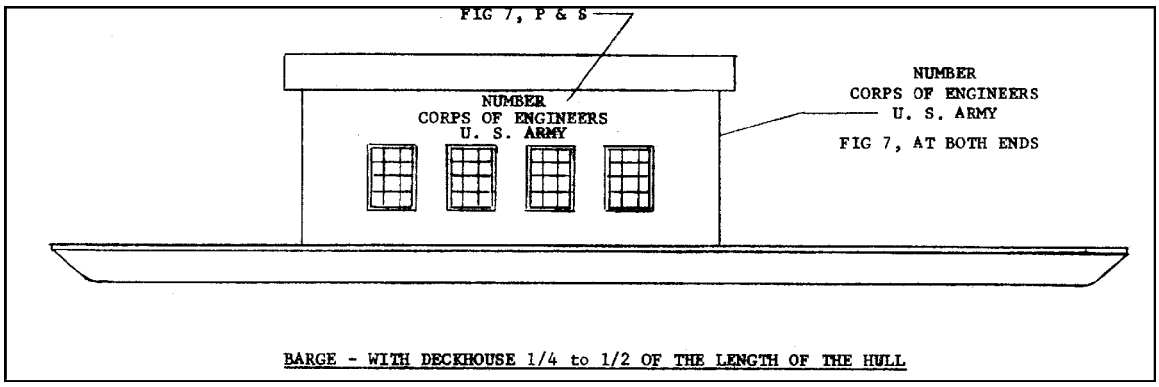
SINGLE RAKED BARGES
WITHOUT DECK HOUSES



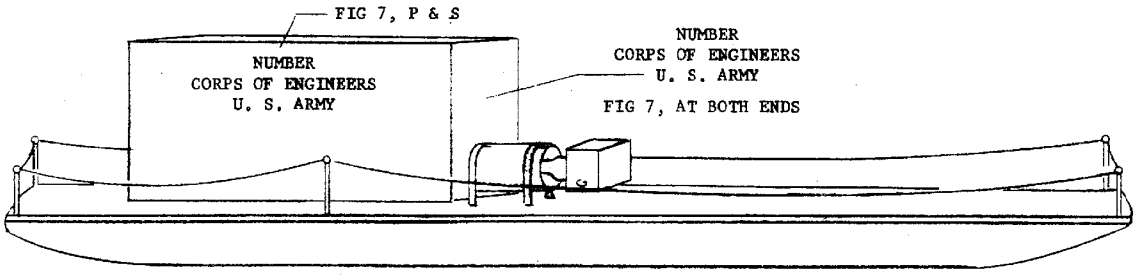
TYPICAL TANK BARGE



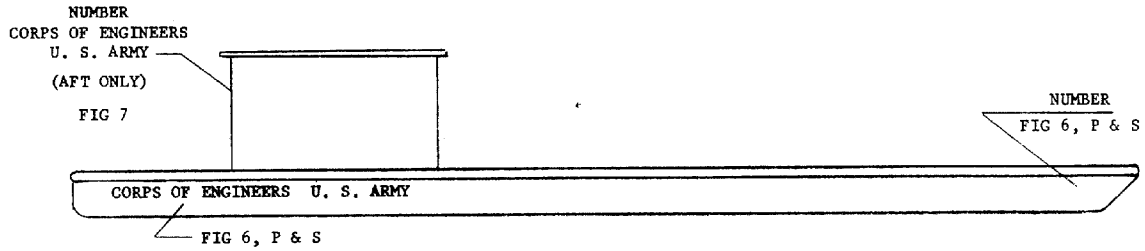
BARGE - WITH DECKHOUSE OVER HALF OF THE LENGTH OF THE HULL



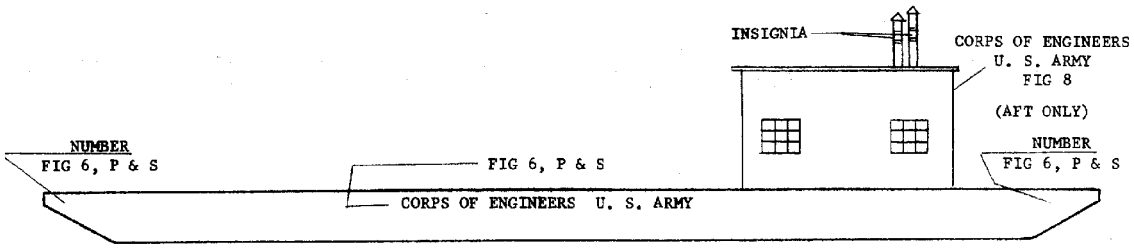
BARGE - WITH DECKHOUSE 1/4 to 1/2 OF THE LENGTH OF THE HULL



