

## CHAPTER 8

### ADMINISTRATIVE AND COORDINATION REQUIREMENTS FOR WATER CONTROL MANAGEMENT

#### 8-1. Administration of Water Control Management Activities

a. Organization. The overall responsibility for water control management throughout the Corps is assigned to the Water Control/Quality Section, Hydraulics and Hydrology Branch, Engineering Division, Engineering and Construction Directorate, HQUSACE (CEEC-EH-W). CEEC-EH-W establishes major policy and guidance pertaining to Corps-wide water control management activities. ER 1110-2-240 establishes the authority and responsibility for water control activities within the Division offices. There are currently seven Division offices in the Corps that have functional Water Control Centers. These are Missouri River, North Pacific, Ohio River, Southwestern, North Central, Lower Mississippi Valley and New England. In Division offices which do not have functional Water Control Centers the water control management responsibilities are usually carried out by the Hydrology/Hydraulics element located within Engineering Division. Although the basic mission and water control objectives of each Division are similar, major differences exist in the types of water control projects and the degree of centralization of responsibilities in the Division and District offices for real-time water management activities. All of the Water Control Centers closely monitor prevailing hydrometeorological and water control conditions throughout their respective Divisions, and all have staff management responsibility over the Districts, except NED, which is an operational Division office having no districts.

b. Functions. There are hundreds of water control decisions made by the Corps each day throughout the nation during normal hydrometeorological conditions. The number and difficulty of these decisions vastly increases during flood events, and most of them are made at the District level. In some Divisions, real-time water control decisions for major projects are made at the Division level. The principal functions required to conduct real-time water control management, whether carried out at the District or Division level, include the following:

- hydrometeorological data collection and processing
- watershed and project hydrologic and water quality analyses
- inter- and intra-agency data exchange

- water control decision-making
- instructions to project operators
- reporting to higher authority
- monitoring project effectiveness and preserving project integrity

The real-time functions stated above are very generalized. They encompass many tasks, such as information exchange, hydrologic forecasting, application of computer models, briefings and release scheduling. Additional supportive activities such as O&M of instrumentation and communication facilities in the office and in the field are also required. Many other developments preparatory to real-time activities are also required prior to their application, such as the formulation of water control plans and "Standing Instructions to Project Operators," compilation of water control manuals, development and adaptation of numerical models, and the establishment of discharge ratings for streams and structures. A significant amount of non-real-time work in the form of annual and post-flood reports are also required. ER 1110-2-1400 provides additional guidance on Water/Reservoir Control Centers and responsibilities.

c. Staffing. The staffs of the Water Control Centers in the Divisions and Water Management Sections in the Districts are normally made up of civil (hydraulic) engineers, meteorologists, environmental engineers and hydrologic technicians. In addition, hydrologists, agricultural engineers, biologists, chemists, physical-scientists, computer technicians and mathematicians contribute significantly to water management in several offices. The responsibilities are highly diversified, and much of the work lends itself to computerization, from basic data collection to modeling water resource systems for multiple water control objectives. Most District and Division water control management elements have acquired high speed computer systems that are dedicated to water control management and have retained full responsibility for both the hardware and software.

d. Role of Project Operators. Physical operation of water control structures for which the Corps is responsible is provided by: the Operations Division of the Corps, owners of non-Corps Federal projects, or by local interests. Project operators, which include damtenders, power plant superintendents, lock masters, resource managers, and others, are furnished standing instructions for water control by the Water Management Section. Information for inclusion in the instructions is discussed in Paragraph 9-2. The hydraulic and

hydrologic aspects of any operation plan in O&M manuals and similar documents are limited to the "physical operation" of structures, such as the manipulation of gates, placement or removal of stoplogs or operation of pumps. Except for very small water control projects where there is little chance for mishap by incorrect operation, project operators are also furnished oral instruction and general information on a real-time basis by water control managers. Clear and direct lines of communication and authority should be established between the water control manager and the project operator. There should be no delay in the communication of instructions to or the receipt of data from the project operator during working or non-working hours. Communication is made directly with the project operator in order to best achieve water control objectives in a timely manner without confusion and error, and to preserve project integrity.

e. Training. It is of the utmost importance that Corps staff having the responsibility for water control management functions be familiar with current technical procedures and computer programs that are available to assist them in carrying out their responsibilities. Although training in the general disciplines involved in water control management is offered at most colleges and universities, formal training focusing on specific aspects of water control management in the Corps is not generally available through regular programs at these institutions. Training directly related to the kinds of problems and situations involved in water control management is offered by selected short-term courses through the Proponent Sponsored Engineer Corps Training Program (PROSPECT) managed by the Huntsville Division. Examples of courses offered through this program and the facility conducting the training are listed below.

