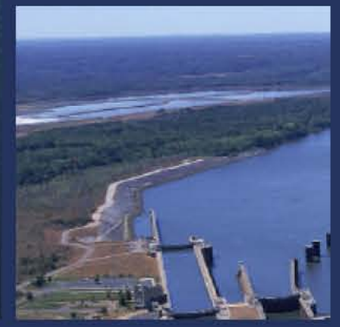
Tennessee River

Waterway Management Plan



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400 West Summit Hill Drive
Knoxville, Tennessee 37902

www.tva.com

TVA

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September 2003	Section 7.1.1, edited paragraph, Appendix I, revised contacts; Appendix II, changed several phase criteria.

Tennessee River
Waterway Management Plan

A joint project of the

Tennessee River Valley Association

Tennessee-Cumberland Waterways Council

U.S. Army Corps of Engineers

U.S. Coast Guard

Tennessee Valley Authority

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Forward

The Tennessee River Waterway Management Plan (TRWMP) has been jointly prepared by the marine industry, U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (USACE) and Tennessee Valley Authority (TVA). This plan is intended to facilitate the safe and orderly movement of barge traffic during high and low water navigation crises on the Tennessee River.

In September 1995, the Mississippi River Industry Executive Task Force, in conjunction with the USCG and the USACE, chartered the Mississippi River Crisis Response Working Group to develop a plan for responding to navigational emergencies on the Mississippi River. The plan prepared by the Mississippi River Crisis Response Working Group was called the Mississippi River Crisis Action Plan (MRCAP). This document is analogous to MRCAP with special focus on the unique nature of the Tennessee Valley reservoir system. Accordingly, this plan deals with potential navigation emergencies on the Tennessee River waterway. Towing industry input was invaluable in preparing this document.

The document was designed to be current by annually updating the designated contact persons and their telephone numbers. This is reflected by placing the date through which the document is current on the inside of the cover sheet and in Appendix I, along with any procedural changes that may have been incorporated.

1
Introduction

This plan provides guidance for marine operations and transportation emergencies on the Tennessee River. Some river emergencies significantly disrupt navigation and may be caused by a natural or man-made disaster, or a combination of both. A map of the Tennessee River is shown below. The goal of the plan is to serve as a guide for officials of USCG, TVA, USACE, local Emergency Management Agencies (EMA), and the marine industry to facilitate the safe and orderly movement of barge traffic during a navigational crisis. Also, the resources of this plan can be utilized to minimize the impacts to waterway users from certain waterway maintenance functions such as lock closures and bridge construction.

TRWMP users must realize that each crisis has its own unique set of issues, factors, and controlling elements that require constant evaluation and adjustment. No plan can replace a clear, logical, and analytical approach to problem solving. Critical to this effort is early and open communication with all parties to assure that response actions reflect fair and equal consideration of the interests of all parties, including the public.

The need for effective communications cannot be overemphasized. Timely exchange of information is important, but only if the involved parties have an integrated system to assure the most current data is disseminated.

Tennessee River and Watershed

2 Hydrology and Meteorology

2.1 Purpose

The purpose of this chapter is to provide those persons charged with mitigating the effects on navigation of abnormal water levels on the Tennessee River with basic information on the hydrological and meteorological factors that affect the Tennessee River system and to identify how these factors affect river levels and navigation safety. This chapter also outlines the general philosophy for dealing with navigation safety issues and discusses the tools available to conduct waterway management activities.

2.1.1 Hydrological and Meteorological Factors Affecting Waterway Management

TVA manages the flow of the Tennessee River for flood control, navigation, power generation, water quality, and recreation. Frequently, special water operations are needed to prevent or minimize flooding. In times of drought, special water operations emphasize conservation to maximize the value of the water to all users.

The Tennessee River system managed by TVA consists of 9 mainstream dams with navigation locks and 40 tributary dams, one of which has a navigation lock and one which is connected by a canal to a mainstream reservoir. The Tennessee River is also connected to the Cumberland River System and the Tennessee-Tombigbee Waterway by canals. The TVA Act requires TVA to provide a channel for 9 foot navigation. The TVA practice is to try to fill all reservoirs in the spring, with the upper 8 main river reservoirs being filled by April 15, Kentucky Reservoir by April 30, and the tributaries by June 1. From then until August, the water is released for minimum flows, thermal cooling, and power generation. After August 1, reservoir levels are gradually reduced preparing the reservoirs for winter rains. Tributary storage reservoirs and local inflow provide the water necessary to maintain navigation on the mainstream reservoirs.

Inflow to the reservoirs is dependent on many factors including water flow, soil moisture, snow cover, precipitation, temperature, and weather patterns. TVA constantly monitors these factors and forecasts river conditions to ensure adequate preparation for a river emergency.