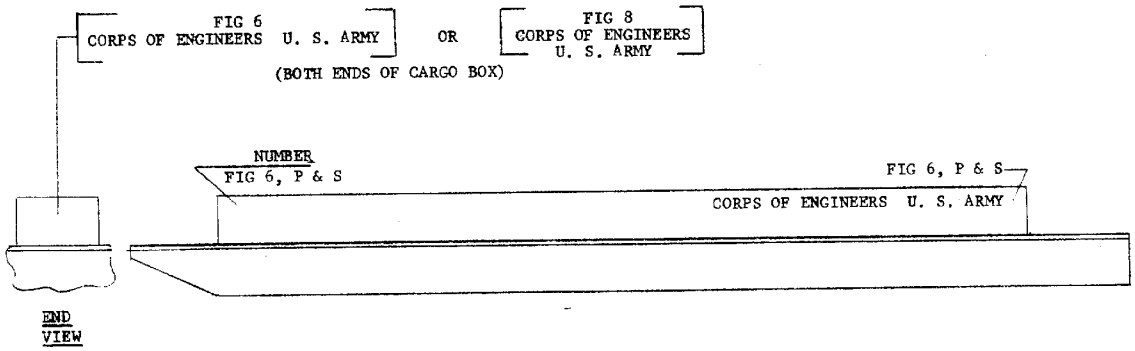
BARGE - WITH DECKHOUSE 1/4 TO 1/2 OF THE LENGTH OF THE HULL



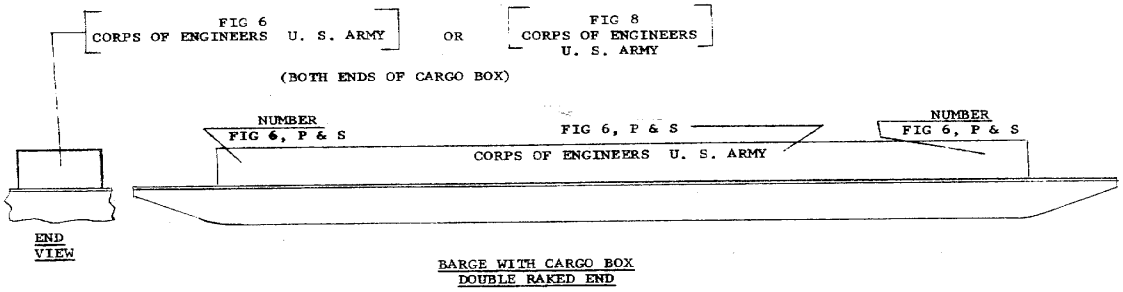
BARGE - DECKHOUSE LESS THAN 1/4 THE LENGTH OF THE HULL



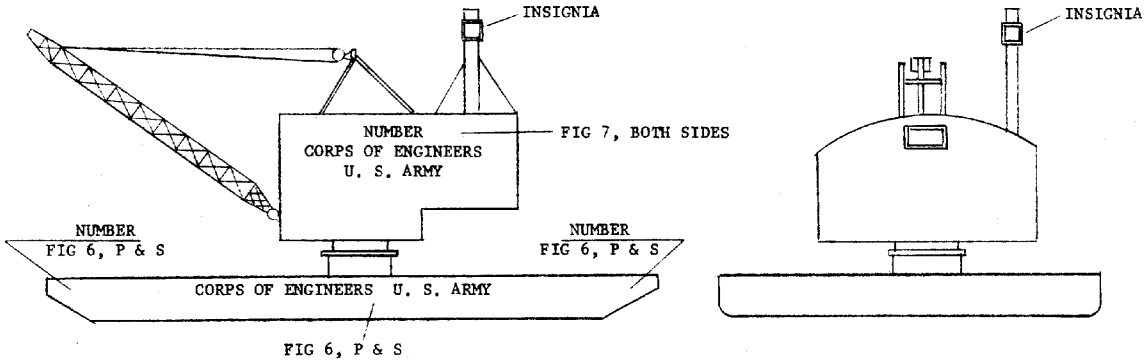
BARGE DECKHOUSE LESS THAN 1/4 THE LENGTH OF THE HULL
DOUBLE RAKED END



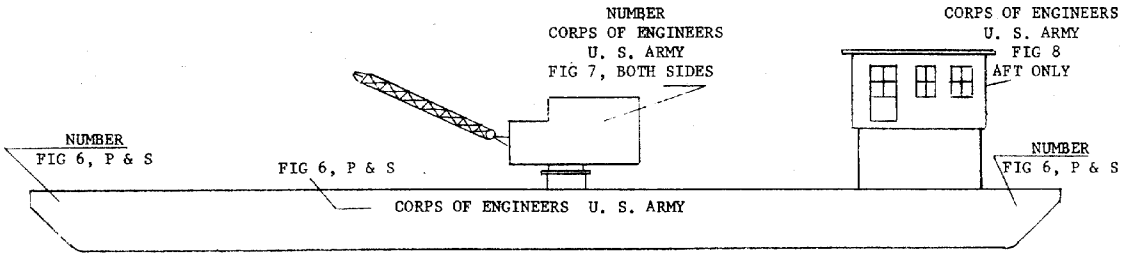
BARGE WITH CARGO BOX
SINGLE RAKED END



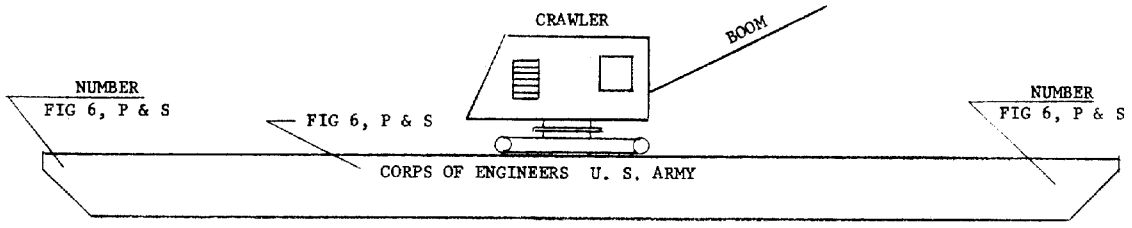
BARGE WITH CARGO BOX
DOUBLE RAKED END



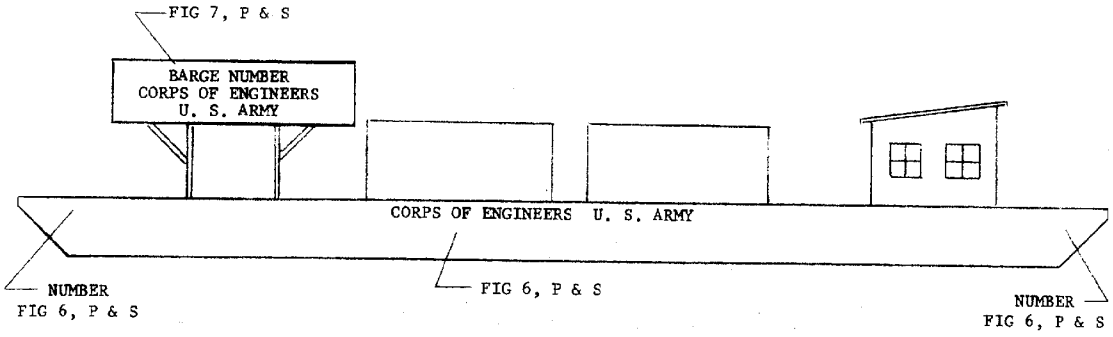
FLOATING CRANE



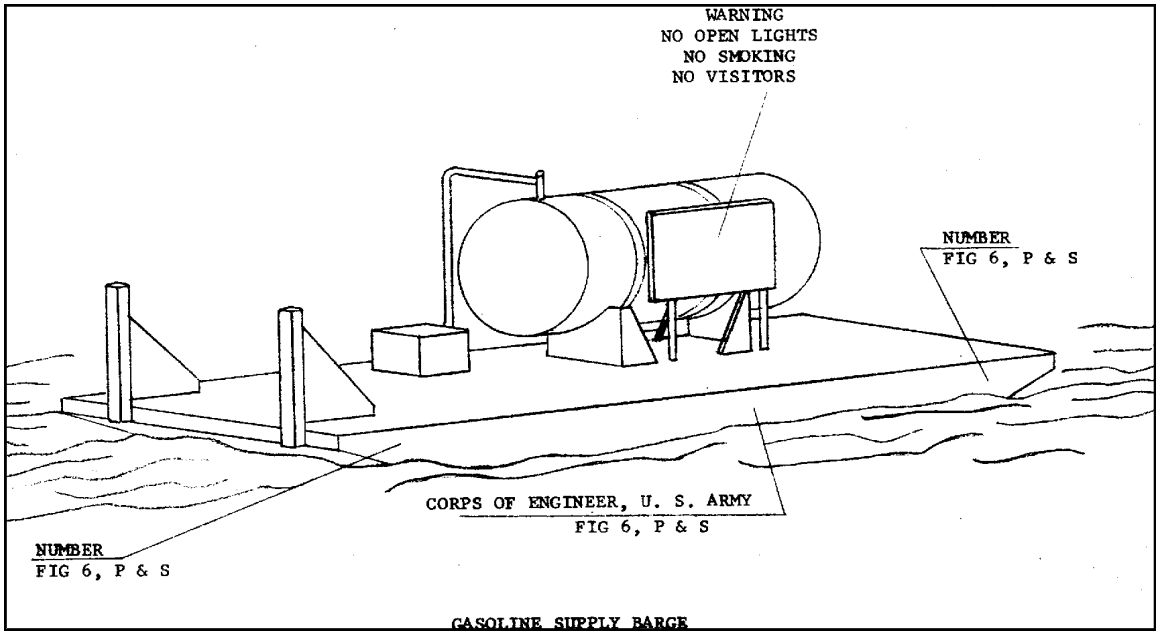
FLOATING CRANE WITH DECKHOUSE



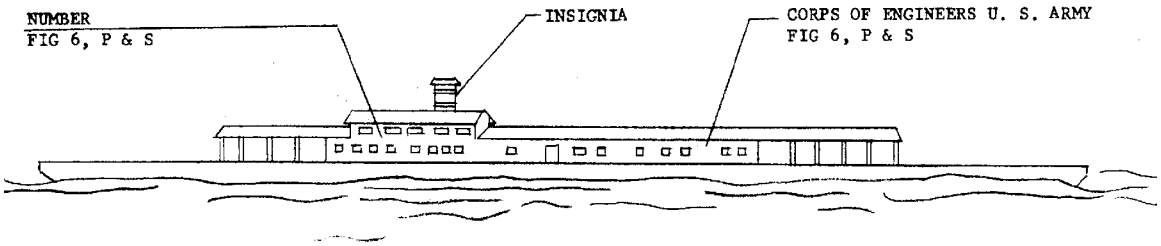
CRANE BARGE



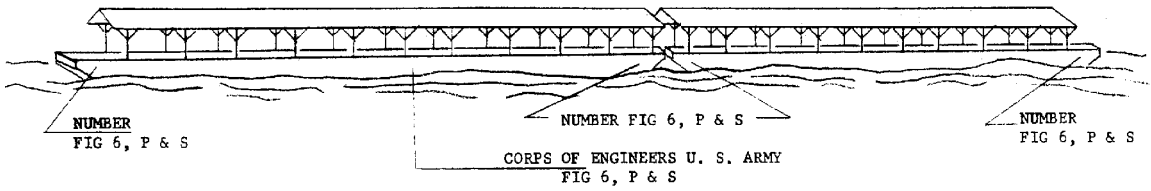
FUEL AND WATER BARGE



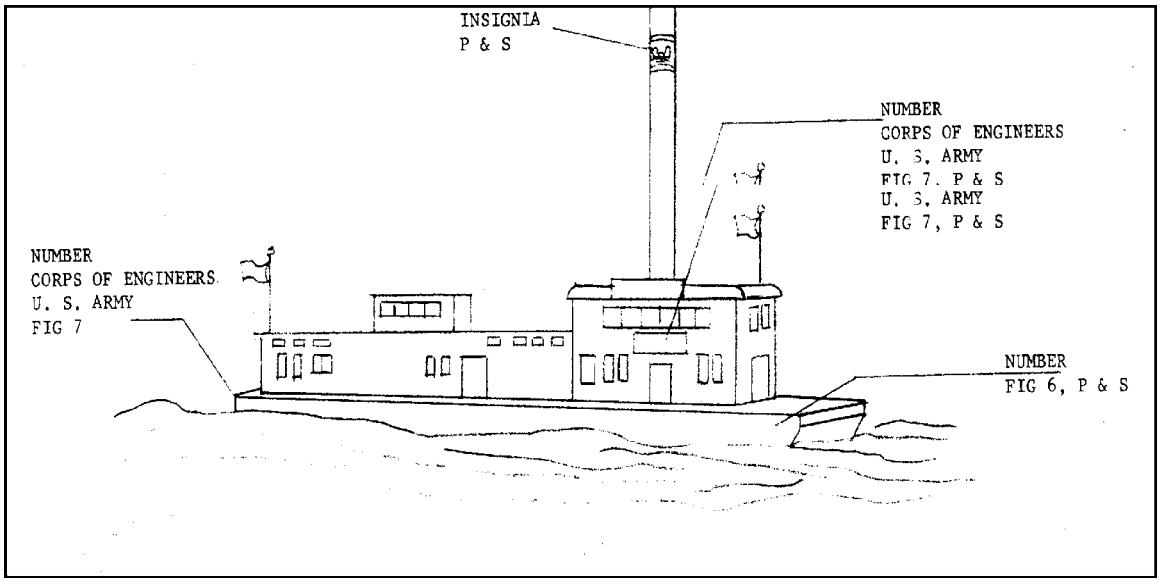
GASOLINE SUPPLY BARGE

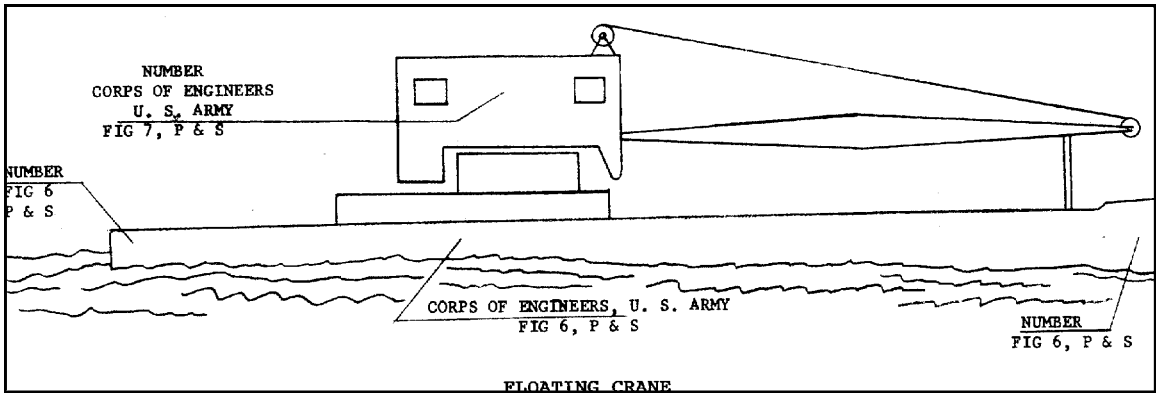


MOORING BARGE

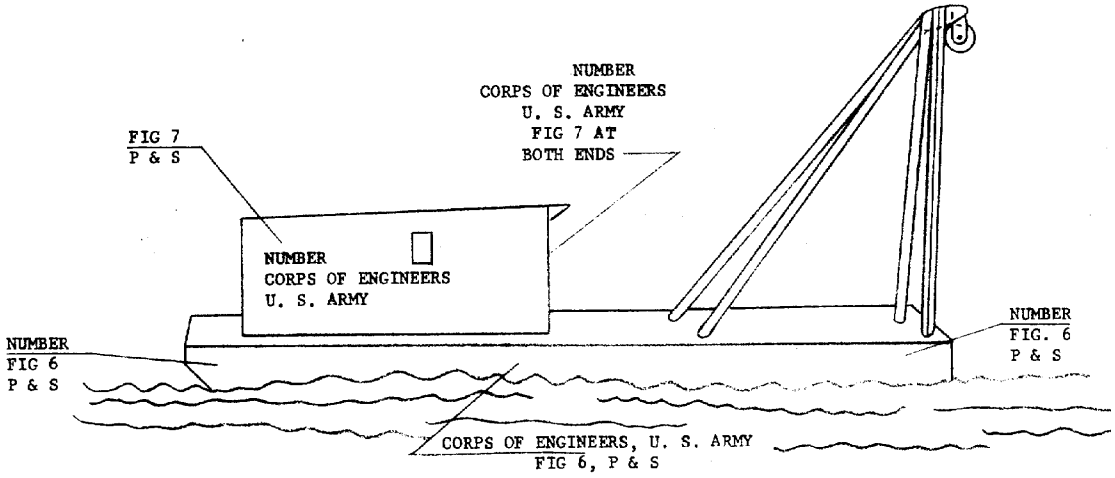


MOORING BARGE
PERMANENTLY JOINED TO FORM ONE UNIT

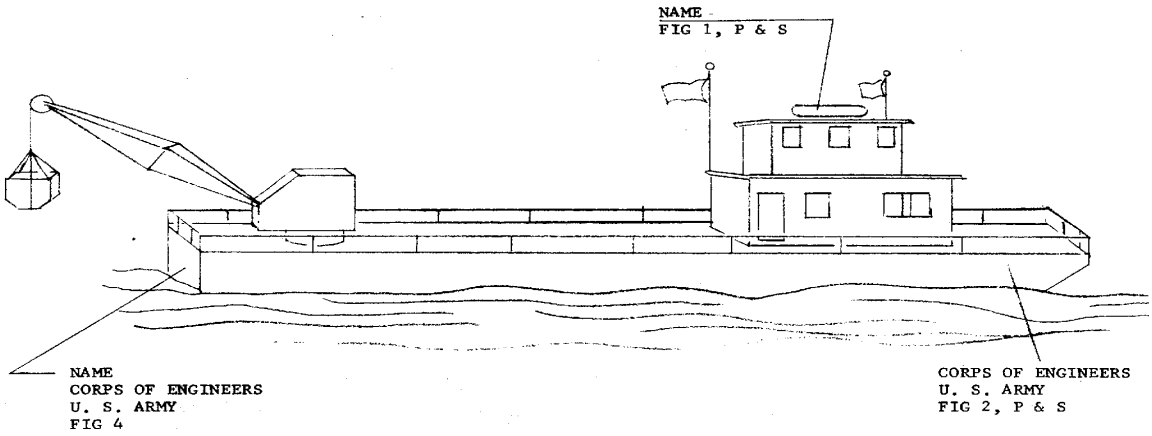




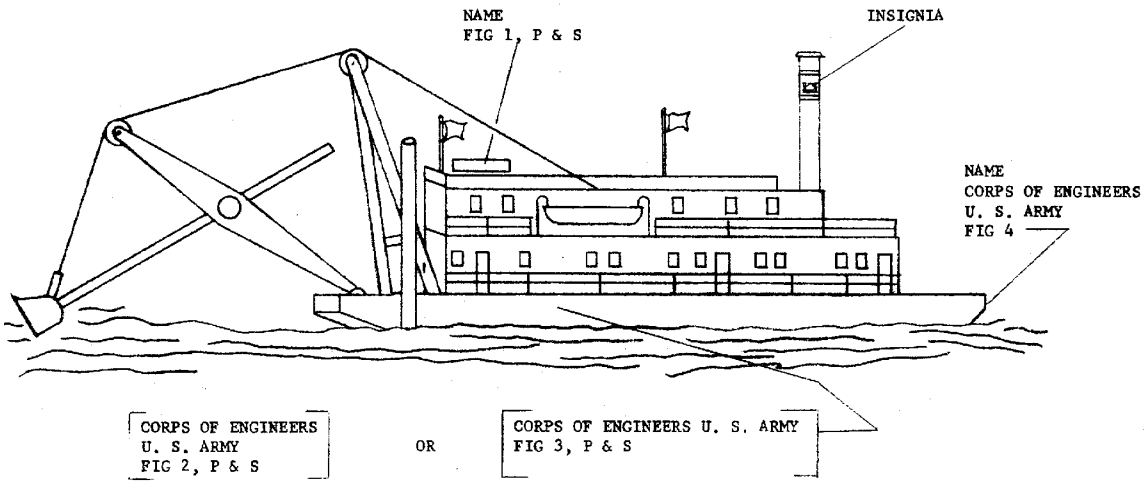
FLOATING CRANE



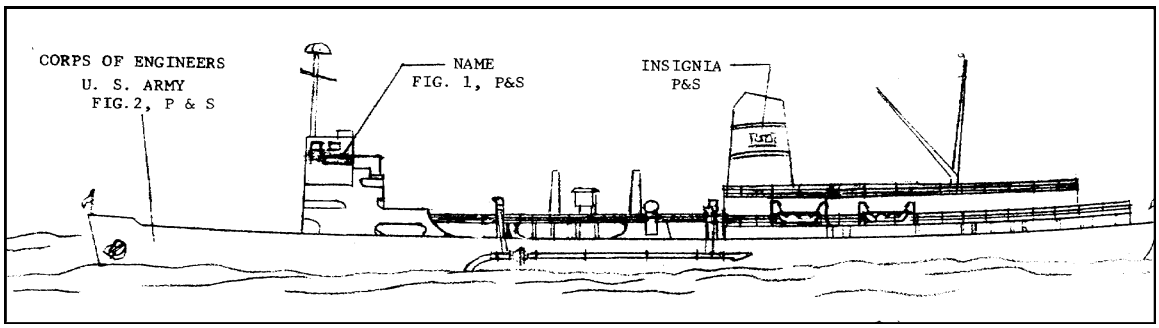
DERRICK BOAT, FIXED NON-REVOLVING

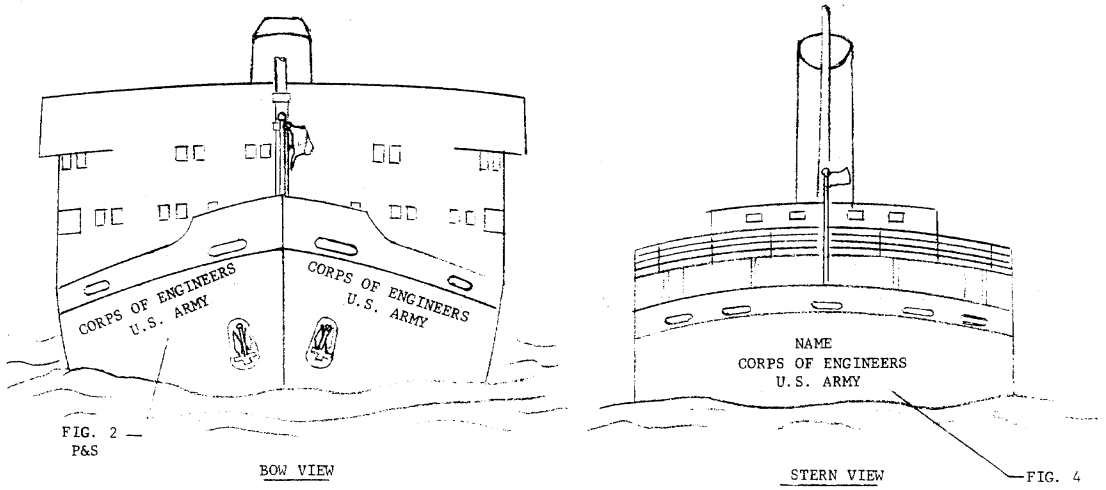


DREDGE - BUCKET



DREDGE - DIPPER

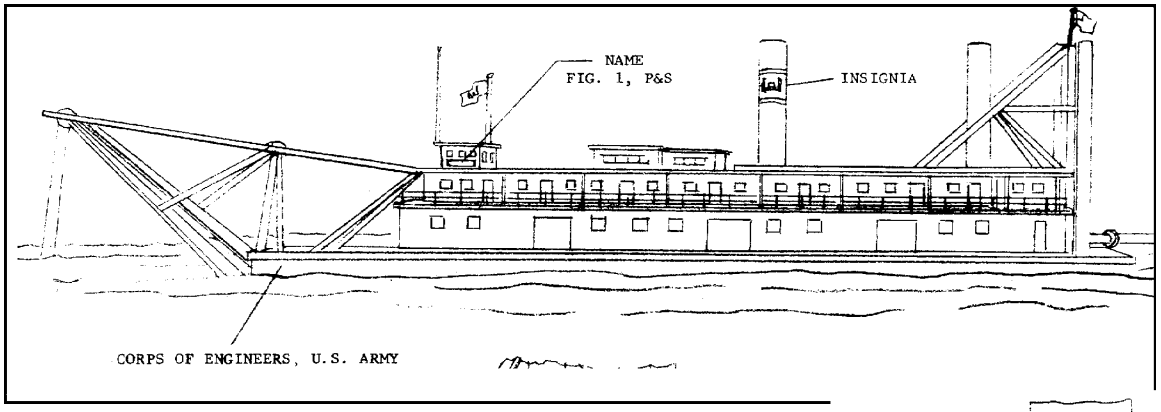


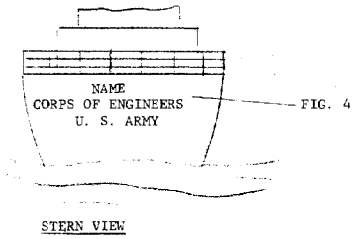


BOW VIEW

STERN VIEW

DREDGE-HOPPER

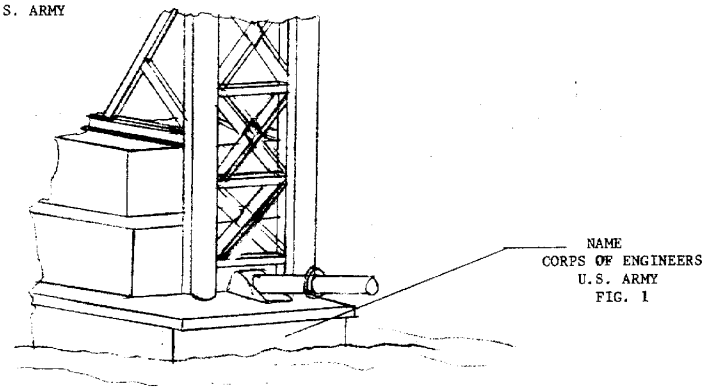




STERN VIEW

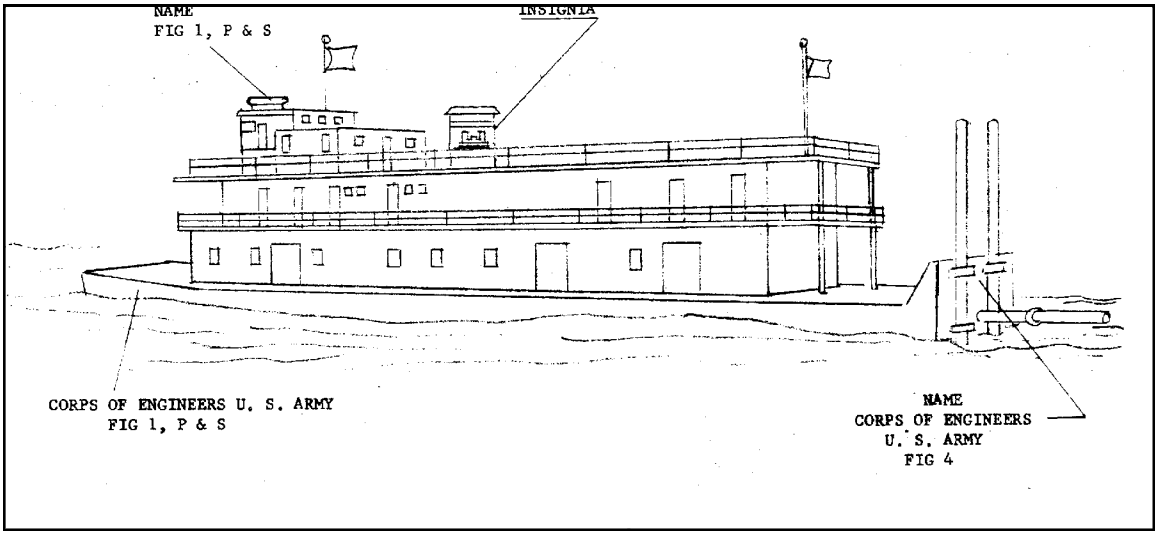
DREDGE - HOPPER

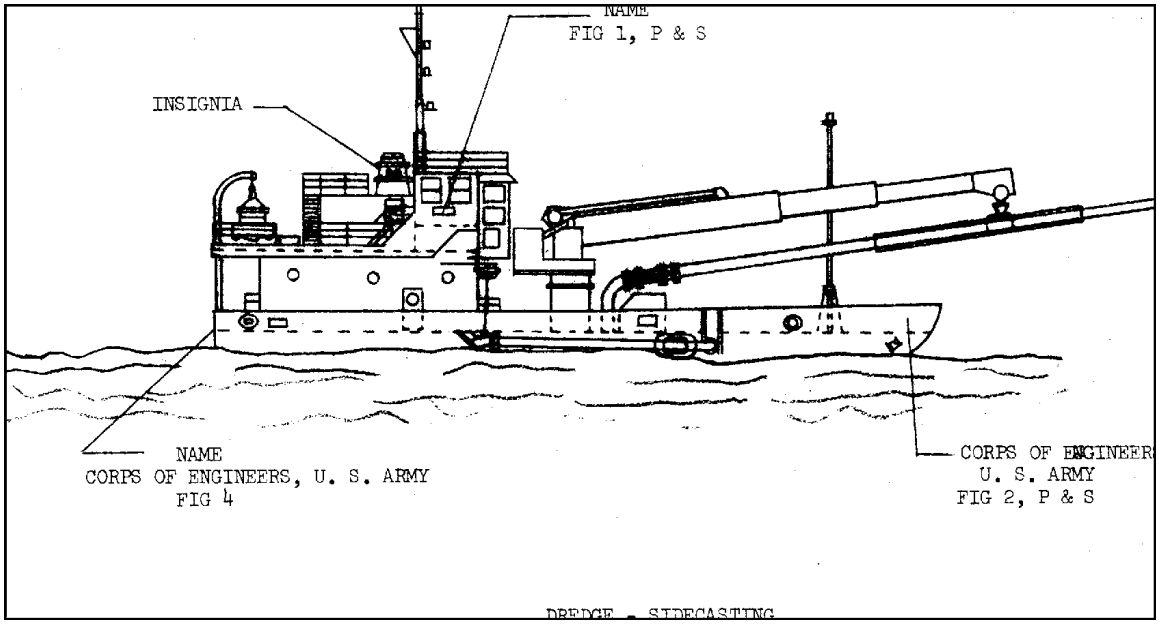
CORPS OF ENGINEERS, U.S. ARMY
FIG. 3, P & S



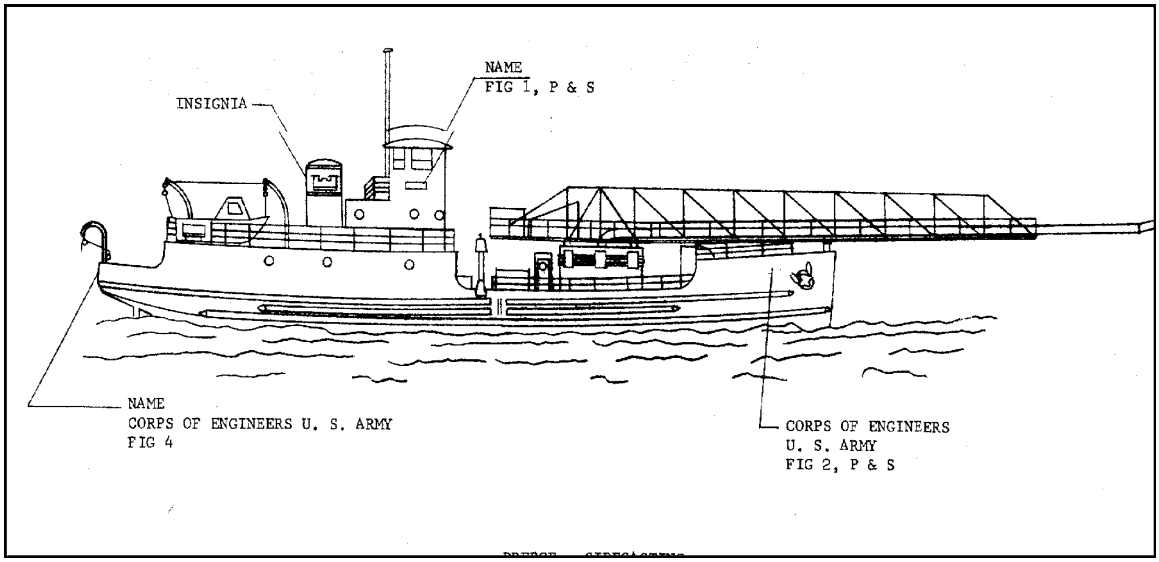
STERN VIEW

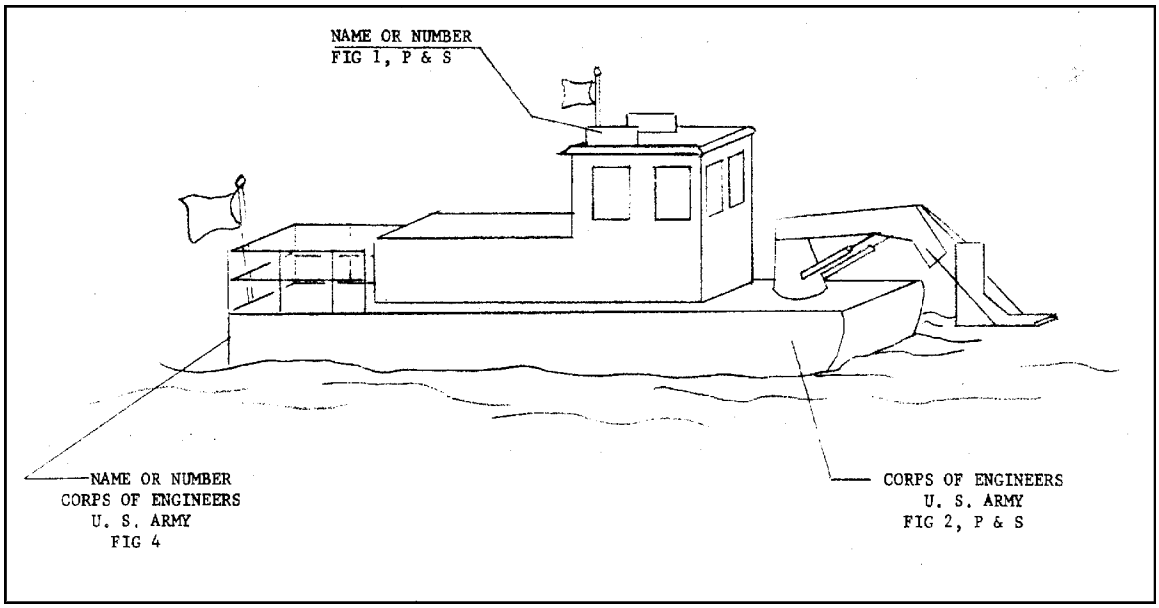
DREDGE - PIPELINE

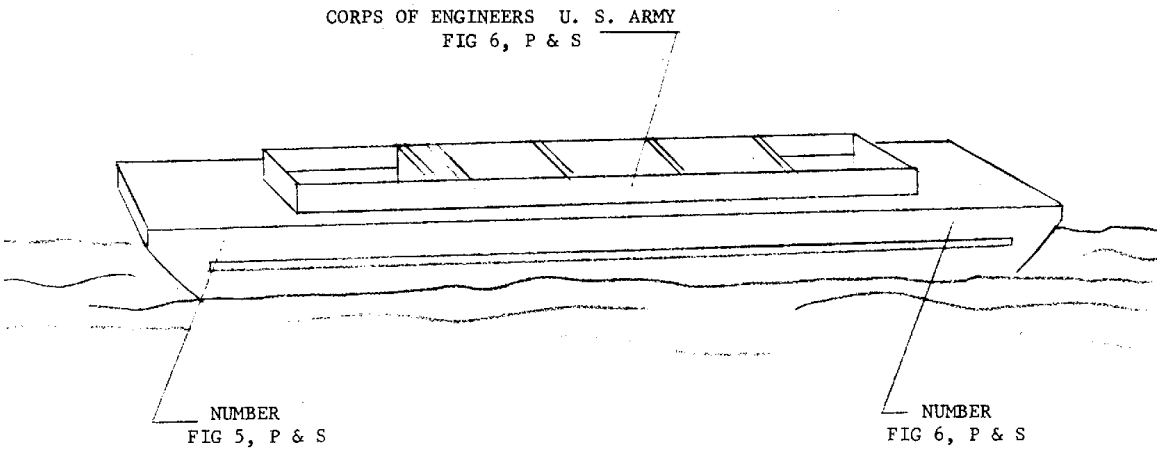




DREDGE - SIDECASTING


NAME
FIG 1, P & S
INSIGNIA
NAME
CORPS OF ENGINEERS U. S. ARMY
FIG 4
CORPS OF ENGINEERS
U. S. ARMY
FIG 2, P & S


NAME OR NUMBER
FIG 1, P & S
NAME OR NUMBER
CORPS OF ENGINEERS
U. S. ARMY
FIG 4
CORPS OF ENGINEERS
U. S. ARMY
FIG 2, P & S



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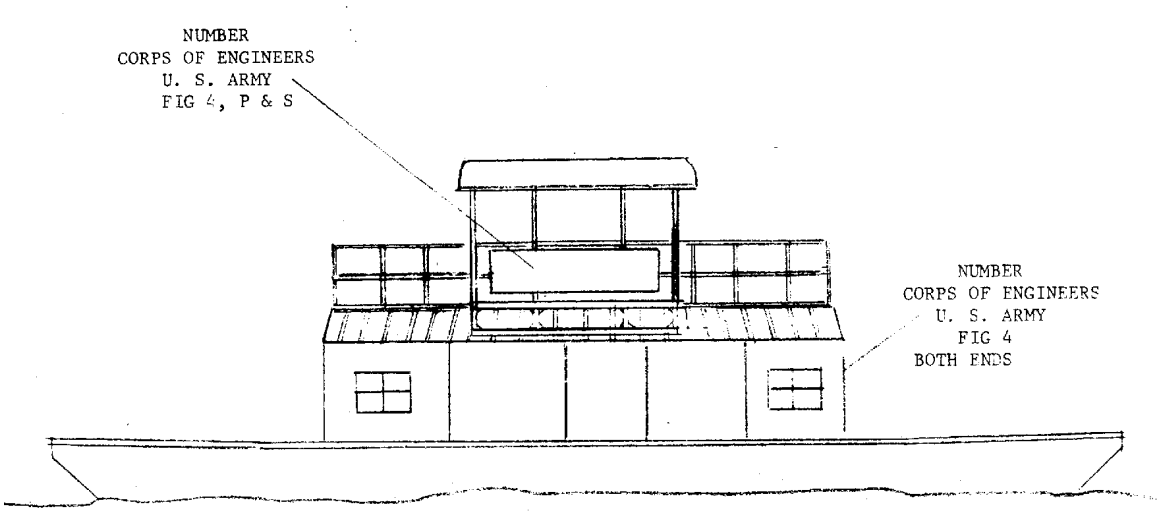
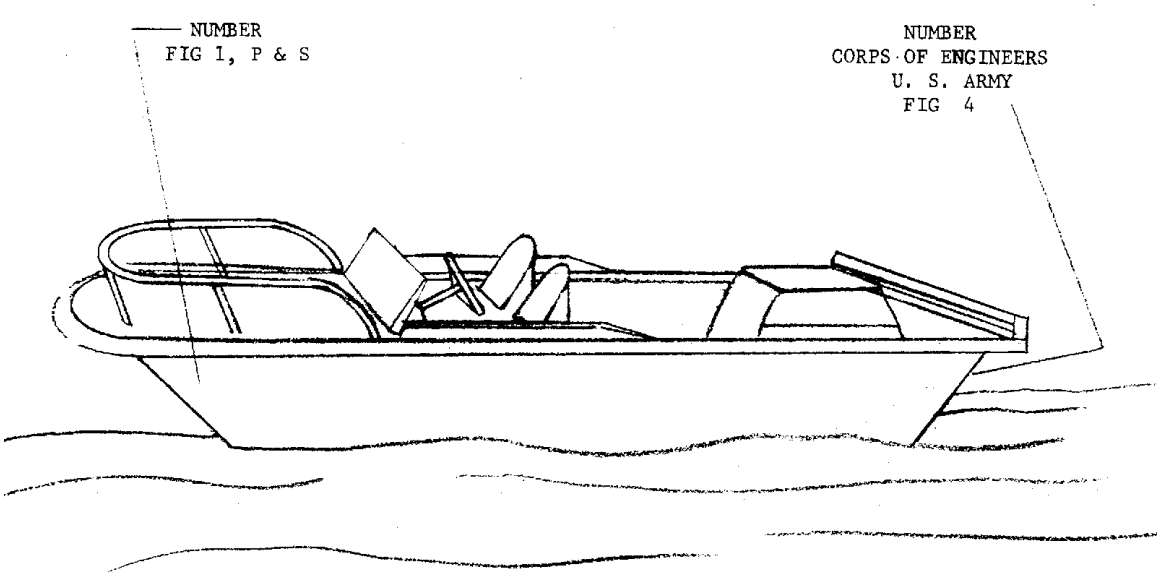
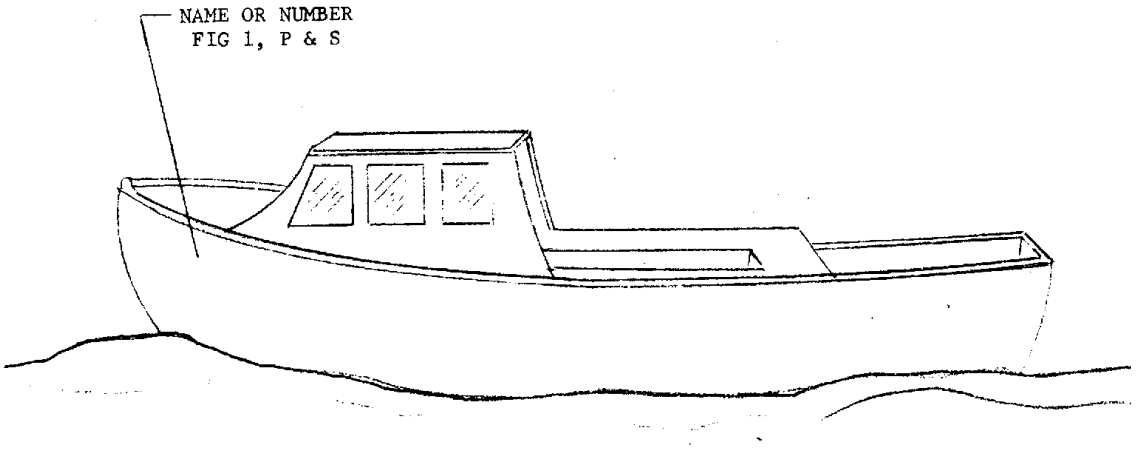