- Real-Time Water Control (Hydrologic Engineering Center - HEC)
- Hydrologic Data Management (HEC)
- Reservoir Systems Analysis (HEC)
- Water Quality Modeling of Rivers and Reservoirs (HEC)
- Hydropower Simulation (HEC)
- Water Supply Hydrology (HEC)
- Sediment Transport in Rivers and Reservoirs (HEC)
- Hydrologic Analysis of Floods (HEC)
- Interior Flooding Hydrology (HEC)

- Sedimentation Analysis (Waterways Experiment Station - WES)
- Hydraulic Design for Engineers and Planners (WES)

Several of these courses are also offered periodically through university extension programs. In addition, workshops on these and other subject areas are conducted periodically by HEC and WES.

## 8-2. Briefing Room Facilities

a. General. Water control briefings are held in the Division Water Control Centers and in some District offices. Briefing facilities range from blackboards in the work area to static displays and overhead computer driven projectors in specially designed briefing rooms. Periodic water control briefings are conducted daily or weekly in some offices and only during floods or emergencies in others.

b. Purpose. A briefing room may be developed as an adjunct of the Reservoir/Water Control Center for the purpose of displaying current data related to water management activities and performing briefings of current and planned river conditions and project regulation. It is planned and designed as a focal point of information related to current river regulation, to be used for exchanging information and informing others on river conditions and water management activities on a regular and systematic basis. The facility includes easily understood charts, diagrams, and other visual aids, which are useful for interpreting the data and understanding of water management problems. The briefings are conducted not only for the exchange of information between the various elements within the water management office, but also for informing other office elements whose activities are related to water control management activities. The briefing room facility is also useful for conducting regular or special meetings for coordinating water management activities, and it may serve as a point for disseminating river information to the general public via the news media. Under emergency conditions as described in Section 7-6, the briefing room may serve as a command center for directing not only the water management functions, but also many other Corps of Engineers activities related to the flood or other emergency conditions.

### c. Design

(1) The briefing room is a specially designed facility to utilize a space for seating usually from 10 to 30 persons, arranged

to easily see the visual displays of information that are manually maintained or electronically projected on display facilities. The briefing room, being designed primarily for use in daily briefings of river and reservoir conditions, requires facilities for both visual and audio interpretations and interchange of ideas among the participants. The room may also be used as a source of current information at times other than for the normal river and reservoir briefings. The visual information display systems are the most important element to be considered in the design of the facility. The emphasis in the design for visual systems is in displaying time-variable data that must be kept current on a daily or hourly basis. (See Chapter 5 for a discussion of graphic displays used in connection with an automated data system.) In addition, the visual display system should incorporate fixed information and data that can be easily recalled and displayed as numerical data, photographic projections of project facilities, and numerous other types of fixed data that may be necessary to explain current operations. The primary considerations for designing the display systems are:

(a) Have easily understood and readable charts or diagrams representing time-variable elements which may be updated currently to display all types of real-time hydrologic, project, and river and reservoir regulation data, as necessary for portraying the entire system regulation. Time plots of current data include data immediately preceding the current event, as well as plots of forecast of future events, as continuous functions.

(b) Include in the time-variable chart displays indicators or plots of reference data, such as project guide curves, minimum and maximum pool levels, established heights or discharges of various flood categories at downstream locations, etc.

(c) Provide for both long-range and short-range historical data (i.e., daily, weekly or yearly), as well as projections of future operations.

(d) Provide for immediate access of data available from the water control data system for display purposes via computer terminals. Consider use of large screen display facilities, cathode ray tube monitors, or other electronic readout devices, including the use of color projection equipment, for easy identification of data. Consider also the use of hard copy paper plots derived from computer terminal printers, as well as x-y plotting devices, for continuous semipermanent displays that are readily available for inspection at all times.

(e) Provide for charts and diagrams depicting current weather conditions, prognostic charts, and weather forecasts, together with

plots of time-variable weather indexes related to generation of streamflow, to show trends in weather elements.

