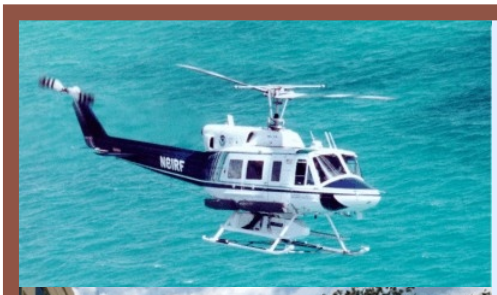

"As Mobile Goes, So Goes the Corps"

A Look at Change Inside a Government Agency

US Army Corps of Engineers
Mobile District, 1985-2003

Brockington and Associates, Inc.
Atlanta Charleston Raleigh
2006

Authorization for the Project

"As Mobile Goes, So Goes the Corps" A Look At Change Inside A Government Agency, Mobile District, US Army Corps of Engineers, 1985-2003 is produced by Brockington and Associates, Inc., Charleston, South Carolina under US Army Contract DACA01-02-D-001, Task Order No. 44. This contract authorizes Brockington and Associates, Inc., to provide a history of the Mobile District from 1985 to 2003. The history is presented in keeping with public history standards and includes an oral history component. It is prepared following the basic themes laid out in a proposal prepared by Brockington and Associates, Inc., in 2002 (Contract No. DACA01-02-D-001, Task Order No. 0023).

Prologue and Acknowledgments

A key component of this history project was the personal oral interviews. During several weeks in Mobile, Charles Philips and Ralph Bailey conducted 41 face to face oral interviews with individuals ranging from former District Engineers to clerical personnel. Most of the interviews were carried out at the District Office. Some were done offsite. Several additional interviews were conducted over the telephone. The interviewees were given a set of questions that were both generic and specific. The generic questions were provided to the interviewee several weeks prior to the interview. The questionnaire quizzed each participant on several aspects of the changes in District culture, information technology, and project management and district projects. The interviewees were asked to speak frankly about both the positive and negative aspects of these changes, if they believed that the changes had occurred. The specific questions dealt with individual projects to which the interviewees were privy. All of the face to face interviews were taped. We expected some interviewees might be guarded with their answers, but were pleasantly surprised by their frank and thoughtful comments. Along with providing background materials for this narrative, the recordings will be provided to the Mobile District.

To accomplish this research, the authors spent three weeks at the Mobile District Office in the fall and winter of 2003–04. During the visit, the authors conducted the interviews and reviewed archival material. We ingested a long list of materials to help better understand the U.S. Army Corps of Engineers, its controversies and claims. We were aided by members of the Public Relations Office, especially Ms. Lorraine Evans and Ms. Janet Shelby. The District Engineer, Colonel Robert Keyser, gave us full access to anyone and everything but classified material. Ms. Sissy Scott and Ms. Audrey Imsand put us in touch with former members of the Mobile District and obtained other valuable information for this work. Mr. Ernie Seckinger directed the project for the Mobile District. He was an excellent source of information and encouragement. He also helped provide access to key employees. Many others gave their time and attention when it was obvious that they had much better things to do than talk to "the guys writing the history."

As we began this project, we were somewhat skeptical of claims of substantial change inside a government agency. The Army Corps of Engineers, so we thought, was often associated in the media with insensitivity to public needs, obsession with large government-subsidized water projects, and entrenched defiance to change. One interviewee recalled that the Corps has been likened to an "800-pound gorilla."

However, surprise and consistency dominated our experience. Surprise, because we discovered that serious changes had taken place inside the Mobile District. Consistency, because it seemed that not only had the changes taken place, but they seemed to be both wide and deep. Everywhere I went, I found civil servants concerned about the "customer's" opinions, about not going over budgets, and about meeting deadlines. They spoke freely about working together as teams and partners with their clients and contractors. They talked openly and seemed responsive to the many players in their complex projects. They confronted their detractors with facts and thoughtful consideration and were far from being "closed-

minded," as their critics often charge. They showed an understanding of both the public need for information and the Corps' need to carry out its mission. It was obvious that they had adapted to the newest digital technologies, and were employing these to better serve their clients and each other.

The Mobile District is not without its problems. There is an ongoing battle of words with some environmental groups and a, sometimes hostile, public media. We found members of the District concerned with the "business" approach the agency has taken. This sparked lively debate. We saw continuing worries over job security by many of the civil servants with whom we spoke. We saw concern that new changes in structure might become entrenched when there is a need to adapt in the future—old habits die hard.

Most of all, we found a group of individuals who take their jobs very seriously and believe they are serving their country in real ways that make a difference. They acknowledge their weaknesses. They work to improve them; they are proud of the work they do, and the impact that it has had on the country.

In 1997, General Joseph Ballard, Chief of Engineers for the U.S. Army, spoke to top Corps of Engineers leadership. As he outlined the changes coming to the Corps, he mentioned that the Mobile District had recently undergone a Reduction in Force and a restructuring to adapt to its future mission. Then, Ballard added, "and as we all know, as Mobile goes, so goes the Corps." The U.S. Army Corps of Engineers is looking to districts like Mobile for leadership. We extend our thanks to the many members of the Mobile District that helped with this history. The authors accept full responsibility for all errors either of omission or commission.

Mr. Adrian Lamarre made available to us a wide range of photographs taken over nearly 20 years. We would like to thank him for his help. We would also like to note that except where noted, photographs were from the Mobile District archives.

Ralph Bailey, Jr.

Charles Philips, Jr.

January 2006

Glossary of Terms

A-76—Office of Management and Budget circular that gives guidelines for comparing government services with those in the private sector.

ACF—Apalachicola-Chattahoochee-Flint River System in Alabama, Florida, and Georgia.

ACT—Alabama-Coosa-Tallapoosa River System in Alabama and Georgia.

AEDC—Arnold Engineering and Development Center in Tullahoma, Tennessee. This center is often referred to simply as Arnold.

ASACW—Assistant Secretary of the Army for Civil Works. Chief of Engineers reports to this sub-Cabinet level appointee of the President.

ADP—Automated Data Program. Former name of the Corps' Information Management Branch.

BRAC—Base Realignment and Closure. First passed by Congress in 1988 to close antiquated bases and realign active bases.

CADD—Computer Aided Design and Drafting. Nearly all Corps designing and drafting is done by computers using CADD.

Canal Zone—Panama Canal Zone. A common term referring to the strip of land inside the Republic of Panama within which the Panama Canal was built and owned by the U.S. until 1999.

Capital Ventures Initiative—Federal law passed to allow private landowners to preserve environmentally sensitive lands while generating income to offset the cost of housing for military families.

CEFMS—Corps of Engineers Financial Management System. The Corps of Engineers current (2003) financial management software program.

COEMIS—Corps of Engineers Management Information System. Corps of Engineers financial management system prior to the adoption of CEFMS in the mid-1990s.

Consent Decree—legal agreement whereby the Mobile District agreed to increase minority hiring, especially for management positions, over a five-year period that ended in 1987.

Benefit/Cost ratio analysis—economic methodology used by the Corps of Engineers to calculate the return on investment in a given project.

CPAR—Construction Productivity Advancement Research. Program for Corps of Engineers to use the Technology Transfer Act to improve construction technology.

Design/Build Contract—Corps of Engineers method of construction contracting that specifies only the basic requirements of a contract, usually the primary functional details, and leaves to the contractor much of the design and methodology.

District Engineer—the highest-ranking officer in a Corps district. Typically, a Corps of Engineers District Engineer is a colonel.

DTOS—Deployable Tactical Operations System. A five-vehicle response system that brings the Corps of Engineers Emergency Management team to a national level emergency scene.

Division Engineer—the highest-ranking officer in a Corps division. Each Corps of Engineers district belongs to a division. The Mobile District belongs to the South Atlantic Division.

ECCV—Emergency Command and Control Vehicle. Tractor-trailer rig that serves as the Command and Control Center when the Corps of Engineers DTOS emergency response unit is activated.

Economic Impact Forecast System—The Army's method of evaluating the economic impact of changes at installations.

EIS—Environmental Impact Statement. This document is required by NEPA on all projects that could potentially harm or damage the natural environment. The Corps of Engineers has been actively involved, along with the courts, in defining the components of these evaluations.

EOC—Emergency Operations Center. An office is found in each district in the Corps as well as at the divisional level.

EPA—Environmental Protection Agency. This agency is an independent agency of the executive branch of the U.S. government that oversees federal efforts to protect human health and the natural environment.

ESSV—Emergency Support and Sustainment Vehicle. Support vehicle for the DTOS emergency response unit. Vehicle usually pulls the satellite antenna.

ETOC—Emergency Tactical Operations Center. Motor Home sized portable emergency vehicle. Center is located in the Tactical Operations Center in Mobile. It is part of the DTOS emergency response unit.

Federal Eagle Hacking Program—plan that reintroduces eagles into former habitats.

FEMA—Federal Emergency Management Agency. The Corps operates in emergencies under the auspices of this federal agency tasked with organizing responses to natural and man-made disasters.

Field Force Engineering—Corps support plan to help combat units obtain rapid information from Corps districts on engineering problems in the field. Combined with a tele-engineering kit, this support is sometimes referred to "reach back support."

FOL—Forward Operating Location. Military operations base near the operations area.

GIS—Global Information System. Method of using positioned satellites to instantly transmit information world-wide. Often used in conjunction with GPS (Global Positioning System), which is used by the U.S. government and the private sector to locate exact coordinates on the earth.

Ground Zero—name given to the site of the World Trade Center after the towers collapsed on September 11, 2001.

Information Management—branch inside each Corps of Engineers district that handles all aspects of information flow, including the maintenance and updating of computers.

Inland Waterways Trust Fund—special congressionally established fund financed by a fuel tax on inland waterway users and sometimes used to help finance inland waterway projects such as the Oliver Lock and Dam.

J-6—J-6 Large Rocket Test Facility at Tullahoma, Tennessee.

JALBTX—Joint Airborne Lidar Bathymetry Technical Center of Expertise.

Life Cycle/Project Management—division inside all Corps of Engineers district offices that coordinates the project-delivery teams. Division was later called just Project Management and more recently Project Management Business Plan.

MDO—Mobile District Office.

Mitigation—In the Corps of Engineers context, mitigation allows a development to proceed because the developer has agreed to purchase or set aside (mitigate) other property of equal or greater value.

NAGPRA—Native American Grave Protection and Repatriation Act of 1990. This federal law mandates that U.S. government agencies return to the Native American tribes thousands of graves that have been disinterred and not properly reburied over the years.

NEPA—National Environmental Policy Act of 1969.

Partnering—Corps of Engineers program for sharing management responsibilities on Corps projects with non-federal cost-sharing partners.

Project Delivery Teams—teams of individuals of various disciplines within the district as well as customers/clients who manage the projects.

RIF—Reduction in Force. Government term for a permanent layoff of personnel.

Regional Village—concept promoted by South Atlantic Division Engineer Ralph Locurcio to electronically link the districts in the South Atlantic Division to coordinate work and share information.

Section 404—Provision in the Federal Pollution Control Act Amendment of 1972 that specifically gives the U.S. Army Corps of Engineers authority to regulate dumping and filling activities in the waters of the U.S., including wetlands.

9/11—term used to describe the terrorists attacks on the U.S. on September 11, 2001.

SHOALS—Scanning Hydrographic Operational Airborne Lidar Bathymetry. A more advanced form of SHOALS is being developed at the Mobile District Office, called **CHARTS**: Compact Hydrographic Airborne Rapid Total Survey.

SMAB—National Aeronautics and Space Administration (NASA) acronym for the Solid Motor Assembly Building at Kennedy Space Center, built by the Mobile District in the late 1980s.

SOCSOUTH—U.S. Operations Command South.

SOUTHCOM—Defense Department acronym for the command structure currently located in Miami that coordinates all U.S. military involvement, including counter-drug activity, in Latin and South America.

Stovepipes—common term that denotes the functional areas into which the Corps of Engineers is organized in the decades following World War II. Similar to stovepipes in a building, each division (i.e., Engineering, Construction, Planning, etc.) within a district completed its work and turned it over to the next. Though all the divisions in a district were joined under the district engineer, they operated quasi-independently.

Technologies and Transfer Act of 1986—offered incentives for private business, government agencies, and academia to work together to enhance U.S. technological advancement.

Tele-engineering kit—special portable engineering kit that includes laptop computers and dial-up satellite linkage to allow video conferencing and data transfer between support and field units. See also Force Field Engineering.

Tenn-Tom—shortened version of the "Tennessee Tombigbee Waterway."

TIP—Treaty Implementation Plan. This was the Corps of Engineers plan for phasing out U.S. forces at the Panama Canal Zone. The plan was implemented in the 1990s.

TIPMO—Treaty Implementation Plan Mobile Office.

TOC—Tactical Operations Center. Corps-wide operations emergency management center located in the Mobile District. The western center is located in the Sacramento District.

TOCC—Test Operation Control Center at John F. Kennedy Space Center at Cape Canaveral, Florida.

UOC—USACE Emergency Operations Center. The main office is located in Washington, D.C.

USACE—United States Army Corps of Engineers.

USAID—United States Agency for International Development. A primary U.S. agency to funnel funding for health and infrastructural improvements into Third World countries.

USARSO—U.S. Army South Command.

VE—Value Engineering, the Corps approach to engineering that attempts to improve the value of the project by looking at functionality.

VERA—Voluntary Early Retirement Authority, a program for those choosing to resign early in their career, usually in lieu of a layoff.

VSIP—Voluntary Separation Incentive Pay. Used to help those volunteering to resign during a layoff of personnel.

Water Resource Development Act of 1986—adopted a new formula for cost sharing between the federal government and other agencies for new water projects.

WTC—World Trade Center.

Chronology of Events, 1985 to 2003

1985 District Engineer Colonel C. Hilton Dunn calls for fundamental change in the philosophy and structure of the Mobile District. The Mobile District dedicates the Tennessee-Tombigbee Waterway in June. The District involvement in anti-insurgency efforts in Latin America is ongoing.

1986 Congress passes the Water Resources Development and Technologies Transfer Acts. Gaillard Island helps bring back the Brown Pelican from the Endangered Species list. The Information Management Division is created. The District begins acquiring 88,000 acres of land as mitigation for wildlife habitat impacted in building the Tenn-Tom Waterway.

1987 Colonel Lawrence Bonine replaces Colonel Dunn as District Engineer.

1988 The District implements Life Cycle/Project Management as a test project. CADD is introduced in the District. The first Base Realignment and Closure Act (BRAC) is passed by Congress.

1989 George H. W. Bush becomes the 41st President of the United States. The Life Cycle/Project Management Division is formally created within the Corps of Engineers. The Berlin Wall is taken down and the former Soviet bloc countries open their borders to the West. The District picks up work for the government of Bolivia, which lead to establishment of the first field office in South America.

1990 The Soviet Union collapses and many of its former provinces become independent republics. El Salvador and Honduras declare an end to the insurgency war. Congress announces its plans for BRAC in five stages. The District is called upon to lead preparation of Environmental Impact Studies for the Army and Air Force as part of the BRAC. Colonel Michael Thuss replaces Colonel Bonine. Saddam Hussein invades Kuwait, precipitating the first Gulf War (1990–91). The state of Alabama sues the Corps of Engineers over water allocation of the ACF River System. Florida joins the discussions over the water allocation of the ACF River System.

1991 The District replaces the Harris Minicomputer Mainframe with microcomputers; the Computer Age begins. Allied forces drive Iraq from Kuwait.