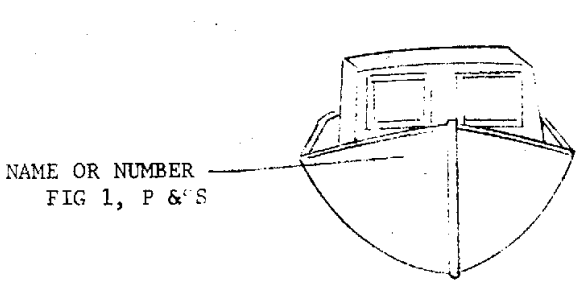
JET PROBING BARGE



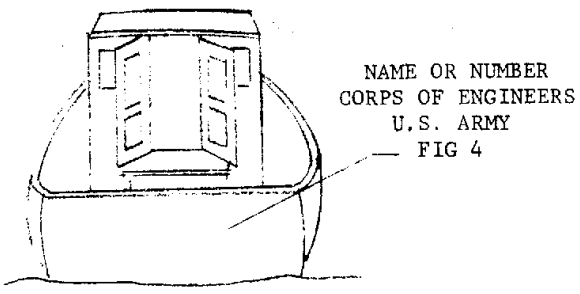
LAUNCH



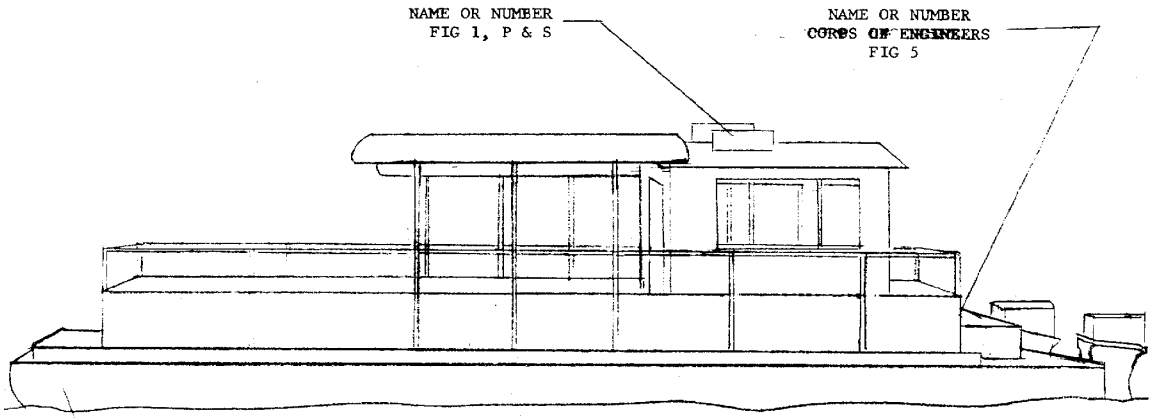
LAUNCH
CLASS 2



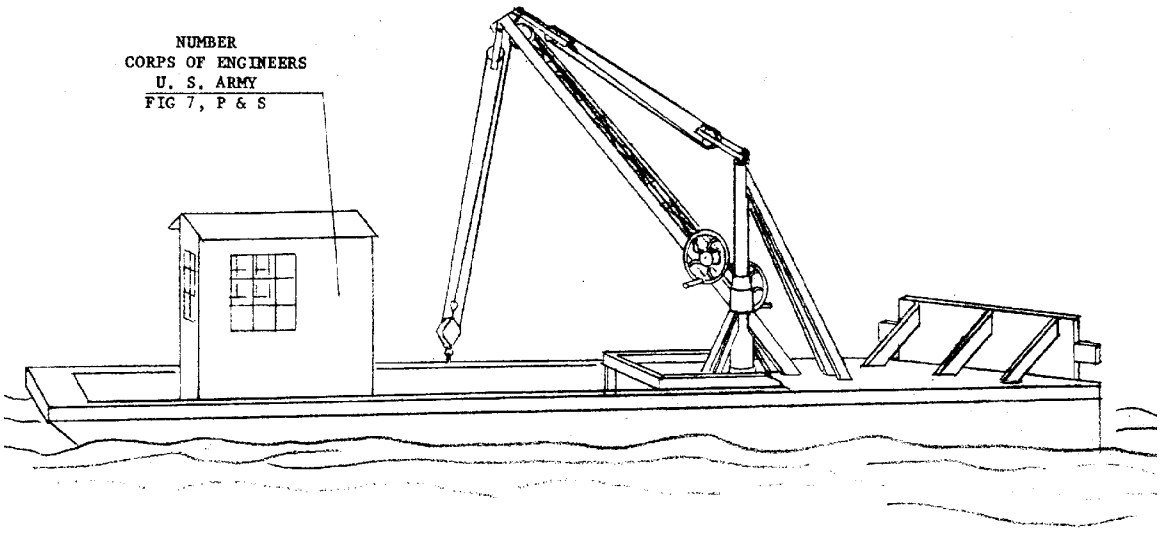
BOW VIEW



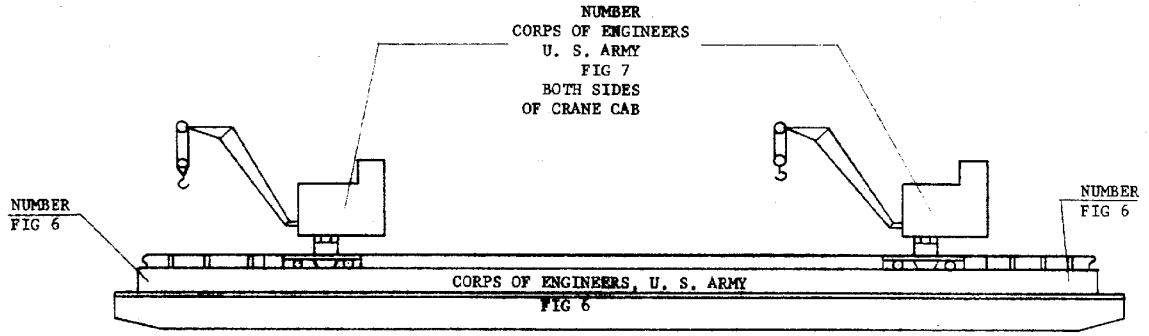
STERN VIEW



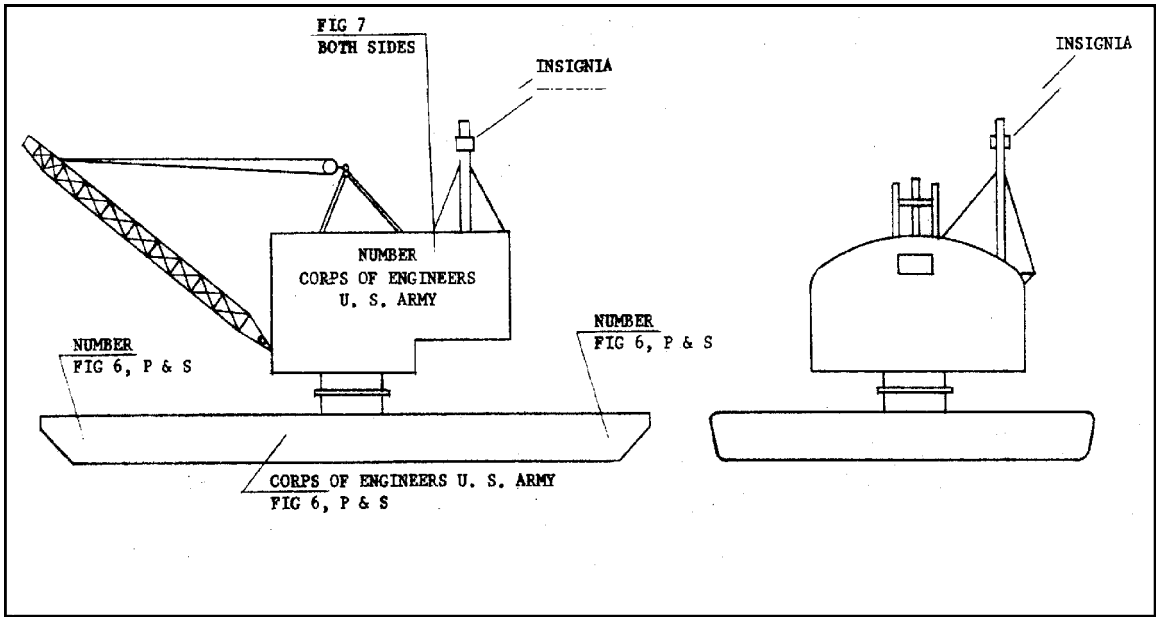
LAUNCH - CATAMARAN TYPE
CLASS 2

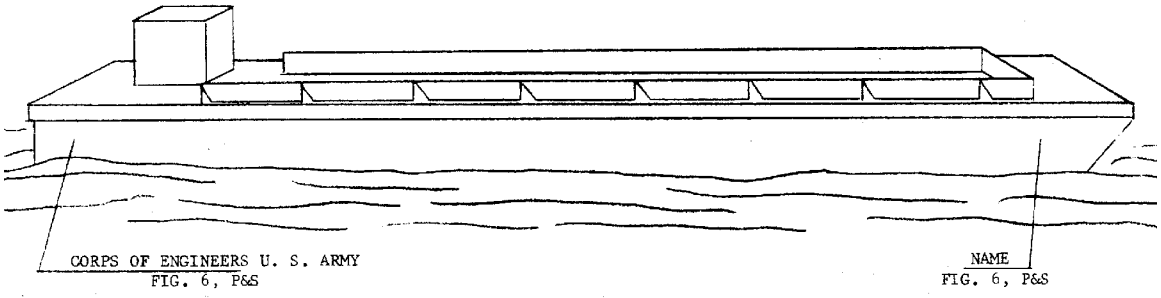


MANEUVERBOAT

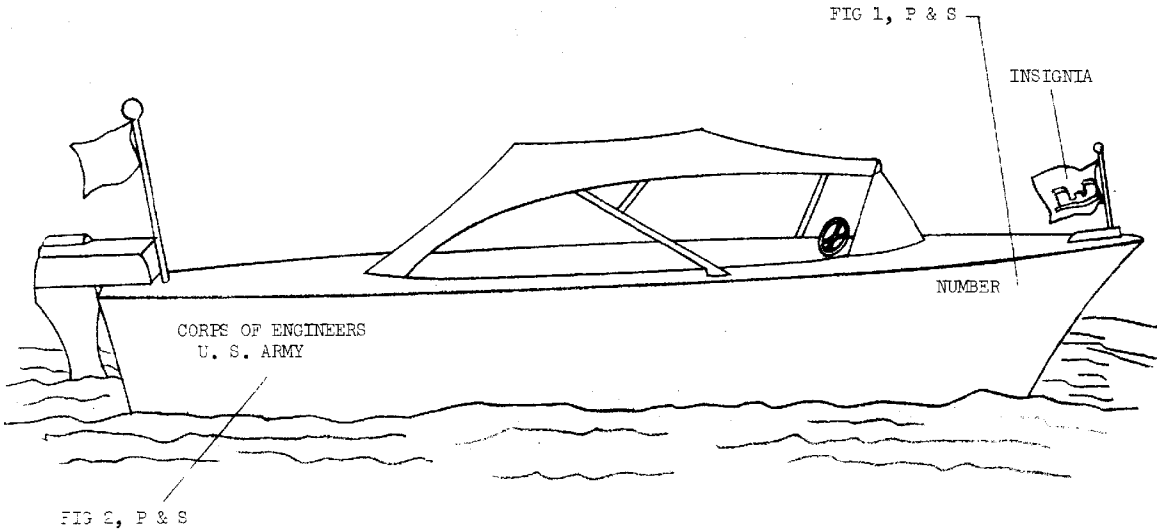


MATTRESS SINKING PLANT

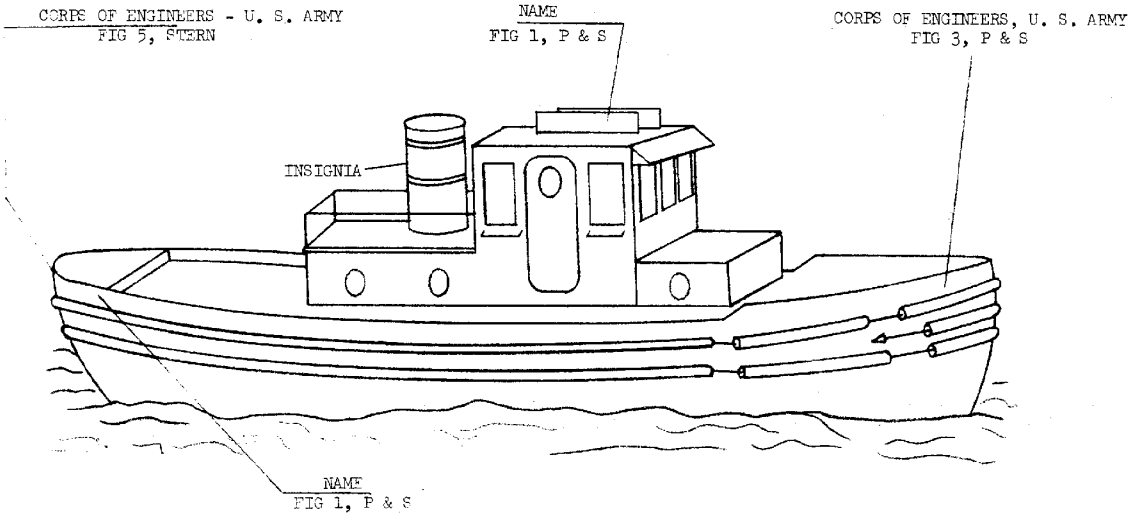




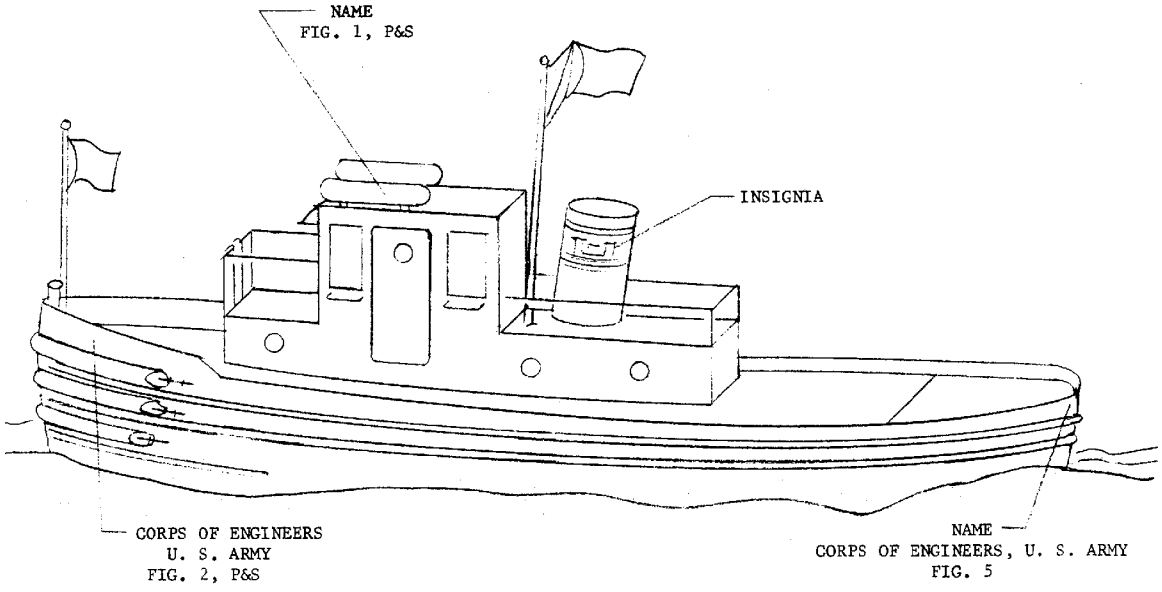
NEEDLEFLAT



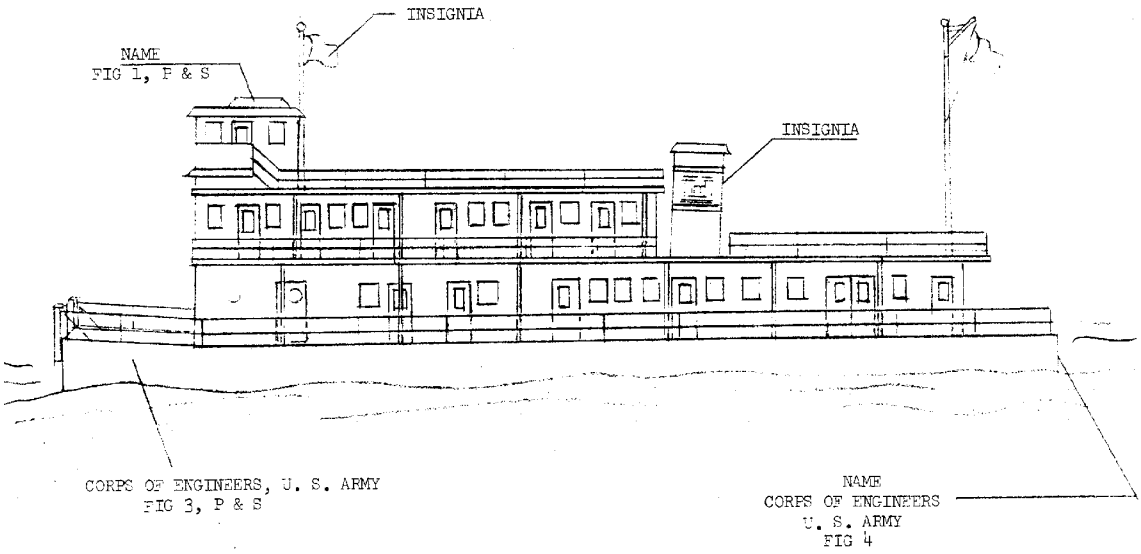
PATROL BOAT
CLASS A AND CLASS 1



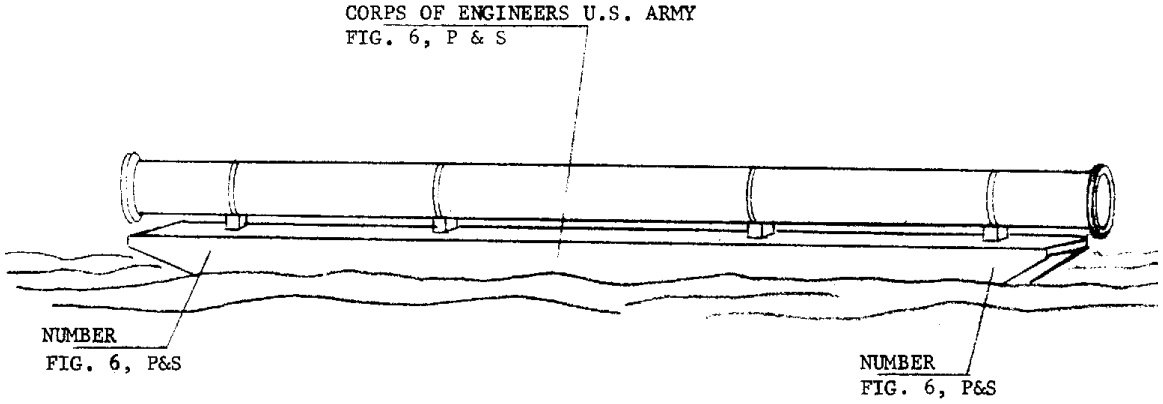
PATROL BOAT
CLASS 2



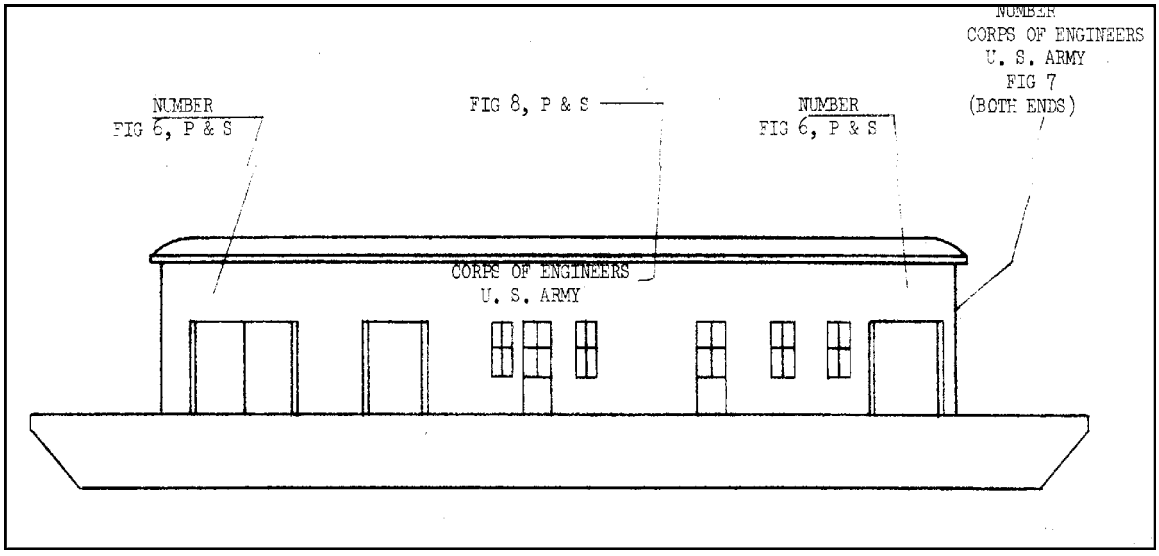
PATROL BOAT
CLASS 3

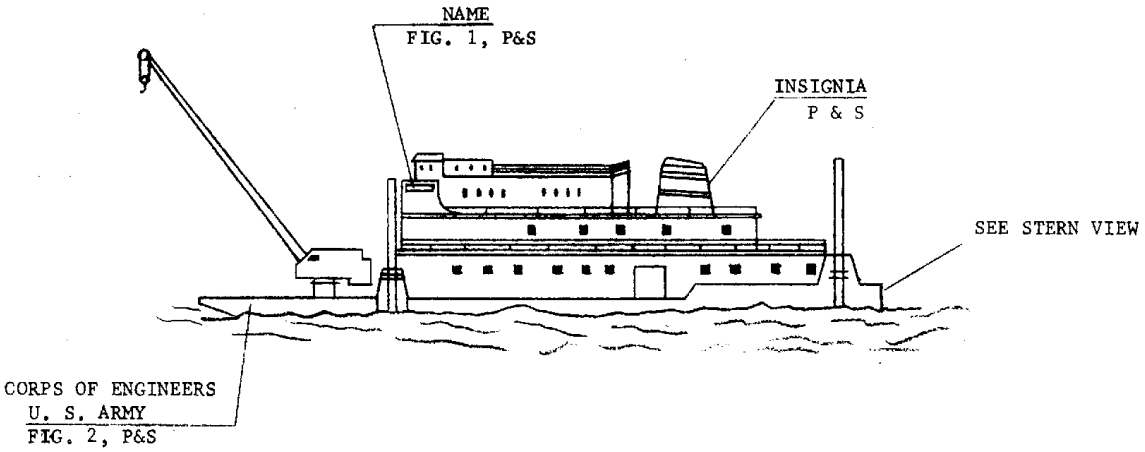


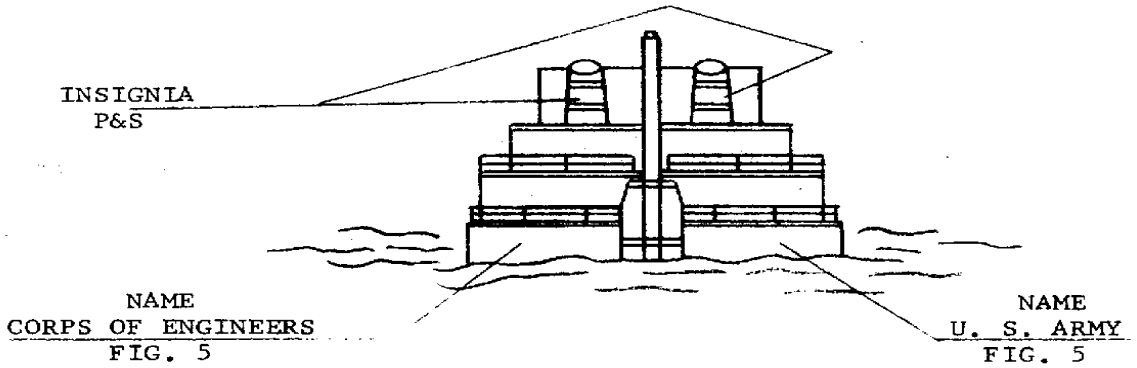
PATROL BOAT
CLASS 4



PONTOON AND DISCHARGE PIPE

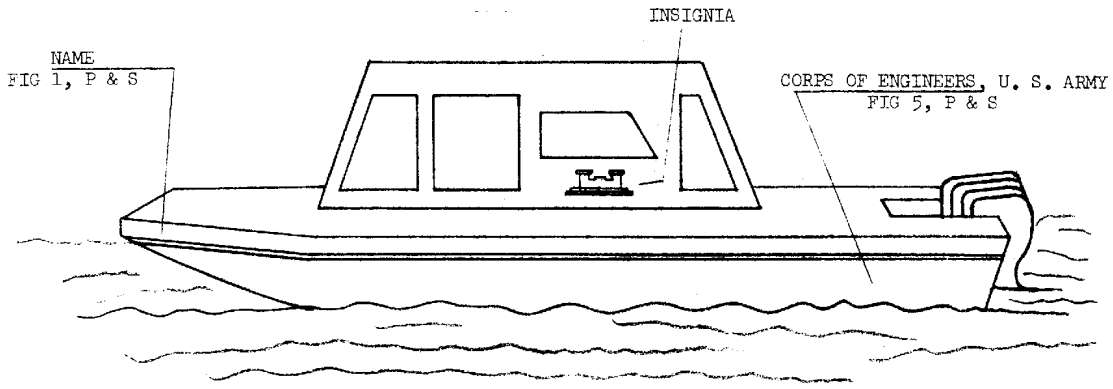




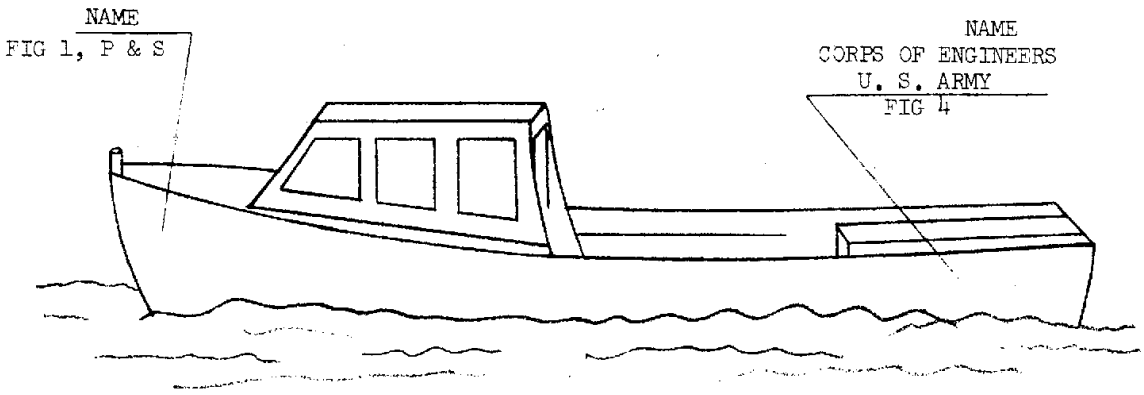


STERN VIEW

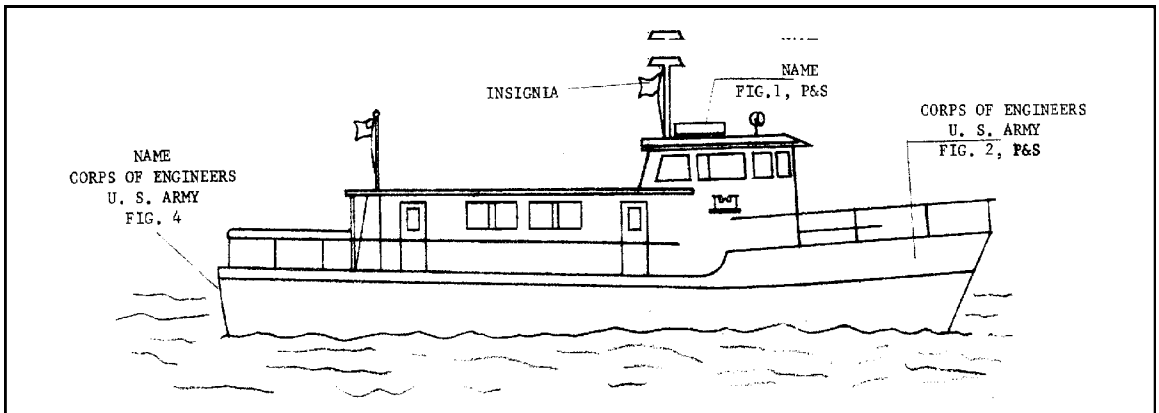
SNAGBOAT / TOWBOAT



SURVEY BOAT
CLASS A AND CLASS 1



SURVEY BOAT
CLASS 2



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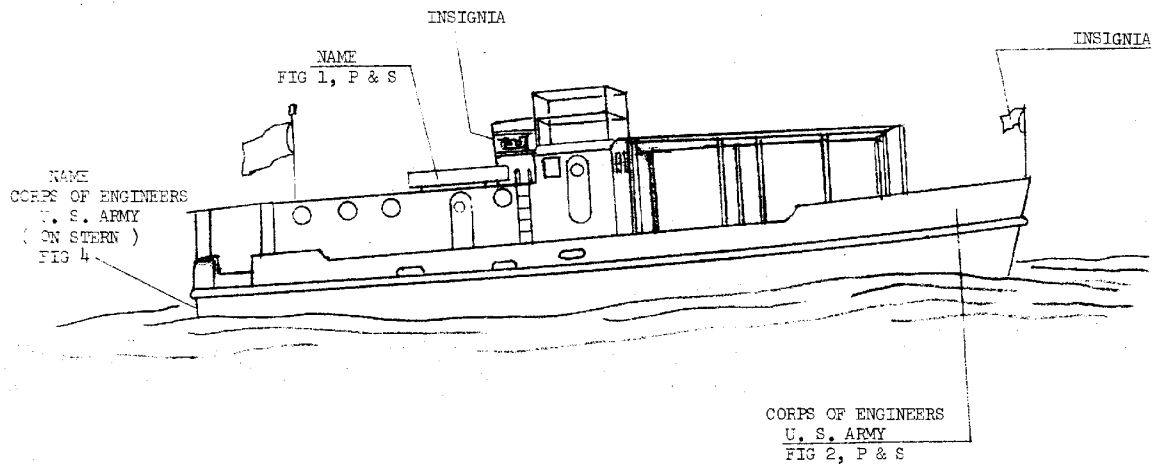

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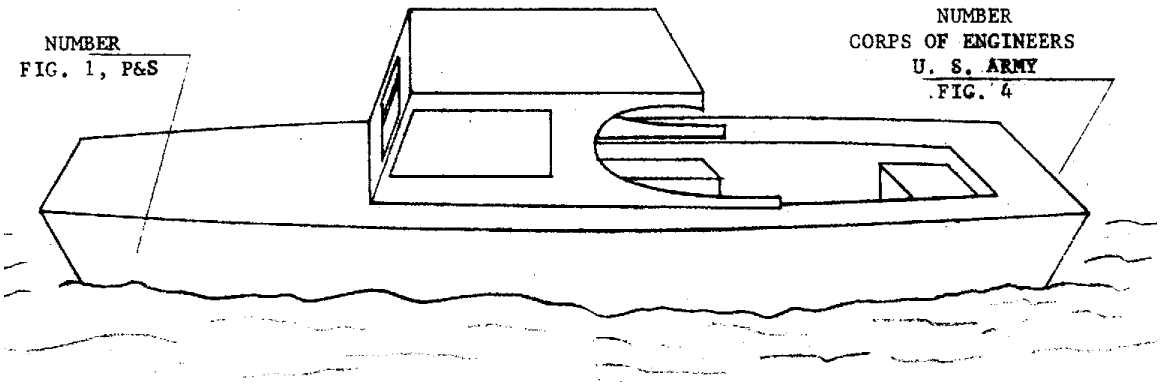
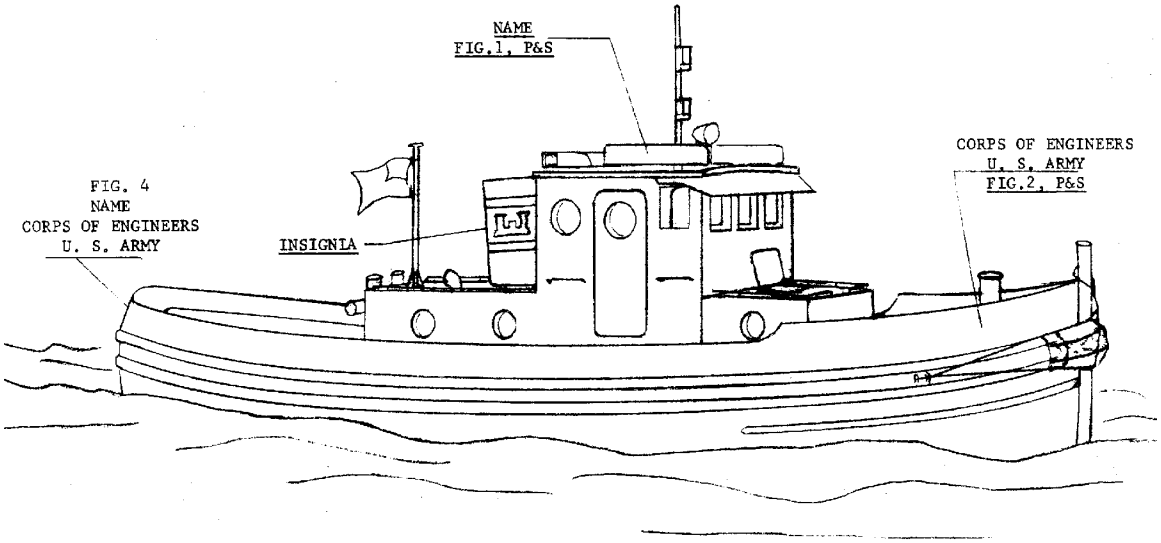