(f) Provide for wall displays, photographic projections, or other types of pictorial representations of data pertinent to river regulation and project operation, such as summary hydrograph data, physical characteristics and descriptions of dam and reservoir projects and outlet facilities, generalized and detailed maps of project areas and river tributary systems, charts or diagrams representing hydroelectric project and power transmission facilities, as well as irrigation, navigation, fish passage, and recreation facilities, detailed maps of levee or local drainage projects, summaries and pictorial representations of channel characteristics and flood conditions, etc. Consider use of back-lighted slide projection equipment and large screen electronic display equipment for this function.

(2) In addition to the visual displays described above, the briefing room should be designed to include the capability of two-way conversations among participants in the briefing room as well as those at other locations. This is important to allow participation by persons from other offices in briefing activities. The briefing room should include the electronic equipment necessary to support voice communication and computer terminal facilities required for normal operation. It should also have all communication equipment necessary in the event of its use as a command post during a flood emergency.

(3) In summary, the briefing room should be a specially designed facility to perform the functions outlined above. The facilities should be designed to aid the lay persons as well as the technical experts in river regulation.

#### d. Utilization

(1) As noted above, the primary use of the briefing room is for conducting river and reservoir briefings on a periodic basis, usually on daily intervals. The briefings are performed by the staff engineers of the Reservoir Control Center and supporting elements, such as the River Forecast Center and/or hydraulic engineers who are specialists in hydrologic engineering, hydropower, water quality, or other fields of water engineering. The briefings may be monitored by District office water management personnel or by personnel from other agencies. These persons may also contribute to the discussions on special information that is within their field of activity. Normally, the briefings are held at a fixed time each day and last for about one-half hour. The frequency of briefings and the attendance by staff members of the water management office and others

depends upon the scope of the water control activities and current river and project conditions.

(2) The river and reservoir briefings are conducted under the supervision of the chief of the Reservoir/Water Control Center or other water management element. The normal schedule of the briefing includes the following items:

- summary of current meteorological conditions and weather forecasts
- summary of unregulated (natural) streamflow forecasts
- summary of system reservoir regulation requirements for flood control, hydroelectric power, irrigation, navigation, fish and wildlife, recreation, or other functional uses
- description of reservoir regulation and individual schedules of project operation in downstream order within the system
- summary of outlook of water management conditions expected in the ensuing weeks or months
- questions and discussions among participants

(3) The briefings, as discussed above, represent a means for informing those not directly involved in the scheduling process with the conditions and rationale of current operations. Specific input obtained from the briefings may, however, guide future operations. Although operating decisions are generally made earlier in the day through the processes described in the preceding sections, the briefings provide a means for critically reviewing current operations to assure that the regulation is in accordance with operating plans and to achieve general coordination of current water control activities.

### 8-3. Administration of Water Management Contracts

a. Data Collection. The collection of most water data used by the Corps is supported by the Corps. The U.S. Geological Survey (USGS), National Weather Service (NWS) and other agencies, through cooperative arrangements, provide services to the Corps to install, operate and maintain the instrumentation for essential water data stations. The Cooperative Stream Gaging Program with USGS (stage and discharge) and the Cooperative Reporting Network with NWS (stream stage and precipitation) were established specifically for assistance to the Corps by these agencies. Arrangements to share the cost at

stations are also made to best meet the needs and constraints of each organization. Arrangements may also be made with the USGS to measure streamflow and/or to process the data, including both collection (measurement and transmission) and handling (processing, archiving and publication). Contractual arrangements for water data collection may be made by the Districts, and the draft agreements are submitted to the Water Control Centers or other water management element for review and approval prior to consummation. Contracting water quality data collection is discussed in Paragraph 8-3c below.

b. Water Supply Contracts. Public and private users of storage space in Corps projects are required to contribute a pro rata share of project construction, water supply withdrawal and O&M costs. The Division formulates and processes the contracts, which state explicitly that the Federal government makes no representation with respect to the quality, availability (yield), or treatment of the water. Withdrawals may be made directly from lakes and from streams below lakes.

c. Water Quality Data Collection. A significant amount of water quality data is obtained by contract for the Corps. The contracts may apply to physical, chemical or biological parameters in water and sediments and may consist of everything from field survey to interpretative reports.

d. Hydropower Contracts. Private utilities or entities desiring to construct and operate a non-Federal hydropower generation facility at a Corps project must obtain a license from the Federal Energy Regulatory Commission (FERC). The Corps, upon receiving a license application from FERC for hydropower construction, recommends the best use of the site power potential that is compatible with the multiple water resource use for the public benefit. The Department of Energy (DOE) markets hydropower generated at Federally owned generating facilities at Corps projects and, as stated previously, operating agreements are normally made in this regard. Private utilities enter into contracts with the regional power administration of DOE for purchase of the hydropower.