Numerous variables affect how much water is in the system at any given time. Listed below are some of the key variables TVA must consider:

1. Base flow (the amount of flow [measured in cubic feet per second, CFS] along a section of river, usually measured at a dam): TVA has established a historical average flow rate for each section of the river prior to impoundment of the reservoir. Flow rates now are dependent on the generation patterns or minimum flow requirements for the applicable time of year.

2. Soil moisture (the amount of moisture concentrated in the soil): High soil moisture content means a large percentage of new precipitation will not be absorbed into the soil. This will result in increased runoff and a corresponding increase in water levels. Soil moisture averages and current levels are available from the USGS and state water/soil conservation agencies.

3. Precipitation (the amount of rain/sleet, etc.): This becomes runoff and impacts water levels in the river systems. The amount and duration of precipitation are equally important factors. Precipitation averages and totals can be obtained from the U.S. Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), the National Weather Service (NWS) and state agencies.

3 Waterway Management

3.1 Goal

The goal of this waterway management plan is to facilitate safe navigation during a period of less than optimum conditions. Timely, well-designed interventions by TVA, USCG, and USACE will bring order to the confusion surrounding a flood, drought, or other incidents such as spills, emergency lock closures, and failure of other structures crossing the river. The plan is intended to limit adverse economic impact on local and regional economies. The management of marine traffic during emergencies requires a clear set of goals and a focused plan of action to address associated complex issues.

River users must be involved in the decision-making process. To ensure issues are addressed in the most efficient manner, working relationships between federal, state, local waterway managers, industry-user groups such as the Tennessee River Valley Association (TRVA) and Tennessee-Cumberland Waterway Council (TCWC), and others should be continuously cultivated and all parties given a partnership in the decision-making process.

TVA, USCG, and USACE must continually monitor hydrological and meteorological reports and the frequency of vessel casualties as indices of navigating conditions. By analyzing developing trends, they can decide when system controls must be implemented to maintain an acceptable level of safety. Section 4 discusses impacts to navigation that waterway managers can expect to occur during high water.

3.2 Marine Transportation Emergency Response Organization

The waterway users of the Tennessee River and its tributaries have a compact group to contact when the need for communications arise. The three organizations that address the industry concerns on the Tennessee River are the USCG, TVA, and USACE Nashville District. With the designation of an Assigned Dedicated Contact Person(s) (ADCP) by the industry, a compact group consisting of industry, USCG, TVA, and the USACE can respond promptly during a navigation transportation emergency or disruption on the Tennessee River. The USCG will contact TVA and the USACE and attempt to contact all towing operators. However, in addition to TVA and USACE, a minimum of three towing-industry operators, listed in Appendix I that can be reached by the USCG, may serve as a quorum for a conference call.

3.3 System Management and Control

Waterway Management intervention actions must be taken when a compelling need exists to preserve the safety of navigation and the environment. Careful analysis of the risks must be conducted in each case, and controls should be exercised only to the extent necessary to mitigate these risks. In all cases, the controls imposed should be the least restrictive necessary. The degree of control can always be escalated as conditions worsen.

Control actions range from passive enforcement actions such as advisories, to drastic enforcement actions such as the temporary cessation of all navigation on the most seriously affected sections of the Tennessee River system. When an intervention must be conducted on one part of the Tennessee River, other areas of the river must be considered. Care must be taken to recognize any restriction implemented to address local safety issues may create undue hardship on vessels and shippers on other parts of the river system.

3.3.1 Safety Advisory

The simplest form of intervention is a navigational safety advisory. It relies on the voluntary compliance of industry to limit risk and prevent vessel casualties. USCG advisories are usually issued after consultation with TVA and USACE. They can be originated by the USCG or self imposed by industry, and disseminated as Broadcast Notice to Mariners (BNTM), USACE bulletin board, River Industry Bulletin Board (RIBB), over the industry facsimile system, or any combination of these methods. The purpose is to advise the marine industry of the existence of hazardous conditions and provide recommendations for navigating safely. Advisories can also be used to notify the marine industry of the Captain of the Port (COTP) intention to take action in respect to developing navigation conditions. Advisories are important tools that provide marine interests time to adjust their operations to avoid future problems.

3.3.2 Safety Zone

Due to the degree of control of Tennessee River flows by TVA, the most probable used intervention activity will be the establishment of a safety zone by the COTP that imposes vessel-operating restrictions. Consultation and deliberation with the TVA, USACE, and industry-user groups usually precede implementation of a safety zone by the USCG. A safety zone entails the control of a portion of the river, tributary, or harbor. This enables the USCG to control access and/or prescribe operating restrictions on vessels seeking to navigate in the area. This approach can be applied to limited or large geographical areas and may involve simple or complex restrictions including:

- Minimum horsepower requirements per barge
- Maximum draft limits
- Maximum tow sizes
- Specific tow configurations
- Length and breadth limits
- Safe-speed zones, no-passing zones, or no-meeting zones
- Helper or towboat requirements
- Traffic separation schemes
- Reporting requirements
- Tank-barge prohibitions or the exclusion of all vessels from the safety zone

The establishment of a safety zone may include active control of vessel traffic through an area or it may be conducted passively, relying on voluntary compliance to limit risk. Safety zones using passive control have been imposed on other waterways during periods of high or abnormally low water and when local construction or pollution response cleanup operations are impacted by passing traffic.