1992 William J. Clinton becomes the 42nd President of the United States. The European Economic Union unites most of Western Europe into one large market. Colonel Robert Griffin replaces Colonel Thuss as District Engineer. Hurricane Andrew devastates Homestead, Florida. Oliver Lock and Dam is completed. The first casinos are built on the Mississippi coast.

1993 J-6 Large Rocket Test Facility completed.

1994 SHOALS technology is first tested.

1995 Colonel William S. Vogel replaces Colonel Griffin.

1996 The CEFMS software is introduced to the District.

1997 The District experiences a Reduction in Force. The District completes the Sparkman Center at Redstone Arsenal.

1998 Colonel John D. Norwood replaces Colonel Vogel.

1999 The U.S. turns over control of the Panama Canal to the Republic of Panama. Attacks increase on Mobile contractors in Colombia. Beau Rivage Casino and Hotel Complex opens in Biloxi.

2000 Y2K "bug" threat amounts to very little, and the District passes through the year without any systemic failures. The District becomes one of two nationwide tactical support centers for Detachable Tactical Operations System (DTOS).

2001 George W. Bush becomes the 43rd President of the United States. Colonel Robert Keyser replaces Colonel Norwood. Arab terrorists attack the Pentagon, the World Trade Center and cause the crash of another airliner in Pennsylvania on September 11. The District-based DTOS units are deployed to the World Trade Center to aid in the rescue and cleanup operations the same day. A U.S.-led international coalition invades Afghanistan.

2002 The Taliban is driven from control of Afghanistan.

2003 A U.S.-led coalition invades Iraq. The District completes the first phase of the Von Braun Center at Redstone Arsenal. Florida backs out of the ACF agreements and Alabama revives a 13-year-old lawsuit against the COE.

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Part I

An Introduction to Project and Information Management

A Framework for Change

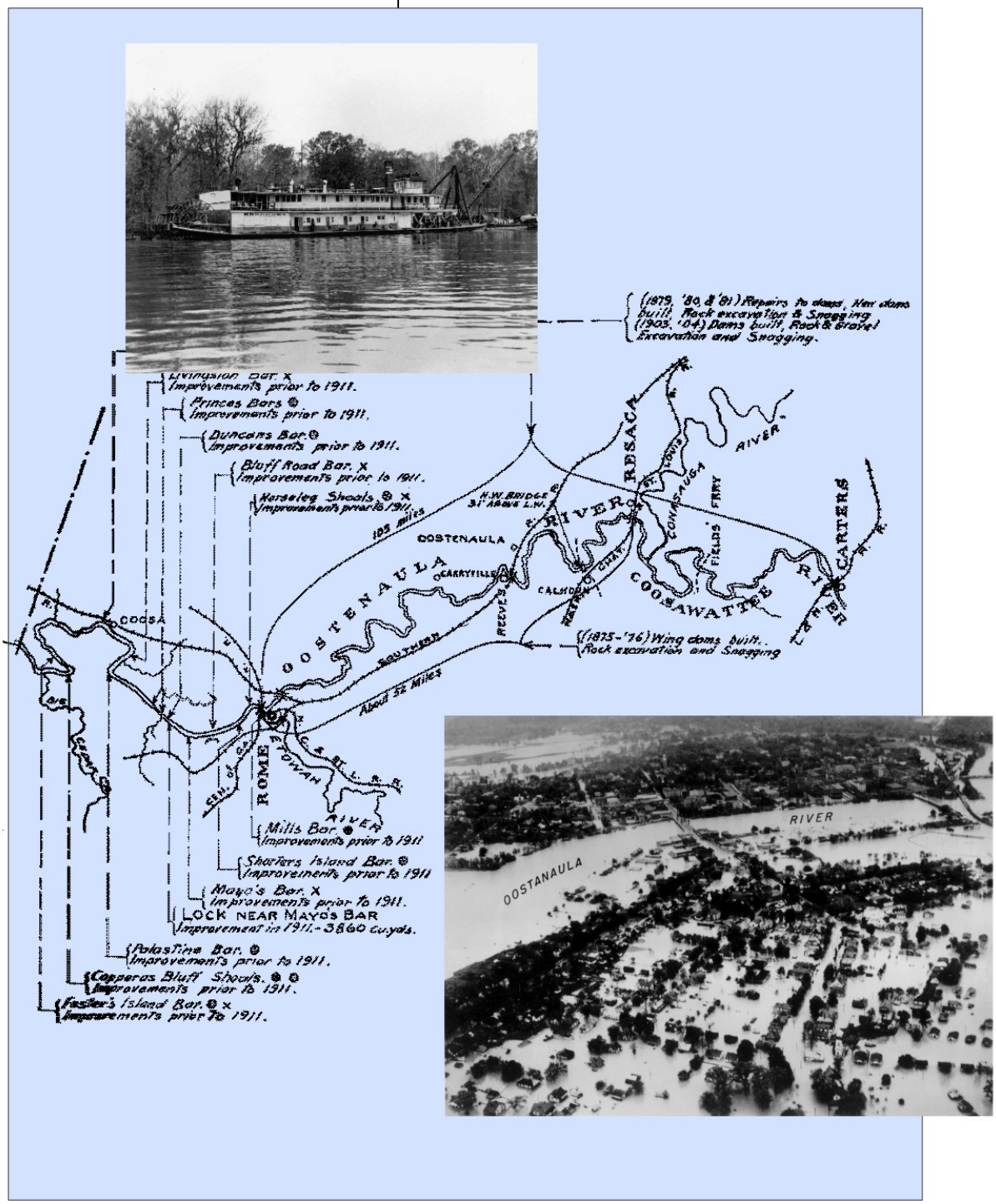
The First 170 Years

In 1985, Dr. D. Gregory Jeane completed his history of the Mobile District Office of the U.S. Army Corps of Engineers from its inception in 1815 to 1985. From the first permanent assignment of an Army engineer to Mobile in 1815, to the space age in the 1980s, the narrative of the Mobile District unfolds meticulously for 170 years. In 1935, the merger of the former Mobile and Montgomery Districts formed the Mobile District. Today, the District oversees projects in Mississippi, Alabama, Georgia, Tennessee, Florida, and Central and South America.

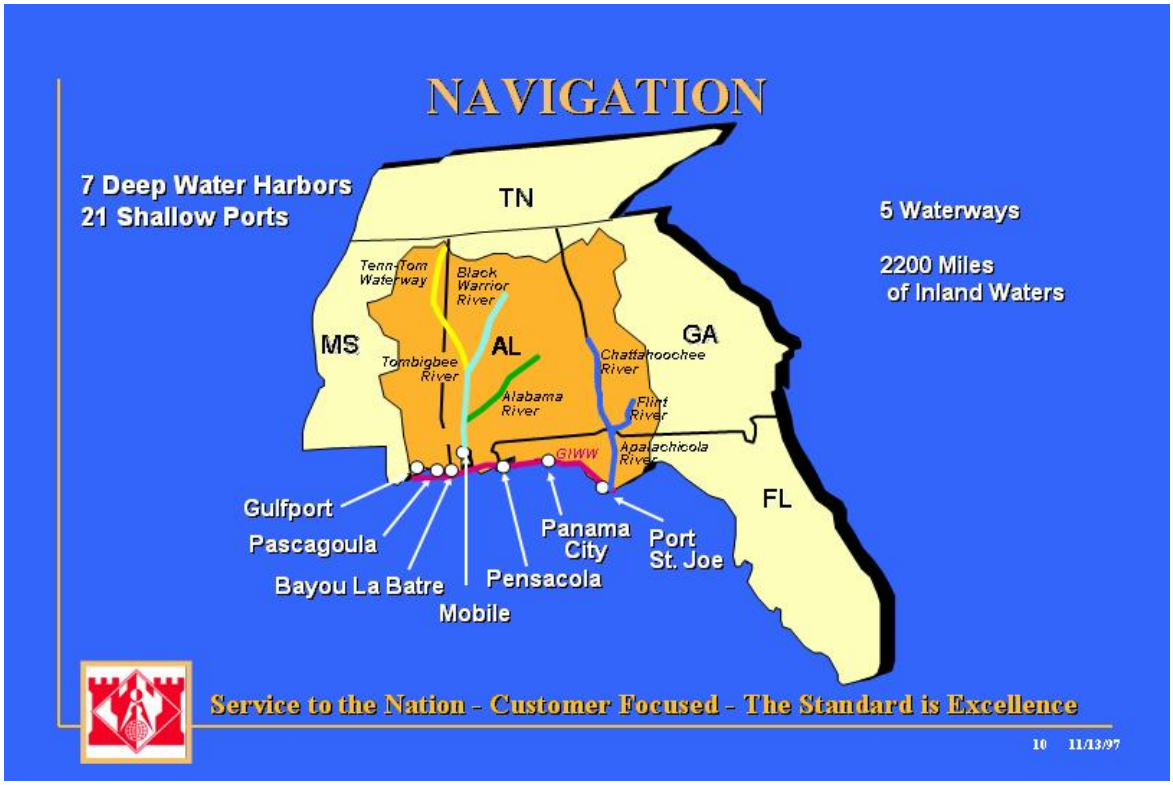
Until the last years of the nineteenth century, the Corps focused on military design projects and water transportation issues authorized by Congress. After 1888, when the civil works boundaries were established, the District focused on navigational improvements and obstruction removal from rivers and harbors. In 1899, Congress passed sweeping legislation, making the Chief of Engineers' Office responsible for regulating pollution and obstructions in the nation's "navigable" waterways, including the construction of wharfs, piers, bridges and any other hazards to navigation. The law initiated a series of surveys of smaller streams and river basins to improve "slack water navigation" through the use of locks and dams. During the early period of the modern era (1912–1985), the Corps directed primary attention and effort to flood control. Controlling the nation's waters emerged as a national issue with the 1927 Mississippi River floods.

Until World War II, the Corps did not oversee military construction. Corps efforts were limited to military design. However, after the war, the Corps, not desiring to lose the military construction expertise it had gained during the conflict, continued to administer military construction projects. In the years after 1985 the District developed sizeable projects at Redstone Arsenal, Anniston Army Depot, Eglin AFB, Maxwell

AFB, Cape Canaveral, Florida, the Mississippi Test Stand Facilities, and the Arnold Engineering Center in



The Flood Control Acts of 1917, 1928, and 1936 were the first steps toward damage prevention on a national level.



The USACE, Mobile District Civil Boundary

The USACE, Mobile District Military Boundary.

Tullahoma, Tennessee. By the 1980s, the Mobile District was clearly established as a premier military construction district.[1]

The public's concern over environmental issues culminated in Congress passing the National Environmental Policy Act of 1969 (NEPA). A number of new environmentally oriented laws followed in the first half of the 1970s. The Corps of Engineers had its role in managing the waterways expanded with the Water Pollution Control Act Amendment of 1972 (often referred to as the Clean Water Act). The Environmental Protection Agency (EPA), created by President Nixon in 1971, became the government's watchdog for environmental concerns. Section 404 of the Clean Water Act extended Corps authorization over dredging and filling the nation's wetlands.

A tow barge in a lock along the Tenn-Tom Waterway.

In response to NEPA, the District began to prepare Environmental Impact Statements (EIS) on projects that significantly affected the environment. As a result, when a water project was assessed, the District emphasized not only the economic benefits but its potential environmental impact. As the District learned to prepare these new assessments, the courts and the EPA expanded Corps authority beyond traditional navigable waterways to the entre wetlands of the U.S. In 1975, the Corps and the EPA clarified definition of wetlands for permitting purposes. Interestingly, by then the Corps of Engineers was beginning to be perceived by the environmental community as an ally to stop unqualified development. Senator Edmund Muskie observed in a Senate hearing in 1977 that "we have put the fox [Corps of Engineers] in the chicken coop [role of protecting the environment], and [it has become] a chicken."[2]

Yet many environmentalists still had their doubts. During the building of the Tennessee-Tombigbee Waterway (Tenn-Tom), the Corps had to overcome two legal challenges led by environmental groups that put the District squarely in the middle of the environmental debate. Essentially, Corps districts sought a middle ground between protection of the nation's wetlands and individual property rights. Yet that ground could be very difficult to find.[3]

The completion of the Tenn-Tom in 1985 brought an end to the large multi-purpose reservoir projects. The Water Resources Development Act of 1986 changed the cost-sharing formula, forcing local and state agencies to carry a larger share of the cost of water projects. Meanwhile, after 1989, Presidents Bush and Clinton both committed their administrations to a national policy of "no net loss of wetlands."[4]

In the early 1980s, as part of the Reagan administration's Sandinista containment policy, the District actively supported friendly governments in Central America. The primary mission was to enlarge and build military facilities for countries like Honduras, Guatemala, and El Salvador. Congress hotly debated the U.S. role in Central America.

A Second History: 1985 to 2003

In 2003, partly as an attempt to evaluate the changes that occurred in the previous 18 years, the District authorized a second history. This history is divided into two parts. In Part I we examine Life Cycle/Project Management and Information Management. In Part II we evaluate Project Management and Information Management through specific District projects. The District experienced a basic "culture" change after 1985. Employees changed the way they interacted with their clients, their contractors, and with each other.

Inside many U.S. companies, a management revolution was taking place beginning in the late 1970s. This change was largely initiated by the success of Japanese companies in the mid-1970s and 1980s. In addition, many Americans experienced serious quality problems with U.S.-made products. Automobiles and electronic products were particularly hard-hit by foreign manufacturers. The Japanese management model encompassed emphasis on teamwork, customer service, and continuous quality improvement. These ideas deeply challenged many long-held beliefs about the lasting ability of the American idea of "individualism" fostered in what authors have described as the "American Management Mystique." By the end of the 1970s, American businesses were struggling to keep up with Japanese manufacturers like Toyota, Nissan, Sony, Canon, Kubota, and Sumitomo.

In the mid-1980s, American businesses began to fight back. They emphasized quality and statistical process controls and gathered feedback from customers. They analyzed "lessons learned" and approached projects with "cradle to grave" thinking. The District adopted some of these trends and changed its operational methods during the 1980s and 1990s.

This study begins in 1985, the year Colonel C. Hilton "Stretch" Dunn, the new District Engineer, laid out a clear pathway for change. Many of Dunn's ideas were successfully implemented. These changes affected both the structure and philosophy of the District.

At the heart of Dunn's strategy, a strategy he called "quality customer care," was *Life Cycle/Project Management* or Project Management. Project Management, as practiced in private industry, focused on a multi-disciplinary team approach to a project. The team was led by a Project Manager. The team consisted of technically competent individuals whose disciplines impacted the project. For example, if a bridge was needed, the Project Manager gathered estimators and planners, structural, civil, mechanical, geo-technical, and environmental engineers, as well as construction managers to represent the various aspects needed to build the bridge. The Project Management team met regularly, and the respective disciplines were afforded the opportunity to review every aspect of the job. The Project Manager reduced communication confusion with the client by affording a single point of contact. Additionally, Project Management decentralized decision-making.

A decentralized team approach to construction was exactly what Dunn had in mind. However, he was under no illusion that Project Management would clash with ingrained District thinking. In traditional Corps operations, each separate division functioned independently, somewhat like "stovepipes." Planning Division planned the project, Engineering Division designed it, Contracting Branch bid it, Construction Division built it, and Operations Division managed it. Dunn believed that Project Management would "increase lateral communication and life cycle project management" and challenge the fiefdoms solidly entrenched within the District. To help deal with the stovepipes, he recommended creation of a Chief Project

Manager position. This position would be held by a civilian. He suggested that the civilian chiefs of each of the various divisions serve as a sort of "Corporate Board."[5]

Structural change within the District is only one part of the story. Technological advances brought even more fundamental change.

In the 1980s, the District adapted to the technological revolution sweeping the country. The District adjusted from large mainframe computers to desktop computers, from desktops to laptops, and from laptops to Blackberries. They made the leap, if not wholeheartedly, toward a "paperless" society.