#### 8-4. Interagency Coordination and Agreements

a. Types of Coordinating Groups. In view of the need for formally constituted groups and methods for coordinating water management activities, various levels of coordinating bodies have been formed which define the working relationships necessary for coordinating scheduling activities. These include the following types of groups:

(1) International Boards, Entities and Operating Committees. These groups operate in accordance with treaties for development or use of international rivers and waterways. These organizations consist of representatives of the U.S. and the adjacent country sharing the water bodies. They may operate at national, regional, or local levels within their respective countries. As such, they may be supervisory bodies that meet infrequently to oversee the operations in order to assure compliance with treaty provisions, or they may be working organizations that meet frequently and communicate as necessary to schedule project regulation.

(2) National Water Resource Coordinating Groups. These coordinating groups are composed of representatives of those Federal agencies at the national headquarters level. These groups coordinate the hydrologic data observation and acquisition programs, acquisition of weather data and forecasts, satellite and ground based communication systems, radio frequency assignments for hydrologic reporting networks, etc., as required for management of water control systems.

(3) Regional River Basin Interagency Committees, Compacts or Commissions. These groups coordinate water management activities within a major river basin or regional areas of the country. These organizations consist of representatives of Federal and state government agencies concerned with planning and construction of projects, and management of water resources within the region. They may be formed voluntarily, by legislative action, or through river basin compacts. Although these organizations may be concerned primarily with planning and construction functions for river basin development, they may also be involved with the problems of coordinating current water management activities for an existing system. They may have subcommittees which deal with the specific problems of coordinating data and river forecasts, and with the technical problems related to multiagency river regulation objectives in general accordance with agency policies and objectives. These organizations are generally not concerned with day-to-day scheduling, but they do deal with current monthly or seasonal regulation.

(4) Operating Committees for Water Use. These committees are formed to coordinate project operating input, as established under contractual agreements with cooperating agencies or utilities for coordinated operation of water control facilities. These committees consist of representatives of the water users, utilities, or government agencies (including the Corps) who are parties to the contract. These persons are generally at the operating level of their organizations, with technical expertise in the scheduling of water or power to meet the contractual requirements. These committees are in close touch with current operations on a monthly or

weekly basis and provide input to water control managers for specific needs. This input will be coordinated with other project requirements and integrated into project schedules. There may also be a supervisory management committee to periodically oversee the operating committee activities and assure that the contract commitments are being met.

(5) Informal Working Relationships. These relationships may be formed between Corps of Engineers water management offices and operators of water control projects owned by navigation companies, local flood control districts, commercial or industrial organizations, etc., which are affected by river regulation. Although these relationships are not formalized in operating agreements, they are an important source of information and coordination and provide input to water control managers.

b. Types of Water Management Agreements

(1) General. The functions and responsibilities of all the above coordinating groups except informal working relationships are formalized by Congressional legislation, by written agreement, or by both. The agreements are usually in the form of Memoranda of Understanding (MOU) signed by the agency heads at the national, regional, or local levels. These agreements, which cover such activities as hydroelectric power generation, fish and wildlife, or water supply, form the basis for carrying out coordination of water management activities by water control managers. This type of arrangement may also be made for coordinating the flood control and navigation regulation of non-Corps projects that are subject to Section 7 of the 1944 Flood Control Act. Even though much freedom may be given another agency toward meeting a desired water control objective, the agreements are very explicit in stating that the Corps is ultimately responsible for the overall achievement of water control objectives, whether complementary or conflicting. There are many such agreements concerning water control management. All such agreements should be reviewed for approval by the appropriate Water Control Center or water management element prior to consummation, and they normally require signature by the Division Commander. Three examples follow:

(2) Data Exchange. Agreements are made with Federal or state agencies regarding the exchange of hydrologic data to be used in making hydrologic forecasts and project regulation in general. These arrangements may be made at the national, regional, or local level. The need for coordination is usually associated with scheduling project regulation. The requirements for coordination of data gathering and exchange and forecasts and/or forecasting activities must be dealt with specifically in each river basin. Actions taken

to coordinate these activities may range from simple exchange of data between agencies to a coordinated data and forecasting center participated in jointly by agency staffs.

(3) Hydrologic Forecasting. The NWS is responsible for the forecasting of hydrological and meteorological events, and for disseminating this information to the public. As part of its responsibility for water control management, the Corps will often supplement NWS forecasts with its internally determined project inflow and local flow forecasts. Corps forecasts should be coordinated with the NWS and project releases provided to that agency.