3.3.3 Vessel Traffic Control System

During the most serious maritime incidents, safety zones are often used in conjunction with the establishment of a temporary vessel traffic control system. These organizations are joint government/industry organizations established on a temporary basis to actively facilitate the safe movement of traffic. They can be used to provide either advisory or mandatory control of traffic and have been used successfully in numerous maritime incidents. These Traffic Control Centers (TCC) are manned by a combination of government and industry personnel under the control of the COTP or Coast Guard District Commander depending on the scope, nature, and duration of the incident.

3.4 Communications

A special communication setup may be required for waterway users if one or more of the following conditions exist:

- There is an extended period of navigation stoppage and conditions are expected to worsen.
- The industry is experiencing difficulty in gaining timely information on river conditions.
- Severe congestion of harbors, terminals, and locks.
- An environmental emergency has developed (chemical or petroleum spill).
- Emergency closure of a lock.
- River crossing structure failure (downed bridge or powerline, ruptured pipeline).

The communication methods and preferences are discussed in Section 8.

3.5 Waterway Management Planning

The response to a transportation emergency can be broken down into four distinct phases: Watch Phase, Action Phase, Emergency Phase, and Recovery Phase. Key events are associated with each phase and specific actions must be executed to ensure that safe and efficient responses are conducted. Specific actions for each phase are listed in Section 4.1, Marine Transportation Emergency Response Cycle and criteria enumerated in Appendix II. Each phase is defined as follows:

Watch Phase

Situation: The Watch Phase is the start of a waterway management activity. It exists when navigation conditions may be affected by TVA water control actions or have markedly deteriorated and weather forecast predict continued abnormal rainfall and streamflow conditions. The COTP, TVA, local USACE personnel and local river user groups will be the first to predict or become aware of difficulties being experienced by commercial navigation interests. This group must confer and decide if the developing scenario has the potential to evolve into a transportation emergency. If the situation has the potential for escalating, then a notice of intent to go to the Action Phase should be issued.

Action Phase

Situation: The Action Phase is the first condition, when active traffic advisories are issued and extraordinary information coordination becomes necessary. Some vessels are navigating with difficulty and local navigation advisories and safety zones are defined to address hazardous areas. There exists a high probability that weather forecasts and hydrological projections indicate conditions will continue to worsen. The IAP is developed for the subject section of the waterway. The plan is prepared by the USCG in conjunction with TVA, USACE, TRVA, and TCWC

Incident Action Plan: The IAP will indicate the goals of the waterway management action and explain the precedence in which operating restrictions will be implemented. Based on the goals of the IAP, appropriate Operations Orders (Op Order) will be issued. This will insure that if a transportation emergency develops, coordinated actions will be taken.

Emergency Phase

Situation: The Emergency Phase starts when areas must be closed to traffic, or when active vessel control is essential to avert casualties. During the Emergency Phase, river conditions and Aids to Navigation (ATON) reliability are significantly deteriorated, severely restricting navigation in certain areas and possibly requiring the cessation of navigation. Weather reports and hydrographic data indicate conditions will be abnormal for a protracted period. The potential for casualties is high and maximum caution should be observed. The Coast Guard ATON system is deteriorating and USCG river tenders cannot meet the demands for marking the river. The USCG will activate the TCC to coordinate the implementation of the IAP.

Recovery Phase

Situation: The Recovery Phase starts once limited navigation can be resumed on the affected section of river system. It is characterized by improving navigation and weather conditions, rivers returning to normal stages and reestablishment of the ATON system. In the early part of the Recovery Phase, traffic may move at reduced capacity under the active control of the USCG. As conditions improve, operating restrictions are gradually removed and navigation is conducted without active direction. This phase ends when active management is no

longer required and navigational advisories are used in lieu of operating restrictions. The USCG will announce the end of the TCC and will complete documentation of the event.

Appendix II provides additional information on the actions to be taken during the Watch, Action, and Emergency phases of high-water events.

Appendix III addresses the concerns during extended periods of low water. Due to the nature of the low water conditions, only Watch Phase criteria are addressed.

3.6 Emergency Waterway Management

The complexity of the river system and the number of factors involved in its management make it essential that a proactive approach be taken concerning waterway management activities. To ensure prevention and response activities are conducted efficiently, it is essential that river users and managers participate in decisions. These users should meet regularly (such as the semiannual Nashville District navigation meetings) to review existing conditions, assess the possibility of future emergencies, and review contingency planning.

