

## CHAPTER 23

### CIVIL WORKS RESEARCH AND DEVELOPMENT

23-1. Purpose and Scope. The Civil Works (CW) Research and Development (R&D) Program supports USACE's performance of CW missions and business programs. The CW R&D Program addresses CW mission-related problems to enhance the performance of all USACE elements. Typically programs focus on the highest priority problems. All USACE organizations regularly review their present and future CW missions and business programs to identify managerial, operational, and engineering problems that could be solved or improved through research and development. Research that is project-specific will not be conducted using CW R&D Program funding unless the research has a broader application.

23-2. Authorization. R&D is an integral and essential component in the overall management of Civil Works programs and functions. Therefore, special authorization is not required.

23-3. Program Development and Execution. The Director of Research and Development (CERD) manages the CW R&D Program. Oversight is based on management by mission-related objectives with appropriate delegation of authority and responsibility to USACE Laboratories and Research Performing Elements. (ER 70-1-5)

a. Program Development. Program development consists of three steps: (1) strategic directions and research needs identification, (2) program formulation, review and approval, and (3) program submission and budget defense.

(1) Strategic Directions and Needs Identification. The overall CW R&D strategic directions and priority issues are provided by the Civil Works R&D Coordinating Committee, based on the Civil Works vision and goals. The CW R&D Coordinating Committee is composed of the CW Division Chiefs or their designees. The Committee meets as required to review research directions and provide policy guidance. Based on the guidance of the CW R&D Coordinating Committee, CERD, with input from the HQ Program Monitors, Field Review Groups, and laboratory Program Managers, identifies research areas, major new initiatives, overall priorities, and funding requirements for review and approval by the CW R&D Coordinating Committee. Once approved, a guidance memorandum from CERD is sent, generally during the first quarter of the fiscal year, to laboratory Program Managers establishing the research program areas, preliminary funding, and other related guidance for the upcoming fiscal year. Laboratory Program Managers, in close consultation with the Program Monitors and Field Review Group, use this guidance memorandum to develop detailed CW R&D programs, critical milestones, and to prepare R&D program documentation.

(2) Program Review and Approval. Program Review Meetings, chaired by CERD, are conducted jointly with the lead laboratory. Participants include CERD representatives, Program Monitors, Laboratory Program Managers, Field Review Groups, Principal Investigators, and other HQUSACE and field staff where appropriate.

The Program Review Meetings review the status and direction of ongoing R&D and determine, in detail, the recommended needs and priorities of R&D work units commensurate with the strategic directions, priority requirements, and funding allocation. In addition, the Program Reviews address the overall program strategy, technology transfer, product implementation, and program justification. After Program Reviews, the Laboratory Program Managers, in close consultation with the Program Monitors, submit the annual prioritization of work units to CERD for HQUSACE review and approval. This prioritization is based on the discussions and Field review Group input during the Program review, as well as on other appropriate CW needs and business program requirements.

(3) Program Submission and Budget Defense. CERD has the primary responsibility for all subsequent program documentation requirements and for its subsequent defense to ASA(CW), OMB, and the Congress.

b. Program Execution. CERD has the overall management responsibility for the proper execution of the approved CW R&D program. Laboratory Program Managers manage the execution of the research program to ensure that program objectives, goals, and critical milestones are met. The Laboratory Program Managers, in consultation with Program Monitors and Field Review Group, are responsible for developing and periodically updating a Strategic Plan that includes a vision statement of overall R&D goals and objectives to support the established Civil Works business programs.

23-4. Current Emphasis and Program Mix. The existing base R&D Program is funded under the General Investigations Account. Additional funding is also provided for problem-specific, and usually fixed year R&D under the Operation and Maintenance (O&M), Construction General (CG), and General Expense (GE) Accounts.

23-5. Organizational Responsibilities. ER 70-1-5 prescribes the functional responsibilities and interrelationships of the field offices, research laboratories and research performing elements, and HQUSACE.

a. HQUSACE Directorate of Research and Development (CERD). The CERD is responsible to the Chief of Engineers for centralized management of the Corps R&D activities at Corps research laboratories and research performing elements. CERD, in close consultation with the CW Divisions, annually recommends a CW R&D Program, including priorities and funding, to the CW R&D Coordinating Committee. CERD defends the approved CW R&D program before the Office of Management and Budget and the Congressional Appropriations Committees.

b. Civil Works Directorate

(1) CW division chiefs appoint the program monitors to provide strategic direction, assist in structuring the R&D program, recommend work unit priorities and funding, review technical documents, assist technology transfer, and communicate field needs and concerns.