(4) Hydropower Generation

(a) An agreement concerning hydropower generation at a Corps project or system may be consummated between a Division Commander and the Administrator of a regional Power Administration Office of the Department of Energy (DOE). Such an agreement is supplementary to a water control plan and manual and may be explicit regarding some aspects of coordination and very general in regard to others. Reasons for DOE to seek such an agreement are to clarify its role in the use of Corps projects and to state its objective of maximizing hydropower generation. Reasons for the Corps to enter into such an agreement are to clarify the Corps overall responsibility for water control management, minimize adverse impacts on flood control activities, prevent significant conflict with other water control objectives and preserve project integrity.

(b) In the interest of multipurpose water management, the Corps requires a signed Memorandum of Understanding with the licensee for non-Federal hydropower construction at a Corps project which specifies the operational procedures and power guide curve (water control diagram) to be used and that is consistent with overall project management objectives and efficient system regulation.

c. Coordinating with Operating Entities and Other Public and Private Water Use Organizations

(1) General Considerations

(a) The Corps seldom works alone in the field of water control management. The job of regulating a major river system involves many other organizations which have an interest in the current daily and seasonal water regulation from an operational or forecasting point of view. The coordination of activities stems from many years of effort in working with others in the planning, design, and construction phases of project development. In the operational phase,

particularly with recently enacted public laws and regulations governing the environmental and public use functions of water management, there is an increasing need to coordinate all phases of project regulation with various interest groups. Water control plans, particularly regulation schedules and annual operating plans, are usually developed in concert with other agencies to express contractual arrangements, formal operating agreements or informal accords, in order to assure the various multipurpose water use functions are achieved for mutual satisfaction. These basic efforts for coordination extend beyond the planning and design stages into current operations, usually through interagency coordinating groups, operating committees, or working relationships established with individual agencies. Mostly, these arrangements are voluntary, although many proceed out of legal commitments made in the planning and design phases of project development. The water management activities may require coordination on an international, national, regional, or local basis, involving countries adjacent to the borders of the United States, as well as U.S. Federal agencies, regional or state water or energy authorities, public or private utilities, or local water oriented agencies or public interest groups.

(b) Some elements of water management coordination are a major determining factor in scheduling project regulation. Examples are coordinated system regulation as required under operating agreements for hydroelectric power, water use agreements and commitments set forth in international treaties, and flood control and navigation requirements established for projects subject to Section 7 of the 1944 Flood Control Act. These firm commitments must be fully recognized during project operations, and they require coordinated efforts among the operating agencies to determine the project schedules. This requires exchange of operating data and communication, as necessary, for scheduling project regulation in a manner to assure compliance with the water control plan. Where several operating agencies are involved, the coordination may be achieved under the authority of an operating committee whose membership includes representatives of each of the cooperating entities or, for a single operating agency, by direct communication with that agency.

(c) Other elements of water management coordination involve agencies that do not own or operate projects, but represent water interests which have inputs for project regulation. These may include Federal, state, or local entities involved in environmental protection, fish and wildlife, navigation, irrigation, water supply, recreation, or local boards concerned with land use in the operation of diversion and by-pass facilities. The needs for coordination with these individual entities are usually met by periodic contacts with the Water Control Center or other water management office of the

Corps. Finally, there is need for coordinating streamflow and river level forecasts. The particular requirements and methods for coordinating water management activities with other agencies vary widely from region to region within the United States. The needs and desires for achieving coordination depend on the local conditions, and, accordingly, there is no set procedure for doing so.

(d) Regional or river basin water management coordinating groups may be used to institutionalize coordination of current water management activities. As noted previously, coordination may be achieved through voluntarily formed committees or groups or by an operating committee formed as an adjunct of formal operating agreements to implement the regulation plans involving two or more agencies.

(e) The motivation for entering into operating committees or groups depends on the needs and desires of the operating office. Obviously, there is little need to consider the coordination of water regulation activities in situations where the water resource projects are mostly single purpose and where there is little input from others which would affect project schedules. On the other hand, it is more likely that project regulation does interact with other uses of the river system, and the multipurpose requirements cannot be determined unilaterally. In any case, the water control manager should be responsive to all types of river users, and have an "open door" policy to local interest groups, as well as to other operating agencies, in order to consider special requirements or to explain operating procedures. If the needs of this type are infrequent, the interactions can be dealt with informally on a case-by-case basis. If, however, there is a continuing need for exchange of data or consideration of special operating requirements, it is highly desirable to establish formal working relationships to coordinate these activities.