4
Waterway Management Issues Associated with High Water

The purpose of this section is to list the impacts waterway managers can expect during a high water event. High water or flood conditions will be marked by deterioration of navigating conditions due to swift currents, heavy debris flow, and the degradation of the ATON system. These conditions may result in vessel casualties, pollution incidents, and barge breakaways. Additional impacts of a high-water event are listed below:

Impacts on Navigating Tows

- Vessels navigating against the current face the potential for stall outs and loss of control.
- Vessels have difficulty making meeting and passing agreements due to effects of the current.
- Heavy debris flow causes damage to rudders and propellers, as well as side-shell damage to barges.
- Vessels have difficulty approaching lock walls.
- Landings and passages through bridges become more difficult due to abnormal out drafts and currents, increasing allision incidents to bridge fendering systems.
- Close-quarter maneuvers and tow building are more difficult.
- Downbound vessels have difficulty controlling their speed, complicating close-aboard maneuvering during passing situations.
- Lock approaches by downbound tows are influenced by abnormal out drafts that lead to potential increase in allisions with lock structures and gates.
- High currents and subsequent full power maneuvers over stress tow rigging, increasing tow breakups.

Impacts on Moored, Fleeted Vessel and Facilities

- Fleet anchors and dead men are strained by high flow and current, increasing the potential for breakaways.
- Tow building and midstream operations become difficult. Fleeting operations require monitoring to prevent breakaways.
- Harbor activity decreases and a lesser number of vessels are available to respond to harbor emergencies.

- Loading and unloading docks become inactive due to crane limitations, causing fleet congestion.
- Facilities, particularly power plants, run short of coal and feed stocks, leading to later requests for passage of critical cargoes.
- Large passenger vessels experience difficulty in maneuvering.

Impacts When Navigation is Halted

- Vessels trapped in the closure area require replenishment of fuel, potable water, and groceries.
- Local law enforcement and relief agencies request small boat transportation to deliver aid.
- Fleets require line boats to assist in maintaining security.
- Tied-off tows and passing vessels near property may create tension with landowners.
- Recreational boaters and marinas operate despite river closure.

4.1 Marine Transportation Emergency Response Cycle

The purpose of this section is to provide guidance for planning and executing waterway management intervention actions during a marine transportation emergency.

The response to a transportation emergency can be broken down into four distinct phases: Watch Phase, Action Phase, Emergency Phase, and Recovery Phase. Key events are associated with each phase and specific actions must be executed to ensure that safe and efficient responses are conducted.

Watch Phase

When a large-scale transportation emergency is imminent, TVA, USCG, USACE, and transportation officials should:

1. USCG will arrange the initial conference call, when it is anticipated that navigation conditions will worsen.
2. Activate previously assigned dedicated contact persons and support staff.
3. Notify affected parties the emergency communication network is being activated.
4. Determine resource and logistic needs.
5. Establish a briefing schedule.
6. Post notice on the RIBB on the Internet of potentially deteriorating navigation conditions on the Tennessee River. (After the USCG has issued a BNTM.)

Action Phase

This is the point when USCG, TVA, USACE and transportation officials have determined that a large-scale transportation emergency exists. They should:

1. Update information from the Watch Phase and activate frequent communication.
2. Convene a joint conference to determine the impact of anticipated scenarios so that the best possible alternative may be selected in advance of actual implementation.
3. Issue an advisory to affected waterway users that reflect the situation and anticipated actions.
4. The USCG drafts a news release and navigational advisory to announce safety zone implementation.
5. Augment staff (if necessary) for previously assigned dedicated contact persons.
6. Establish an information system for gathering pilot input on navigating conditions via industry.
7. Increase surveillance to capture real-time pictures of river conditions.
8. The USCG issues news releases outlining the crisis situation, the establishment of the Traffic Information Center (TIC) and planned intervention activities.
9. Issue a BNTM and revise notice for the RIBB on the Internet of potential actions by the COTP for the Tennessee River.
10. Initiate development of policies for vessel queuing, test tow procedures, special movements, vessel replenishment, and reduced crewing.
11. The COTP will establish a safety zone in preparation for the cessation of navigation within the affected area.
12. The USCG issues regular news releases, navigation advisories (BNTM), and briefings to ensure a continuous flow of information to all interested parties. The RIBB is updated.

Emergency Phase

During this phase, USCG, TVA, USACE, and transportation officials have determined that a large-scale transportation emergency exists. They should:

1. Examine the crisis and update information from the Action Phase.
2. Issue notices implementing safety zones.
3. Issue waivers to vessels needed to maintain safe harbor operations.
4. Discuss imminent operations and revise the Op Order as necessary.

5. Post notice on the RIBB Internet page of the situation and the actions taken. The USCG issues BNTMs.

6. The USCG issues a news release explaining the situation and the actions taken.

7. Initiate traffic management in preparation for the restart of operations.

8. Make preparations for initiating test tows and queuing systems.

9. Continue communications among TVA, USCG, USACE, and transportation officials to brief them on the situation and the proposed traffic start-up plan.

10. Continue information gathering from overflights, industry vessel location reports, and surface patrols.

11. Prepare a briefing for the TRVA/TCWC on river conditions necessary to resume navigation and the restrictions that are anticipated once traffic resumes.