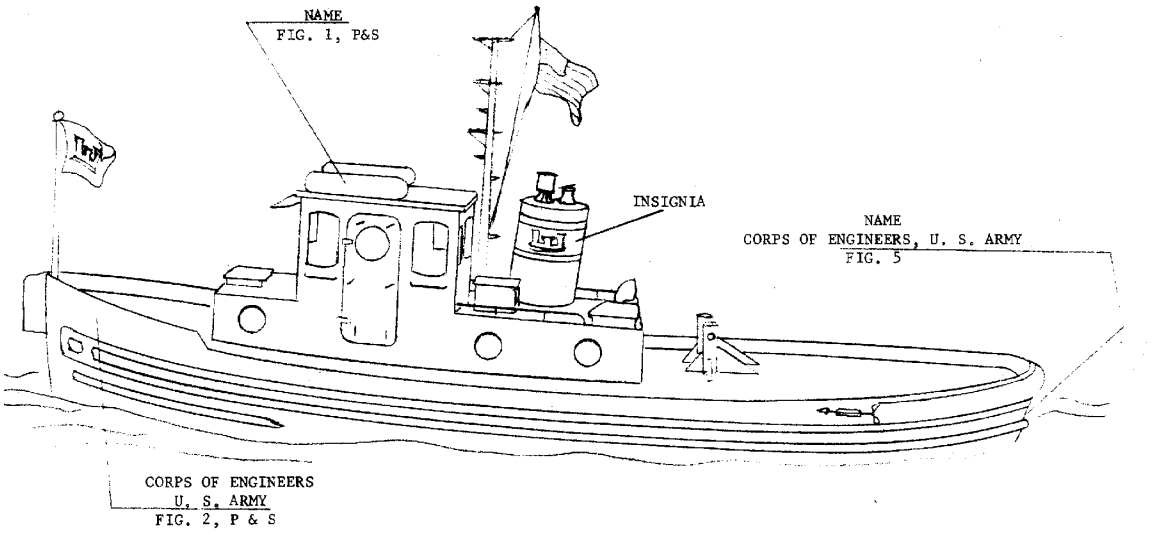
CLASS 4



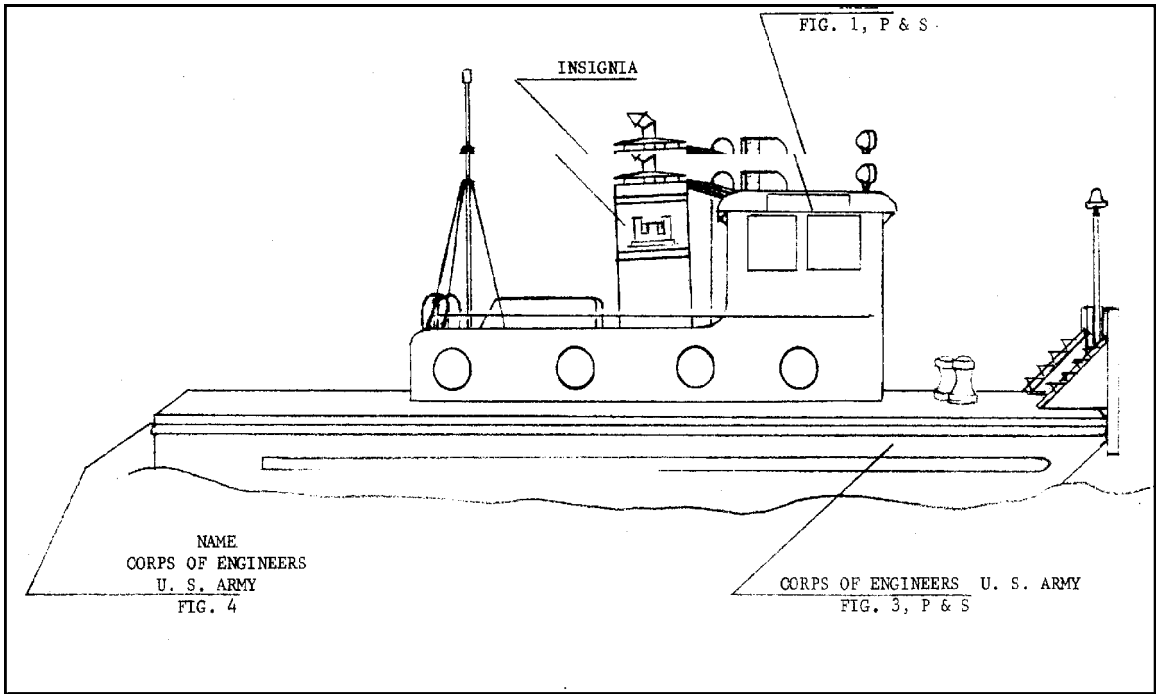
TENDER
CLASS A AND CLASS 1

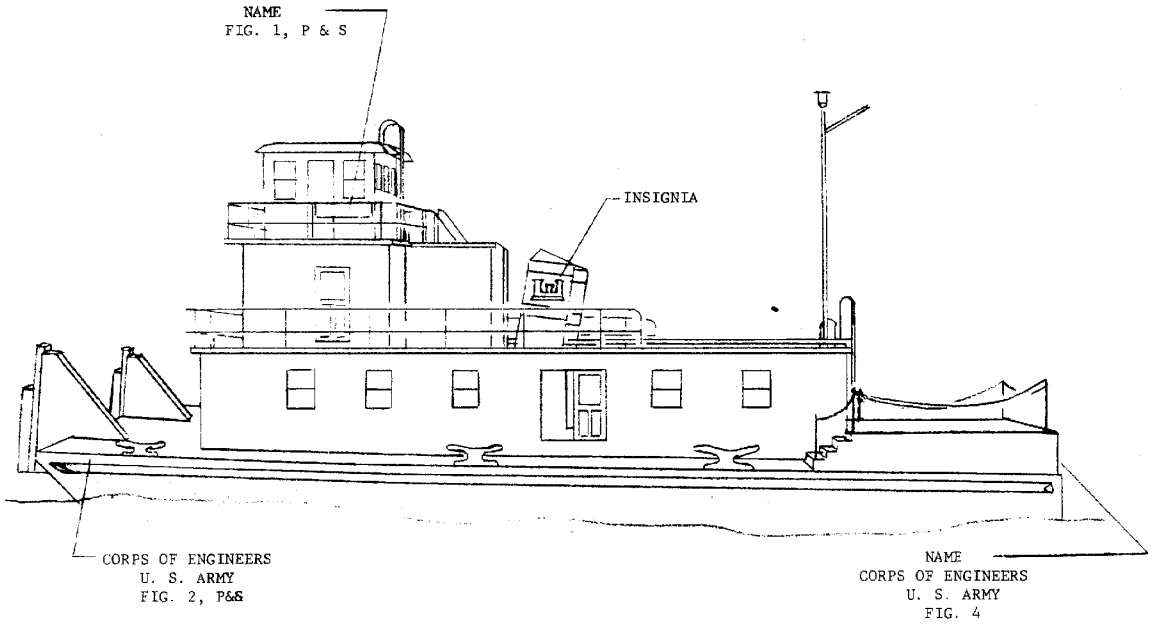


TENDER
CLASS 2

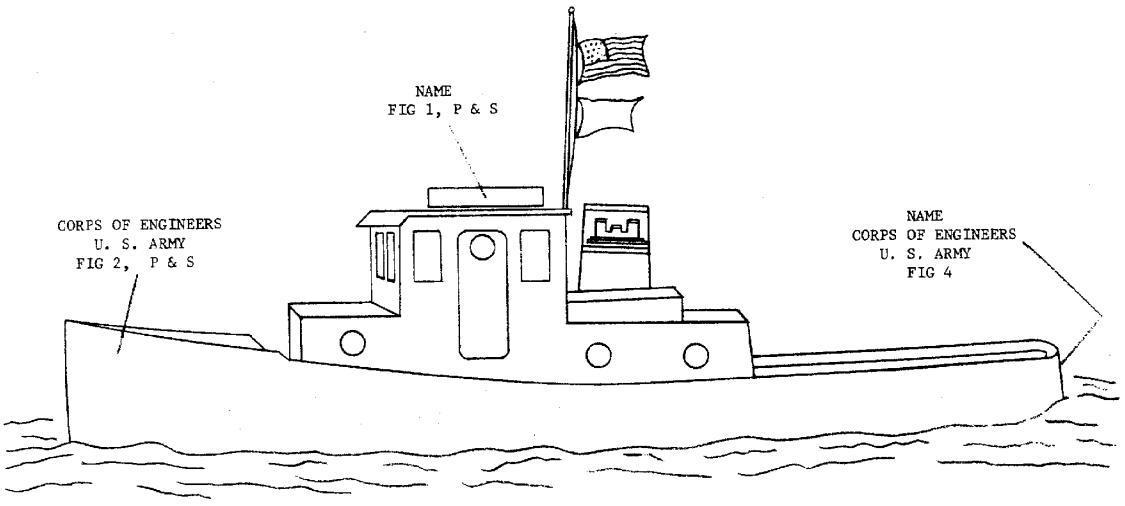


TENDER
CLASS 3





TOWBOAT
CLASS 4



TUGBOAT
CLASS 3

CORPS OF ENGINEERS
U. S. ARMY
FIG 2, P & S

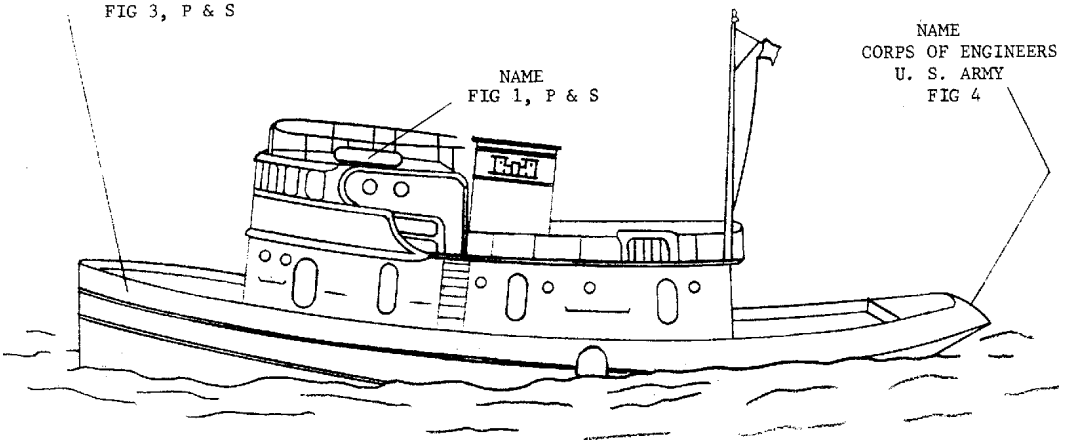
OR

CORPS OF ENGINEERS U. S. ARMY
FIG 3, P & S

NAME
CORPS OF ENGINEERS U. S. ARMY
FIG 5

OR

NAME
CORPS OF ENGINEERS
U. S. ARMY
FIG 4



TUGBOAT
CLASS 4

APPENDIX K

SIZE AND SPACING OF IDENTIFICATION DESIGNATIONS

Table of Contents

ITEM PAGE

Bow Designation Arrangements of Floating Plant Other Than Barges K-1

Stern Designation Arrangements of Floating Plant Other Than Barges K-2

Barge Designation Arrangements K-3

Section Thru Insignia Fasteners K-4

Figure K-1

PREFERRED BOW DESIGNATION ARRANGEMENT

Figure K-2

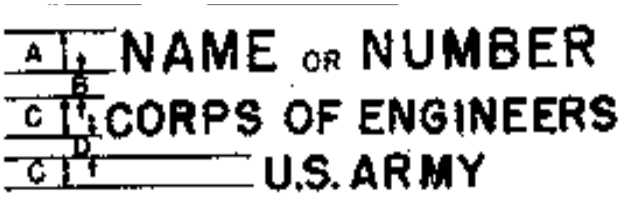
ALTERNATE BOW DESIGNATION ARRANGEMENT

Figure K-3

Table K-1 DIMENSIONS FOR DESIGNATIONS

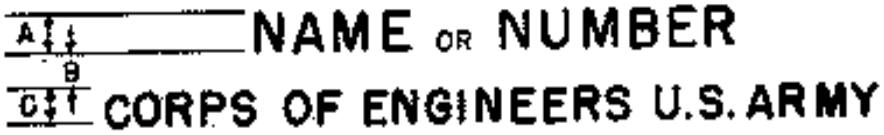
CLASS	SIZE OF VESSEL (LOAD WATER LINE LENGTH)	DIMENSIONS IN INCHES			
		A	B	C	D
A	LESS THAN 16'-0"	6	4	5	2-1/2
1	16'-0" TO LESS THAN 26'-0"	7	4	5	2-1/2
2	26'-0" TO LESS THAN 40'-0"	7	4	5	2-1/2
3	40'-0" TO LESS THAN 65'-0"	8	5	6	3
4	65'-0" TO LESS THAN 125'-0"	10	6	8	4
4	125'-0" AND OVER	12	7	10	5