The changes proved to be as important for the workers themselves as it was for their work. The adjustment to a new computer provided a world in which the employees also adjusted their thinking about other issues. Fellow workers, as well as clients, became "customers." The Engineering Division became more concerned about what value it added to each project. The Construction Division looked at new methods of bidding projects, allowed the contractors more say in project scoping, and embedded goals and rewards for achievement. Since clients like the Air Force and the Army would have "alternatives to the Corps doing their work," they would not be "told what the Corps would do" but asked "what they would like, and how best to achieve it—given the budget and schedule needed." Project Managers had real-time financial and management data.[6]

The Mobile District needed to change. Project Management and Information Management provided the tools to meet the challenge.

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[1]For information of the growth of the Mobile District's construction program prior to 1985, see D. Gregory Jeane, *A History of the Mobile District Corps of Engineers*, prepared for the U.S. Army Corps of Engineers, Mobile District (Charleston, SC: Brockington and Associates, 2002), chapters XII and XIII. For a well-written study of the political and economic battle to build the Tenn-Tom, see Jeffrey K. Stine, *Mixing the Waters: Environment, Politics and the Building of the Tennessee-Tombigbee Waterway* (Akron, OH: University of Akron Press), 1993. The full historical background on the idea of building the massive waterway is found in James H. Kitchens III, "An Outlet to the Gulf: The Tennessee-Tombigbee Waterway, 1571–1971," an unpublished manuscript, Office of History, U.S. Army Corps of Engineers, 1985.

[2] Garrett Power, "The Fox in the Chicken-Coop: The Regulatory Program of the U.S. Army Corps of Engineers," *Virginia Law Review*, Vol. 63 no 4, 559.

[3] Stine, The Tennessee-Tombigbee Waterway and the Evolution of Cultural Resources Management, *The Public Historian*, Vol. 14 (Spring 1992), 8 and Jeane, *Mobile District*, 179.

[4] For an excellent summary of the "takings" battle between environmental regulation and private property rights, see Carroll Pursell and William Willingham, "Protecting the Nation's Waters: A History of the U.S. Army Corps of Engineers' Regulatory Responsibilities 1899–1999," an unpublished manuscript in the Office of History of the U.S. Army Corps of Engineers, pp. 169-180. For the impact on the Mobile District prior to 1985, see Jeane, *Mobile History*, pp. 177-79. For brief summaries of both Presidents' "wetlands" policies, see Pursell and Willingham, *Protecting the Nation's Waters*, Chapter 4.

[5] C. Hilton Dunn, Future Directions, a letter to the Mobile District reprinted in Jeane, *Mobile District*, appendix II.

[6] Dunn, Future Directions.

Colonel C. Hilton Dunn

A Call to Change

Seascape and Radical Change

It was still hot on the Gulf Coast of Florida in September 1985, when mid- and top-level managers at the Mobile District met with the new District Engineer at Seascape Resort near Destin. Colonel C. Hilton "Stretch" Dunn (1985–87) was full of enthusiasm and ideas as he shared his vision for the District. Most of the conference's attendees were taken aback. Change had been in the air since the previous District Engineer, Colonel Patrick Kelley, had arrived in 1982, but this new commander had an energy and compulsion that his employees found somewhat unnerving.

Colonel Dunn was son of Lt. General Carroll H. Dunn, former Deputy Chief of Engineers. Colonel Dunn was a decorated Vietnam veteran and well known for his personal enthusiasm for the Army Corps of Engineers. In the year prior to coming to Mobile, Dunn spent his time studying and reflecting on directions the Corps of Engineers was taking. He admitted that he regularly consulted with his father about the management problems he was observing inside the agency. Years later, Curtis Flakes, the Mobile District Chief of Planning and Environmental Division, said that Dunn was "light years ahead of his time and hit the District with the force of a Category 5 hurricane."[1]

Dunn was most concerned about what he called *Quality Customer Care* and with posturing the organization for long-term prosperity. He noted that the nature of District projects was going to change. He saw the District moving toward contracting out more functions, with Operations assuming a much greater role, greater than Engineering or Construction. The role of the District Engineer was changing. Dunn intended to decentralize responsibilities and depend "on the ability of good people to do a bang-up job rather than on the systems of the past." He also believed that the District needed to develop leadership that was "participatory, developmental, team-oriented, and long-range in focus."[2]

Dunn believed that civil works would require greater cost sharing with the non-federal agency requesting the project. Military construction would decrease, but not go away. However, the military would not always need to come to the Corps for their work. They would have alternative sources of help. The Consent Degree agreed to by the Mobile District Office had to be fulfilled by the end of his tour. Finally, he noted somewhat ominously, future work would be available to the District, "only if we are prepared and have shown we can maximize what we have well."[3]

Dunn would later write, "at Seascape I had reached the 'conclusion' that the Corps had to undergo a change more dramatic than the environmental era of accommodation of the 1960s and '70s if it is to progress, much less prosper." The Corps must become more "flexible to meet the national challenges facing the country…and differences in subcultures [inside the Corps] are affecting our capacity to change and posture ourselves to be asked to take on future national challenges."[4] Finally, he concluded, if we do not change we will "wither or become marginally effective in responding. We'll become just another federal agency and lose most if not all of our military leadership." In "Stretch" Dunn's mind, management change was no longer an option for the Mobile District; it was crucial to its survival.[5]

Dunn was merely observing what Americans had expressed at the polls in 1980 with the election of Ronald Reagan and his platform of reducing the role of government. Business philosophy was creeping into the government. Federal agencies were being tied to tighter budgets and forced to become creative in looking for cash to fund civil works projects. Federal regulatory agencies, like the Corps, were being forced to curtail some of the powers they exercised.

The September 1985 meetings at Seascape.

However, after 1985, the Reagan administration, as well as the administrations that followed, sought a more conciliatory relationship with Congress over regulatory power. On the one hand, the courts were forcing the role on Corps regulators to expand, particularly in the arena of wetlands regulation. The Water Resources Development Act of 1986 (WRDA-86), being debated even as the meeting at Seascape progressed, specified that the Corps develop mitigation plans for destroyed wetlands as a project proceeded, instead of afterwards. Additionally, the WRDA-86 demanded changes in cost sharing with end user entities.[6]

The Technologies and Transfer Act, passed the same year, made similar arrangements for the use of new technology and encouraged government entities to set up partnerships with private industry and academia to share developing technologies. The law also liberalized patent and trademark protection for inventive government employees.

Dunn observed that these changes were occurring inside his own district. *The Mobile*, the District's monthly paper, describes several of these early partnering activities. For example, the Planning Division worked with communities along the Tennessee-Tombigbee Waterway, helping them adapt to the recreational and economic changes the waterway

created. One of these environmental efforts involved setting aside thousands of acres of bottomland hardwood swamp to offset the loss of land caused by construction of the waterway. The District field office at Lake Lanier, Georgia, worked with local officials on recreational and potable water plans for the use of the lake. Cultural resources officers partnered with other state, local, and federal agencies on historic preservation projects. The Construction Division saw the value of working with its counterparts in Latin America.

The American Management Mystique

Dunn arrived at the Mobile District in the early 1980s during a time of self-evaluation and introspection in most American businesses. Consumers were dissatisfied with the poor quality of many American-made goods. Citizens and government alike warily observed the growing economic power of foreign manufacturers.[7]

U.S. businesses did not ignore the foreign challenge. Though slow to realize what was happening, by the early 1980s, companies like Xerox and Ricoh/Nashua were investigating Japanese successes. At the heart of Japanese quality and profitability was an obscure group of scholarly teachers led by an American University professor, W. Edwards Deming. His ideas on statistical process controls, continuous improvement, quality circles, and decentralization of decision-making did not find ready acceptance in the U.S. in the 1960s, but were widely embraced by many Japanese firms. Japanese companies, and some American ones who had Japanese subsidiaries, were scrambling for something called the "Deming Prize."[8]

By the time Dunn arrived at the Mobile District, authors such as Tom Peters were picking up on the role of quality with their books *In Search of Excellence* and *The Pursuit of Excellence.* Entities as diverse as General Motors and the Philadelphia Chamber of Commerce initiated quality changes emulating Japanese methods. Special executive parking places disappeared or were given to employees for excellence in performance. Ties and coats were shed to create a more "leveling environment" inside the firm. Open-door policies and more accessibility to management offices for workers became common. *Just in Time* production was implemented, as was employee participation in decision-making. *Total Quality Management* and *Customer-Focused Thinking* became an integral part of company culture. Top management filled a more "facilitator" role. Deming Societies began popping up all over the U.S., as Deming and others like him became the most sought-after seminar leaders in the country. The results were amazing as companies like IBM, Chrysler, and Xerox reemerged as industry leaders.[9]

The Army was beginning to recognize the advantages of close integration in its leadership training. Their evolving Air/Land Battle doctrine demanded ever-closer working relationships with the Air Force. In the words of the Army training manual, the two branches needed more "doctrinal and training commonality." The idea that two branches of the service could work independently without close communication and coordination on the battlefield was a concept of the past.[10]

Dunn proposed to initiate change through consensus-building within the civilian leadership. Over the next two years, he sought to inculcate the District with his vision of *Quality Customer Care*. He attempted to build "caring leadership, teamwork, and a shared trust," and encouraged leadership to shed entrenched beliefs that "sharing power was a sign of weakness." He encouraged the military and civilian leadership to work together because of their "shared professional values." Dunn challenged divisional chiefs to change their

emphasis from "short-term gains and confrontation to one which is more participatory, developmental, team-oriented and long-range focused." He called on his fellow associates to become more businesslike, encouraging partnerships with the suppliers and clients.[11]

Project delivery team at work on Redstone Arsenal.

Dunn recognized the political nature of the Corps activities, and that special flexibility at times was required. Congressional intervention could wreak havoc on managerial efforts to effect change. Too often, decisions that began rationally within an agency quickly became submerged in the give-and-take world of political expediency. The Corps had to balance out these political realities with rational and profitable decision-making.[12]

Some of Dunn's associates resisted his *Quality Customer Care* approach. Interviewees remembered that even the word "customer" was foreign to many of them. One remembered that during Dunn's tenure, many went around saying, "Who is that kook upstairs running around talking about customers?" Dunn's basic thought was that the American public was their ultimate customer. Whether in peace or war, the primary job of the Corps was to provide quality engineering services to the nation. Dunn intended each member of the District to treat every other member as their "customer" too. The office clerk was the customer of the Section Chief just as much as the Air Force might be.[13]

Dunn felt that Corps efforts should focus on low-budget, low-cost missions that would provide high returns. He noted that the District-led initiative in Latin America was a good example of providing global security and "nation building" with a low-cost investment. He particularly thought that the Corps effort to support SOUTHCOM in Latin America was an example of a multifaceted customer requiring varied engineering support. In addition, as the Army became more "green," the District needed to be more sensitive to the environmental issues it faced.[14]

Dunn believed that in the future, fiscal accountability would demand lower costs and faster delivery of products. Competition would increase as both the Army and the Air Force were given more latitude on their choice of contractors. Jobs would have to be *earned*, a fact he stressed over and over. They would no longer be just *handed to* the Corps.

District work at Soto Cano Air Base in Honduras.

Dunn believed that the key words in the future for civil works were "cost sharing." The Water Resources Development Act passed by Congress in October 1986 broke an impasse between the Reagan administration and Congress. Future District civil works projects would demand a greater emphasis on working closely with local governing agencies. Much of the District success would be based on "underscoring the public confidence in our ability to handle the job efficiently, effectively, and to the satisfaction of the customer." He noted that environmental sensitivity

District officials inspecting obstructions in the Escambia River, Florida.

would be crucial as the country managed the impact of droughts and changes in groundwater and seawater levels along the coast and minimized the environmental impact of inland projects.[15]

Dunn saw the line between civil and military projects fading. Revitalizing decaying infrastructure would be a continuing and serious part of effective war preparations, mixing both civil needs and military uses. The Army, he observed was looking at the evolution of Air/Land Battle Scenario, a joint cooperative effort in battlefield conditions. Extending the life of bridges, highways, and port facilities as well as replacing antiquated military installations would offer the District plenty of opportunity to support these efforts in the future. But the District's role was far from secure. Dunn noted that the District would have to find cost-effective ways to meet this national challenge, or others would come along and take its place.[16]

Dunn saw that the nation's needs would be in areas such toxic and hazardous waste removal, clean water, sewage treatment, sea level and climate changes, public health care facilities, construction industry productivity, and counter-terrorism.

The District adopted many of Dunn's ideas. Tests of his new management philosophy were not long in coming.

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[1] Curtis Flakes, "Planning Leaders Corner," *Planning Ahead*, a publication of the U.S. Army Corps of Engineers, Vol. 8 No. 3 (March 2005), p. 11.

[2] Dunn, Future Directions and Samuel R. Green, "Managers meet with New DE at Seascape," *The Mobile*, Vol. 7 no. 10 (October), 1985, 1. Dunn surely observed that the Corps budgets had given more money to operations than construction in the previous two years. He was merely concluding, like so many others, that the era of the large construction project had come to an end. See House Subcommittee on Energy and Water Development, *Energy and Water Development Appropriations for 1986*, 99th Cong., 1st sess., 1985, 1-5 and Senate, Committee on the Environment and Public Works, *FY86 Budget Review*, 99th Cong., 1st sess., 1985, 550.

[3] Dunn, Future Directions. The Consent Degree was a legally binding agreement wherein the Mobile District

agreed to increase employment and management opportunities for minorities within the District. See McLaughlin et al. v. Alexander et al. *Final Amended Decree*.

[4] Ibid.

[5] Ibid.

[6] One example of Congress's resistance to Reagan's changes was the hold-up for 18 months of Robert Dawson's appointment as Assistant Secretary for Civil Works. See Purcell and Willingham, *Protecting the Nation's Waters*, 118. For more on the history of cost-sharing with non-federal entities, see Martin Reuss and Paul K. Walker, *Financing Water Resources Development: A Brief History*, a report prepared for the U.S. Army Corps of Engineers, Office of the Chief of Engineers, 1983, and Water Resources Development Act of 1986 (Public Law 99-662) signed November 17, 1986.

[7] Many of these weaknesses were exposed in the marketplace. Japan in particular led other Asian nations in a stellar rise in both quality and quantity of goods. Companies like Toyota, Nissan, Canon, and Sony set direction for whole industries in the 1980s. For material on the problems with U.S. manufacturing quality and management styles, see W. Edwards Deming, *Out of the Crises* (Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study, 1986), preface and Chapters 1 and 2; Robert Locke, *The Collapse of the American Management Mystique* (New York: Oxford University Press, 1996), chapter 4; Thomas J. Peters and Robert H. Waterman, *In Search of Excellence: Lessons from America's Best-run Companies* (New York: Harper and Row), chapter 1.

[8] Both of Peters' books, *In Search of Excellence* and *A Passion for Excellence* (New York: Random House Publishing, 1985) give numerous examples of excellent companies that are considered world-class. Many of these, particularly those Peters and Waterman found in *Search*, had been successfully competing with foreign firms for years. IBM, Eli Lilly and Company, Coca-Cola, 3M, and Eastman-Kodak are good examples. Florida Power and Light Group was the first non-Japanese company to capture the Deming Prize in 1989.

[9] An excellent example is found in Eric Gehlman, "Ford's Idea Machine. A Once Troubled Giant discovers a recipe for recovery. Change everything," *Newsweek*, November 24, 1986. See Dunn, Future Directions.