12. Obtain concurrence between federal, state, and local governments to restart navigation.

13. Determine sufficient aids to navigation are in place to permit resumption of navigation.

14. If warranted, establish "trigger" river stages for the start of a "test tow" program and the eventual resumption of limited traffic.

15. If the test tow proves successful, traffic resumption efforts should move forward.

16. Use the data and experience gained in the "test tow" program to establish tow size and limits for the eventual restart of traffic.

Recovery Phase

During this phase USCG, TVA, USACE, and transportation officials have determined that a large-scale transportation emergency no longer exists. They should:

1. Continue with telephone conferences, if warranted, to examine the crisis and update information in the Emergency Phase.

2. Unless otherwise indicated, provide updates through news releases, BNTM and Internet site updates.

3. Evaluate operating restrictions on a recurring basis.

4. Maintain any imposed operating restrictions and issue updated navigational advisories as necessary.

5. Announce the end of the TIC through news releases, BTNMs, and other means possible (i.e. RIBB).

6. Conduct a debriefing of the operation to capture lessons learned.

7. Draft an after-action report and incident history to be used in refining the TRWMP.

8. Collect and archive pertinent records of the response.

9. Return the assigned dedicated contact persons to their normal functions.

5
Low Water

During periods of low water, navigation may be constrained by the amount of water that TVA can make available. Tows may encounter reduced channel widths and draft limitations. During winter drawdowns for flood control, TVA augments flows to facilitate commercial traffic downstream of Pickwick and Wilson Locks and in the channel above Knoxville. Appendix III provides the pertinent low water information.

6

Environmental or Other Emergencies

At times, situations develop that are not related to weather. Bridge construction accidents, downing of electrical transmission lines, or chemical or petroleum spills may require navigation interruption by the USCG. During these periods, the USCG has control of the situation and makes the necessary decisions. Pertinent information about these events is distributed using the communications guidelines of the TRWMP.

7

Authorities and Responsibilities

The successful management of any traffic crisis is dependent on the cooperation of the waterway system participants. This includes agencies of the federal government, state and local emergency management agencies, and industry groups. This chapter identifies the key organizations in these areas, outlines their authorities and responsibilities, and explains their involvement with traffic management during a river crisis.

7.1 Federal Agencies

There are three federal agencies primarily responsible for actions relating to navigation on the Tennessee River—TVA, USCG, and USACE.

Federal law provides the requisite authority for establishing and maintaining a clear navigational path throughout United States territorial waters. Included as part of a national waterway system is the Tennessee River and its tributaries, which are part of the inland waterway system. Primarily, the USCG regulates navigation on these "navigable waters of the United States." The USACE provides technical advice to the USCG to enable them to properly evaluate and make decisions on navigation safety matters. TVA is responsible for authorizing waterway projects on the Tennessee River, and with the USACE, evaluating and maintaining navigation facilities and channels, and directing emergency flood-control operations.

7.1.1 Tennessee Valley Authority

TVA: Under the TVA Act of 1933, as amended, 6 U.S.C. §§ 831-831dd (1994), TVA is authorized to construct and operate dams and reservoirs in the Tennessee River and its tributaries to promote navigation and to control destructive floods. Also under the TVA Act, TVA has broad responsibilities for the "development of the natural resources of the Tennessee River drainage basin and of such adjoining territory as may be related to or materially affected by the development for the general purpose of fostering an orderly and proper physical, economic, and social development of said areas. The broad responsibilities placed on the Authority relate to navigability, flood control, reforestation, marginal lands, and agricultural and industrial development of the whole Tennessee Valley." Those responsibilities specifically include the construction and maintenance of the dams and reservoirs in the Tennessee River and its tributaries and providing a nine-foot channel in the river. See 16 U.S.C. 831C(l).

TVA is headquartered in Knoxville, Tennessee.

7.1.2 U.S. Coast Guard

USCG: Title 14, U.S.C., defines USCG roles and responsibilities in establishing and maintaining the safety of ports and waterways. 33 CFR 165.20 gives COTPs and USCG District Commanders the authority to impose safety zones, security zones, and other restrictions to ensure the safe flow of navigation.

The COTP for the Tennessee River is the Commanding Officer of the Marine Safety Office in Paducah, Kentucky.

7.1.3 U.S. Army Corps of Engineers—Nashville District

USACE: Title 33, U.S. Code defines USACE roles and responsibilities regarding development of or changes to waterfront facilities, weirs, dams, or dikes. Specifically, the USACE is authorized to review and approve all changes to hydrodynamic structures for the purposes of maintaining a navigable channel. In addition, the USACE is charged with conducting waterworks operations to maintain the physical nature of a navigable channel on particular waterways. By Memorandum of Agreement with TVA, USACE is responsible for operation and maintenance of the locks on the Tennessee River. The USACE also maintains the Tennessee River commercial channel and federal mooring facilities.