NAME OR NUMBER SIZE AND
BOW DESIGNATION ARRANGEMENTS
OF FLOATING PLANT OTHER THAN BARGES



PREFERRED STERN DESIGNATION ARRANGEMENT

Figure K-4



ALTERNATE
STERN DESIGNATION ARRANGEMENT

Figure K-5

Table K-2 DIMENSIONS FOR DESIGNATIONS

SIZE OF VESSEL (LOAD WATER LINE LENGTH)	DIMENSIONS IN INCHES			
	A	B	C	D
LESS THAN 16'-0"	5	3	4	2-1/2
16'-0" TO LESS THAN 26'-0"	6	3	4	2-1/2
26'-0" TO LESS THAN 40'-0"	6	3	4	2-1/2
40'-0" TO LESS THAN 65'-0"	7	3	4	2-1/2
65'-0" TO LESS THAN 125'-0"	8	4	5	3
125'-0" AND OVER	10	5	6	3-1/2

STERN DESIGNATION ARRANGEMENTS
OF FLOATING PLANT OTHER THAN BARGES

BARGE HULL, CARGO BIN, BULWARK AND DECKHOUSE MARKINGS

Figure K-6

BARGE DECKHOUSE MARKING
AND CRANE CAB MARKING

Figure K-7

ALTERNATE BARGE DECKHOUSE MARKING

Figure K-8

Table K-3 DIMENSIONS FOR DESIGNATIONS

BARGE LOAD WATER LINE LENGTH	DIMENSIONS IN INCHES				
	A	B	C	D	E
LESS THAN 40'-0"	7	3	4	2-1/2	5
40'-0" TO LESS THAN 65'-0"	8	4	5	3	6
65'-0" TO LESS THAN 125'-0"	10	5	6	4	8
125'-0" AND OVER	12	6	7	5	10

BARGE DESIGNATION ARRANGEMENTS

SECTION THRU INSIGNIA FASTENERS

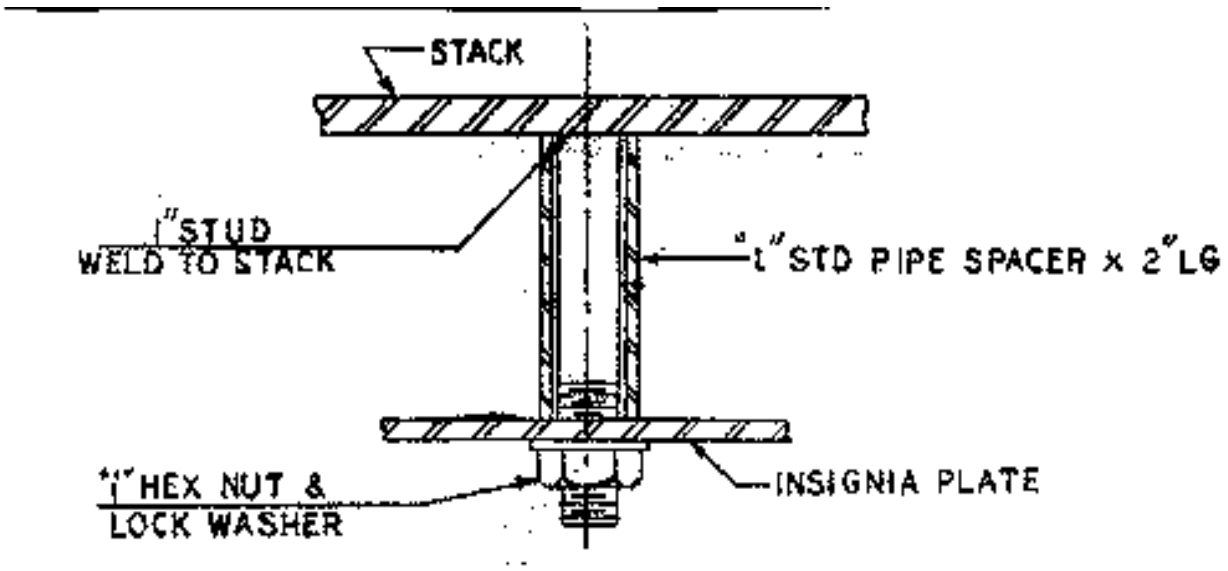


Figure K-9

General Notes

1. Shaded parts to be cut out.

2. Heavy lines of 1/8" and/or 3/16" width to be painted black.

3. Each side of the painted lines to be cut not less than 0.03" deep into the surface for guide in painting. Painted lines shall be 1/8" wide up to and including 30" long plaque, and 3/16" wide for sizes above.

4. Edges of plate to be finished true and smooth with no burrs.

5. The outlines of plate and cut outs to be machine cut.

6. Aluminum alloy surfaces in contact with other metals shall be insulated with asphalt impregnated tape, or other approved insulating material to preclude metal-to-metal contact.

APPENDIX L

INSPECTION AND CERTIFICATION AGREEMENT BETWEEN U. S. ARMY CORPS OF ENGINEERS AND U. S. COAST GUARD

1. Inspection Agreement. The Coast Guard upon proper application will inspect Corps of Engineers vessels and issue Certificates of Inspection to such vessels when they are found to comply with the applicable statutes and vessel inspection regulations. In any case where, after inspection, it is found that a Certificate of Inspection cannot be issued, the applicant for inspection will be furnished with a written statement setting forth the particulars in which the vessel fails to meet Coast Guard requirements.

2. Applicable Vessel Regulations.

a. The Rules and Regulations for Cargo and Miscellaneous Vessels (CG-257), and Rules and Regulations for Tank Vessels (CG-123), will be considered the basic Coast Guard rules and regulations applicable to Corps of Engineers vessels, insofar as they reasonably apply.

b. Corps of Engineers vessels being vessels of the Department of Defense and used for public purposes, are not subject to the provisions of the International Convention for Safety of Life at Sea and, accordingly, will not normally be furnished with Convention certificates.

3. Manning. The Coast Guard will specify the minimum manning requirements on the Certificate of Inspection. A sufficient number of personnel will be properly licensed and certificated in accordance with Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (CG-191) to meet the minimum manning requirements. In addition, all other personnel in the deck, engine, steward and other departments will possess United States Merchant Mariners Document (Certificate of Identification) under the provisions of CG-191. Such licensing and/or certification will be required as a condition of employment.

4. Shipment and Discharge. The employment of crew members will be in accordance with the laws and regulations of the Civil Service Commission.

5. Casualty Review. Corps of Engineers vessels and their Masters will report marine casualties to the Coast Guard and the Coast Guard will investigate such casualties in accordance with the laws and regulations applicable to vessels of the United States.

6. Disciplinary Action. The Coast Guard will take action under R. S. 4450 as amended (46 USC 239) against those crew members whose possession of valid seamen's documents issued by the Coast Guard is a condition of employment. Any disciplinary action considered appropriate by the Corps of Engineers will be taken under Civil Service Commission laws and regulations.

7. Modification of Standards.

a. Vessels of Special Design. In the case of Corps of Engineers vessels of special design, the Coast Guard may, in individual cases, permit such variation from the requirements of law and

regulations as may be shown to be necessary for the special purposes for which such vessels are designed.

b. Lifesaving Equipment. Subject to prior agreement, as it pertains to existing vessels, it is intended that all Corps of Engineers inspected vessels be equipped with lifesaving equipment in accordance with the rules and regulations applicable to vessels of the United States. Life vests constructed in accordance with military specification MIL-L-17653 (a) or (b), or subsequent approved specification, are authorized and approved for use on vessels engaged in Rivers operations. These life vests are also authorized and approved for use as work vests aboard vessels in Ocean, Coastwise, and Great Lakes operations which are also equipped with U.S. Coast Guard approved life preservers specified in the Coast Guard rules and regulations.

8. Plan Approval. Approval of plans for new construction, conversion and alteration will be carried out in accordance with U.S. Coast Guard rules and regulations.

9. Repairs and Alterations. Required notice of repairs or alterations shall be carried out when required by and in accordance with U.S. Coast Guard rules and regulations.

10. Modification of Agreement. Modifications or supplements to this basic agreement may be made by mutual consent. Such modifications or supplements will be in the form of addendums to this basic agreement.

/s/ William F. Cassidy
WILLIAM F. CASSIDY
Lieutenant General, USA
Chief of Engineers

Date: 25 April 1969

/s/ T. R. Sargent
T. R. Sargent
Rear Admiral, U.S. Coast Guard
Chief of Staff

Date: 19 May 1969

APPENDIX M

CORPS OF ENGINEERS MOTORBOAT LICENSE GENERAL REQUIREMENTS

M-1. General. Motorboat Operators License, ENG Form 3962 and Operators Identification Card OF 346, will be issued to all motorboat operators covered under paragraph 4c(1), Chapter 7, ER 1130-2-500, who do not have a current motorboat license issued by the U.S. Coast Guard. The licenses are serially numbered and Districts will maintain a permanent log record of all issuances. The Operators Identification Card SF 46, used for this purpose will contain the same number as the Motorboat Operators License and will be modified as follows:

a. Front of Form - Strike the words "MOTOR VEHICLE"; "vehicles and/or"; and "Government vehicles."

b. Back of Form - Strike the words "VEHICLE AND/OR" and in that column, list "Motorboat." Under the CAPACITY column indicate the class or size of motorboat.

The card will be carried by the operator whenever he is operating a boat. The license and card will be valid for use in any Corps District and a transferee will not be required to renew until the expiration date of his Corps of Engineers license, or U.S. Coast Guard license.

M-2. Qualifications.

a. One year experience in the operation of motorboats or the successful completion of a training course as prescribed in ER 385-1-91.

b. Satisfactory completion of the tests and examinations required by ER 385-1-91.

M-3. Suspension or Revocation. District Commanders may suspend or permanently withdraw a license when determined necessary for the following reasons:

a. Reckless, negligent, or careless operation.

b. Willful damage to a Corps of Engineers motorboat.

c. Violation of Coast Guard Rules of the Road in a manner to endanger life and property.

d. Misconduct which warrants suspension of license.

M-4. Posting. All licenses will be posted in accordance with the policy for Inspection Certificates as outlined in paragraph 7-8a(1), Chapter 7, Section 3, ER 1130-2-500.

M-5. Renewal. The expiration date for an original license or renewal will be five years from date of issue. Applicants for renewal will meet the following requirements:

a. Certify that they have operated a motorboat at least three months in the last two years.

b. Pass a brief review test of the Coast Guard Rules of the Road. (Use of book for written or oral test permitted.)

c. Have a current Operators Identification Card SF 46.

d. Have a Corps of Engineers or Coast Guard license with an expiration date that is not more than one year prior to the date of application for renewal. If more than one year has elapsed since the expiration date, the applicant will be required to again qualify by taking the test and examination prescribed in ER 385-1-91, to the extent considered necessary by the District Commander.

e. No license will be renewed earlier than 90 days prior to the expiration date.

f. Original licenses will be marked "Issue No. l." Each five year renewal issue will increase the issue number by one. Corps of Engineers licenses issued to replace Coast Guard licenses will give credit for previous Coast Guard Issue Numbers and follow in consecutive order.

g. Attend a refresher course as appropriate for the license required.

M-6. Procurement. ENG Form 3962 will be requisitioned from HQUSACE, ATTN: CECW-OD. These are accountable forms. The DA Form 17, Requisition for Publications and Blank Forms will be used when requisitioning this form.

APPENDIX N

U. S. COAST GUARD APPROVED PERSONAL FLOATATION DEVICES

N-1. Requirements for Use. The use of U.S. Coast Guard approved personal floatation devices will be as follows:

a. Personal Floatation Devices. Personal floatation devices are designed for emergency use on vessels 40 feet or more in length which are involved in Ocean, Coastwise and Great Lakes operations. They are not required to be worn except in the event of abandon-ship operations or similar emergency conditions where survival equipment is necessary. They must be aboard and readily accessible at all times on the basis of one personal floatation device per person.

b. Work Vests. Work vests shall be worn as prescribed by EM 385-1-1. They are authorized and approved for use as personal floatation devices on vessels engaged in Lakes, Bays, Sounds and Rivers operations. These work vests are also authorized and approved for use as work vests aboard vessels in Ocean, Coastwise and Great Lakes operations which are also equipped with U.S. Coast Guard approved personal floatation devices.

APPENDIX O

CORPS OF ENGINEERS MARINE ENGINEERING BOARD MEMBERSHIP

The following individuals are designated as Members of the Marine Engineering Board:

Member	Installation
Chief, Dredging and Navigation Branch Operations, Construction and Readiness Division	HQ, USACE Directorate of Civil Works
Representative, Construction-Operations Division	USACE Division, Lower Mississippi Valley
Representative, Construction-Operations Division	USACE Division, Missouri River
Representative, Construction-Operations Division	USACE Division, North Atlantic
Representative, Construction-Operations Division	USACE Division, North Central
Representative, Construction-Operations Division	USACE Division, North Pacific
Representative, Construction-Operations Division	USACE Division, Ohio River
Representative, Construction-Operations Division	USACE Division, South Atlantic
Representative, Construction-Operations Division	USACE Division, South Pacific
Representative, Operations Division	USACE Division, Southwestern

APPENDIX P

SAMPLE AGREEMENT

COOPERATIVE AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE _____ ASSOCIATION

This Cooperative Agreement is for the mutual benefit of both parties and is between the United States Army Corps of Engineers, _____ District (hereinafter referred to as the "Corps") and the _____ Association (hereinafter referred to as the "Association"), acting through the Chairman of the Board of Directors or the Board's designee.

WITNESSETH: (Select the most appropriate Whereas clause)

WHEREAS, The Corps operates the _____ Visitor Center (or other facility) at the (project name), (state), for public recreation and the understanding of the Corps mission at (___); and,

WHEREAS, The Corps achieves its operational goals for natural resources management through a wide range of activities, programs and events; and,

WHEREAS, the Corps operates its program for the benefit of the public. The public requires information and facilities for the safe and appropriate use of Corps projects. This information is conveyed through a variety of interpretive media such as; programs, exhibits, and displays which rely heavily upon the use of audio visual materials, photographs, models, interactive displays, lectures, artifacts and other materials which illustrate the Corps, its mission and activities in and around (project name) as well as the archaeological, natural and cultural history of the area; and,

WHEREAS. The Corps and the Association mutually recognize there are significant national public benefits to a visitor center (or other facility) which uses interpretive techniques and supports the Corps goals for education, perpetuation of national pride, preservation of national heritage, safety, and enjoyment of the people of the United States; and,

WHEREAS, the Corps natural resource management program fosters the stewardship of our natural and cultural environment; and,

WHEREAS, the Association has as its purpose the enhancement of the environment through research, education and scientific activities and intends to assist the Corps in the conduct of its natural resource management programs and activities; and,

WHEREAS, the Association has as its purpose the interpretation for the public's benefit and education of the archeological, natural, cultural, and historical environment, and the Association intends to assist the Corps in its interpretive activities at (project name) through the use of its programs, exhibits, displays, and materials at the _____ Visitor Center (or other facility):

WHEREAS, the Association has the authority to assist the Corps in its presentation to the public of the natural, cultural, historical and project related features of the (project name) through programs, exhibits and materials;

WHEREAS, the Corps has authority, pursuant to Section 4 of the 1944 Flood Control Act, 16 U.S.C. 460d, to permit the maintenance and operation of recreation facilities at water resource development projects by local interests and may enter into leases with non-profit organizations for park and recreational purposes;

WHEREAS, the Corps has the authority, pursuant to the Federal Water Recreation Act, Public Law 89-72; the National Historic Preservation Act, as amended, Public Law 89-665; The National Environmental Policy Act, Public Law 89-190; and the Archaeological Resource Protection Act, as amended, Public Law 96-95, to provide Natural Resources Management programs, activities and interpretive functions;

Whereas, the Corps wishes to accept and the Association wishes to provide the hereinafter described interpretive and educational services to the visiting public at the (project name);

NOW, THEREFORE, the parties agree as follows:

1. The Corps authorizes the Association to provide, and the Association agrees to provide, the hereinafter described interpretive and educational services; and/or research and scientific services, and/or maintenance services (select most appropriate) to the visiting public and/or the Corps (select most appropriate).

2. CORPS RESPONSIBILITIES.

A. Timely Review and Approval.

The Corps agrees to review and give necessary approvals or disapprovals in a timely manner to the Association for any and all proposals, programs, special events, suggestions and other activities that the Association might wish to engage in.

B. Use of Government Facilities (delete if inappropriate)

1. Should the Association, as part of its cooperative activities, require the use of Corps facilities at the _____ Visitor Center (or other facility) the Corps agrees, that in recognition of the services the Association is contributing to the public, provide at no cost to the Association such facilities, utilities, janitorial services, and routine and general maintenance when incidental to the normal operation of the facility by the Corps.

2. Should the Association require facilities, utilizes and services over and above what the government would normally require for operation of the facility, or area used by the Association, the Association will reimburse the Corps at an agreed upon, but nominal cost in recognition of the services that the Association is contributing to the public.

3. A separate (insert appropriate type of real estate instrument) instrument will be granted to the Association for the use of government owned real property. The instrument will not merge with the Agreement.

3. ASSOCIATION RESPONSIBILITIES.

A. Corporate Requirements.

1. The Association's Articles of Incorporation and By-Laws shall comply with the requirements of the state(s) in which the Association is incorporated. Non-profit 501(c)(3) status must be maintained in accordance with state and Federal laws. The Association will make available for inspection, at the request of the Corps, documents demonstrating non-profit status.

2. This agreement will automatically terminate if non-profit 501(c)(3) status is not maintained.

3. The Association shall have liability insurance which indemnifies, saves, holds harmless, and defends the United States against all fines, claims, damages, losses, judgements and expenses arising out of, or from any omission, or activity of the Association in connection with activities under this Agreement. (Delete if covered by a Real Estate Document.)

4. The Association will exercise reasonable care to prevent damage to any Government property used, or occupied during its operation and shall, insofar as possible, protect all such property. (Delete if covered by a Real Estate Document.)

B. Interpretive Activities.

1. The Association may offer educational and interpretive services which support the mission of the Corps and/or the project. This includes assisting, planning, designing, implementing and conducting interpretive and educational programs, activities and exhibits. (Delete if inappropriate.)

2. The Association may offer scientific, research, maintenance and/or other services which support the mission of the Corps and their natural resource management program. This includes assisting, planning, designing, implementing and conducting scientific and/or maintenance programs, activities and exhibits. (Delete if inappropriate.)

3. The Association will cooperate with the Corps in the following activities: (Delete in total or any parts deemed inappropriate.)

a. Produce and make available to visitors by sale or free distribution, suitable interpretive and educational literature and aids to increase the visitors understanding and appreciation of the natural history, cultural, historical, and man-made features of the project area (or other Corps site) and the Corps of Engineers.

b. Acquire specimens and/or objects pertaining to the history, cultures, environment, or recreational activities of the project area for the purpose of adding them to the exhibitry or programs at Corps visitor centers (or other Corps facilities) and assist in preservation programs as appropriate.

c. Assist in the development and improvement of interpretive devices, and educational materials including signs, exhibits, materials, and audio-visual aids.

d. Assist in the sponsorship and coordination of professional workshops, training opportunities and special events.

e. Assist in all practical ways the interpretive, educational and community programs of the Corps and the project (or other Corps site) for the benefit of the American public.

C. Sales Option (delete if inappropriate)

1. As part of this Agreement, the Association may operate a sales area on a continuous or intermittent basis.

2. The Association is hereby authorized to sell and/or distribute interpretive and educational items such as publications, maps, audiovisual aids, crafts, and other objects directly related to the interpretive and educational themes of the project, visitor center (or other facility), region and Corps. The Corps may request the Association to sell specific items of interpretive value.

3. The Association shall order, receive, inventory, stock, and otherwise manage all items offered for sale and/or distribution.

4. The Association will sell only items that are appropriate and of high quality. The Association will not sell any item that has not been approved by the District Commander or his authorized representative. The Association will sell items at their fair market value and prices of said items will be submitted and approved in writing, in advance by the District Commander or his authorized representative.

5. The Association will not sell any original artifacts, sacred items, or antiquities to which the Archaeological Resource Protection Act, as amended, would apply, whether or not such items were discovered on lands owned or controlled by the United States.

6. The Association will display the sales items in good taste and in keeping with the general design and decor of the facility which houses the sales area.

7. Association sales are restricted to a location approved by the Corps, which will be kept clean and presentable at all times.

D. Fiscal Management.

1. The Association will conduct its fiscal operations in accordance with accepted business practices. This includes the appropriate use of a funds accountability system, purchase orders, receipts, invoices, and inventory records.

2. The Association shall annually submit (within 135 days following the end of each fiscal year) a complete financial report to the Corps which includes a written summary of Association activities for the year.

3. The Corps may review the fiscal records of the Association at any time during the term of this Agreement.

4. JOINT RESPONSIBILITIES.

A. Donation of Interpretive Services or Materials.

1. The Association may, at the discretion of its Governing Board, loan materials and/or services to the Corps. The Corps reserves the right to accept or decline without obligation, any service, or loan by the Association.

2. The Corps will take reasonable precautions to protect items loaned by the Association, but assumes no other responsibility for these items. The Corps will return loaned property or items as requested by the Association.

B. Personnel.

1. The Association and the Corps shall each designate, in writing, an Association member and a Corps person and alternate who will act as points of contact for the purpose of implementing this Agreement.

2. The Association will provide such personnel as are reasonably necessary to conduct, operate and manage its cooperative activities. This does not preclude Corps personnel, during the course of their normal duties, from assisting the Association with nominal duties, including sales.

3. Corps personnel may not serve in a voting capacity on the governing board, or as Treasurer for the Association. Corps personnel may serve in an advisory capacity on the Association's governing board or committees. Corps personnel may not act as the official representative of the Association in any matter relating to the Corps, or the terms of this Agreement. However, if the Association has a membership program, Corps personnel may join and participate in membership activities.

4. The Corps will orient all Association personnel, staff and/or volunteers with regard to Corps rules, regulations, and requirements, particularly with regard to the project and facilities, safety, and appropriate emergency procedures. Association staff and volunteers involved in visitor contact will receive additional orientation in regard to interpretive services. All orientation will be conducted prior to assumption of duties.

5. Association employees, or volunteers may not wear the Corps uniform, or items of clothing that resemble the uniform. Employees and volunteers of the Association, when working at duties that bring them into contact with the public, will wear visible identification that identifies them as an Association employee or volunteer.