(f) In some respects, the needs and desires for interagency coordination go hand in hand. The desires for this type of activity in any particular area may reflect long standing working relationships between the organizations, which over a period of time, lead to confidence and respect of individuals and organizations in attaining the water management goals through cooperative effort. There is no way to prescribe the methods to be used to achieve these relationships, nor is it possible to direct the degree of effort to be expended. Inasmuch as many of the procedures are based on voluntary actions between the agencies, the decisions on these matters must be based on the initiative and judgment of all parties to best reflect the public interests.

(2) Conflicts in Water Use. In the process of formulating

operating strategies for current water management, conflicts may arise reflecting competing interests of water users. The conflicts may be in connection with interpretation of operating rules and agreements for carrying out the authorized project functions by project user groups (e.g., navigation, power, irrigation or flood control interests), or they may be related to achieving the environmental or social goals in conjunction with the economic and authorized regulation requirements. These conflicts may encompass local or regional problems that have major impacts on various and diverse segments of society with regard to their social and economic well being and their perception of importance to the public good. Although many of these types of problems are dealt with and resolved in the planning and design phases of project development, often other problems of water utilization arise in the operational phase. Furthermore, there may be changes in public attitudes with regard to water management procedures that must be taken into account in scheduling project regulation. The conflicts may involve a wide range of impacts, varying from minor effects in formulating regulation schedules to accommodate a limited water use requirement, to major effects on regional power supplies and employment, fishery resources, flood regulation, environmental impacts, or other impacts related to water use.

(3) Efforts to Resolve Conflicts Through Coordination. Efforts to resolve conflicts in water management are initiated at the working level through the concepts of coordinated operation described in the preceding sections. There first needs to be a thorough exchange of data and information pertaining to the current operation and an explanation of the scheduling requirements between the operating office and the individual water user groups who have an interest in the functional use of the project. These discussions often clarify operating requirements and interpretations of project regulation schedules and serve as a basis for better understanding of the overall requirements for multipurpose regulation. From these discussions, it is often possible to resolve relatively minor conflicts by negotiation and judgmental decisions to adjust project schedules and accommodate special requirements without significantly jeopardizing other water use functions.

(4) Public Hearings on Water Management Problems. It is often desirable to air changes in water control plans and conflicts arising from current water management activities and proposed strategies for regulating projects by holding public hearings. Such hearings may be initiated by the District or Division Commander, in accordance with procedures normally available for this purpose. Such meetings would be publicized with an advanced public notice through the news media, and special invitations would be sent to known interested agencies and local interest groups to present testimony. The purposes of the

meetings are to inform the local interest groups and the general public about problems related to the water management and river regulation activities in the project area, to exchange views on the impacts of alternative methods of regulation, and to seek input which could be considered in formulating operating decisions. The need for public meetings depends upon the severity of the conflicts and the effects of the operating decisions on the general public, with particular emphasis on public use functions, such as fishing, boating, recreation, and aesthetics, combined with the effects on the local economy, employment, safety, and general well being of the people.

(5) Involvement with Elected Public Officials. It is important to keep elected public officials, particularly Congressional representatives and governors, informed in cases where water management decisions have a significant effect on their constituencies. Informal contacts by the District or Division Commanders can alert these public officials to potential problems which may have political significance. Where issues are involved which represent major conflicts and would severely impact a large segment of the public, it may be desirable to suggest that the public officials conduct the public hearings as discussed in the preceding paragraph. In any case, it must be fully recognized by all echelons of command in each Corps office having water management responsibilities that the Corps must be responsive to the needs and desires of the general public in carrying out these responsibilities. The interactions can best be achieved through the elected officials and the general public by anticipating problems, informing and explaining technical objectives and methods of control, listening to input from others, and conducting the operations in a reasonable and prudent manner considering all water management goals.