USACE jurisdiction on the Tennessee River is headquartered in Nashville, Tennessee.

7.1.4 U.S. Army Corps of Engineers—Lakes and Rivers Division, Cincinnati

The USACE Lakes and Rivers Division coordinates Tennessee River releases during flood events to minimize impacts on the lower Ohio and Mississippi Rivers.

The USACE Lakes and Rivers Division is located in Cincinnati, Ohio.

7.2 State and Local Governments

State and County Emergency Management Agencies (SCEMA) personnel and local public safety personnel represent local interests and can significantly impact traffic management decisions. Though it is not always practical to involve local interests in traffic management decisions, particularly when they involve federal statutory requirements, SCEMA should be consulted and informed of decisions that may have an effect on local waterways and overall public safety. If necessary for successful problem resolution, an invitation may be extended to a state or local agency to participate in a particular emergency traffic event. Currently, TVA has agreements with the Hamilton and Loudon County EMAs for notifying barge terminal operators when specific trigger flows are anticipated in their respective areas.

7.3 Industry Groups

As the principal river users and experts, industry groups should be called upon to provide assistance during waterway management activities. TRVA and TCWC are the primary organizations available to provide these services on the Tennessee River. Designated contact members of TRVA and TCWC are listed in Appendix I.

8 Communications

Efficient and effective communication can prevent or minimize damage and/or losses that can occur due to a navigation transportation emergency. With the most current and correct information available, towboat operators can make the necessary decisions to minimize their risk and potential damage to the navigation system. Communication between towboat operators, TVA, USACE, and USCG will assure the most current vessel locations and ensure decisions are based on timely information.

Communications has three distinct phases: collection, processing, and dissemination. The TVA, USACE, and USCG staffs must ensure that as much information as possible has been received, is accurate, and properly and timely disseminated. Timely reports should be provided to the public affairs officers of TVA, USACE, and USCG for dissemination to interested parties.

Communication Methods

The USCG must communicate with TVA, USACE, and as many users as possible, primarily by conference call, to reach timely decisions affecting the waterway. The following discusses the additional means that results of the conference calls can be disseminated:

The best method of communication in a standard and effective manner is by using technology such as the Internet, auto-attendant phone systems, and fax on demand. TVA, USACE, USCG, and towing industry all have Internet sites. A list of these sites can be found in Appendix IV, and the appropriate information will be posted on these sites and updated as frequently as possible as the information changes. Current Internet and mapping technology allow an almost instantaneous update and retrieval by multiple users.

Other information systems such as fax on demand and auto-attendant phone systems should be available for those who do not have Internet access.

There is a time when person-to-person contact is the best way to communicate during a crisis. Personal attention to the concerns of key customers and local emergency operations staff can eliminate feeling of mistrust or apprehension. The use of person-to-person contact takes more time than other communication methods and should be used judiciously.

While the goal of this plan is to minimize reliance on telephone, voice-to-voice contact, that option still exists. By using current technology, information can be properly detailed and frequently updated and the number of phone conversations minimized.

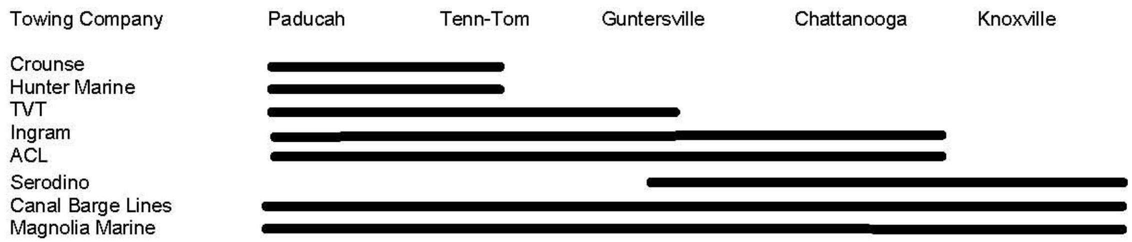
9
Public Information

The general public has a major stake in the timely restoration of marine commerce following a river crisis. Extended river closures have a tremendous impact on local and regional economies. For general and recreational safety, navigational emergency information needs to be passed to the public in a timely fashion. With the Internet sites publicized, many individuals can access the information of value to them. In addition to the Internet, announcements on radio and television serve a function. Again, those without Internet access may call an automated phone attendant.

Appendix I

Assigned Dedicated Contact Persons

Typical operating river ranges to readily select minimum quorum of three for USCG consultation.