[10] For a good summary of the Air/Land Battle Doctrine and its development, see Major Thomas J. Gill, *The Air Land Battle, The Right Doctrine for the Next War*, an executive summary for the U.S. Marine Corps University Command and Staff College, 1990. A copy can be read on the Global Security.org Web page: http://www.globalsecurity.org/military/library/report/1990/GTJ.htm

[11] Dunn, Future Directions.

[12] Ibid.

[13] Curtis Flakes interview, October 23, 2003, and Dunn, Future Directions.

[14] Dunn, Future Directions.

[15] The Water Resources Development Act of 1986 was the first since 1977 and broke a five-year impasse between Congress and the Reagan administration. The primary issue was the level of local funding Reagan wanted versus what Congress would accept. The Reagan administration signaled a more conciliatory approach to Congress by proposing its first such bill in February 1985. Robert Dawson, proposing the bill on February 20, noted that some members of Congress "we are sure, continue to be concerned that the new financing policies might favor wealthier regions and communities." He went on explaining the Reagan position: "The policies are tied to the flow of benefits produced by the project, not the wealth of the beneficiaries." House Committee Subcommittee on Energy and Water Development, *Energy and Water Development Appropriations for 1986, Part 1*, 99th Cong., 1st sess. 1985, 4. See Dunn, Future Directions.

[16] Dunn, and C. Hilton Dunn interview, January 27, 2004.

Federal Regulations Alter the District's Mission

NEPA and the Environment

The Mobile District is a federal agency and an extension of the U.S. Army. Thus, federal regulations substantially impact the agency and give it direction. Congress passing and the President signing the National Environmental Policy Act (NEPA) of 1969 gave new directions to all federal agencies. The Water Pollution Control Act (called the Clean Water Act) of 1972 extended Corps authority through its Section 404 program to include not just navigable waters but creeks, tributaries, marshes, sloughs, swamps, and other wetlands that empty into navigable streams. Americans concluded that management of development along the sensitive waterways was a critical issue. For its part, the Corps was committed to the national goal of "no overall net loss of the nation's remaining wetlands," and to the long-term goal of increasing the nation's wetland resource base. Interpretation of that goal at the local level became one of the toughest challenges for the Mobile District. [1]

In the early 1980s, the District's environmental branch spent most of its time studying and preparing mitigation proposals for the huge Tenn-Tom Waterway. By the time the first towboat moved though the locks in January 1985, District officials were completing their assessment of thousands of acres that were to be acquired for preservation. In WRDA-86, Congress mandated that due to the massive destruction of hardwood bottomland caused by construction of the waterway, 46,000 acres of Corps-owned wetlands should be set aside for fish and wildlife protection. In addition, Congress provided funding for 88,000 acres in Mississippi and Alabama to be purchased from private landowners and likewise preserved.[2]

Locks and Dams on the Tennessee-Tombigbee Waterway and the Black Warrior River.

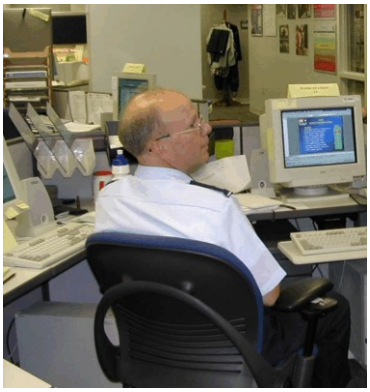
In the decade that followed, the District acquired experience in preparing environmental impact studies, negotiating with federal and local agencies, and purchasing large tracts of land from the public. In the process, members of the new Environmental and Planning Division and their contractors would put to good use an array of applications. By the mid-1990s, the District found itself with expertise in restoring wildlife and fish habitat, identifying and preserving cultural resources, preparing Environmental Impact Statements, and managing large new tracts of recreational lands.

The continued navigational use of sensitive waterways in Florida prompted that state to ask the District to temporarily cease dredging in west Florida. The water allocation plan for the Apalachicola, Chattahoochee, and Flint River Systems (ACF) became a study of local and national political, legal, and environmental wrangling.[3]

The Water Resource and Development Act of 1986 changed the financing of Corps civil projects. Vice President Albert Gore initiated a revamping of government processes in the early 1990s, and the Corps of Engineers was one of the entities he specifically targeted. The turnover of the Panama Canal to the Republic of Panama gave the District responsibility in environmental assessment and cleanup of U.S. military bases in preparation for the U.S. withdrawal from the Canal Zone. Finally, the Base Realignment and Closing Act (BRAC) of 1988 (as well as all subsequent acts) opened a large door for Mobile District officials to expand their expertise in preparing environmental assessments. The District was chosen to lead the Corps' environmental role in preparing the assessments for the impacted Army bases.

Funding, Fat, and Force Reduction

Congress attempted to encourage the sharing of technological advances among government, private, and academic entities by passing the Technologies and Transfer Act of 1986. This act authorized federal agencies to set up partnerships with businesses and academia to fund research into the growing technological revolution.



By the mid-1990s, all field offices as well as District personnel had desktop computers.

Pushed by then Assistant Secretary of the Army for Civil Works Robert Page's staff, the South Atlantic Division and the Mobile District attempted to establish working relationships with different universities and the construction industry. However, the law tended to favor districts that were more research-based. Additionally, federal insistence that the industries carry half the financial load, as well as the radical changes in computer technology, minimized the impact of the law on the Mobile District.[4]

In the presidential campaign that year, vice presidential candidate Albert Gore pledged to "reinvent government" by revamping the workings of the federal government. Once in office, he led a presidential task force to evaluate government agency programs to eliminate redundancies, to remove "gobbledy-gook" from reports, and to knock down roadblocks from deeply entrenched non-productive offices.[5]

The Vice President's program included awards for improving efficiency, a national performance review, widespread support for the use of technology to increase efficiency, and use of the Internet to increase public awareness of government agency work. Particularly, the new administration wanted to use the new computer technologies to "circumvent the traditional hierarchical organizational structures in government" that had in the past thwarted efforts to change. The directive to the Mobile District could not have been clearer.[6]

Unfortunately, the Vice President's plan had little direct effect on the District. One interviewee remembered that at first many District personnel thought that an effort to cut red tape and make work more effective would be welcome change to the District struggling with acceptance of Life Cycle/Project Management. However, they were amazed that little else was said regarding the initiative. The Army's plan to reorganize, presented to the new administration in 1992 and accepted by the National Performance Review, involved changes in the District and divisional responsibilities. However, the plan was later rejected by the Governmental Reform and Savings Act of 1993, wherein Congress demanded even more savings from the Corps. Ultimately, little change occurred as a direct result of government action. Instead, District workload reduction, productivity gains, and other technology advances led to a Reduction in Force in 1997.[7]

District Officials gather around the computer system in one of the DTOS units.

One regulation that was both misunderstood and feared was the Office of Management and Budget Circular A-76. This directive mandated government agencies, including the Corps, to compare the agency cost of its services or products with those from an outside commercial source. In the mid-1980s, the District went through a series of A-76 comparisons. In

theory, the A-76 was an evaluative tool to compare subcontracting work cost to Corps of Engineers cost. However, implementation of the regulation often resulted in nothing more than replacing Corps jobs with those in the private sector, with no real cost benefit. Marvin Whitley, project manager for A-76, observed that, "A-76 directives often penalized the jobs of the members of the District who get their hands dirty."[8]

The District Engineer ordered Whitley to form teams to prepare the Request for Proposals for the A-76 evaluations. In every situation, District officials determined that the District could equal or surpass contractor services. Thus, no major outside contracting of services occurred in the 1980s. Nonetheless, A-76 remained a sensitive subject for District employees.

The specter of an A-76 review was raised again in late 2003, when Headquarters in Washington announced that the entire Corps would undergo an A-76 evaluation of Information Technology in 2004. Because of the specialized work that the Information Management Office performs, at least one manager felt that if the private sector won the competition, employees likely would be hired by the contractor. Even the prospect of making more money as a contractor did not assuage employees concerns about being forced to leave government service.[9]

The entire field of A-76 directives produced a conundrum for managers and government officials alike. Prospective employees are attracted to the District in part because of the job security and governmental benefits. Employees believe they give up better opportunities in the private sector when they choose to work for the federal government.

In addition, civilian employees of the U.S. Army swear an oath of allegiance to the United States. This oath creates an employee/employer relationship unlike that of any other private sector entity. They find the government's "businesslike" approach to their employment troubling. Many believe the "cost/value ratio" that most businesses apply toward hiring and firing does not take into account the special loyalty required to work for the military. Although most District employees find the emphasis on cost-cutting and efficiency good for the agency, they find changes like A-76 troubling.[10]

Base Closings and the Panama Canal

Even before the end of the Cold War, Congress grappled with how to close antiquated military outposts both at home and abroad. As the Berlin Wall was coming down, Congress passed the Base Realignment and Closure Act in 1989. The Act was revised several times in the early 1990s. Headquarters of the Corps of Engineers called upon the Mobile District to lead the effort in preparation of Environmental Impact Statements for the affected Army and Air Force Bases. Headquarters determined that the Mobile District's environmental experience with the Tenn-Tom in the mid-1980s provided it with a unique set of skills among the various Environmental and Planning Divisions. Consolidating these efforts in one district became the least expensive route for the Corps.[11]

The District blended a civil works environmental project with its traditional military construction as it managed both BRAC and the Panama Canal withdrawal, just as Dunn had foreseen. The implementation of the Panama Canal Treaty gave the District additional environmental work responsibilities in a military setting in the early 1990s.

In 1978, the U.S. Senate ratified the Panama Canal Treaty. The Treaty gave the U.S. until 2000 to turn over the Canal operations and all U.S.-owned

property inside the Canal Zone to the Republic of Panama. Prior to the early 1990s, U.S. attention had been focused elsewhere. Observers noted that little was done toward evacuating U.S. forces from Panama.[12]

Difficulties with Panamanian dictator Manual Noriega spilled over into a U.S.-led invasion of the country in Operation Enduring Freedom in 1989. One repercussion of Enduring Freedom was the renewed attention given to the Canal Treaty. By then, most Americans had forgotten that the U.S. had agreed to end its presence in Panama by 2000.[13]

In the early 1990s, U.S. foreign policy toward Panama concentrated on a smooth transition of control over the Canal. Since the Mobile District included Central America, the District focused primarily on maintenance of U.S. military and civilian buildings until the early 1990s. The District opened a Treaty Implementation Office in 1989. In 1992, the District was ordered by the South Atlantic Division to develop a Treaty Implementation Plan. This plan would establish timetables and environmental assessments for facilities of the Army and Air Force in the Canal Zone. In addition, the District plan had to continue maintaining the U.S. bases till the transfer took place at the end of the century.[14]

The years from 1985 to 2003 were fraught with federal and state policy change. From court-initiated expansion and clarification of NEPA, to technology and cost sharing in projects, to Reinventing Government and Reduction in Force, to state regulatory changes and base closings in the U.S. and abroad, the District was very busy.

The Corps mission had changed. Gone were the large reservoir projects. A different variety of smaller and more complex projects filled the schedule of District officials. Government policy and increased environmental regulations in the years following 1985 created a new opportunity for the District that often blended military, regulatory, and environmental missions.

To meet these new developments, Colonel Dunn recommended the adoption of Life Cycle/Project Management. However, Life Cycle/Project Management was not initiated during his tour. Dunn looked at the ideas of project management as a positive philosophical change from within the organization. However, as his successor found out, Project Management was such a severe change to an entrenched organization used to talking more and listening less that it took actual structural change to birth the plan. That was left to Dunn's successor.

Colonel Lawrence Bonine (1987–90) implemented the biggest structural change in the District in decades. Project Management put an effective tool in the hands of District management, but as Dunn had experienced, its adoption caused much discord, so much that the effort nearly failed. The District became a test site for the program.

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[1] Pursell and Willingham, *Protecting the Nation's Waters*, 6-7.

[2] The Tennessee-Tombigbee Waterway was the largest Corps project until that time. Initiated by President Nixon in 1971, it was completed ahead of schedule in January 1985. The nearly $2 billion waterway involved a 230-mile inland waterway from the Tennessee River in northern Mississippi through to the junction of the Tombigbee and Black Warrior River at Demopolis, Alabama. The key effort was a 27-mile cut through the geographic mountainous divide that separated the Tennessee and Tombigbee watersheds. The waterway became an environmental legal fight and was twice stopped by court injunction. It was also a political fight. One observer astutely called the proponent's efforts nothing short of "legislative wizardry" in obtaining and keeping public and congressional support. The project barely reached an

acceptable cost/benefit ratio. Since construction, the Tenn-Tom has received a lackluster report on its cost savings as well as revenue generation. A good work on the background of the Tenn-Tom is James Kitchens's manuscript in the U.S. Army Corps of Engineers Office of History archives, "An Outlet to the Gulf: The Tennessee-Tombigbee Waterway, 1571–1971." The most carefully thought-through of the opponents on the waterway is Jeffrey K. Stine's *Mixing the Waters*. An equitable look at the proponents' side was presented in Vol. 7 (1985) of *Environmental Geology and Water Sciences*. The entire volume was dedicated to discussion of the Tenn-Tom.

The *Eddie Waxler* was the first commercial towboat to come through the completed Tenn-Tom. For a study of the acquisition of lands for the Tenn-Tom mitigation effort, see U.S. Army Corps of Engineers, Mobile District, *Project Management Plan for the Tennessee-Tombigbee Waterway Wildlife Mitigation Project*, a report prepared for the Mobile District, U.S. Army Corps of Engineers (1990). Also, for an explanation of how the Water Resources Development Act of 1986 called for specific lands to be set aside for wetland and wildlife preservation, see U.S. Army Corps of Engineers, Mobile District, *Summary Report, Tennessee-Tombigbee Waterway Wildlife Mitigation Project*, a report prepared for the U.S. Army Corps of Engineers, Mobile District, (1992).

[3] See Julie Hauserman, "Dredging may end on Apalachicola," *St. Petersburg Times* (Florida), Thursday, August 17, 2000, and "Bill would end dredging on Panhandle river," Associated Press State & Local Wire, Tallahassee, Florida, Tuesday, July 16, 2002.

[4] The Vicksburg District, home of the Engineer Research and Development Center, and the Cold Regions Research and Engineering Lab in Hanover, New Hampshire, have used the act extensively.

[5] For attempts to put the Corps under BRAC for drawdown purposes, see Nancy P. Dorn interview by Dr. Martin Reuss on December 18, 1996, and January 8, 1997, Office of History, Headquarters, U.S. Army Corps of Engineers, Washington, DC, 75-80. For a good summary of the Vice President's Reinventing Government initiative see the following web page: http://govinfo.library.unt.edu/npr/whoweare/appendixf.html (accessed July 28, 2005). One of the more innovative aspects of the VP's program was the "no gobbledy-gook" award.

[6] Most of the inspiration and quotations used by the Vice President for Reinventing Government came from David E. Osborne and Ted Gaebler, *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector* (Reading, MA: Addison-Wesley, 1992).

[7] See the Corps of Engineers reorganization effort in Information Bulletin, Mobile District Public Affairs Office, *Corps Reorganization Included in President's Government Reform and Savings Act of 1993*, a summary report prepared for the Mobile District, U.S. Army Corps of Engineers (1993). Also see United States Army Corps of Engineers, "Corps Reorganization Plan, 1992" (Washington, DC: GPO, 1992). A copy is in two binders in the Mobile District Library, Mobile, Alabama. The reorganization report gives five reasons for reorganization, all of them issues that Dunn touched upon in his 1985 analysis. They were: fewer traditional projects, shrinking workload, workload and workforce imbalances, enhancement of technical expertise, and high overhead costs.