#### 8-5. Water Management Reports on Prevailing Conditions.

a. General. Much of the project and water data collected in real-time are stored in a data system. The data are used to regulate projects and to prepare reports. The following reports are prepared in concise form to conduct real-time water management from data in data base systems.

b. Project Operators Reports. In addition to reporting water control actions, water data are often monitored by project operators, as specified in the Standing Instructions to the Project Operator for Water Control (see Section 9-2), and furnished directly to the Water Management Section in the District or to the Water Control Center or other water management element in the Division, as appropriate. The requirements for monitoring and reporting are usually more intensive

during flood events.

c. Water Control Morning Reports. These management type reports are used to evaluate watershed and project conditions. They are the principal means of informing all in-house staff having a need to know prevailing conditions, and they take on many forms. The reports are formulated from several small reports on project and hydrometeorological conditions that have been entered into a data base management system each workday morning in a water management office. The information in the reports includes observed water data, hydrologic forecasts, release schedules, and power generation schedules.

d. Special Advisories. Advisories on potential and actual emergency events of any nature that have a significant impact on water management associated with Corps projects (and responsibilities) are reported immediately to the Division water control management element and to CEEC-EH-W by telephone. The advisories provide additional information through water management channels on the water control aspects, when appropriate, of any situation reports that are submitted to higher authority in accordance with Chapter 7 of ER 500-1-1, "Natural Disaster Procedures," 21 December 1984. Some examples are:

- severe weather warnings
- high runoff potential
- flash floods
- emergency conditions affecting the quality of streamflow, water quality and ecology
- any unsafe condition connected with water control that could impact the regimen of streamflow, considering both Corps and non-Corps projects

These advisories are required to keep the Division Commander and Commander, USACE, apprised of events such as the above and, whenever possible, prior to the time they come to the attention of the general public and as they progress. Reports made by telephone are normally followed immediately by a concise narrative summary (Special Advisory) of the event. The follow-up advisories are reported by the most rapid means available for hard copy communication, often by telecopier or computer.

e. Discharge Data. Discharge measurements are made and reported to the water management office in preliminary form as soon

as possible (expeditiously) during flood events for select stations that are vital for real-time decision-making. Adjustment of the preliminary values, when required, are also reported as soon as they are made.

f. Flood Damages. The Districts provide flood damage estimates, potential and actual, to the Division water control management elements for specific areas during prevailing flood events upon special request. Complementary maps depicting areas of inundation and land use may accompany the basic data and may be furnished as computer graphics.

g. Reports for the Media. Water control data at projects and at control points on streams are furnished to the news media. Caution is exercised to avoid furnishing river stage forecast information to the press or organized interest groups since forecasts of river stage are normally disseminated to the public by the National Weather Service (NWS). However, the Districts often furnish forecasts to local interests upon request for areas that are impacted by discharge from Corps projects, after coordinating with NWS. This subject is addressed in ER 1110-2-240.

8-6. Documents, Reports and Records. Several documents and reports on water control management are prepared for use in regulating water resource projects, administrative purposes at the Division and HQUSACE levels, and/or providing a permanent record of project and control point conditions.

a. Water Control Documents. The basic requirement for preparation of water control documents is stated in ER 1110-2-240. The contents of these documents are discussed in Chapter 9. They consist of:

- standing instructions to project operators
- water control plans
- water control manuals (for individual projects and for water resource systems)

b. Annual Operating Plans and Other River Basin Committee Reports. These reports commonly address the achievement of water control objectives during the previous year, and the operating plan for the current or on-coming year for certain project purposes of interagency (joint) interest. Annual operating plans are based on long-term runoff projections. Navigation, hydropower and water supply are the purposes of major concern in these reports. They

long-term runoff projections. Navigation, hydropower and water supply are the purposes of major concern in these reports. They represent the outcome of and plans for mutually agreed to water control decisions.

c. Annual Report on Water Control Management Activities. These reports are prepared by the Districts, consolidated for the Division by water control management elements, and submitted to CEEC-EH-W. They include project accomplishment, progressive development for future plans of the Centers, annual report on water quality activities, and a status of water control documents, with a schedule for their initial preparation and revision. The report is required by ER 1110-2-240.

d. Reports on the Water Control Data System (WCDS) Master Plan. An annual report consists of the original WCDS Master Plan for a Division, with annual supplements for water data collection and handling within each District. The report applies to field instrumentation and to computers used for water data collection. This report, which also includes budget request information, is required by ER 1110-2-240. A quarterly report is also submitted by each Corps District that uses the Geostationary Operational Environmental Satellite Data Collection System on the status of water data transmitters via satellite, which includes all current active transmitters and a deployment schedule for the next four quarters.

e. Annual Report on the Cooperative Stream Gaging Program. This report concerns the funding of water data collection (stage and discharge) provided to the Corps by the U.S. Geological Survey. This activity and the report are discussed in detail in ER 1110-2-1455.

f. Annual Billing for the Cooperative Reporting Network. This transaction consists of a reverse billing procedure between CEEC-EH-W and the Districts to fund water data collection provided to the Corps by the National Weather Service.

g. Annual Budget Request

(1) General. Construction funds are preferably used to prepare the initial preliminary water control documents that are required prior to project completion and to prepare the documents in final form within one year after project completion. Water control managers in the Districts prepare budget requests two years in advance for water control management activities and furnish them to the Operations Division, which manages the O&M, General and MR&T, Maintenance funds, for submission to HQUSACE. The requests are prepared in the March-June timeframe in accordance with annual budget guidance provided by Programs Division, Directorate of Civil Works.