5. ASSIGNMENT.

No transfer or assignment of this Agreement or any part thereof or interest therein, directly or indirectly, voluntary or involuntary, shall be made by the Association unless approved in writing by the Corps.

6. MODIFICATION AND AMENDMENTS.

Modifications and amendments to this agreement in the form of Supplemental Agreements may be made from time to time upon the mutual written consent of the District Commander for the Corps and the Board of Directors of the Association.

7. DURATION.

This agreement shall be effective for five years commencing on the day following the ratification of this agreement by the Corps. This agreement will automatically renew for another five year period on October 1 of the last year, unless notice of cancellation is given by either party before the date of renewal. The Corps reserves the right to terminate the agreement, or any part thereof, at any time upon written notice. Prior to giving such notice, the Corps will meet with the Association to set forth the reasons for such termination.

8. MISCELLANEOUS

A. The rights and benefits conferred by this agreement shall be subject to the laws of the United States governing the Corps of Engineers and to the rules and regulations promulgated thereunder whether now in force or hereafter enacted or provided; and the mention of specific restrictions, conditions, and stipulations herein shall not be construed as in any way impairing the general powers of supervision, regulation and control by the Corps.

B. This Agreement in no way obviates the responsibilities of the Corps, or the Association as may be required by a Lease Agreement. In situations where the Association leases facilities or areas from the Corps, this Agreement would automatically become null and void upon the termination or cancellation of the Lease Agreement.

C. The Association agrees that all its activities shall be conducted in accordance with all applicable laws and regulations, both state and Federal.

IN WITNESS WHEREOF, the Association has caused this agreement to be executed this _____ day of _____, 19__.

_____ASSOCIATION

By _____
Chairperson, Board of Directors

IN WITNESS WHEREOF, The Corps has caused this agreement to be ratified this _____day of _____, 19_____.

UNITED STATES ARMY CORPS OF ENGINEERS

By _____
District Commander

APPENDIX Q

SAMPLE COOPERATING ASSOCIATION ARTICLES OF INCORPORATION AND BY-LAWS

ARTICLES OF INCORPORATION

Purpose:

To provide for the visitor to Corps of Engineers sites every possible means of excellence in interpretation of the theme of story through the following methods:

1. Stimulation of interest in the educational activities and encourage scientific investigation and research in the fields of geology, botany, zoology, history, ethnology, engineering, cultural resources and related subjects concerning the Corps Of Engineers site and adjacent region.

2. Assistance:

(a) In the development of the Corps of Engineers natural resources program and interpretive theme, the use of all Corps personnel and for the use of visitors while at the Corps site.

(b) In obtaining photographs, slides, motion pictures, video tapes and other materials for the purpose of explaining and interpreting facts relating to the geology, botany, zoology, history, ethnology, engineering, cultural resources, and related earth sciences pertaining to the Corps of Engineers site.

3. Publishing, in cooperation with the Corps of Engineers, technical bulletins, maps, guides, illustrated interpretive books, and other publications dealing with every phase of investigation in, or related to, the Corps of Engineers site and its environs.

4. The purchasing and resale of Government and private publications dealing with the Corps site and its environs; the production, purchase, if necessary, and sale of natural color transparencies pertaining to historical events, and/or natural resources relating to the story of the Corps site. The profits from these transactions will be used in the production of the aforementioned publications and in the development of visitor facility exhibits, and in printing or purchasing of stationery, miscellaneous supplies and equipment for the interpretation of Corps of Engineers sites and related themes for the association.

5. Accepting, holding, and disbursing of funds received by donation or other means for the purpose of the Association. The operations, business, property, and assets of the Association shall be strictly limited to purposes which shall be scientific, educational, or for the benefit of the Corps of Engineers site and no part of the net income of the Association shall inure to the financial benefit of any member.

BY-LAWS

Article I
Purposes

Section 1.

The Operations, business, property, and assets of the Association, Inc., shall be limited to historical, scientific, interpretive, educational and recreational purposes.

Article II
Membership

Section 1.

There shall be three types of membership in the Association, namely, (1) voting, (2) non-voting lifetime; and (3) complimentary. All members shall be furnished a suitable membership card as evidence thereof.

Section 2.

Voting membership will be granted to any person upon payment of an initial membership fee of five dollars ($5.00) and payment of one dollar ($1.00) annual dues each year thereafter. Failure of any voting member to pay the annual dues shall result in said member automatically becoming a non-voting lifetime member. Annual dues are payable before the month of January of the calendar year for which payable.

Section 3.

Any person interested in the furtherance of the aims and purposes of the Association may become a non-voting lifetime member upon payment of a membership fee of five dollars ($5.00). No payment of annual dues shall be required of any such member. Should such a member, who is otherwise qualified, desire to become a voting member, they may do so by payment of one dollar ($1.00) annual dues for the current year and retain voting membership for each year annual dues are paid thereafter.

Section 4.

Any person may be granted complimentary membership upon resolution duly made and passed by the Board of Directors. No initial or annual dues shall be paid by such member.

Section 5.

All members shall be entitled to receive all annual or other reports of the Association and all members may attend the annual meeting of the Association. Only a voting member may become an officer or director of the Association or vote in any election of any matter specified to be submitted to the membership.

Section 6.

Any member may withdraw from the Association upon giving notice in writing thereof to the Board of Directors. Any member may be expelled from membership upon good cause and by the unanimous vote of the Board of Directors.

Article III
Organization and Administration

Section 1.

The Association shall have the following officers, all of whom shall serve without compensation:

A. A Board of Directors

B. A Corps of Engineers Association Coordinator

C. A Treasurer

D. An Advisory Committee

Section 2.

The Board of Directors shall consist of nine directors elected from the voting membership of the Association. At the time of the adoption of these by-laws the existing Board of Directors shall designate three of its number to serve for three years, three to serve for two years, and three to serve for one year. Thereafter at each annual meeting three directors shall be elected to succeed those directors whose terms will be next expiring. Each director thereafter elected shall take office on January 1 following their election or appointment. Vacancies on the Board of Directors shall be filled by selection and appointment by a majority of the remaining directors. Directors may not succeed themselves for consecutive terms.

Section 3.

The Board of Directors shall meet as soon as practical after January 1 following the annual meeting of the Association and at such other times as the Chairperson may call a meeting, or at any time that the Corps of Engineers Association Coordinator may request a meeting with the concurrence of three or more members of the Board of Directors. At the first meeting of the board held after the annual meeting of the Association, the board shall elect one of its members as its Chairperson for the ensuing year, and until a successor is elected. At any meeting held in the absence of the Chairperson, a temporary Chairperson will be selected to preside.

The Board of Directors shall formulate all the operational policies of the Association and shall direct its activities through the Corps of Engineers Association Coordinator and a hired Business Manager. The powers of the board shall be limited only by law, the articles of incorporation, by-laws of the Association, and the policies of the Corps of Engineers as articulated through the Cooperative Agreement, dated _____, and duly signed by the Chairperson of the Board of Directors.

Five or more members of the board shall constitute a quorum for any meeting of the board.

Section 4.

The Corps of Engineers Association Coordinator shall be the Interpretive Specialist for the Corps of Engineers site or such other person as the Corps of Engineers Natural Resource Manager shall appoint to this office with the concurrence of the Board of Directors. The term of office shall be until replaced by the Corps of Engineers Natural Resources Manager. The Corps of Engineers Association Coordinator shall serve as the Corps of Engineers representative to the Board of Directors and shall advise the board on all Corps interpretive program needs. The Corps of Engineers Association Coordinator shall supervise the day-to-day business activities of the Association through the Business Manager and submit to the board such reports of its affairs as may be requested and submit an annual report to the Board of Directors at the annual meeting each year. The Corps of Engineers Association Coordinator shall serve as the editor of all the Association's publications and shall act as advisor on all publications activities. In keeping with the Cooperative Agreement between the Association and the Corps of Engineers, the Corps of Engineers Association Coordinator shall not sign checks or legal contracts as a representative of the Association. The Corps of Engineers Association Coordinator shall meet with the Board of Directors, but shall have no vote on actions taken by the board that concern the Corps of Engineers site or the Corps of Engineers as a whole.

Section 5.

A Business Manager will be hired by and serve at the pleasure of the Board of Directors. The Business Manager will serve as the Association's on site liaison with the Corps of Engineers and shall represent the Association in all business and legal activities. The Business Manager shall authorize the expenditure of Association funds for sale publications, printing, stationery, travel, employment of clerks, and incidental expenses incurred in the conduct of the affairs of the Association, provided that no individual expenditure exceed the sum of $100 without prior approval of the board or through the authorized budget. The Business Manager shall hire and fire all Association employees and shall conduct those necessary business transactions to hire and fire. The Business Manager shall be the immediate supervisor of all persons employed by the Association, except when a person is hired for specific interpretive duties, at which time that person shall be supervised by the chief interpretive officer of the Corps of Engineers site. The Business Manager shall take and maintain minutes of all meetings of the Board of Directors and all minutes shall be read and approved at the next following meeting of the board.

Section 6.

The Treasurer may not be a member of the Corps of Engineers paid staff. The Treasurer shall be appointed by the Board of Directors and shall administer the finances of the Association and supervise the keeping of the Association's books. The Treasurer shall submit an audited annual financial statement to the Board of Directors for presentation and approval at the annual meeting of the Association. Unless a member of the Board of Directors, the Treasurer shall have no vote in actions taken by the board. The Treasurer shall furnish a bond to the Association in the sum of $10,000 at the expense of the Association.

Section 7.

The Advisory Committee shall be composed of interested scientists, historians, and friends of the Corps of Engineers, available for consultation on Association matters and technical questions. They shall represent the principal friends of the Association's endeavor and shall be invited and encouraged to offer suggestions and criticisms of the policies and work of the Association. The members of the Advisory Committee shall be selected and appointed by the Board of Directors. Members of this committee shall hold office for one year, subject to reappointment. All immediate past Directors shall serve on this committee for one year.

The Corps of Engineers Natural Resources Manager or the Corps of Engineers Association Coordinator shall be a member of this committee.

Any number of persons may serve on this committee. Inactive members may be replaced upon notice by the Board of Directors.

Article IV
Meetings

Section 1.

The Association shall hold an annual meeting in an appropriate place during the month of November. Notice of the time and place of such meeting and the agenda thereof shall be given by mail to all members of the Association.

The Chairperson of the Board of Directors shall conduct the meeting. The Corps of Engineers Association Coordinator shall present the annual report of the Association's activities and its plans for the future. The Treasurer shall present a financial report.

Three directors will be elected at the annual meeting in accordance with Article III, Section 2 of the By-Laws. Nominations for such positions shall have been made by the Chairperson on behalf of the Board and included in the notice of the annual meeting. Other nominations may be made from the floor at the meeting. Those three nominees receiving the highest number of valid votes cast will be elected; a tie vote will be broken by the Chairperson. Only voting members present may vote on the election of directors or other motions made at the annual meeting.

A quorum is not required at the annual meeting.

Section 2.

All meetings will be conducted according to Roberts Rules of Order.

Article V
Property, Funds, and Assets

Section 1.

All property, funds, and assets of any nature received or acquired by the Association shall be taken, held, disposed of and expended in a manner hereinafter provided:

All moneys received from membership fees and the sale of publications, or derived in any manner from the business operations of the Association, shall be deposited in the operations fund and shall be used for the publication of technical and popular publications and the development of the visitor centers, exhibits, for the purchase of sales publications, stationery, miscellaneous supplies and equipment, traveling expenses, secretarial employment, and other miscellaneous expenses incurred by the Association in the usual course of business.

Moneys received by donations for specific operating purposes shall be expended only for the purposes specified by the donor.

Article VI
Miscellaneous

Section 1.

The principal place of business of the Association shall be determined by the Board of Directors.

Section 2.

The Association shall maintain all funds in any bank or savings and loan association whose deposits are insured by an agency of the United States. The Board of Directors shall determine the financial institutions used for this purpose. All checks drawn for checking accounts and withdrawals from savings accounts shall require the signature of the Business Manager and/or the Treasurer.

Section 3.

The Board may adopt a corporate seal as it sees fit.

Article VII
Amendment of By-Laws

Section 1.

Power to repeal or amend these By-Laws and to adopt additional By-Laws is hereby delegated to the Board of Directors, and may be executed in any meeting of the Board of Directors, provided that proper notice has first been given to the individual Directors by mail at least one week prior to the meeting. Such action must be executed by a unanimous vote of the Directors present.

Article VIII
Dissolution

Section 1.

In the event of dissolution of the Association, the Board of Directors will decide the disposition of the net assets of the Association and the procedure used to dispose of them.

APPENDIX R

EXAMPLES OF FORMS USED IN THE VOLUNTEER PROGRAM

US Army Corps of Engineers

AGREEMENT FOR INDIVIDUAL/GROUP VOLUNTEER SERVICES
(Act of July 30, 1983 Public Law 98-63)

AREA

NAME/GROUP *(Type or Print Full Name)*	TELEPHONE NUMBER
ADDRESS *(Street, City, State and Zip Code)*	
STATUS ON INDIVIDUAL/GROUP	

Brief description of work to be performed, including minimum time commitment required. *(Attach complete job description.)*

I understand that I will not receive any compensation for the above work and that volunteers are NOT considered to be Federal employees for any purpose other than tort claims and injury compensation, and I understand that volunteer service is not creditable for leave accrual or any other employee benefits. I also understand that either the Corps of Engineers or I may cancel this agreement at any time by notifying the other party.

I hereby volunteer my services as described above, to assist the Corps of Engineers in its authorized work.

(Signature of Volunteer) *(Date)*

We agree to obtain parental or guardian consent for each individual under 18 years of age and to comply with applicable child labor laws. We understand that the individuals volunteering under this agreement will not receive any compensation for the above work and that they will NOT be considered to be Federal employees for any purpose other than tort claims and injury compensation, and we understand that volunteer service is not creditable for leave accrual or any other employee benefits. We also understand that either the Corps of Engineers, or we, may cancel this agreement at any time by notifying the other party. We agree to provide the Corps of Engineers with a listing of active participants home address, and the number of hours each contributed, when and as requested.

(Signature of Group Representative) *(Date)*

The Corps of Engineers agrees, while this agreement is in effect, to provide such materials, equipment and facilities as are available and needed to perform the work described above, and to considered the individuals volunteering under this agreement as Federal employees only for the purpose of tort claims and compensation for work related injuries.

(Signature of Accepting Official) *(Date)*

ACCEPTANCE/TERMINATION OF AGREEMENT

(Signature of Accepting Official) *(Date)*

ENG FORM 4880-R, Nov 85 (Proponent: DAEN-CWO-R)

US Army Corps
of Engineers

PARENTAL APPROVAL

NAME OF VOLUNTEER _____

PARENT OR GUARDIAN'S NAME _____

ADDRESS _____

TELEPHONE _____ _____
(Residence) *(Business)*

I affirm that I am the parent/guardian of the above named volunteer. I understand that the Corps of Engineers' VOLUNTEERS program does not provide compensation, except as otherwise provided by law, and that the service will not confer on the volunteer the status of a Federal employee. I have read the attached description of the work that the volunteer will perform.

I give my permission for _____ to participate

In this program sponsored by _____
(Name of Sponsoring Organization, if applicable)

at _____ from _____ to _____
(Name of Accepting Official) *(Date)* *(Date)*

_____
(Signature)

_____
(Date)

ENG FORM 4881-R, Nov 85 (Proponent: DAEN-CWO-R)

US Army Corps of Engineers

VOLUNTEER SERVICE RECORD

NAME *(Last, First, Middle Initial)* _____ DATE *(Month, Year)* _____

PROJECT/OFFICE _____ PREVIOUS HOURS _____

DAY	JOB TITLE	LOCATION	HOURS WORKED	EQUIVALENT VALUE IN $/HR.	DOLLAR VALUE
		TOTAL FOR MONTH			
		CUMULATIVE TOTAL			

ENG FORM 4882-R, Nov 85

(Proponent: DAEN-CWO-R)

United States Army
Corps of Engineers

Certificate of Appreciation

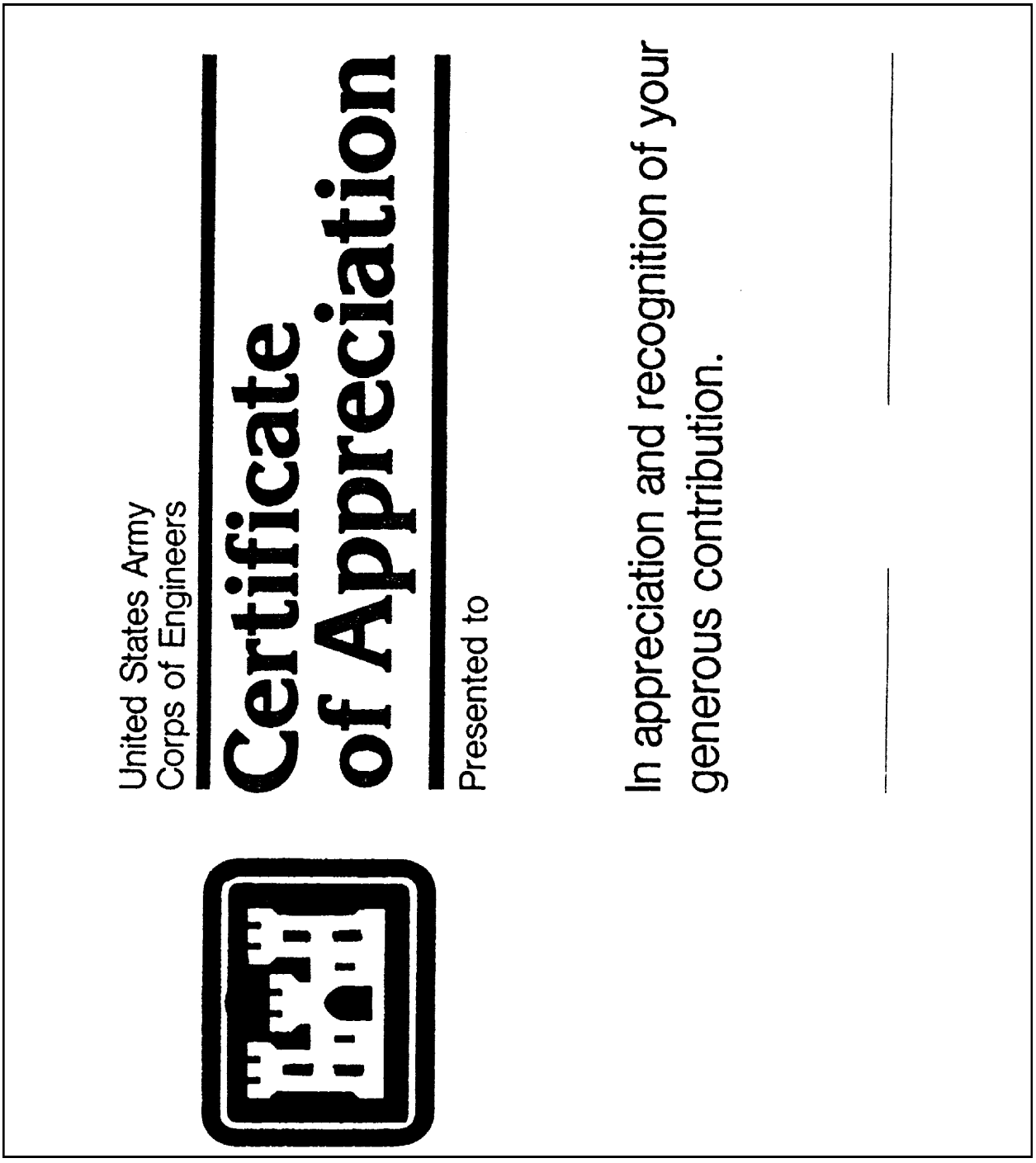
Presented to

In appreciation and recognition of your generous contribution.

_____ _____

APPENDIX S

SAMPLE CERTIFICATE OF APPRECIATION



APPENDIX T

SAMPLE CHALLENGE COST-SHARING FINANCIAL WORK SHEET

Project Name _____ Contact person _____

Address_____

Phone _____

Work Project Title_____

Location_____

Proposed date of work_____

Description of work_____

_____

_____

Partner _____ Contact person _____

Address _____

_____ Phone _____

	Corps	Partner	Total
Salaries	$_____	$_____	$_____
Travel	$_____	$_____	$_____
Materials and Supplies	$_____	$_____	$_____
Equipment Use	$_____	$_____	$_____
Cash/Funds	$_____	$_____	$_____
Personal Property	$_____	$_____	$_____
Other	$_____	$_____	$_____
Contingencies	$_____	$_____	$_____
Total	$_____	$_____	$_____
Share of total cost	_____ %	_____ %	

APPENDIX U

SAMPLE CHALLENGE COST-SHARING AGREEMENT

(This is only an example of the type of agreement that can be written for challenge cost-sharing. The agreement should be tailored to meet the needs of the particular arrangements negotiated.)

CHALLENGE COST-SHARING AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
_____

THIS AGREEMENT, entered into this __ day of _____, 19_, by and between the Department of the Army (hereinafter the "Government"), represented by the District Commander, U.S. Army Engineer District _____, and _____, (hereinafter the "Partner"), represented by _____.

WITNESSETH, THAT:

WHEREAS, the Government manages lands and waters at Beautiful Lake which includes recreational opportunities for the public, and

WHEREAS, the installation of an accessible fishing platform at Scenic Recreation Area on Beautiful Lake will increase the recreational opportunities for the public, and

WHEREAS the Partner is interested in promoting and assisting the Government in providing this accessible fishing platform, and

WHEREAS, it is mutually beneficial to the Government and the Partner to work cooperatively to make this accessible fishing platform available to the public, and

WHEREAS, the Partner, in order to assist the Government in this project has voluntarily agreed to pay a portion of the cost, and

WHEREAS, Section 225 of the Water Resources Development Act of 1992, PL 102-580, (Oct 31, 1992), authorizes the Secretary of the Army to accept contributions from the Partner and apply those contributions to the Project, and

WHEREAS, the Government and the Partner have the full authority and capability to perform as hereinafter set forth and intend to cooperate in financing and challenge cost-sharing in accordance with the terms of this agreement;

NOW THEREFORE, the Government and the Partner agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this agreement:

a. The term "Project" shall mean a 12' x 16' fishing platform with a 5'x 20' platform walkway, aluminum frame, pressure-treated wood surface, and 5'x 30'x4' concrete sidewalk leading from the parking lot to the platform in Scenic Recreation Area on Beautiful Lake, as generally described in the [Specify the approved project report], dated _____, 19_ and approved by _____ on _____, 19_.

b. The term "total project costs" shall mean all costs incurred by the Government and the Partner directly related to construction of the project.

c. This agreement in no way restricts the Government from participating in similar activities or arrangements with, or accepting contributions from, other public and private agencies, organizations, and individuals.

d. All donated property, facilities and improvements placed on Government land as well as any work accomplished under this agreement shall become the property of the Government.

ARTICLE II - OBLIGATIONS OF THE PARTIES

a. The Government, subject to and using funds appropriated by the Congress of the United States (hereinafter the "Congress"), and using funds provided by the Partner, shall expeditiously construct the Project, applying those procedures usually applied to Federal projects, pursuant to Federal laws, regulations, and policies. The award of contracts, modifications or change orders, and performance of all work on the Project (whether the work is performed under contract or by the Government personnel) shall be exclusively within the control of the Government.

b. The Government shall provide_____.

c. The Partner shall provide_____.

d. The Government shall perform a final accounting to determine the contributions provided by all parties to this agreement and to determine whether each has met its obligations under paragraphs b and c of this Article.

e. No Federal funds may be used to meet the Partner's total project costs under this Agreement.