[8] For a brief summary of how A-76 operates in a governmental agency, see Marvin Whitley, *Competitive Sourcing, AKA A-76*, a report presented to the Wilmington Island Club in Savannah, Georgia, June 5, 2003. A copy is in the possession of the authors. An A-76 Circular introduced in 1966 allowed government agencies to competitively compare certain "non-inherent government services" to the cost of contracting those services from private contractors. The objective of undergoing an A-76 evaluation was to enhance the "quality, economy, and productivity" of the government's services. For example, the U.S. Army is by nature strictly a U.S. government function. However, library services inside government agencies could be obtained from a private company, and therefore they are eligible for an A-76 evaluation. For more on A-76, see website: http://www.whitehouse.gov/omb/circulars/a076/a076.html

[9] Teresa E. Russell interview, January 12, 2004, Robert B. Keyser interview, January 15, 2004, and George Vella interview, January 21, 2004.

[10] Russell interview.

[11] James B. Hildreth interview, January 22, 2004.

[12] A good book on the background to the U.S.–Panama Canal Treaty is Michael L. Conniff, *Panama and the United States: The Forced Alliance*, The United States and Americas series, (Athens, GA: University of Georgia Press, 1992). See chapters 7 and 8.

[13] For more on the rise and fall of Noriega, see Ibid, chapter 9 and John Dingas, *Our Man in Panama: How General Noriega Used the U.S. and Made Millions in Drugs and Arms* (New York: Random House Publishers, 1991).

[14] See "Mobile and SAD tackle treaty implementation," *The Mobile*, Vol. 11 no. 4 (April 1989), 1 and see information in Mobile District Files, box marked, "CESAM-PM-LA #179407," binder marked, "Turnover Cooperation Program," files marked, "TIP Background Briefing," and "Memorandum of Understanding between the Department of the Army, Executive Agent for Implementation of Panama Canal Treaty and U.S. Army Corps of Engineers," dated May 19, 1989.

Colonel Larry Bonine

The Advent of Life Cycle/Project Management

Project Management vs. the Stovepipes

Although Project Management was a mainstay of private construction companies for many years, the Corps resisted this organizational innovation. Project Management was a team-based approach to managing construction projects. Although Dunn recommended the adoption of this process, the initiative was shelved during his tenure as District Engineer despite intense lobbying and discussion. Dunn could not overcome the traditional stovepipe orientation of many of his civilian managers.

In 1988, then-Assistant Secretary for the Army (Civil Works) Robert Page authorized the South Atlantic Division to initiate Project Management within the Mobile District. Colonel Lawrence Bonine (1987–90), who replaced Dunn, was ordered to implement the process as a trial. Several military and civil projects were put forth as possible "test projects." These included the Oliver Lock and Dam, already in the planning stage, the J-6 Rocket Test Center to be built in Tullahoma, Tennessee, and the Solid Rocket Assembly Project being initiated at Cape Canaveral.[1]

District officials formed a new division to coordinate all projects called Life Cycle/Project Management, or Project Management as it was later called. The Project Manager would assemble a team of interdisciplinary specialists, each of whom played an active role in each phase of the project. The team, referred to as the Project Delivery Team, provided cohesion, synergy, and a sense of ownership among the disciplines. Dunn and others were not necessarily trying to destroy the Corps "stovepipes," but rather trying to link them together. The idea seemed simple and logical, but it resulted in bitter turf wars within the District.[2]

The Corps uses the analogy of the "stovepipe" to explain its lines of authority. Since World War II the different divisions within a district had developed independently from each other. Managers demanded that all communications continue to go up the stovepipe line of authority in order to be addressed. In this self-protective world, miscommunications were common and finger-pointing routine. Ultimately, delays and inadequate input from the proper discipline caused cost overruns and missed completion dates—sometimes by years. The average project, assuming congressional approvals went smoothly, could take seven to ten years. By the 1980s, clients of the District realized that they could complete their own projects with other contractors in half the time and with half the trouble.

To complicate matters, environmental issues had to be given a larger role in District regulating and planning. Moreover, the traditionally conservative Engineering Division had developed small internal "fiefdoms" and even "sub-fiefdoms." These were so insular that even when a division had clear authority over an aspect of the project, communication problems went unresolved, and inefficiency was the byproduct. For example, one interviewee commented that it was "absolutely unheard of that I would walk into my boss's office (to resolve a problem)…not without specific invitation. An idea we would consider absurd today. But at the time, that was how the Mobile District operated." Another interviewee added that it used to be the primary task to "keep information away from the chiefs."[3]

The idea of team building, while practiced in some degree on specific projects, was unheard of outside of the Planning Division. Needless to say, by the 1980s the District was a classic example of American managerialism, where "individual accountability…fostered turf wars and inhibited creative interaction among employees."[4]

Lawrence Green, Chief of the Planning Division, volunteered to develop and lead the new Project Management Division, a task that Bonine later admitted was "simply too daunting and too full of fractious pitfalls" to have been completely successful. However, Green willingly took on the challenge and moved ahead by forming a Project Management Division Office.[5]

The Division became home to all Project Managers. Most of the new Project Managers came from Engineering. This presented a difficulty for the Engineering Division, as it already had an internal Project Management Branch. Thus, from Engineering's point of view, it not only had to give up key personnel, but also had to lose a function it traditionally considered part of the organization.[6]

Project Delivery Teams brought disciplines together to help solve potential problems. One of the innovative ideas was to get members of the Office of Counsel to sit on the teams. As Bonine later remembered, "We hoped to get legal input so we could eliminate situations that could prove serious impediments to project success months, if not years, into the project." In other projects, biologists might sit on a team to study the impact of a bridge construction project. Corps archaeologists might be members of a project in which known cultural resources would be disturbed by the work.[7]

Larry Green advertised for Project Managers and then selected ones for each of the District's missions: Military, Civil, and Support for Others. However, some members of the Engineering Division ostracized those who accepted positions as Project Managers. This caused resentments. Instead of breaking down barriers between divisions and developing a team approach to projects, Green found himself facing new barriers. To help solve this problem,

Bonine promoted Green to Deputy District Engineer for Life Cycle/Project Management.

Life Cycle Program begins

Engineer Day picnic set for June 10, 1988

Life Cycle

Mobile District newsletter announces the beginning of Life Cycle/Project Management in 1988.

Bonine's promotion of Green created additional jealousies that further impeded Green's efforts. Members of Engineering elicited help from Information Management to develop systems and reports to help them resist the changes. Stonewalling became routine, as reports were delayed, phone calls not returned, and cooperation broke down. Fifteen years later, some District employees were still highly critical of Engineering Division's resistance to the changes.[8]

At the time, however, the discontented members of the District had their rationale. Green's detractors were not just trying to protect their stovepipes. Many inside the District felt that the key job of the Corps was engineering services. "After all," one interviewee remembered, "it is the U.S. Army Corps of *Engineers*!" The formation of a new division to oversee projects, and by function, to oversee Planning, Construction, and Engineering removed control of the projects to the Project Management Division and thus to the individual Project Delivery Teams.[9]

Resistance by the Engineering Division centered on its philosophical view that engineering could best manage the project. It observed that most issues on construction sites involved some form of engineering decision-making. Thus, keeping the Project Management Office as a branch of Engineering placed the office where it best served the District. As Green was so often reminded, the Corps had never had a catastrophic failure at one of their projects. In time, management in engineering changed, and a new Chief of Engineering conceded to working more closely with Project Delivery Teams.[10]

District officials never evaluated the trial projects. Less than six months after the trial began in June 1988**,** Corps Headquarters decided that Life Cycle/Project Management was to be institutionalized throughout the Corps. The directive went out at the end of 1988, and the Division was formalized that winter. Larry Green became the first official Chief of the Life Cycle/Project Management Division, and civilian Deputy Engineer for Life Cycle/Project Management.[11]

In 1992, Larry Green retired from the Corps, and Jamie Hildreth, another Planning Division manager, became the second Deputy Engineer for Project Management. Hildreth, a 26-year member of the District, was a strong advocate of the multidisciplinary approach to project issues. With the Engineering Division under new management, and Hildreth's clear emphasis on participation, the Project Management Division grew and prospered.[12]

Life Cycle/Project Management became Project Management and in 2003, Project Management became institutionalized Corps-wide as Project Management Business Process. Today, Project Management Business Process seems firmly ensconced in the thinking of the District. In recent years, Headquarters directives have aimed at applying the concept across the board to all Corps projects. This move concerns adherents to the program. Nearly everyone agrees Project Management has been good for the District and the Corps. However, there is an equally strong view that the process, as now implemented, could become just another entrenched way

of "doing things"—without the flexibility and adaptability it was intended to create. Debate on the subject has revolved around the question "Has the Corps, by directive, merely substituted one form of 'stovepipe' for another?"[13]

Partnering in the District

In 1989, Lawrence Green, Chief of Program Management, sent a memo to District employees describing the role the District was going to assume in developing "Partnering." The memo, followed a few months later by a formalized guidebook, was an effort by the Life Cycle/Project Management office to do "business with a contractor or customer that recognizes that we have common goals which can be achieved through cooperation and open communications."[14]

Like Project Management, the purpose of partnering was to create a synergy of effort between contractors, clients, and Corps Project Management. Green hoped to address the "assumed adversarial relationship" between contractors and the owners. He thought this contributed to independent decision-making, "posturing in preparation for confrontation… escalated construction costs due to misinterpretations, rework, litigation, and pursuit of the most defensible alternatives to problems which arise."[15]

Instead, he proposed to draw on the experience of private firms like Flour-Daniel, Dupont, and ICI Americas. These companies had developed a cooperative management team approach with their contractors and their clients. This allowed the contractors a better opportunity to maximize their profit while ensuring a quality product as quickly as possible for the customer.[16]

Though a facilitated process, District officials proposed structuring partnership agreements that included both the primary contractors and the Corps client. To promote the partnerships, the District organized mandatory workshops to facilitate communication, insisted on top management commitment, and served as the champion for the partnership. Green noted that the District's Project Management program and the concept of partnering, "promotes the same goals that are of paramount interest… quality, schedule, and cost."[17]

In the late 1980s, partnerships were initiated on the Oliver Lock and Dam Project in Alabama, the J-6 Large Rocket Test Facility in Tennessee, the Test Operation Control Center at Cape Canaveral, and the Advanced Solid Rocket Motor Plant in Mississippi. The partnership agreements usually spelled out the general goals of the partnership, such as "working together as a cohesive team." The agreements also stated that they would "communicate and cooperate in all matters affecting the project." Finally, they usually spelled out a method to break down communication barriers by developing specific action plans on hot topics such as work change orders, safety, and follow-up on operation and maintenance.[18]

Joseph Birendelli, District Project Manager for the Oliver Lock and Dam, became the primary District negotiator for developing partnership agreements between the Corps, the clients, the contractors, and other interested parties. These agreements were usually simple, referenced contracts that set out the general goals and objectives of the partnership. The fundamental goal of the agreement was to keep the parties working together to meet the project's objective.[19]

For example, the J-6 project partnership defined some of the aspects of a successful project: limiting contract cost growth to 2 percent, awarding 100 percent of the award fee, and maximizing value engineering. The Oliver Lock and Dam agreement placed emphasis on quality, safety, timeliness of completion, budgetary

restraints, and individual growth. All partnership agreements were put in writing and signed by everyone on the partnership team. The partnerships were not legally binding, but were meant to foster an attitude of openness and trust.[20]

Partnering took on international dimensions in 1992, when Dan Burns and Joseph Birendelli formed a team to introduce sister districts to the new concept. One exceptional use of partnering by the District followed in the wake of the First Gulf War, 1990–91. The District was invited by Corps Headquarters to go to Kuwait to help U.S. and foreign companies work closely with the kingdom to rebuild the parliament buildings in Kuwait City.[21]

Ultimately, partnering became an integral part of District work, and use of the concept was adapted to small projects as well as large ones. By 1997, the Chief of Engineers was proclaiming to the House Committee on Energy and Water Development that the "Partnering Program—our new way of doing business—is a corporate success story which has spawned a cultural phenomenon. The process," he went on, "is based on trust, openness, teamwork, and risk-sharing by all stakeholders in projects—customers and vendors alike." Finally, General Ballard exclaimed, "Contract claims have been reduced by over 70 percent in five years." However, adaptation to new ideas by the Project Delivery Teams also included an old idea—outsourcing.[22]

A Reduction in Force (RIF)

Outsourcing was not a new concept, although it presented a particularly thorny set of side problems. Traditionally, government outsourcing involved the "transfer of a function from a government entity to an outside, private-sector provider." This was usually preceded by a benefit/cost analysis, and often referred to a "build or bid" decision. For example, Engineering had to decide whether to design an entire project in-house or submit part of the design to a contractor to produce.[23]

The District had to face two issues when it considered outsourcing. Firstly, it needed to consider what hardships would be caused by potential layoffs. Naturally, morale issues surfaced when employees were threatened with job loss. District employees felt that by working for the U.S. government, they gave up the better benefits offered by the private sector. They also swore loyalty oaths, creating a bond between employee and employer that required special consideration when reductions in force were discussed.[24]

The District also risked losing valuable expertise. For an entity whose mission is varied, complex, and unique, expertise can take decades to obtain. Expertise spans such critical elements as business contacts, technical competency, and client confidence. Younger members cannot assimilate these elements without lengthy training time. Nancy Dorn notes in congressional hearings that, "One critical impact of low workload and rapid, broad workload fluctuations is an adverse effect on hiring, training, and maintaining a highly skilled, professional work force. A District that is shrinking," she went on, "may not be sufficiently challenged professionally… and is increasingly less able to attract new engineering talent." Since younger members are usually the first to be laid off, the District would find itself with an aging work force that had no younger members. Ultimately, the District could find itself without the fundamental expertise that underlies its existence. Additionally, former District Engineer Robert Keyser added, "Is a contractor then hired to watch another contractor?"[25]

The middle years of the 1990s saw continued advances in software, huge leaps in technology, and continued reductions in workload. In early 1997,

Colonel William S. Vogel, the District Engineer, was ordered by Headquarters in Washington to conduct a Reduction in Force.[26]

Probably no single event caused more underlying dissatisfaction and concern among District employees than the Reduction in Force of 1997. The Reduction in Force underscored many of the changes undertaken in the District since the mid-1980s. As Dunn had predicted, the civil workload declined, and, to a lesser degree, so did the military workload. Additionally, in 1996, the Corps consolidated all the Financing and Accounting Offices and the Human Resources Offices into locations in Tennessee and Georgia, respectively. Budgetary tightening, caused by the end of the Cold War and Operation Desert Storm, further reduced the need for military infrastructure. Inside the military boundaries of the District, work associated with military base closings concluded. Inside the civil works boundaries, demand for District engineering services fell with the completion of the Oliver Lock and Dam in 1993. Senator Daniel P. Moynihan verbalized the feeling of many on Capital Hill when he commented to the Assistant Secretary of the Army, "This extraordinary organization [the Corps] has no civil mission any more. The dams are built. The snags are out of the Mississippi, the levees are up." The District failed to find new work.[27]

Voluntary reductions began as early as 1985, when the District had nearly 2,000 employees. During those years the work force strength fell by 25 percent in Engineering alone. By 1996, nearly 268 employees had elected to leave the Mobile District through either Voluntary Separation Incentive Pay (VSIP) or through Voluntary Early Retirement Authority (VERA).