Information on this page is current through September 15, 2003

Appendix II

High Water

Tennessee River Trigger Points/Recommended Actions

- Watch Phase Criteria
- Action Phase Criteria
- Emergency Phase Criteria

Sample of USCG Broadcast Notice to Mariners

WATCH PHASE CRITERIA

Facility	Tailwater gage reading (ft) and elevation (MSL)		Flow in 1000 cubic feet per second	Comments
Kentucky Lock	n/a	n/a	300	Tailwater gage readings are influenced by the Ohio River stage at Paducah, KY.
Pickwick Main Lock	44.0	386	175	Upbound fast double lockages will not be conducted when there is discharge through the spillways, regardless of the amount, or when total discharge exceeds 100,000 cfs.
Pickwick Aux Lock	43.8	386	175	Downbound fast double lockages will not be conducted when the total discharge exceeds 100,000 cfs unless specifically requested by the operator of the vessel to be locked.
TRM 256.5			200	High flows make entrance to Florence Canal difficult.
Wilson Main Lock	30.0	425	200	
Wheeler Main Lock	17.5	509	200	
Guntersville Main Lock	29.7	567	130	
Nickajack Lock	26.0	606	100	
The Gorge, TRM 446-455			46	
Chickamauga Lock	20.8	639	46	Hamilton Co. EMA notified to alert terminal operators at flows in excess of 46,000 cfs.
Watts Bar Lock	22.8	686	45	Full turbine capacity.
Fort Loudoun Lock	23.8	747	30	Full turbine capacity.
Melton Hill Lock				Mariners must contact Fort Loudoun Lock to schedule lockages.

ACTION PHASE CRITERIA

Facility	Tailwater gage reading (ft) and elevation (MSL)*		Flow in 1000 cubic feet per second	Comments Safety advisories with recommended tow restrictions may be implemented.
Kentucky Lock	n/a	340	n/a	Tailwater gage reading at which monitoring for rising level begins.
Pickwick Main Lock	52.0	394	225	Use caution on Kentucky Lake due to increasing tailwater slope.
Pickwick Aux Lock	51.8	394	225	
TRM 256.5			275	High flows make entrance to Florence Canal difficult.
Wilson Main Lock	32.5	427.5	275	
Wheeler Main Lock	16.4	507.9	275	
Guntersville Main Lock	31.7	569	160	
Nickajack Lock	28.5	608.5	125	
The Gorge, TRM 446-455			75	Recommend navigation through the Gorge during daylight hours only at flows above 75,000 cfs.
TRM 454-468			75	Hamilton County EMA notified at flows greater than 46,000 cfs to alert Chattanooga terminal operators.
Chickamauga Lock	24.3	642.5	75	
Watts Bar Lock	22.3	685.5	50	
TRM 592-601			50	Loudon County EMA notified to alert terminal operators.
Fort Loudoun Lock			45	Use caution due to cross-currents above lock.
Melton Hill Lock				Mariners must contact Fort Loudoun Lock to schedule lockages.

* Maximum tailwater assumes maximum pool level at downstream facility.

EMERGENCY PHASE CRITERIA

Facility	**Tailwater gage reading (ft) and elevation (MSL)** (Varies based on HW of downstream reservoir, or Ohio R. at Paducah, KY)		**Flow in 1000 cubic feet per second**	**Comments** Safety zones with tow restrictions or river and lock closures will be implemented.
Kentucky Lock	n/a	341	n/a	Tailwater gage readings at which lockage is discontinued.
Pickwick Main Lock	58.0	400	400	2' freeboard on lower approach wall.
Pickwick Aux Lock	57.8	400	400	Lower approach wall is under water.
TRM 256.5			350	High flows make entrance to Florence Canal difficult.
Wilson Main Lock	35.0	430	350	Florence canal protects lower lock approach, difficulty is in canal approach or departure a TRM 256.5
Wheeler Main Lock	17.5	509	350	
Guntersville Main Lock	35.7	573	200	Lock closed due to high flows which make entrance to lower approach difficult.
Nickajack Lock	32.5	612.5	175	
The Gorge, TRM 446-455			90	Safety zone enacted and barge traffic discontinued through Gorge.
TRM 454-468			90	Hamilton County EMA previously notified to alert Chattanooga terminal operators.
Chickamauga Lock	26.3		90	Lock closed due to turbulence at mooring cells, making tow breaking down or rebuilding unsafe for deckhands.
Watts Bar Lock			100	Lock closed due to turbulence in lower approach channel.
TRM 592-601			n/a	Loudon County EMA previously notified to alert terminal operators.
Fort Loudoun Lock			60	Lock closed due to high flows downstream.