ARTICLE III - METHOD OF PAYMENT

a. The Government shall maintain current records of contributions provided by the Partner and a current projection of total project costs. At least quarterly, the Government shall provide the Partner with a report setting forth all contributions provided to date and the current projection of total project costs, of the components of total project costs, of each party's share of total project costs, and of the Partner's contribution required in accordance with Article II.b. of this Agreement. On the effective date of this Agreement, total project costs are projected to be $_ _____, and the Partner's contribution required under Article II.b. of this Agreement is projected to be $_____. [NOTE: PROJECTIONS SHOULD BE ADJUSTED AS APPROPRIATE FOR INFLATION THROUGH THE PERIOD OF CONSTRUCTION.] Such amounts are estimates

subject to adjustment and are not to be construed as the total financial responsibilities of the Government and the Partner.

b. The Partner shall provide the contribution required under Article II.b. of this Agreement in accordance with the following provisions: Not less than [NUMBER OF DAYS, 30 OR MORE] calendar days prior to issuance of the solicitation for the first construction contract, the Government shall notify the Partner of the funds required from the Partner to meet its projected contribution, including its proportionate share of the Government's financial obligations incurred prior to the commencement of the period of construction. Prior to the issuance of the solicitation, the Partner shall provide the Government with the full amount of the required funds by delivering a check payable to "FAO, USAED, [APPROPRIATE USACE DISTRICT]" to the Government's [TITLE OF APPROPRIATE GOVERNMENT REPRESENTATIVE]. The Government shall draw from the funds provided by the Partner such sums as the Government deems necessary to cover: (a) the Partner's proportionate share of the Government's financial obligations incurred prior to the commencement of the period of construction; and (b) the Partner's proportionate share of the Government's contractual and in-house financial obligations as they are incurred during the period of construction. In the event the Government determines that the Partner must provide additional funds to meet its obligation, the Government shall notify the Partner of the additional funds required. Within [NORMALLY 60] calendar days thereafter, the Partner shall provide the Government with a check for the full amount of the additional required funds.

c. Upon completion of the Project and resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Partner with the results of the final accounting. The final accounting shall establish total project costs, each party's contribution provided thereto, and each party's required share thereof.

1. In the event the final accounting shows that the total contribution provided by the Partner is less than its required share of total project costs, the Partner shall, no later than 90 calendar days after receipt of written notice, make a payment to the Government of whatever sum is required to meet the Partner's required share of total project costs.

2. In the event the final accounting shows that the total contribution provided by the Partner exceeds its required share of total project costs, the Government shall, subject to the availability of funds, refund the excess to the Partner no later than 90 calendar days after the final accounting is complete. In the event existing funds are not available to refund the excess to the Partner, the Government shall seek such appropriations as are necessary to make the refund.

ARTICLE IV - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to both parties. The parties shall each pay 50 percent of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE V - FEDERAL AND STATE LAWS

In exercise of their respective rights and obligations under this Agreement, the Government and the Partner agree to comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of Title VI of the Civil Rights Act of 1964, PL 88-352, and the Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulations 600.7, entitled "Non-discrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

ARTICLE VI - RELATIONSHIP OF PARTIES

a. In the exercise of their respective rights and obligations under this Agreement, the Government and the Partner each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other.

b. In the exercise of its rights and obligations under this Agreement, neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights such other party may have to seek relief or redress against such contractor either pursuant to any cause of action that such other party may have or for violation of any law.

ARTICLE VII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE VIII - INDEMNIFICATION

The Partner shall hold and save the Government free from all damages arising from services it performs or provides for the construction, operation, maintenance, repair, replacement, and rehabilitation of the Project, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE IX - TERMINATION OR SUSPENSION

a. If at any time the Partner fails to fulfill its obligations under this Agreement, the District Commander shall terminate this Agreement or suspend future performance under this Agreement unless he/she determines that continuation of work on the Project is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the Project.

b. If the Government fails to receive annual appropriations in amounts sufficient to meet Project expenditures for the then-current or upcoming fiscal year, the Government shall so notify the Partner, and 60 calendar days thereafter either party may elect without penalty to terminate this Agreement or to suspend future performance under this Agreement. In the event that either party elects to suspend future performance under this Agreement pursuant to this paragraph, such suspension shall remain in effect until such time as the Government receives sufficient appropriations or until either the Government or the Partner elects to terminate this Agreement.

c. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to the Project and proceed to a final accounting in accordance with Article II of this Agreement.

d. Any termination of this Agreement or suspension of future performance under this Agreement in accordance with this Article shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceeds 3 months.

ARTICLE X - NOTICES

a. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally or by telegram, or mailed either by first-class, registered, or certified mail, as follows:

If to the Partner: Mayor
City Hall
Address
City, State 00000

If to the Government: District Commander
U.S. Army Engineer District
Address
City, State 00000

b. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

c. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at the earlier of such time as it is actually received or seven calendar days after it is mailed.

ARTICLE XI - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the Commander, _____ District.

The Department of the Army

BY: _____
Patricia M. Brown
Colonel, Corps of Engineers
District Commander

DATE: _____

The City of _____

BY: _____
Joanna Q. Public
Mayor

DATE: _____

APPENDIX V

RECONNAISSANCE REPORTS INFORMATION REQUIREMENTS

V-1. Provide a statement of the aquatic plant problem, including but not limited to: (1) location and brief physical description of problem area(s), (2) a map of the problem area; (3) identification by common and scientific name of the plant or plants involved; (4) estimated surface area covered by problem plants; (5) depth or density of problem plants; (6) nature of physical, biological and economic damages caused by the problem plants; and (7) any other information clarifying the nature and magnitude of the problem.

V-2. Present a preliminary evaluation of procedures for management operations, including applicable physical, mechanical, chemical, biological and integrated control technology, that may be employed.

V-3. Document preliminary program cost estimates for management operations including estimated Federal and Sponsor costs. Present sufficient data on cost estimates to allow review by species, control technology and cost per acre if applicable.

V-4. Provide a preliminary economic evaluation with approximation of benefits and briefly summarize supporting data.

V-5. Explain how/why Federal (Corps) involvement is or is not justified.

V-6. Provide cost estimates for preparation of a Detailed Study Report (DSR) and other required NEPA documents. Include a schedule of funding by fiscal year(s) and an estimate of time needed to complete studies after receipt of funds.

V-7. Identify any special problems that require resolution prior to initiation of the DSR.

V-8. Submit, along with any Reconnaissance Report submitted for review and approval that recommends proceeding with preparation of an DSR, a negotiated Detailed Study Cost-Sharing Agreement (DSCSA) and a letter from the Sponsor indicating willingness and intent to sign the DSCSA upon approval of the Reconnaissance Report.

APPENDIX W

MODEL
DETAILED STUDY COST-SHARING AGREEMENT
BETWEEN THE UNITED STATES OF AMERICA

AND

(THE SPONSORING STATE)
FOR A STUDY OF AQUATIC PLANT CONTROL IN
(NAME OF STATE OR OTHER AREA)

THIS AGREEMENT, entered into this ____ day of _____, 19__, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), represented by the Contracting Officer executing this Agreement, and the (SPONSORING STATE) (hereinafter referred to as the "Sponsor"), acting by and through (designated state agency).

WITNESSETH, THAT

WHEREAS, Section 104 of the Rivers and Harbors Act of 1958 (PL 85-500), codified as amended at 33 USC 610, authorizes a comprehensive program to provide for control of undesirable aquatic plants from the navigable waters, tributary streams, connecting channels, and other allied waters of the United States in the combined interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health, and related purposes; and

WHEREAS, the Government has conducted a preliminary study of aquatic plant control problems in the State of _____, pursuant to this authority, and has determined that further study in the nature of an "Aquatic Plant Control Detailed Study" (hereafter called the "Study") is required to fulfill the intent of the study authority and to complete the determination of the extent of the Federal interest in aquatic plant control in the State of _____; and

WHEREAS, the Secretary of the Army is authorized to receive cash contributions of funds tendered by non-Federal interests and to expend such contributions on studies pursuant to Section 104 of PL 85-500, as amended, and Section 105 of PL 99-662; and

WHEREAS, the Sponsor has the authority and capability to furnish the cooperation hereinafter set forth and is willing to participate in study cost sharing and financing in accordance with the terms of this Agreement; and

WHEREAS, the Sponsor and the Government both understand that entering into this Agreement in no way obligates either party to implement a project and that whether a project is supported for authorization and budgeted for implementation depends upon the outcome of the Study and whether the proposed solution is consistent with the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and with the budget priorities of the Administration; and

WHEREAS, the Water Resources Development Act of 1986 (PL 99-662) specifies the cost sharing requirements applicable to the Study;

NOW, THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS

For the purposes of this Agreement:

a. The term "Study" shall mean all planning, engineering, and design work to be completed prior to initiation of the aquatic plant control project pursuant to the requirements of ER 1130-2-412 and other applicable guidance.

b. The term "Study Cost" shall mean all disbursements by the Government pursuant to this Agreement, whether from Federal appropriations or from funds made available to the Government by the Sponsor, and all Negotiated Costs of work performed by or contracted for by the Sponsor pursuant to this Agreement. Such costs shall include, but not be limited to: labor charges; direct costs; overhead expenses; supervision and administration costs; contracts with third parties, including termination or suspension charges; and any termination or suspension costs associated with this Agreement.

c. The term "Study Period" shall mean the time period for conducting the Study commencing with the execution of this Agreement and ending with a determination: of insufficient need; that a Federal interest does not exist; or of approval of the DSR by Office of the Assistant Secretary of the Army (Civil Works).

d. The term "Negotiated Cost" is the cost of a work item to be accomplished by the sponsor as in-kind services as specified in the Initial Project Management Plan incorporated herein and which is acceptable to both parties.

e. The term "Contracting Officer" shall mean the Commander of the U.S. Army Engineer District, _____, or his designee.

f. The term "fiscal year" (FY) shall mean the fiscal year of the Federal Government (October 1 through September 30 of the following calendar year).

ARTICLE II - OBLIGATIONS OF PARTIES

a. The Sponsor and the Government, using funds contributed by the Sponsor and appropriated by the Congress, shall expeditiously prosecute and complete the Study, currently estimated to be completed in __ months from the date of this Agreement, substantially in compliance with Article III herein and in conformance with applicable Federal and state laws and regulations, the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, and mutually acceptable standards of engineering practice.

b. The Government and the Sponsor shall each contribute, in cash and in-kind services, fifty (50) percent of all Study Costs, for which the total cost is currently estimated to be $_____, as specified in Article IV herein; provided, that the sponsor may, consistent with applicable Federal statutes and regulations, contribute up to 25 percent of the Study Costs as in-

kind services; provided further, that the Government shall not obligate any cash contribution by the Sponsor toward Study Costs until such cash contribution has actually been made available to it by the Sponsor.

c. No Federal funds may be used to meet the Sponsor share of Study Costs under this Agreement unless the expenditure of such funds is expressly authorized by statute as verified by the granting agency.

d. The award of any contract with a third party for services in furtherance of this Agreement which obligates Federal appropriations shall be exclusively within the control of the Government. The award of any contract by the Sponsor with a third party for services in furtherance of this Agreement which obligates funds of the Sponsor and does not obligate Federal appropriations shall be exclusively within the control of the Sponsor, but shall be subject to applicable Federal statutes and regulations. The Government will have the opportunity to review and comment on all contracts and modifications which the sponsor negotiates and awards in furtherance of this agreement, including work to be done by any local unit or other designee of the state.

e. The Government and the Sponsor shall each endeavor to assign the necessary resources to provide for the prompt and proper execution of the Study and shall, within the limits of law and regulation, conduct the study with maximum flexibility as directed by the Executive Committee established by Article V, herein.

f. The Government shall not continue with the Study when it becomes evident that there is no solution in which there is a Federal interest or which is not in accord with budget priorities unless the Sponsor wishes to continue under the terms of this Agreement and the Department of the Army grants an exception. If a study is discontinued, it shall be concluded according to Article XII and all data and information shall be made available to both parties.

g. The Sponsor may wish to conclude the Study if it determines that there is no solution in which it has an interest or which is not in accord with its current policies and budget priorities. When such a case exists the Study shall be concluded according to Article XII and all data and information shall be made available to both parties.

ARTICLE III - INITIAL PROJECT MANAGEMENT PLAN

Appendix A, the Initial Project Management Plan (IPMP), is hereby incorporated into this Agreement. The parties to this Agreement shall substantially comply with the IPMP in prosecuting work on this Study. The IPMP will negotiate the scope and schedule of study services to be accomplished and the costs of in-kind services. The following modifications, to be approved by the Executive Committee (see Article V), shall require an amendment to this Agreement:

(1) any modification which increases the total Study Costs by more than (percentage to be negotiated with 15% maximum) percent.

(2) any modification in the estimated cost of a Study work item or any obligation for a Study work item, which changes the total cost of that work item by more than (percent to be negotiated with 15% maximum) percent.

(3) any extension of the completion schedule for a Study work item of more than thirty (30) days; or

(4) any reassignment of work items between the Sponsor and the Government (see Appendix A).

ARTICLE IV - METHOD OF PAYMENT

a. The Government shall endeavor to obtain during each fiscal year the appropriation for that fiscal year at least in the amounts specified in the IPMP incorporated herein. Subject to the enactment of Federal appropriations and the allotment of funds to the Contracting Officer, the Government shall then fund the Study at least in the amounts specified in the IPMP.

b. The Sponsor shall endeavor to obtain during each fiscal year the cash contribution for the fiscal year at least in the amounts specified in the IPMP incorporated herein and, once the funds are obtained, will make such funds available to the Government. The Government shall withdraw and disburse funds made available by the Sponsor subject to the provisions of this Agreement.

c. Funds made available by the Sponsor to the Government and not disbursed by the Government within a Government fiscal year shall be carried over and applied to the cash contribution for the succeeding Government fiscal year; provided, that upon study termination any excess cash contribution shall be reimbursed to the Sponsor after a final accounting, subject to the availability of appropriations, as specified in Article XII herein.

d. Should either party fail to obtain funds sufficient to make obligations or cash contributions or to incur Study Costs in accordance with the schedule included in the IPMP incorporated herein, it shall at once notify the Executive Committee established under Article V herein. The Executive Committee shall determine if the Agreement should be amended, suspended or terminated under Article XII herein.

ARTICLE V - MANAGEMENT AND COORDINATION

a. Overall study management shall be the responsibility of an Executive Committee. Membership on the Executive Committee shall normally include the following district personnel and their counterparts in the non-Federal sponsor: District Commander; Chief, Planning Division; and Chief, Operations Division. The Executive Committee will meet in regularly scheduled annual meetings. Interim meetings of the Committee will be scheduled as necessary to resolve conflicts or policy issues.

b. To provide for consistent and effective communication and prosecution of the items in the IPMP, the Executive Committee shall appoint representatives to serve on a Study Management Team.

c. The District Study Manager will be responsible for the day-to-day study management. She/he will maintain close coordination with the Federal and non-Federal members of the Study Management Team to ensure timely prosecution of the study in compliance with this agreement. She/he will maintain a written record of all telephone conversations and meetings with the other members of the team.

d. The District Study Manager will, with input, review, and approval from the remainder of the Study Management Team, prepare quarterly progress reports for the Executive Committee.

The quarterly reports will delineate the progress of all work items and document all unresolved conflicts or policy issues requiring resolution by the Executive Committee. The quarterly reports will also report any modifications to the Scope of Study requiring amendments to this agreement.

e. The Study Management Team will coordinate on all matters relating to prosecution of the Study and compliance with this Agreement, including cost estimates, schedules, prosecution of work elements, financial transactions and recommendations to the Executive Committee for termination, suspension or amendment to this Agreement.

f. The Study Management Team will prepare periodic reports on the progress of all work items for the Executive Committee.

ARTICLE VI - DISPUTES

a. The Study Management Team shall endeavor in good faith to negotiate the resolution of conflicts. Any dispute arising under this Agreement not disposed of by mutual consent shall be referred to the Executive Committee. The Executive Committee shall resolve such conflicts or determine a mutually agreeable process for reaching resolution or for termination under Article XII herein.

b. Pending final decision of a dispute hereunder, or pending suspension or termination of this Agreement under Article XII herein, the parties hereto shall proceed diligently with the performance of this Agreement.

ARTICLE VII - MAINTENANCE OF RECORDS

The Government and the Sponsor shall keep books, records, documents and other evidence pertaining to study costs and expenses incurred pursuant to this Agreement to the extent and in such detail as will properly reflect total Study costs. The Government and the Sponsor shall maintain such books, records, documents and other evidence for inspection and audit by authorized representatives of the parties to this Agreement. Such material shall remain available for review for a period of three (3) years following the termination of this Agreement.

ARTICLE VIII - RELATIONSHIP OF PARTIES

a. The parties to this Agreement shall act in an independent capacity in the performance of their respective functions under this Agreement, and neither party will be considered the officer, agent, or employee of the other.

b. To the extent permitted by applicable law, any reports, documents, data, findings, conclusions, or recommendations pertaining to the Study will not be released outside the Executive Committee or the Study Management Team; nor will they be represented as presenting the views of either party unless both Parties shall indicate agreement thereto in writing.

ARTICLE IX - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or other elected official, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE X - FEDERAL AND STATE LAWS

In acting under its rights and obligations hereunder, the Sponsor agrees to comply with all applicable Federal and state laws and regulations, including section 601 of Title VI of the Civil Rights Act of 1964 (PL 88-352) and Department of Defense Directive 5500.II issued pursuant thereto and published in Part 300 of Title 32, CFR, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

ARTICLE XI - COVENANT AGAINST CONTINGENT FEES

The Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in its discretion, to add to the agreement or consideration or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE XII - TERMINATION OR SUSPENSION

a. This Agreement shall terminate at the completion of the Study Period; provided, that prior to such time and upon thirty (30) days written notice, either party may terminate or suspend this Agreement without penalty.

b. Within ninety (90) days upon termination of this Agreement the Study Management Team shall prepare a final accounting of Study Costs, which will display disbursements by the Government of Federal funds, cash contributions by the Sponsor, and credits for Negotiated Costs of the Sponsor. Subject to the availability of appropriations, within thirty (30) days thereafter the Government shall reimburse the Sponsor for the excess, if any, of cash contributions and credits given over fifty (50) percent of total Study Costs. Within thirty (30) days of the final accounting, the Sponsor shall provide the Government with any cash contributions required so that the total Sponsor share is fifty (50) percent of total Study Costs.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

BY _____
Colonel, Corps of Engineers
District Engineer
Contracting Officer

STUDY SPONSOR

BY _____
(Title)

Appendix A - Initial Project Management Plan

INITIAL PROJECT MANAGEMENT PLAN

FOR A

MODEL

DETAILED STUDY COST-SHARING AGREEMENT
BETWEEN THE UNITED STATES OF AMERICA

AND

(THE SPONSORING STATE)
FOR A STUDY OF AQUATIC PLANT CONTROL IN
(NAME OF STATE OR OTHER AREA)

a. The Initial Project Management Plan (hereinafter referred to as the "Plan") documents the plan for joint Federal and non-Federal efforts to conduct a feasibility study. The study will be conducted in sufficient detail to provide a basis for a recommendation (favorable or unfavorable) concerning implementation of aquatic plant control activities for name of aquatic plant(s) in the waters of the State of _____. The Plan will establish the negotiated costs of in-kind services, by either contract or in-house labor, and estimates of both the total study phase cost and the respective Federal and non-Federal share. The Plan will control the allocation of dollars (effort) among the tasks and assure that all interests are given appropriate attention during the conduct of the study. Additionally, the Plan will address the following items:

(1) The work items, schedule, and responsibility for accomplishment.

(2) The estimated cost of work items, including the negotiated cost of work items to be accomplished by the state, or its assigns, as in-kind services.

(3) Criteria to assess the adequacy of completed work items, including appropriate references to Corps of Engineers guidance in support of work items for quality assurance purposes.

(4) The specific coordination mechanism between the Corps of Engineers and the cooperating state agency.

(5) Procedures for reviewing and accepting the work of both parties to this agreement.

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of the Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid by any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each failure.

_____

Sponsor

APPENDIX X

MODEL

LOCAL COOPERATION AGREEMENT
AQUATIC PLANT CONTROL OPERATIONS
BETWEEN THE DEPARTMENT OF THE ARMY

AND

(THE SPONSORING STATE)
FOR AQUATIC PLANT CONTROL IN
(NAME OF STATE OR OTHER AREA)

THIS AGREEMENT, entered into this _____ day of _____, 19__, by and between the DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government"), represented by the District Commander,_____ District, and the (SPONSORING STATE) (hereinafter referred to as "the State"), acting by and through (designated State agency).

WITNESSETH, THAT:

WHEREAS, a comprehensive program to provide for control and progressive eradication of undesirable aquatic plants in the navigable waters, tributary streams, connecting channels, and other allied waters of the United States in the combined interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health, and related purposes; and was authorized by Section 104 of the Rivers and Harbors Act of 1958 (PL 85-500), codified as amended at 33 USC 610; and

WHEREAS, studies conducted by the Government under this authority have led to development of a program (hereinafter referred to as the "Program") for the control of undesirable aquatic plants in (name of State or area); and

WHEREAS, Section 103(c)(6) of the Water Resources Development Act of 1986, PL 99-662, specifies the cost-sharing requirements applicable to the Program; and

WHEREAS, the parties recognize that the non-Federal portion of the required cost share shall be provided entirely by the (designated state governmental unit); and

WHEREAS, the State has the authority and capability to furnish the cooperation hereinafter set forth and is willing to participate in Program cost-sharing and financing in accordance with the terms of this Agreement;

NOW, THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS

For the purposes of this Agreement:

a. The term "Total Annual Operation Program Costs" and "Program" shall mean all planning, engineering, design, and control operations related to the implementation of the control plan described in the ____ Work Plan (Appendix A).

b. The term "Total Annual Operation Program Costs" and "Program Costs" shall mean all costs incurred by the State and the Government directly related to the Total Annual Operation Program, as described in the ____ Work Plan. Such costs shall include, but not necessarily be limited to, the costs of actual control costs, costs of applicable engineering and design, supervision and administration costs, costs associated with the provision of necessary transfer and disposal sites for harvested materials, costs associated with Government inspection of program activities, and all costs for preparing the ___ Work Plan.

c. The term "Contracting Officer" shall mean the Commander of the U.S. Army Engineer District,_____, or his designee.

d. The term "fiscal year" (FY) shall mean the fiscal year of the Federal Government (October 1 through September 30).

ARTICLE II - OBLIGATIONS OF THE PARTIES

a. The performance of all activities and the provision of any lands, easements, or rights-of-way required for all activities covered by this Agreement shall be accomplished by the State in accordance with the ____ Work Plan, subject to the appropriation of funds. Contracting responsibilities (i.e., contracting for control operations by the Government, the State, or both) are established in the ____ Work Plan.

b. As further specified in Article VI, the Government and the State shall each provide 50 percent of the total annual operational program costs incurred under the Aquatic Plant Control Program by the Government and the State in performing the approved effort identified, assigned and undertaken pursuant to this Agreement as described in the ____ Work Plan.

c. If applicable, prior to issuing invitations for bids, the State shall submit to the Contracting Officer for approval the detailed plans, specifications, data for analysis of design, and a general program outlining the order, rate of prosecution and method (contract or hired labor) of accomplishing the major items of work and setting forth the estimated cost thereof. In the event the State prosecutes the work herein by contract, all bids received and the proposed provisions of any contract shall be subject to review by the Government prior to award. Any such contract shall contain all applicable provisions required by Federal law and regulations, including, but not limited to, applicable labor and equal opportunity provisions.