Unfortunately, these reductions were not enough. In a special issue of *The Mobile* in spring 1997, District Engineer Sid Vogel noted that civil work had fallen 40 percent in the previous four years. In March, Vogel announced that the District would have a Reduction in Force (RIF). Shortly thereafter, the District hosted Chief of Engineers Lt. General Joseph N. Ballard. Ballard met with members of the Mobile District to discuss plans for the RIF.[28]

Lt. General Ballard, in his remarks to the District, tried to clarify the Corps perspective. He proposed that after the RIF, the District would be "better aligned for business, to satisfy the customer, and to build a better team." He hoped this would revolutionize effectiveness, seek growth opportunities, invest in people, and develop an ongoing process of "realigning to better satisfy the customer." He noted that the Corps could no longer rest on its past reputation to gain work. A leaner, more focused District held an advantage in "shaping a culture that reinforces corporate-ness, customer service, core values, and the importance of investing in people."[29]

The District made a number of options available to those leaving. Voluntary early retirement or separation included generous offers to those who qualified. A Special Outplacement Center and seminars were made available to those who were leaving. The Center provided arrangements for new job training and helped employees locate openings within other Corps districts and federal agencies. The Center provided counseling and aided the former employees in obtaining jobs in the private sector.

Detailed explanations of the Reduction in Force were presented at seminars so all employees could evaluate their jobs. In all, 115 employees of the District were released or left in the spring and summer of 1997.

Some employees volunteered to leave so that others could keep their jobs. "Bumping" or "retreating" made layoffs particularly difficult for others. An employee marked for reduction could "bump" another

employee out of a job who had a lower subgroup standing. By "retreating," an employee marked for reduction could displace an employee within the same occupational subgroup who had less service time. Studies for each affected employee were done, and all released employees found work with other agencies, found employment in the private sector, or took one of the buyout or retirement options.[30]

Vogel reported in November that despite the RIF, all schedules on District projects were met. He noted that a number of projects reached successful conclusion, and the Mobile District registered a perfect safety record. In addition, the District made advances in using technology for contracting that involved bid submittal via CD-ROMs, while the Latin American Office continued to grow. Vogel congratulated the District, saying, "When you look at what you've been through this last year, with the personnel turbulence and the changes and the concerns caused by the Reduction in Force, that's impressive." Meanwhile, District employees continued to debate job security in a U.S. agency.[31]

In 2003, then-District Colonel Robert Keyser observed that the Reduction in Force resulted from an inability to be flexible in a changing environment. "We didn't find enough work for ourselves so we had a RIF. The objective of Project Management is to keep flexible and cost-effective so we do not have another RIF. If Project Management becomes another inflexible aspect of the Corps, we will eventually have another RIF."[32]

In 1985, the U.S. Army Corps of Engineers faced a difficult future. A static, entrenched, government agency was facing reduction in need. Large projects handed out by generous congressional delegations were disappearing. Intense public demand for cost control and budget reductions demanded a fresh look at all government agencies.

Dunn and the District Engineers who followed him initiated structural, technological, and, most importantly, philosophical changes into the District. For the most part, the changes took. Curtis Flakes, Planning and Environmental Chief, summed up the outcome. In 2003, he declared, "Customer-focused thinking has been inculcated throughout the entire organization."[33] Employees, managers and workers alike, talk freely about what they do as adding value, or about watching their budgets carefully. They all note that the District has undergone radical change, especially the Construction and Engineering Divisions.[34]

Two concerns surfaced in the study of the Mobile District with regard to management changes. The primary concern among employees was that Project Management, although originally a mechanism for change, could become just another "stovepipe." As a result, the District could find itself back where it was before 1985.

Almost as important was the concern for jobs. Job security was no longer a reason employees gave for working at the District. Nearly all the employees interviewed saw their work becoming more like the private sector. Most saw this as very disquieting. On one hand, Corps management has succeeded well in impressing upon the Mobile District officials that their jobs were no longer secure, through the use of planned A-76 evaluations, structural reorganization, workload reductions, and RIFs. On the other hand, these efforts have made the District more creative in interdisciplinary team managing and more innovative in its search for new work. Balancing job security and productivity in a government agency is a difficult task. Some might argue that it is not a task to be left to a government agency.[35]

Regardless of the District employees' opinions on management changes, they all agreed that in the arena of Information Management there was no going back.

The next chapter will look at the changes facing the Mobile District that came from the information revolution sweeping the country and how the District adapted to them.

[1] Green, Life Cycle, *The Mobile*, 2. The District served as a lead district in the concept of "partnering" within the construction industry of the U.S. government sector. See Green Memo re. Partnering dated June 12, 1989. A copy is located in Mobile District Files, marked PM-AA 1266, File 415-10F Design Partnering.

[2] Dunn, Future Directions. For a more careful explanation of Project Management or Project Management Business Process, see U.S. Army Corps of Engineers, Professional Development Support Center, *Project Management Business Process*, a training program produced for USACE employees (Huntsville, AL: Professional Development Support Center), not dated.

[3] Mike T. Abeln interview, January 12, 2004, and Carl L. Burgamy, Jr. interview, January 13, 2004. For an accurate assessment of Mobile's intransigence, see Dunn, Future Directions.

[4] Locke, *Mystique*, 153.

[5] Life Cycle Program Begins, *The Mobile*, Vol. 10 no. 4, 1 and Lawrence Bonine interview, February 2, 2004.

[6] Bonine and Hildreth interviews. See also Lawrence Green interview, February 2, 2004, Edward M. Slana interview, January 21, 2004.

[7] See Bonine interview, Ernest W. Seckinger, Jr. interview, March 31, 2004, and Curtis M. Flakes interview, October 23, 2003.

[8] Slana and Russell interviews.

[9] In an interview in 1996, Nancy Dorn, former Assistant Secretary of the Army (Civil Works) from 1991–93, commented that the implementation of Project Management became "sort of a turf fight . . . who was going to be called what, and that sort of thing. . .[and especially at the] district level, in terms of actually turning the project over to one person. . .rather than all these different little pods. . .passing from this little pod to this little pod to this little pod within the district." See Nancy P. Dorn, interview with Dr. Martin Reuss on December 18, 1996, Office of History, Headquarters, U.S. Army Corps of Engineers (Washington, DC), 72-73.

[10] Green interview. The claim was not exactly true. The Corps had catastrophic failures at Lock 26 on the Ohio River in 1912 and at Locks 9 and 10 on the Kentucky River in 1905. It is true there have been no failures on any U.S. Army Corps-built large reservoir dams.

[11] See Tom Ichniowski, "Corps adapts to a changing world," *Engineering News-Record*, Vol. 224 no. 19 (May 19, 1990) and Green, Life Cycle, *The Mobile*, 1-2. Among interviews that the authors collected, several noted that the original trials were never meant to be trials but Secretary Page's instructions were not properly understood by those in command. Like Dunn, perhaps the Secretary misunderstood the intransient nature of Corps of Engineers structure at the time, and concluded that in order to effect change Life Cycle/Project Management had to be ordered to be done.

[12] Green, Slana, Hildreth, and Robert N. Scott interviews.

[13] Dunn interview.

[14] U.S. Army Corps of Engineers, Mobile District, *Guide to Partnering for Construction Projects*. Mobile, Alabama, 1990, 1.

[15] U.S. Army Corps of Engineers Mobile District, *Partnering the Joint Pursuit of Common Goals to Enhance Engineering Productivity*. Mobile, Alabama, 1989, 3.

[16] Green, June 12, 1989 Memorandum and Mobile District, *Guide*, 1.

[17] Mobile District, *Guide*, 2.

[18] TOCC [Test Operational Control Center] Partnering Agreement. A copy is reproduced in Mobile District, *Guide*, attachment E.

[19] For an example of a Partnering workshop, see Mobile District files box marked, PM-AA Box 1226, file marked File 415-10 Design Partnering. For information on Partnering at Mobile, see Mobile District, *Joint Pursuit*, and Melissa LeBlanc, "Partnering, Who Needs It?" *The Mobile*, Vol. 12 no.1 (1990). Also see Green interview and Joseph Birendelli interview, January 14, 2004.

[20] Mobile District, *Guide*, Attachment E.

[21] Birendelli interview and Sissy J. Scott interview, January 14, 2004. Also see "Partnering Goes International," *The Mobile* Vol.14 no. 6 (1992), 6.

[22] See Mobile District, *Guide*. For an especially interesting overview of a partnering project, see "Base Partnering, Hurlburt Field projects succeed with coordination," *The Mobile*, Vol. 18 no. 1 (January 1996), 7-11. For Ballard's statements, see House Subcommittee on Energy and Water Development, *Hearings before a Subcommittee of the Committee on Appropriations*, Testimony of Lt. General Joe N. Ballard, 105th Cong., 1st sess., 1997.

[23] "Outsourcing offers alternative expertise," *The Mobile*, Vol. 18 no. 9 (1996), 2.

[24] Russell, Keyser interviews.

[25] House Subcommittee on Water Resources, *Hearings before the Subcommittee on Water Resources of the Committee on Public Works and Transportation*, 102nd Cong., 2nd sess., 1992. See also Keyser, Vella, and Dunn interviews.

Most interviewees had some comments about the negative impact of the RIF.

[26] See Mobile District files marked "RIF". Files located in the Office of Civilian Employment.

[27] For example, see Ichniowski, "Corps Adapts," *Engineering News-Record*, 25; Bill McAllister, "Army Corps of Engineers Starts No-Pork Diet Early," *Washington Post*, December 4, 1992; John Nordenheimer, "Corps of Engineers Looking Warily for New Role," *New York Times*, February 28, 1993; House Subcommittee on Energy and Water Development, *Hearings before a Subcommittee of the Committee on Appropriations*, Testimony of Nancy P. Dorn, 102nd Cong., 2nd sess., 1992, 5-6. Senator Moynihan is quoted in Ichniowski, "Corps Adapts," *Engineering News-Record* of May 10, 1990, p. 24.

[28]Though some in the district blamed Col. Vogel for the RIF and claimed that he did not have to do it, all archival work this author researched and interviews with several dozen employees indicated that he was under direct orders to do so. For more information on the RIF at Mobile, see *The Mobile*, Vol 17 no. 10 (October 1995), Vol. 19, no. 1 (Jan–Feb. 1997), 2 (Spring 1997) and 6 (Dec 1997–Jan 1997).

[29] *The Mobile*, Vol. 19 no. 2, p. 13.

[30]See U.S. Office of Personnel Management Supplement 351-1 *Reduction in Force, Federal Personnel Manual System* (Washington, DC: GPO, 1989), and files in the Office of Civilian Personnel at the Mobile District, marked RIF Issues. See William S. Vogel interview, January 29, 2004. In addition, one of the saddest events to come out of the RIF was the stroke of longtime employee Anne Cave. She had been at the District since WWII and had performed the swearing in of every one of the members at the time—a distinction that no other member of any District had. She retired during the RIF.

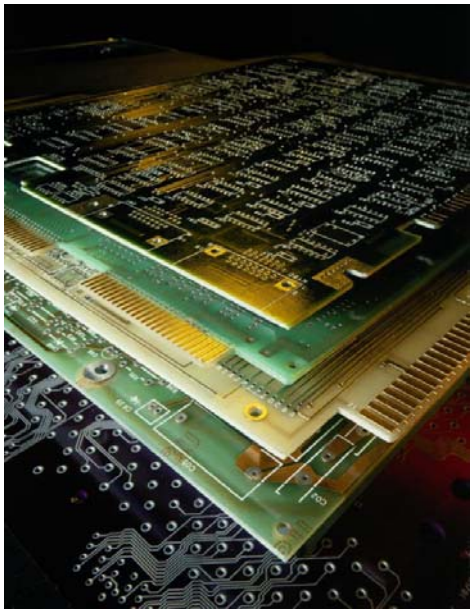
[31] *The Mobile*, Vol. 19 no. 6, 2.

[32] Keyser interview.

[33] Flakes interview.

[34] Robert Schodlbauer interview October 23, 2003.

[35] See Dunn, Keyser, and Bonine interviews.



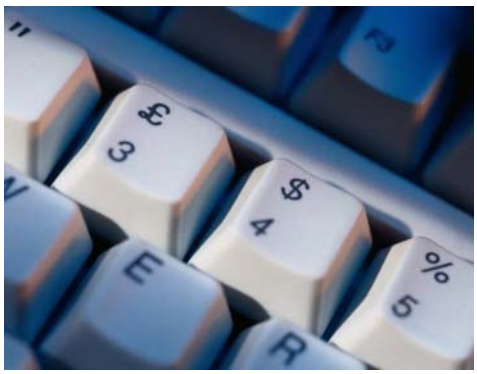
Information Management

Doing More with Less

The District Goes High Tech

In the fall of 2003, Jeff Lilycrop, Chief of the Spatial Data Branch, located in the downtown Mobile District Offices, was planning to map the entire coastline of Florida. Meanwhile, Betsy Hicks, Chief of the Resource Analysis Branch, was showing an associate how to use the Corps of Engineers Financial Management System (CEFMS), the District's financial software, to get real-time financial data on his PC. Earlier that morning, a group of engineers huddled around a computer screen for a real-time video conference with District personnel stationed in Iraq. The world of technology was moving so fast that "our regulations can't keep up with our technology," commented one District official. By the early 1990s, the District was implementing the latest technology in its Information Management Office. The changes in this world were nothing short of spectacular.[1]

Associates in Information Management, formerly known as Automated Data Processing (ADP), were very instrumental in initiating change at the District. In 1980, the new section chief of ADP began to experiment with customer service surveys to determine what the District needed from automation to do its job. Years later, interviewees recalled the then novel idea that the members of the District were their "customers." Members of the section at the time, like most members of the District, took the attitude that they "were a federal agency, just another office of the Corps, and if you wanted data entered, you came to us."[2]



The idea that ADP served the District and should treat them like customers was far from their thinking. Customers, if they existed at all, were the outside users of Corps' work such as the Army, the Air Force, or visitors to the parks the Corps managed. They were not internal co-workers. But ADP's effort initiated an attitude change in the section. They began to look for ways to add value to projects and to keep costs down. The changes that Dunn would later propose for the District fit the business focus that ADP had initiated years earlier.

In 1986, following an Army-wide trend, the District consolidated the Automated Data Processing Center (ADP) and the Office of Administration Services into one section, the Information Management Office. The office consolidated the planning and management of voice, data, and radio communications into one organizational element. The office was divided into four sections: planning, integration, systems services, and customer assistance. To highlight the importance of the new Office, a GS-14 Division Chief, Edward Winton, was promoted to chief of the new Information Management Office.[3]

Almost immediately, Information Management initiated open discussions about changing District thinking. Winton invited all divisions to send representatives to a weekly meeting to "think about the way the District does business, and about culture and mind change at work."[4]

All of the organizations sent representatives to a series of meetings led by Information Management. In these Information Systems Planning sessions, representatives met for six hours a day for four and a half weeks. Years later, one participant recalled that supervisors accused these representatives of "raising hell…with all the talk about customers, and changing the way the District does business, and rethinking our processes." Eventually, Winton hired an outside consultant to attempt to facilitate change. This early attempt was largely ignored by District officials. However, officials could not ignore the growing importance of technology.[5]

The Dawning of the Computer Age

Even as late as 1984, computers were an anomaly for most employees in the District. The only computer in the District until the middle of the decade was an old key-punch computer, requisitioned in 1966 from Brookley Army Air Field. At the time, information was transferred to a standard form using blocked spaces for the entry, and operators then punched the information into the computer. The key-punch operators were the only ones allowed to enter data.

By 1985, the District began to experiment with a Harris Mini Computer. This unit was employed for personnel records and aiding engineers with complex hydrology calculations. The Harris computer had a 40 megabyte hard drive. Shortly, the Harris was upgraded to 80, then 300 megabytes. About the same time, the Planning Division purchased two Apple II microcomputers for use in the cultural resources program. The first desktops used 8,086 microchips.