Sample Broadcast Notice to Mariners

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                          *      UNCLASSIFIED      *
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FROM: GRUP/GRUOHVCOMM                                  18:10:36 Apr 21, 98
PD 02 DE NC
PD/002328 02/001685
_____________________________________________________________________________
                        UNITED STATES COAST GUARD
                   GROUP OHIO VALLEY COMMUNICATIONS CENTER
                              LOUISVILLE, KY
            *** Action Office is responsible for all Action, ***
            *** Re-addressing and Re-routing required by this **
              *** message. (COMDTINST M2000.3, Art 10.A.4) ***
_____________________________________________________________________________
P 211730Z APR 98 ZUI ASN-GOV111000066
FM COMCOGARDGRU OHIO VALLEY LOUISVILLE KY
TO CCGDEIGHT NEW ORLEANS LA//OAN/M/CC//
INFO COGARD DIRWESTRIVOPS ST LOUIS MO
PD/COGARD MSO PADUCAH KY
COGARD MSD NASHVILLE TN
CDRUSAED NASHVILLE TN
02/USCGC OUACHITA
BT
UNCLAS //N16502//
SUBJ: WESTERN RIVERS BNM 0170-98 OV
SAFETY AND ALL SCHEDULED BROADCASTS UNTIL CANCELLED.
USCG EIGHTH DISTRICT NOTICE TO MARINERS NR 0170-98 OV
TENNESSEE RIVER
THE COTP PADUCAH, IN CONSULTATION WITH TVA, THE CORPS OF ENGINEERS
AND THE TOWING INDUSTRY, HAS ESTABLISHED A SAFTEY ZONE ON THE
TENNESSEE RIVER FROM MASSENGALES LIGHT, MI 446.0 TO WILLIAMS LIGHT,
MI 454.6. NO VESSEL MAY ENTER THIS SAFTEY ZONE WITHOUT PRIOR APPROVAL
OF THE COTP. EXTREMELY HIGH FLOW RATES FROM CHICKAMAUGA DAM HAVE
PRODUCED HAZARDOUS NAVIGATING CONDITIONS THROUGHOUT THIS AREA. FLOW
RATES ARE EXPECTED TO DROP FROM THEIR CURRENT LEVELS OF 180,000 CFS
TO 125,000 CFS BY THURSDAY MORNING 23 APR. AT THAT TIME, SAFETY ZONE
RESTRICTIONS WILL BE REEVALUATED.
BT
NNNN
_____________________________________________________________________________
Posted By: DPO     13:21:46 Apr 21, 98
Posted To:         Apr-21-98
Viewed By: CAB     13:26:00 Apr 21, 98
           SEC     15:04:51 Apr 21, 98
           CO      15:30:31 Apr 21, 98
           LTE     07:12:42 Apr 22, 98

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                          *      UNCLASSIFIED      *
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211730Z APR 98  COMCOGARDGRU OHIO VALLEY LOUIS                  PAGE 01
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Appendix III

Low Water

Tennessee River Trigger Points Recommended Actions

- Watch Phase Criteria

WATCH PHASE CRITERIA

Facility	Tailwater gage reading (ft) and elevation (MSL).		Comment
Kentucky Lock	11	300	TW below El 300 presents difficulties to tows entering and leaving the chamber. *
Pickwick Main Lock	13	355	TVA provides flows to maintain minimum tailwater elevation of 355.0. **
Pickwick Aux Lock	12.8	355	Upper miter sill only has 10' clearance at minimum headwater elevation 408.0.
Sheffield Cut, TRM 252-254			Minimum Pickwick pool elevation 408.0. **
Wilson Main Lock	13	408	
Wheeler Main Lock	13	504.5	
Guntersville Main Lock	13.2	550.5	
Nickajack Lock	13	593	
Chickamauga Lock	13.8	632	
Watts Bar Lock	11.8	675	
Fort Loudoun Lock	11.8	735	
Above Knoxville TRM 649-652			Minimum depth of 7' at minimum pool EL. 807. TVA periodically augments flows to attain EL 809 for barge transit.**

MSL- Mean Sea Level

* During periods of low rainfall and a falling Ohio River stage, the wicket gates are set at Lock & Dam 52 to stabilize the water level in this stretch of the river for navigation. Gates cannot be set until the Ohio River elevation at L&D 52 is between 298.5 and 299.0 MSL. It takes between 12 and 24 hours to set the gates and stabilize the pool. During this period, the tailwater at Kentucky Lock and Dam may fall below El 300.0.

** Flows provided in accordance to TVA's low water guidelines for Pickwick, Wilson and above Knoxville.

Appendix IV

Internet Sites for River Information

USCG— http://www.uscg.mil/d8/uscgd8.htm

USACE—http://www.ord-wc.usace.army.mil

TVA—www.lakeinfo.tva.com

RIBB—http://www.ribb.com

Glossary

ADCP	Assigned Dedicated Contact Person(s)
ATON	Aids to Navigation
BNTM	Broadcast Notice to Mariners
CFS	Cubic Feet per Second
COTP	Captain of the Port
EMA	Emergency Management Agencies
IAP	Incident Action Plan
MRCAP	Mississippi River Crisis Action Plan
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
Op Order	Operations Orders
RIBB	River Industry Bulletin Board
SCEMA	State and County Emergency Management Agencies
TCC	Traffic Control Centers
TCWC	Tennessee-Cumberland Waterway Council
TIC	Traffic Information Center
TRWMP	Tennessee River Waterway Management Plan
TRVA	Tennessee River Valley Association
TVA	Tennessee Valley Authority
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USGS	U.S. Geological Survey

Notes

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