(1) The State shall secure competitive bids, by advertising, for all work to be performed by contract, or with approval of the Contracting Officer, perform the necessary control operations with its own forces or those of their local governmental unit designee.

(2) The State shall submit to the Contracting Officer a detailed estimate of costs, a tabulation of all bids received, and a request for approval of award of a contract to the lowest qualified bidder and furnish such copies of the contract as may be required and submit to the Contracting Officer, for approval, any amendments or modifications thereof.

(3) The State shall provide adequate continuous operations inspection, and submit monthly progress reports showing the work done throughout the Program.

(4) The State shall provide necessary facilities and access for inspection of the Program by the Contracting Officer.

(5) The State shall keep accurate and adequate cost accounts and records, open at all times for inspection and audit by the Contracting Officer.

d. No Federal funds may be used to meet the State's share of project costs under this Agreement unless the expenditures of such funds is expressly authorized by statute and verified in writing by the granting agency.

ARTICLE III - LANDS, FACILITIES, AND RELOCATION ASSISTANCE

a. The State agrees to provide all lands, easements, rights-of-way, including dredged or disposal areas and appropriate transfer sites for harvested materials, determined to be necessary for the work covered by the ____ Work Plan. Such costs shall be apportioned in accordance with the terms of Article VI, with the State bearing 50 percent of such costs.

b. The State shall comply with the applicable provisions of the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, as amended, in acquiring any necessary lands, easements and rights-of-way for the control operations, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

ARTICLE IV - VALUE OF LANDS AND FACILITIES

In the event any lands, easements, and rights-of-way, including dredged or harvested material disposal areas and appropriate transfer sites for harvested material, are needed for the Program, the value of the lands, easements, and rights-of-way to be included in Total Annual Program Costs and credited toward the State's share of Total Annual Program Costs will be determined in accordance with the following procedures:

a. If the lands, easements, or rights-of-way are owned by the State as of the date this Agreement is signed, the credit shall be the fair market value of the interest at the time such interest is made available to the Government for the Program. The fair market value shall be determined by an appraisal, to be obtained by the State, which has been prepared by an independent and qualified appraiser who is acceptable to both the State and the Government. The appraisal shall be reviewed and approved by the Government.

b. If the lands, easements, or rights-of-way are to be acquired by the State after the date this Agreement is signed, the credit shall be the fair market value of the interest at the time such interest is made available to the Government for the Program. The fair market value shall be determined as specified in subparagraph a. above. If the State pays an amount in excess of the appraised fair market value, it may be entitled to a credit for the excess if the State has secured prior written approval from the Government of its offer to purchase such interest.

c. If the State acquires more lands, easements, or rights-of-way than are necessary for project purposes, as determined by the Government, then only the value of such portions shall be included in Total Annual Program Costs and credited to the State's share.

d. Credit for lands, easements, and rights-of-way in the case of involuntary acquisitions which occur within a one-year period preceding the date this Agreement is signed or which occur after the date this Agreement is signed will be based on court awards, or on stipulated settlements that have received prior Government approval.

e. For lands, easements, or rights-of-way acquired by the State within a five-year period preceding the date this Agreement is signed, or any time after this Agreement is signed, credits provided under this paragraph will also include the actual incidental costs of acquiring the interest, e.g., closing and title costs, appraisal costs, survey costs, attorney's fees, plat maps and mapping costs, as well as the actual amounts expended for any relocation assistance provided in accordance with the obligations under this Agreement.

ARTICLE V - CONTRACT MANAGEMENT

a. To provide for consistent and effective communication between the State and the Government during the term of the control Program, the State and the Government shall appoint representatives to coordinate on scheduling, plans, specifications, modifications, contract costs, and other matters relating to the Program.

b. The representatives appointed above shall meet as necessary during the period of construction (the contract for control operations), or the term of the Program, and shall make such recommendations as they deem warranted to the Contracting Officer.

c. The Contracting Officer shall consider the recommendations of the representatives in all matters relating to the Program, but the Contracting Officer, having ultimate responsibility for conduct of the Program, has complete discretion to accept, reject, or modify the recommendation.

ARTICLE VI - METHOD OF PAYMENT

a. The State shall implement the Program in accordance with the _____ Work Plan and the Government shall, during the period of construction and operation, subject to appropriations, reimburse the State the amount necessary to ensure the Government's share equals 50 percent of the total project cost.

b. The Government shall pay its share of total costs in proportion to the rate of expenditures by the State in accordance with the following provisions:

(1) After initiation of the Program, the Government will, subject to paragraph b. below, make monthly payments upon receipt from the State of properly executed and duly certified invoices covering services satisfactorily performed during the preceding month. All monthly payments by the Government shall take into account any project costs incurred by the Government for the stated time period.

(2) All work for payments requested by the State must be certified by the Contracting Officer to have been performed in accordance with this Agreement before the Government shall approve the request for payment.

c. Upon completion of the ____ Work Plan and resolution of all relevant contract claims and appeals, the Government shall compute the total ____ Work Plan costs and tender to the State a final accounting of Program costs. In the event that the total reimbursement by the Government to the State results in the State contributing less than the required share of total program costs at the time of final accounting, the State shall, within 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet their share of total Program costs. In the event the State is determined at the final accounting to have provided more than 50 percent of the total Program costs, the Government shall, subject to the availability of appropriations, refund the excess to the State within 90 calendar days of the final accounting.

ARTICLE VII - DISPUTES

Before any party to this Agreement may bring suit in any court concerning an issue relating to this Agreement, such party must first seek in good faith to resolve the issue through negotiation or other forms of non-binding dispute resolution mutually acceptable to the parties.

ARTICLE VIII - RELEASE OF CLAIMS

The State shall hold and save the Government free from all damages arising from the Total Annual Operation Program, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE IX - MAINTENANCE OF RECORDS

The Government and the State shall maintain books, records, documents, and other evidence pertaining to hours of equipment operation and costs and expenses as will properly reflect all net costs, direct and indirect, of labor, materials, equipment, supplies, and services and other costs and expenses of whatever nature involved therein. The Government and the State shall maintain such books, records, documents, and other evidence for a minimum of three years after completion of the control program and resolution of all claims arising therefrom, and shall make available at their offices at reasonable times, such books, records, documents, and other evidence for inspection and audit by authorized representatives of the parties to this Agreement.

ARTICLE X - FEDERAL AND STATE LAWS

In acting under its rights and obligations hereunder, the State agrees to comply with all applicable Federal and state laws and regulations, including section 601 of Title VI of the Civil Rights Act of 1964 (PL 88-352) and Department of Defense Directive 5500.II issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

ARTICLE XI - RELATIONSHIP OF PARTIES

The parties to this Agreement shall act in an independent capacity in the performance of their respective functions under this Agreement, and neither party will be considered the officer, agent, or employee of the other.

ARTICLE XII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE XIII - COVENANT AGAINST CONTINGENT FEES

The State warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the State for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in its discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE XIV - TERMINATION OR SUSPENSION

a. If the Government fails to receive annual appropriations for the Program in amounts sufficient to meet Program expenditures for the then-current or upcoming fiscal year, the Government shall so notify the State. If the State or its contractors(s) fail(s) to receive appropriations for the Program in amounts sufficient to meet Program expenditures for the then-current or upcoming fiscal year, the State shall so notify the Government. After 90 days, either party may elect without penalty to terminate this Agreement or to defer future performance hereunder; however, deferral of future performance under this Agreement shall not affect existing obligations or relieve the parties of liability for obligations previously incurred. In the event that either party elects to terminate this Agreement, the parties shall conclude their activities relating to the Program and proceed to a final accounting in accordance with Article VI.

b. It is understood and agreed that termination of this Agreement by any party for whatever reason shall not end the obligation of the State to hold and save the Government free from damages as provided herein in Article VIII.

ARTICLE XV - NOTICES

a. All notices, requests, demands, and other communications required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally, given by prepaid telegram, or mailed by first-class (postage-prepaid), registered, or certified mail, as follows:

If to the State:

[ADDRESS]

If to the Government:

[ADDRESS]

b. A party may change the address to which such communications are to be directed by giving written notice to the other in the manner provided in this section.

c. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at such time as it is personally delivered or on the third business day after it is mailed, as the case may be.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date signed by the _____ District Commander.

THE DEPARTMENT OF THE ARMY THE STATE

*BY:_____ BY: _____

DATE:_____ DATE: _____

*Footnote: When submitting this agreement for approval, the District Commander may sign the agreement if this model Local Cost-sharing Agreement is used as a form contract and not modified in any manner. If the model Local Cost-sharing Agreement is altered or modified in any way, this signature block will be left blank. ASA(CW) will determine who will sign for the Army.

CERTIFICATE OF AUTHORITY

I, (name of official), do hereby certify that I am the Attorney General of the State of _____, that the (State designee) is a legally constituted public body with full authority and capability to perform the terms of the Agreement between the Department of the Army and the (State designee) in connection with the (state or area) Aquatic Plant Control Program, and to pay damages, if necessary, in the event of the failure to perform in accordance with Section 221 of PL 91-611, and that the persons who have executed the Agreement on behalf of the (State designee) have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this Certificate this ___ day of ____, 19_.

_____
Attorney General of (State)

APPENDIX Y

INFORMATION REQUIREMENTS FOR ENVIRONMENTAL ASSESSMENTS AND ENVIRONMENTAL IMPACT STATEMENTS

Y-1. Description of the Problem.

a. Identify by scientific and common name the problem aquatic plant(s) to be managed.

b. Explain the history of the infestation.

c. Describe the location(s) and size of the infestation(s) as specifically as possible.

d. Discuss the severity and importance of the aquatic plant problem.

Y-2. Program Overview.

a. Discuss the APC program goals in terms of practical control levels.

b. Explain the environmental, sociological/political and economic criteria for selecting treatment areas.

c. Explain monitoring proposed to measure program success.

Y-3. Pesticide Identification.

a. Identify all pesticides proposed for use by common, trade and chemical name.

b. Give name and percentage of active ingredient.

c. Give current EPA registration number.

Y-4. Pesticide Application.

a. Indicate formulation to be applied, i.e., granular, aqueous solution or liquid.

b. Discuss general details of proposed method of application, i.e., equipment and techniques.

c. Give concentration of the active ingredient as proposed for application.

d. Give rate of application in pounds per acre, (kg/ha) or other rate.

e. Explain probable frequency of application.

f. Identify the area of the control site(s) in acres or other descriptive unit.

g. Provide site description, i.e., lake, river, drainage canal, irrigation canal.

h. Identify sensitive areas of potential contamination and/or bioaccumulation. Identify disposal requirements.

Y-5. Biological Control.

a. Identify the biological control agent(s) by scientific and common name.

b. Identify the country of origin of the agent, applicable quarantine studies, and when the agent was cleared for release in the U.S.

c. Describe the target aquatic plant species, application technology, and areas where release is expected to occur.

Y-6. Mechanical Control.

a. Discuss potential environmental impacts of operating mechanical devices in the harvest areas.

b. Explain the impacts of harvested material on transfer sites and disposal sites for harvested material.

Y-7. Alternatives.

a. Discuss alternative methods of control, including the "no action" option.

Y-8. Non-target Plants and Organisms.

a. Discuss the possible impact of control activities on non-target organisms (such as humans, domestic or wild animals or fish, threatened or endangered species, and non-target plants), the environment and biological agents being used as a part of an integrated control program.

b. Discuss possible cumulative effects of the proposed actions in relation to other Federal or non-Federal control activities in the treatment area.

APPENDIX Z

MINIMUM WORK REQUIREMENTS

Z-1. General. Aquatic plant control operations conducted under Local Cooperation Agreements (LCAs) are authorized by Section 104 of the Rivers and Harbors Act of 1958, codified as amended at 33 USC 610, the Aquatic Plant Control (APC) program. Work performed under the LCA shall be in conformance with all applicable Federal, State and local laws, regulations, and ordinances. All operations carried out, or caused to be carried out, by the State pursuant to the LCA shall conform as a minimum to the requirements in this Appendix which shall be attached and made a part of the LCA. The State shall, within 60 days of the effective date of the LCA, submit to the Corps for approval a Program Management Plan which demonstrates how these minimum requirements will be met by the State in operations and management of the program.

Z-2. Eligibility. Water bodies eligible for treatment under the program are navigable waters (including waterbodies navigable within themselves) that demonstrate a federal interest and a positive benefit/cost ratio. Reservoirs, channels, harbors, and other waterbodies managed under the Operations and Maintenance program of the Corps of Engineers or other Federal Agencies are not eligible for inclusion under this program other than for experimental work. Federal interest and navigability will be determined by the availability of the water body for use by the general boating public. The specific eligibility criteria are:

a. The water body must have unrestricted access to the boating public by way of an established boat ramp or directly navigable to, or from, another eligible waterbody.

b. The water body must have a sign at each boat ramp stating that it is a public boat ramp or use area.

c. The water body must have at least one public directional sign on the nearest paved road or main thoroughfare indicating the way to the area.

d. The boat ramp must have sufficient space to safely turn a vehicle and trailer around and then park with enough room to avoid being struck by the next backing trailer.

e. There shall be no intimidating conditions in the boat ramp area which could be construed as being threatening to the user (no trespassing signs, pillars with chains, etc.)

Z-3. Control Methods. Environmental manipulation, mechanical, chemical, biological, snagging methods, or an integrated mixture of these methods may be used in accordance with this appendix and the approved Annual Work Plan (see Appendix 14-F). The methods selected for use and approval thereof will consider the demonstrated effectiveness, economic justification, selectivity to target species, and potential adverse environmental effects. Research or unproven methods are not allowable under the LCA except as they may be used to provide operational benefits.

a. Environmental Manipulation. Alteration of the physical environment of the target species through dredging, water level manipulation, shading or other similar procedures may be used to manage plants susceptible to these methods. Amortization over the anticipated period of control may be used in the computation of benefit/cost ratio.

b. Mechanical Control. Mechanical devices such as floating booms, underwater cutters and mechanical harvesters may be used where their justification is economically justifiable. Mechanical control can also be used in special areas where water use restriction or environmental considerations select for this method of control.

c. Chemical Control. Herbicides used must be registered for the intended use by the U.S. Environmental Protection Agency. The products must have full EPA registration, Special Local Needs registration, Specific Exemption, or Experimental Use Permit, in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (PL 92-516), as amended. Spray mixture additives (adjuvants) are allowed when required by the product label or when the benefits to be derived exceed the additional cost of the additive. Herbicides shall be used in a manner consistent with label instructions and precautions and manufacturers Material Safety Data Sheets. Herbicide selection will include consideration of the potential environmental damage, the label water use restrictions and consistency with primary water usage. The public shall be notified of any water use restrictions due to treatment and the dates the restrictions are to be in effect. Herbicide application shall be controlled at all times to prevent drift onto non-target areas or species of plants. No application will be made when prevailing winds make such operations hazardous to non-target areas or plants. The use of aircraft for the application of herbicides will be restricted to specific areas and weather conditions to prevent any possible hazard from drifting chemical.

d. Biological Control. Biological control agents such as insects, fish, bacterial or plant pathogens may be used as they are proven to effectively assist in the control of aquatic plants and have proven their ability to perform this task without undue harm to the ecosystem.

e. Snagging. Removal of physical obstructions such as wind fall timber to gain access to pockets of target plants that are significant to the overall control effort or otherwise benefit the program are allowable. Snagging operations specifically for the purpose of assisting APC operations which require less than one day for a typical work crew to perform in one general area may be undertaken without prior approval. More extensive snagging work must be agreed upon by the Corps and the State whether in the Annual Work Plan or supplement thereof prior to performance to be eligible under the LCA. Extended work periods of snag removal for the general benefit of navigation are beyond the authority of the APC program.

f. Integrated control.

Z-4. Levels of Control. The level of control will vary with the growth potential and mobility of the species, the potential impact on navigation, flood control, hydropower, protection of environmental resources, and the benefit(s) accrued from the proposed control effort. Methods of control that select for beneficial, native species will be used whenever possible. Treatment of native species will normally be performed only when unavoidable or as a necessary part of the control of problem exotic species.

Z-5. Public Notification. The State will inform residents adjacent to control areas and potential users of the areas of the nature of the control program and any necessary restrictions.

Z-6. Inspection and Acceptance. APC program activities will be conducted in accordance with the LCA and the Annual Work Plan. All operations are subject to normal inspection by the Government to ensure that the work is accomplished as planned and the results obtained are satisfactory. In addition, the State shall comply with inspection requirements as specified in the

LCA for Control Operations and the Annual Work Plan. The Government shall have the right to inspect the work to be performed at any time during its progress and to make final inspection upon completion thereof. Failure of the Government to object within 20 days after final inspection shall constitute satisfactory performance of the contract by the State.

Z-7. Procurement. Any materials and supplies used by the State or designated representatives on that portion of the work assigned to it will be purchased by the State or designated representative. Accepted methods of procurement will be followed and current inventories will be maintained.

Z-8. Plant and Equipment. If the State or its designated representatives furnish the plant and equipment to perform that portion of the work coming under the State's contribution, the initial purchase cost of said plant and equipment shall not be included as an integral part of the State's contribution. However, an equitable rental charge for the plant and equipment (based on the initial cost of the item, anticipated economic life, reasonable maintenance charges, and amortization costs) may be included in the State's cost-sharing contribution. The same rental arrangement shall be applied concerning any additional work assignments. Rental charges will be made only on a daily use basis and will be applicable only to those items approved for the work. Plant and equipment furnished by the State may be increased or decreased to meet existing needs of the work by agreement of all parties concerned.

Z-9. Safety. Safety requirements, as a minimum, will be in accordance with Corps of Engineers Manual EM 385-1-1, revised October 1993, and future revisions, entitled "Safety and Health Requirements Manual."

Z-10. Reporting. The Corps and the State shall each provide to the other the number and types of reports set forth below for their respective operations within the time frame specified.

a. Annual Work Plan. The State shall provide a draft Annual Work Plan of operations for the next year to the Corps during the third quarter of the Federal fiscal year. A description of the Annual Work Plan is provided in Appendix 14-F.

b. Weekly Schedule of Operations. At the beginning of each week, a schedule identifying proposed operations for the week will be submitted to the Contracting Officer for any work conducted or contracted by the State or the Government. The schedule will list the proposed sites of work for the work crew or crews, and the type of control activities to be performed.

c. Weekly Report of Operations. This weekly report, which includes a daily log of operations shall be maintained for each work crew. Information included in the log will describe the treatment area, any chemicals or equipment used, the weather conditions, and any pertinent observations. This report, as well as daily time sheets and vehicle operation logs shall be kept for the use of Government inspectors in certifying completion of the job.

d. Survey/Inspection Reports. Surveys of waterbodies to determine extent of plant growth for planning purposes or inspections of work performed will be recorded in a format and level of detail agreeable to the Corps and the State.

APPENDIX AA

ANNUAL WORK PLANS

AA-1. General. The Annual Work Plan (AWP) is a projection of anticipated APC operations for the upcoming Federal fiscal year. It should include, but not be limited to, the management objectives of the proposed program, control technologies to be employed, public notification and education, a list of management and operations personnel, a list of all equipment to be used and approved rental rates, an estimate of acres to be controlled by species and water body, and maps of each water body in the program showing location of public boat ramps. A detailed budget for the upcoming fiscal year and the division of costs between the State and Government shall also be included.

AA-2. Proposed Operations. Proposed operations will be based upon the most accurate and current information available on the distribution of target aquatic plants and their relation to observed or anticipated interference with navigation (commercial or recreational), flood control, or water supply. All water bodies will meet the eligibility criteria listed in Appendix Z, Minimum Work Requirements. The intent of the APC program is to conduct control operations as required at all of the areas listed in the Annual Work Plan subject to the availability of funds.

AA-3. Annual Work Plan Review and Approval. All requirements, deadlines, and responsibilities of the State and Government in preparing subsequent AWPs, Local Cooperation Agreements (LCA) or amendments to the current LCA and AWP will be included in the AWP. The State shall provide the Corps with a draft AWP for the upcoming Federal fiscal year for review during the third quarter of the current fiscal year. In the event that the State has designated representatives (cooperators) conducting operations on its behalf, the cooperators will submit a draft AWP for their area of responsibility through the State to the Corps for review. After review of the draft AWP, the Corps, State and cooperators, if applicable, will meet to discuss the upcoming year's operations and determine program priorities in the event all requested funds are not received. This meeting is also an appropriate forum for review of other responsible agency comments regarding the APC program activities. After this meeting, follow-up guidance will be forwarded to the State and cooperators. Upon receipt of the APC program allocation, the Corps will notify the State of the funds available for cost-sharing, and if necessary, meet again with the State to reconcile planned operations with the available funds. At this time the AWP(s) will be finalized. Additional areas not included in the final AWP may be proposed for inclusion in the program if agreeable to the State and the Government if an emergency or unanticipated situation arises. If the proposed area has not previously been designated or determined eligible for the APC Program, the Government will determine eligibility.

AA-4. Coordination, Implementation and Management. All State and Government responsibilities concerning program coordination, implementation, and management of work efforts with other agencies will be specified in the AWP. Operations should be planned in advance to ensure the most effective and economical program possible. If more than one agency is engaged in similar control work in the operations area, close coordination among all agencies is required to avoid duplication of effort, maximize efficiency and prevent adverse environmental impact.

AA-5. Control Methods. A full and complete description of the work to be performed, the control method(s) and species of vegetation to be controlled, location of work areas, acreage

proposed for treatment, and any plant surveys or field investigations necessary in support of the program will be included in the AWP.

AA-6. Public Notification. All necessary and planned activities to keep the public and local interests informed of program operations will be made part of the AWP. Such activities may include, but are not limited to, newsletters, news releases, public meetings, and presentation of APC program information. Specific responsibilities of the State or Government for public notification are to be detailed. Designated program representatives will inform residents adjacent to control areas and potential users of the areas of the nature of the control program and any necessary use restrictions.

AA-7. Inspection. The Government shall have the right to inspect the work at any time during its progress and to make final inspection upon completion thereof. Failure of the Government to object within 20 days after final inspection shall constitute satisfactory performance of the contract by the State.

AA-8. Plant and Equipment Rental Rates. If the State or its designated representatives furnish the plant and equipment to perform that portion of the work coming under the State's contribution, the initial purchase cost shall not be included as an integral part of the State's contribution. Instead, an equitable rental charge for the plant and equipment (based on the initial cost of the item, anticipated economic life, reasonable maintenance charges, and amortization costs) will be negotiated. Rental charges will be made only on a daily/hourly use basis and will be applicable only to those items approved for the work. Plant and equipment furnished by the State may be increased or decreased to meet existing needs of the work by agreement of all parties concerned.

AA-9. Safety. Safety requirements, as a minimum, will be in accordance with Corps of Engineers Manual EM 385-1-1, revised October 1993, and all future revisions, entitled "Safety and Health Requirements Manual."

AA-10. Reporting Requirements. Reporting requirements include the "Weekly Schedule of Operations" and the "Daily Log of Operations." Weekly, a schedule identifying proposed operations for the ensuing week will be submitted to the Contracting Officer for any work conducted or contracted by the State or the Government. The schedule will list the proposed sites of work for the work crew(s), method of control and target species. In addition, a daily log of operations shall be submitted for each work crew. Information included in the log will describe the treatment area, any chemicals or equipment used, the weather conditions, and any pertinent observations. Also, daily time sheets and vehicle operation logs shall be kept for the use of Government inspectors in certifying completion of the job.