(2) Account 609, Water Control Management. Account 609 is reserved for water control management activities and consists of the following three categories:

- Category E10 (09.1), Data Collection and Maintenance for Water Control and Water Quality Activities,
- Category E11 (09.2), Water Control Analyses and Studies, and
- Category E12 (09.3), Water Quality Analyses and Studies.

Item E10 consists of the cost for single or multiple project water control/quality data collection activities.

(3) Account 630.1, Purchase of Water Control Data System Equipment. Instructions for budget preparation under this account are explained fully in the annual budget guidance. The work functions category code for this account is identified as E15 in the guidance. Item E15 consists of the cost to replace or purchase new equipment for a single project (a non-PRIP purchase).

h. Summary of Runoff Potential. Seasonal reports on hydrometeorological conditions are required by ER 1110-2-240. These brief reports include the outlook for floods resulting from snow accumulation and for droughts, with supplemental reports as the situation progresses.

i. Post Flood Reports. Water control managers contribute significantly to the preparation of post flood reports (see ER 500-1-1). Project regulation effects, including evaluation of stage reductions at key stations and estimates of damages prevented by projects, are determined and furnished to the Operations Division.

j. Water Data Records. Records of stage, discharge, water quality parameters and other information that define water control events are compiled and stored in various ways, including the use of national archives such as STORET, administered by EPA, WATSTORE, administered by USGS, and the precipitation archive at Asheville, NC, which is administered by NWS.

k. Federal Register. See ER 1110-2-240 and ER 1110-2-241.

(1) Corps Projects. A list of Corps and non-Corps projects authorized by Federal laws and directives is published in Part 222.7, Title 33 of the Code of Federal Regulations (CFR). The list is kept up-to-date by CEEC-EH-W with input from the Division and District offices.

Section 7 of the 1944 Flood Control Act is published in Part 208, Title 33 of the CFR by the Corps. The Corps is responsible for prescribing the regulation of these projects for flood control and/or navigation since Federal funds were used for their construction. Part 208.10 applies to small local protection flood control projects that are turned over to local interests for physical operation and maintenance (O&M) after their completion. The requirements in Part 208.10 address O&M, but they do not address regulation of the projects for water control. When appropriate, "Standing Instructions to the Project Operator for Water Control" are prepared by water control managers and furnished local interest group for these projects. Part 208.11 applies to all other projects subject to Section 7 that are not included under Part 208.10. The Corps prepares water control manuals for projects listed under Part 208.11, including water control plans and standing instructions.

1. Annual Report on Project Benefits. Monetary benefits are determined annually for all project purposes that produce tangible benefits. The Economics Branch in the Planning Division routinely computes the benefits attributable to flood control, navigation, hydropower, water supply and recreation using data contributed by the Engineering and Operations Divisions. The information is then furnished to HQUSACE for preparation of the Annual Report of the Chief of Engineers, Civil Works Activities. When appropriate, benefits are also determined for water quality and fish and wildlife enhancement, streambank and beach erosion control, and restoration of the environment (e.g., terrestrial, wetlands or aquatic plant control). An annual flood damage report, which includes damages prevented and damages incurred in each state, is prepared by CEEC-EH-W with significant input from NWS. The report is submitted to Congress in response to House Committee Report 98-217, Energy and Water Appropriations Act, 1984.

m. Annual Water Quality Report. To insure that adequate information on Corps water quality management activities is available to HQUSACE, Division and District water control management elements and other interested parties, a water quality report is prepared annually by each Division and submitted to CEEC-EH-W. The report summarizes the Division's Water Quality Management Program and highlights specific project information, planned activities and other pertinent information, ideas and concerns. Guidance is contained in ER 1130-2-334, Reporting of Water Quality Management Activities at Corps Civil Works Projects.

n. Periodic Inspections and Reports. Water control managers should participate in periodic inspections and review prepared reports for each project to make sure there are no immediate problems that might adversely impact regulation procedures or project water control management activities.