(2) The CW R&D Coordinating Committee reviews the proposed

distribution of CW R&D funds within the current fiscal year and the upcoming fiscal year to determine program balance, assure future problems are properly evaluated, and determine proper emphasis. Upon completion of the review, the Committee makes specific recommendations to the Director/CW and the Director/CERD.

c. Field Commands. Each R&D Program includes a separate field review group (FRG). The FRG acts as a consultant to the CW program monitor, laboratory program manager and to CERD on the scope and conduct of the R&D and effective implementation of R&D end-products.

#### 23-6. Transfer of Research Results.

a. Technology transfer is an integral part of the entire R&D process. The laboratory program manager, in consultation with the program monitor(s), the field review group, and principal investigator develops a Technology Transfer Plan. This plan is a general description of the direction and approach for technology transfer of a research program. Each research program must provide for consistent transfer of products and information to the USACE field offices primarily and to other agencies including the private sector secondarily. The technology transfer process will involve active participation of all members of the USACE family to assure the products of the CW R&D Program are usable, timely, and appropriate. Appropriate implementation mechanisms to consider include PROSPECT or other long-term training courses, recommended technical revisions to ECs, EMs and ETLs, draft technical input to new or revised Engineering Guide Specifications, and development of technical/procedural guidance necessary for effective implementation of ERs and other CW policy documents.

b. The CW R&D Program shall consider transferring technology to other DoD and Federal agencies, state and local governments, and private enterprises as authorized by the Stevenson-Wydler Technology Innovation Act of 1980, as amended. It is the joint responsibility of the Directorate of Civil Works, program monitors, CERD, and the field review group to advise and assist the program manager in technology transfer to such organizations. Procedures for complying with the Act are given in AR 70-57, which gives the Office of Research and Technology Applications (ORTA) the responsibility for managing the domestic technology transfer activities. The laboratory's ORTA will assist in identifying technologies suitable for transfer through Cooperative Research and Development Agreements (CRDA), Small Business Innovation Research Program (SBIR), Patent License Agreements (PLA), and other methods for technology transfer to the domestic civilian sector. The CW R&D program manager may consider technology transfer to foreign governments. CERD will decide each foreign technology transfer after coordination with appropriate officials.

#### 23-7. Internal and External Coordination and Information Exchange.

a. In the interest of eliminating unnecessary duplication of research efforts, Corps laboratories are charged with the responsibility for identifying R&D efforts by others that have potential application to the CW R&D Program.

b. To assure coordination of the CW R&D Program with the programs of other agencies, the Corps maintains close contacts with other Federal water resource agencies, including Bureau of Reclamation, Tennessee Valley Authority, and Bonneville Power Administration. Professional contacts with Federal Highway Administration, National Resources Conservation Service, National Marine Fisheries Service, Fish and Wildlife Service, Environmental Protection Agency, the Bureau of Mines, Federal Emergency Management Agency, National Science Foundation, and National Institute of Standards and Technology are also maintained.

c. External coordination is accomplished through the Defense Documentation Center, National Technical Information Service, and the Water Resources Scientific Information Service. In addition, Corps technical people serve on committees which discuss each agency's programs and capabilities, and participate in professional society activities and committees.

d. Internal information exchange is accomplished by publishing the documented research effort, ETLs, EMs and special research center bulletins. The Corps maintains a Scientific and Technical Information System that is a coordinated network of research and technical libraries interfaced with other national public and private systems.

23-8. Exclusion of Non-R&D Activities from R&D Funding. Non-R&D activities such as routine data collection, training, development of manuals and standard computer programs and Scientific and Technical Information (STINFO) Centers are not funded from "General Investigations - Research and Development" fiscal category.

23-9. Research not Funded as R&D. Congress has specifically authorized programs which include R&D. R&D is funded under these specific programs (e.g., Aquatic Plant Program). When R&D is related to a specific project and is not transferable, the effort is funded by the specific project. All R&D efforts, regardless of source of funds, are integral to the CW R&D Program.