Before the year was out, Financing purchased four additional units. In 1986, the first network was installed at the Lake Sidney Lanier field office. These units were wired to a single local server. Despite these early attempts, widespread use of desktop computers did not occur in the District until the 1990s.[6]

A large military project provided the necessary impetus for the next leap in technology. In 1986, the Air Force selected the Corps of Engineers to build the J-6 Large Rocket Test Facility at Arnold Air Force Base in

Tullahoma, Tennessee. The South Atlantic Divisional Office delegated the project to the Mobile District. During the planning stages District Information Management officials were introduced to new technologies coming out of the private sector.

In meetings the District held with contractors at Vandenberg Air Force Base in California, the Unix Based System was demonstrated. Later that year, personal computers dramatically increased the speed with which contractors were paid and personnel records were managed.

The J-6 Rocket Project was a model partner project, discussed in greater detail in the next section. The project received high visibility within the District. Exposure to the commercial use of computers at Vandenberg and the success of the first network at Lake Lanier with the Corona Computers got the attention of Information Management. "At Lake Lanier, the ability to get information to the Park Rangers increased dramatically," commented George Vella, later head of IM. "We were not interested in technology for technology's sake, but in using the technology to help the District gets its job done better and faster."[7]

CADD Comes to the District

Two more events affected the use of technology in the District in the late 1980s. Around 1988, the first Computer Automated Development and Design (CADD) systems came online in Engineering. The small in-house computers the District had at that time were not adequate to support the CADD systems, so more powerful units were purchased. Meanwhile, thoughtful observers watching the work of the CADD computers were spurred to new thoughts about technology and its uses within the Mobile District.[8]

The late 1980s and early years of the 1990s were difficult years for Information Management. For the first time, contractors were hired to help with implementation of technology and were kept on as support for the agency. At the same time, officials realized that District information support team members were not only stretched too thin, but were under-trained in the fast-changing technology. They may have observed that District managers were somewhat reluctant to embrace the new technology. For example, as late as 1991, David Samec reported in *The Military Engineer* that despite the presence of desktop computers in every district, "management at division, district, and area offices appears not to understand the potential and power of computers for construction management." He went on, "There seemed to be a lack of commitment by management to use computers."[9]

Information Management officials observed that the work force was going to need to be entirely retooled for the desktop computer. They would need a new, less fearful approach toward the use of technology. Officials could see that "managing technology" would replace "computer programming." To foster groups of "interdependent people with responsibility, authority, and accountability, District officials needed to develop quality processes and systems" that encouraged the use of computers to maximize employee efficiency. To meet that call, District Engineer Robert H. Griffin (1993–95), called on Information Management to work closely with customers, using "knowledge and technology—fewer people working smarter with shared data systems and new processes—to do what once was done with a lot of people using stubby pencils." This would be the future.[10]

District Information Management officials exploited an opportunity to experiment with electronic communications and expose the advantages to upper management on a large scale. In early 1992, the District

Panama Canal Treaty Implementation Team set up an office in a downtown Mobile, several blocks from the District's main office on St. Joseph Street. As an experiment, the Information Management Office linked the two offices to the Internet and set up access to e-mail, a new innovation at the time. E-mail communications between the two offices not only helped clear up many issues, but allowed a new medium for rapidly transferring spreadsheets and other documents. Observers inside the District Office were impressed with the efficiency and speed of the transfer of information. The electronic era was arriving.[11]

Within three years, the District had discarded its old UNIX e-mail system and adopted Lotus Notes for communication throughout the South Atlantic Division. Before long, all PCs were attached to the Internet for better communication between the various District offices.

South Atlantic Division Commanding General Ralph Locurcio saw the need for closer coordination between the Districts. He attempted to make this possible by developing a "Regional Village."

The Regional Village

Locurcio envisioned a "standardization of information architecture infrastructure, such as Microsoft Office." Once implemented, the Project Managers and Information Management team members could use software applications to work more closely. He planned to expand this synergy to technical divisions such as Real Estate, Engineering, and Construction. For example, a Real Estate Officer in Mobile could more easily communicate with his counterparts in Jacksonville or Wilmington via the Internet.[12]

The SAD Regional Village Team (photo courtesy of Teresa Russell).

Standardized common sets of references would cut down redundancies. At the same time, Locurcio hoped that the districts would communicate better and share "lessons learned" and "best practices." By the summer of 1996, standard templates for each of these programs were being loaded and finalized.

There were problems with the development of the Regional Village. To begin with, simple software implementation proved to be a bigger problem than anticipated. Microsoft Office solved many of the problems associated with the Regional Village Concept, but getting all of the offices to use Microsoft took time. In addition, the implementation of a new financial software program, the Corps of Engineers Financial Management Systems (CEFMS), also caused delays when it was implemented in 1996. The District took more than a year to move to CEFMS. By the time it was accomplished, the Regional Village concept had been dropped.[13]

Regional Village's demise was an example of changing technology surpassing the speed of changing policy. Business technology expanded so fast that the goals sought by Regional Village were met by the use of computers, e-mail, spreadsheets, CDs and other electronic advances. All of the South Atlantic Division District offices eventually adopted Microsoft Office. CDs meant that large amounts of paperwork could be saved to a single disk. Digital cameras and digital scanners allowed photographs to be shared instantly. Video conferencing became the standard mode of

holding meetings among districts to reduce travel time and costs. Finally, CEFMS, the new Corps-wide, fully integrated software, gave all the districts a real-time management tool.

Real-Time Management

By the early 1990s, with Project Management making more demands to see real-time information, the Corps realized that its existing accounting system, COEMIS (Corps of Engineers Management Information Systems), needed to be replaced. COEMIS was mainframe-driven and information was updated periodically. Project Managers had little or no control over their budgets, data was entered in batches sometimes weeks late, and none of it was in real time. There were separate systems for payables and disbursements, and much of the work was still done by hand.

For example, purchase orders, after being completed by Contracting, had to be typed manually into the system and copies distributed to all the affected areas. Project Managers got information once a month, and often the information was weeks old. Everything was done after the fact. Rita Boccierei, a training manager, noted that, "in the COEMIS system you can see you paid somebody $500 but you have to take out a sheet of paper to see who you paid." The new system would do away with these absurdities.[14]

The end of the District Mainframe-1991 (photo courtesy of Teresa Russell).

In May 1994, Robert H. Griffin, then District Engineer, announced that the District would get the Corps of Engineers Financial Management System (CEFMS). The new system would be fully integrated with all aspects of financial management, from trip expenses to details about every purchase. The system would interface with logistics, real estate, contracting, and travel. CEFMS would supply real-time cost control information to the Project Managers. In addition, there would be a reduced paper trail, or so promoters claimed. Teams were established to determine the level of training needed by District members. Although PCs had been in the District for more than ten years, nearly 75 percent of the employees were expected to need training.[15]

An oversight committee was established to help smooth a transition that proved formidable. Not only were there personnel frustrations in a district that was still largely computer illiterate, but once "go live" was reached, technical and financial functions had to continue without interruption. All departments had to anticipate monetary expenditures since checks would not be available for at least 30 days. Workarounds had to be programmed for instances in which CEFMS would not perform a needed function. New reports had to be designed for an organization that lived on reports. Operators had to be trained in the "IM Customer Assistance Center," today called the "Help Desk." It became necessary to put off "go live" for more than a year. Originally scheduled for fall 1994, the actual transition did not occur until May 1996.

A financial management training center was opened in the Southtrust Building in downtown Mobile. CEFMS manuals were created and distributed. Users were trained. A special team evaluated all business processes. The Regional Village connections instituted at the Division level were adjusted to be sure all interfacing systems could handle CEFMS data. In April of 1996, a special edition of *The Mobile* appeared, dedicated solely to the CEFMS conversion. District Engineer Sid Vogel summed up the feeling and

exasperation felt by most employees: "It's going to be a challenge. There is no doubt about it."[16]

On May 20, 1996, the system was turned on. Initially, the transition from paper to computer was frustrating. One Project Manager in the Army Management Team worried, "The way it stands now, it just about doubles or triples my workload." Others voiced some hope that the transition would not last forever. A West Point, Georgia, field office manager voiced some optimism: "I hope a year from now I can look back and say it was worth it."[7] At first, the system was DOS-driven; eventually "point and click" technology made it easier for those who preferred to use a mouse.[17]

Seven years later, there was almost universal agreement that CEFMS had lived up to its promises. Project Managers got live information, especially in the financial, contracting, and operations areas. The system produced faster and more reliable data than COEMIS. In one more respect, the concept of teamwork seems to have been absorbed by the District. Betsy Hicks, a CEFMS team leader, commented, "I think that conversion to CEFMS in the Mobile District created a team atmosphere; we are all in this together. That has been good for this District." [18]

For the first time, all users learned to use the desktop computer and obtained Internet access. In 1998, the District replaced Lotus Notes with Microsoft Office. This permitted an even closer collaborative environment both inside and outside the District Office.

The changes in technology contributed to the demise of the stovepipe approach to business. The old Corps processes were disappearing so fast that many found it hard to believe that the District had ever been able to get anything done.

In 1996, George Vella became Information Management Office Chief. Having served in key positions inside the District for more than 15 years, he brought an eye for innovation and customer service to the office. Stressing cooperation and efficiency, he pioneered many of the changes in the District in the late 1990s. With his energetic personality and forward-looking use of technology, he put the Information Management Office at the forefront of cultural change inside the District. Vella noted that Information Management, both at Mobile and elsewhere, was "integral to the cultural change brought about by command leadership." Vella summarizes the changes the Corps has withstood and embraced in the last eighteen years, stating, "We might be a public agency, but we are a business. We, in Information Management, operate 24 hours a day, seven days a week. If we do not, we will fail. We are totally dependent on the satisfaction of the customer to whom we have just delivered goods."[19]

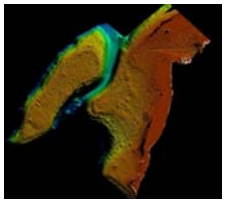
Not every project survived. Technology can outdistance itself, as it did in the Regional Village concept. Another example is the Corps of Engineers ID process. In the early 1990s, a ten-digit personal identification number was given to every Corps employee. This allowed employees to have access to the external Internet and the internal Intranet from a distant computer. However, as technology progressed in the early 2000s, the connections for personal IDs no longer interfaced correctly with the latest computers. Thus, when new computers were issued to employees at the District, access to CEFMS was denied. "Workarounds" could be developed, but when members attempted to access the District system from a distance, they found they did not have access.[20]

The Technology Transfer Act of 1986 held no promise for the Mobile District. Originally, the act amended the older Stevenson-Wydler Technology Innovation Act by authorizing cooperative research and development agreements for government-owned and operated labs. It formed a consortium for information and royalty sharing for federal scientists and engineers.

Under the authority of the Act, Assistant Secretary for the Army Robert Page proposed a joint research program between the Corps and the construction industry—an industry that had seen a 16 percent drop in productivity in the previous decade.[21]

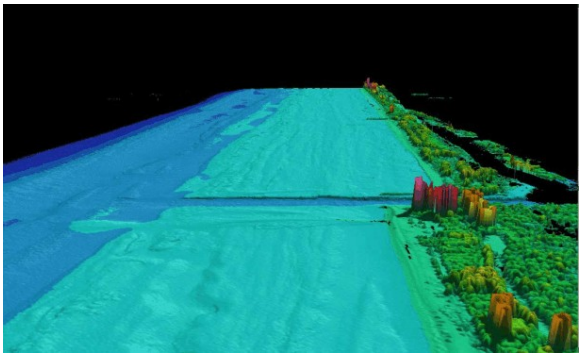
Page's idea was to have the Corps of Engineers, the construction industry, and local universities work together to share technology and to share in the resultant royalties. The joint government-industry-academic effort was named Construction Productivity Advancement Research, or CPAR. Page hoped that the "CPAR program would enable the Corps to transfer more effectively its technologies…to the U.S. construction industry, which spends less than a fourth of a percent on research." Although a task group was set up in Washington and a number of other districts became involved in initiatives, the Mobile District did not engage in the program. Interviewees noted that the construction industry failed to provide the necessary financial support, and that the initiative was geared toward districts with strong research and development offices. [22]

Hydrographic Scanning and GIS



District employees shared technology on the GIS-SHOALS Program successfully. By 1995, computer experts had developed 3-D mapping. In addition, Global Information System (GIS)-based software allowed the operator to not only look at the site in 3-D, but also to pose a list of "what if" questions. Could a crane operate between two buildings? What color are the buildings now? What if they were painted a different color? How much paint would it take? How much would it cost? Operators could look at water lines and determine what types of pressure they supported, what size pipes were necessary, and when the last maintenance was performed.[23]

The program allowed the same analysis to be performed on the specifications of the building. Was the building constructed of cinder block, wood, steel, or a combination of all three materials? If a ditch were necessary, where did it need to be dug, how much dirt would be removed, and what size vehicle was required to remove the material? Road sizes, material composition, and specifications were only a click of the mouse away—instead of hours of sifting through musty file drawers. In the mid-1990s, only Patrick AFB and Cape Canaveral Air Stations in Florida had similar technologies.



A SHOALS picture of the Lake Worth Inlet, Florida.

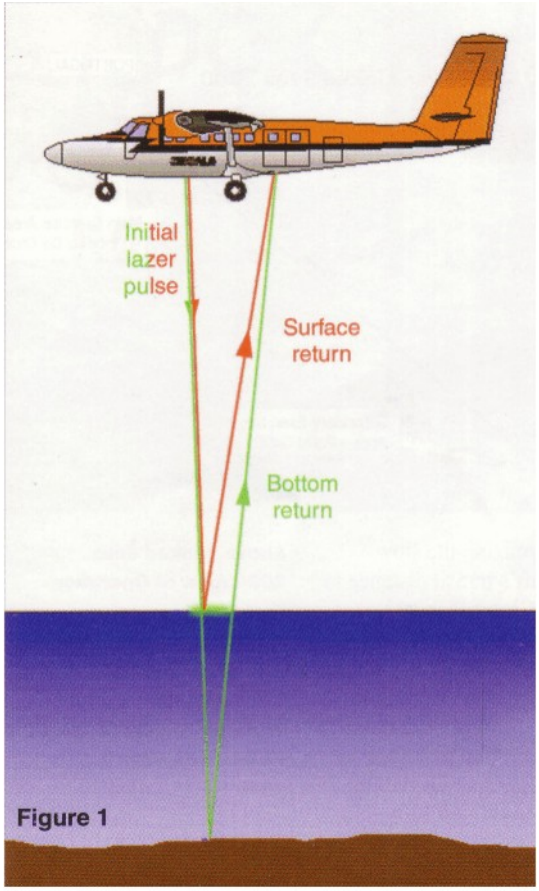
Michael Baker, Jr., Inc., a private contractor who worked closely with the District's GIS specialists, developed 3-D mapping technology. The District improved the technology by adding the "Mobile District Office Touch Map." This allowed the user to look at the District map, and by pointing the cursor to a particular field headquarters, get all the information on that site, including who worked there, and who was in charge. In addition, information on dams, locks, hunting and fishing areas, campsites, and other recreational information could be available.

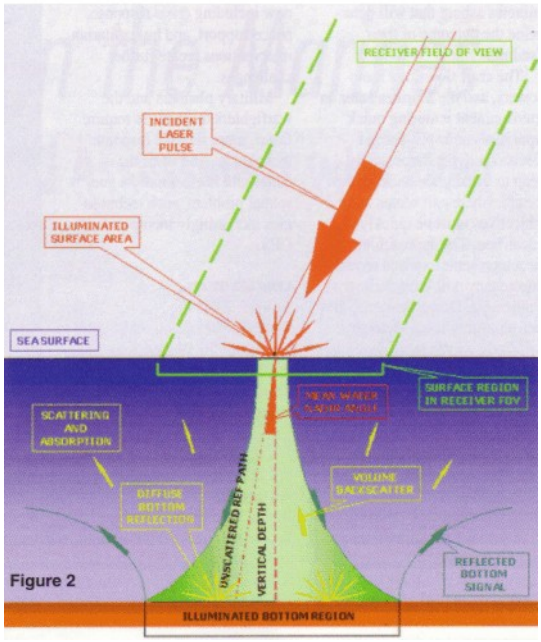
The only drawback to the program was the cost. As Jimmy Reeves, chief of the GIS Survey and Photogrammetry Section, commented, "It's a big

expense to input vast amounts of information into the computer database, but people who have the foresight to do so will recover the cost by utilizing the data in operations and maintenance of the facility." What Reeves may not have realized was that the very issue of cost that made the program difficult to obtain also drove the District to use a team approach in managing the technology. Divisions had to cooperate to share both the costs and the benefits. Each division—Planning, Engineering, Operations and Construction—could use the technology, but no division could afford to develop it alone.[24]

SHOALS

3-D technology was adapted for underwater mapping in the Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) project. SHOALS took GIS to a new level using technology called lidar bathymetry. The technology uses a pulse of light shot from an airborne bathometer. When the pulse hits the water's surface, part of the energy in the pulse is reflected back to the bathometer. The remaining energy bounces off the bottom. The reflected energy is recorded at the airborne receiver; the time difference between the return from the water's surface and the return from the sea bottom provides the water depth. Using Global Positioning Systems (GPS) and tide surveys to account for tidal changes, the system can collect some 200 laser pulses per second or 12,000 readings per minute. When first tested in 1994, the system was strung from the bottom of a helicopter.





How Lidar Bathymetry works.

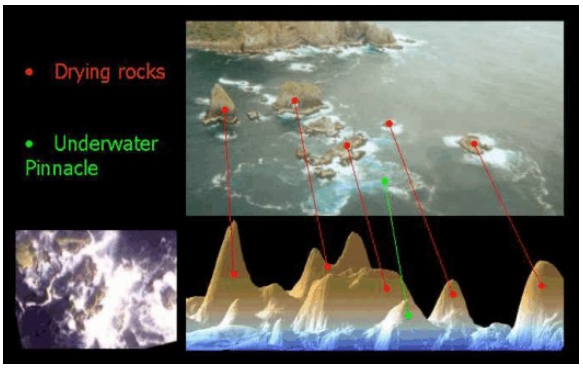
To illustrate some of the potential of SHOALS, the District team completed a 12-hour, 50-square-kilometer reading of Tampa Bay Harbor in Florida for the National Oceanic and Atmospheric Administration (NOAA) in 1995. During this survey, the SHOALS team took some 5.5 million soundings. Tests run by the NOAA ship *Mt. Pleasant* during a four-month deployment collected 30,000 depth findings in the same area. The two findings were then compared and matched, assuring NOAA officials of the reliability, speed, and precision of the SHOALS system.[25]

The SHOALS system was developed by a carefully crafted partnership called the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX), based out of the District and headed by Jeff Lilycrop. Lilycrop initiated the SHOALS effort out of the Vicksburg, Mississippi, District Office in the 1980s. The project was moved to Mobile in the early 1990s. Inside SHOALS are civil engineers, hydrographers, physicists, pilots, flight specialists, technicians, mathematicians, and lidar specialists.

The program, a result of the partnering effort that the Army initiated with the Canadian government in 1988, also included private sector involvement. Optech, a Canadian manufacturer of bathymetry systems in Ontario, built the SHOALS system under contract with the District. Since 1994, John E. Chance & Associates, Inc., has operated the system and collected the data.

Three drawbacks to the system have been its cost, its inability to penetrate below about 150 feet, and its inability to operate accurately in murky water. The unit cost several million dollars to build. Lilycrop notes, "Optech is working on making the system available on a commercial basis by the year 2004." Use of the system has been limited to regions of the U.S. and the world where the water is clear, such as Florida, Hawaii, the Pacific Islands, the Caribbean, California, Australia and New Zealand, and Latin America.[26]

In 2000, the SHOALS team began to look into faster measurement levels. In another joint partnership with the U.S. Navy, Compact Hydrographic Airborne Rapid Total Survey (CHARTS) was created. CHARTS dramatically increased the lidar bathymetry work of SHOALS, making 1,000 to 10,000 pulse-generated measurements per second. CHARTS combines the technology learned from SHOALS with improvements in computer speed since 1998.



Charts technology maps a California coastline.

In addition, CHARTS integrates the faster topographical lidar with digital cameras for high-resolution surveys of beach and coastal area development. This will be the first process to be marketed commercially. In 2003, the District announced that to provide a closer working relationship, SHOALS would move to the NASA Stennis Space Center in southern Mississippi. This would put them closer to both NASA, which is using the services and Optech, which opened a Mississippi office to ensure commercial exposure and to provide support to both the District and private clients. Chance & Associates also relocated to southern Louisiana to be more responsive to the needs of the program. SHOALS and CHARTS customers are as diverse as the U.S. Geological Survey, the Federal

Emergency Management Administration, the government of New Zealand, and the Mexican navy.

The District, as did many other industries in the United States during the 1990s, hoped that technology would help them do more with less. The speed of the changes created an elastic and robust economy in the private sector, while at the same time, District members saw an extraordinary rise in the applications of light and digital technology.

By 1996, PCs were on every employee's desk. E-mail became a critical communications tool. CDs enabled users to save thousands of documents on a single disk the size of a hamburger. Digital cameras made real-time photography commonplace, and e-mail and digital capabilities meant photographs could be sent world-wide in a matter of minutes.

Using technological advances, the District Engineer can now travel instantly to some of the most remote regions of the world. If he can see the sky, he can communicate directly with the District Office in Mobile. District members have more flexible hours, as some now work from home using the Internet and fully secured access to information. District employees can get access to their retirement, their pay, and their time schedules. They can set up appointments, hold conference or video calls, and get almost instant access to live costing information. Twenty-five years earlier, these tools were unheard of. "We have developed a mindset of adding value, and technology has been used to help bring about this cultural change in the District, and we are definitely doing more with less," concludes Vella.[27]

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[1] Betsey A. Hicks interview, October 24, 2003

[2] Russell interview and Vella interview.

[3] See "Winton interim head of IMO," *The Mobile*, Vol. 8 no. 7 (July 1986).

[4] Alan Galdis interview, October 23, 2003.

[5] Galdis interview.

[6] For a history of the early use of desktop computers in the Mobile District, see Vella and Russell interviews.

[7] Vella interview. For a discussion of technology changes during the early 1990s, see Jack K. Lemley, Engineers Managing Change, *The Military Engineer*, Vol. 85 no. 559 (September–October 1993) 14-15.

[8] Vella interview.

[9] Samec, Captain David W., "Is the Corps Wasting Its Time? Computers and Management," *The Military Engineer*, Vol. 83 no. 546 (November–December 1991) 38-39. The Corps and the Army were certainly trying to get technology out. *The Military Engineer* of August 1991 dedicated the publication to studies of the use of digital technology in solving engineering problems. See *The Military Engineer*, Vol. 83 no. 544 (August 1991).

[10] Samec, *Military Engineer*, 38-39 and see also Harvey R. Shrednick, Richard J. Shutt, and Madeline Weiss, "Empowerment: Key to IS World-class quality," *MIS Quarterly*, Vol. 16 no. 4 (December 1992), 491. For information on the capacity of the Information Office, see Robert H. Griffin, "Workload paradox—doing more with less," *The Mobile*, Vol. 17 no. 3 (March 1995), 2.

[11] For information on the establishment of the Mobile District to direct the day-to-day technical support for the Panama Canal Treaty Implementation Master Plan, see Memo of Understanding between the Department of the Army, Executive Agent for Implementation of Panama Canal Treaty and U.S. Army Corps of Engineers, dated May 1989. A copy is in the Mobile District Files, box marked "PM-LA 179409" file marked "Briefings." Though the Treaty Implementation Office was established in the District at the time, the office in the building down the street that initiated the e-mail correspondence was not opened until 1992.

[12] For an outline of Locurcio's idea, see Dan Parrott, "Regional Village: Imagine if you will…" *The Mobile*, Vol. 18 no. 6 (June 1996) 8-10; and "Regional Village & Wide Area Network," *The Mobile*, Vol. 18 no. 7 (July 1996) 9-12.

[13] For further discussions of Regional Village, see Russell and Vella interviews.

[14] Corps' New Financial Management System, *The Mobile*, Vol. 16 no. 6, 12.

[15] Ibid. and see also discussion of the planning and implementation of CEFMS at Mobile District, Hicks interview.

[16] Special Issue: New Financial Management System Arrives, *The Mobile*, Vol. 18 (Spring 1996, Special Edition), 4

[17] "Speaking Out," *The Mobile*, Vol. 18 no.8 (Aug and September 1996), 3.

[18] Hicks interview.

[19] Vella interview.

[20] Ibid.

[21] For more on the Technology Transfer Act of 1986, see United States Code Title 15, Chapter 63, Section 3710. A copy is available online at: html://www.access.gpo.gov/uscode/uscmain.html. See also Jay Kraker, "Corps Ready to Roll on R&D," *Engineering News-Record*, R&D Section, (June 2, 1988), and Tom Ichniowski and Steve Setzer, "Corps Seeks Plans to Boost Productivity," *Engineering News-Record*, Vol. 222 no. 6, (February 9, 1989).

[22] See "Corps Proposes Joint Research with Industry and Academia," *The Mobile*, Vol. 10 no. 11 (November 1988). A number of other offices did get involved in CPAR activities in the 1990s. However, most of these offices were highly involved in research and development, a task not found extensively at the district level. See testimony of Jesse A. Pfeiffer in House Subcommittee on Science, Research and Technology, *Hearing before the Subcommittee on Science, Research and Technology of the Committee on Science, Space, and Technology*, 101st Cong., 1st sess., 1989. For examples, see the Vicksburg District activity in "Partnership Tests Long-lived Concrete Mixture," *Engineer Update* Vol. 21 no. 10 (October 1997) and "The Cold Regions and Engineering Lab Work" in Charles R. Korhonen, Robert D. Thomas, and Edel R. Cortez, "Increasing Cold Weather Masonry Construction Productivity," Special Report 97-16 prepared for the Office of the Chief of Engineers, Washington, D.C., 1997.

[23] A brief review of the program is found in "3-D Mapping," *The Mobile*, Vol. 17 no. 6 (June 1995), 8-10. An example of how this technology was used is found in Laura Dwyer and Bruce Markley, "Topo Team Finds Water in Haiti," *Engineer Update*, Vol. 22 no. 11 (November 1998).

[24] Janell Ahenert, "3-D Mapping, Engineering explores new dimensions in maps," *The Mobile*, Vol. 17 no. 6 (June 1995), 10.

[25] For a review of the SHOALS program, see Lt. Gen. Robert Flowers, "Partnership & New Technologies: A Joint Airborne Lidar Bathymetry Technical Center of Expertise," *Sea Technology*, January 2002; Jeff W. Lilycrop, Jennifer L. Irish, Robert W. Pope, and Geraint R. West, "GPS Sends in the Marines," *GPS World*, November 2000; Geraint R. West and Charles E. Wiggins, "Airborne Lidar Bathymetry in the Management of Florida's Coastal Zone," *Integrated Coastal Zone Management*, not dated, reprint from the publication and distributed by the Mobile District, U.S. Army Corps of Engineers and John E. Chance & Associates, Inc.; Mobile District, U.S. Army Corps of Engineers, Joint Airborne Lidar Bathymetry Technical Center of Expertise, *SHOALS, Scanning Hydrographic Operational Airborne Lidar Survey*, a publication illustrating the use of SHOALS technology, not dated.

[26] Jeff Lilycrop interview, January 21, 2004. For additional information on the SHOALS program see also Mary Whittington interview, January 16, 2004, and Edward Culpepper interview, January 16, 2004.

[27] Vella interview.

District engineers at the J-6 Project.

Part II

Testing the Changes

The World and the District Change

Since 1985, momentous changes have occurred in the United States, the U.S. Army Corps of Engineers, and the Mobile District. In 1986, President Ronald Reagan and Soviet Premier Mikhail Gorbachev agreed to a major reduction of nuclear weapons. Within three years, the Iron Curtain collapsed. Most of the world's Communist states followed suit. In 1992, the European Economic Union became a reality, and at the same time China, Japan, Korea, and other Pacific Rim countries continued to grow economically.

Throughout these years, the U.S. increased its military presence in Israel, Iraq, Kuwait, and Saudi Arabia. Arab terrorists attacked the U.S. mainland on September 11, 2001, and prompted President George W. Bush to declare a "War on Terror." Bush then invaded Afghanistan in the fall of 2001 to rout a hostile government that had sponsored the terrorist attack. In 2003, the President authorized U.S. forces to invade and occupy Iraq to oust strongman Saddam Hussein. Meanwhile, in Latin America, U.S. military involvement switched from fighting leftist guerillas to fighting a war on drug smuggling.

Closer to home, completion of the Tennessee-Tombigbee project in 1985 ended the "Big Dam Era" in the U.S. civil works programs. The opening of the waterway brought to a close most of the large internal navigational improvements planned for the District. Although the Oliver Lock and Dam Project was an exception, few civil works projects of its size were in congressional appropriations after 1985.

Environmental compliance and regulation became a larger component in the Corps mission. Environmental groups became more sophisticated at raising public concern, using both litigation and the media to put pressure on federal agencies. Emergency management became a primary focus of the District as

both natural and manmade disasters greatly affected the District's civil area of responsibility.

Carter's Lake, Georgia.

In their search for new work, District leaders focused on projects where their expertise could be used effectively. Project Management was tested at the Oliver Lock and Dam Project in Tuscaloosa, Alabama, and the J-6 Rocket Test Facility (J-6) in Tullahoma, Tennessee. As part of its Support for Others mission, the District negotiated for work with NASA, the Drug Enforcement Agency, the Emergency Management Office, and other U.S. agencies. The District's work at Cape Kennedy Space Center developed an expertise in partnering that was applied with great success in succeeding projects.

Oliver Lock and Dam, Alabama.

Meanwhile, an unusual number of hurricanes and earthquakes hit the U.S. and Latin America. To help its southern neighbors, the District allocated resources on divergent interests such as hospitals, fruit processing plants, Naval and Air Force bases, and flood control dams. Support for the Panama Canal treaty implementation added an interesting and complex variation to the District's Central American military mission. The end of the Cold War gave the District in-depth experience preparing Environmental Impact Statements for the Base Realignment and Closure Act.

Water control bridge for a USAID bridge project in Honduras.

Part II of this history covers various military, civil, and Support for Others projects that comprise the Mobile District mission. The projects reveal the depth of the changes that occurred inside the District as much as they do the technical expertise of its members.

If change has occurred in the Mobile District, do these projects reveal the breadth of the change? Could the Mobile District shed its reputation for an entrenched, expensive, government agency? If these changes have occurred, have they translated into a more efficient, cost-effective and timely source for its military and civil customers? Did the demand for change initiate customer-focused thinking, or was customer-focused thinking an outgrowth of the new world that new technology introduced? The history examines the effect of the change in the arena of the District's projects. We conclude Part II with a few questions for the future.

The District work at Soto Cano Air Base, Honduras.

Innovation and Adaptability in the Military Mission

Partnering and Fixed Price

Support for the U.S. Army and U.S. Air Force remains the District's first and foremost mission. This was highlighted with the U.S. military's involvement in Latin America. In the 1990s, the focus of U.S. military involvement in Latin America changed from anti-Communist insurgency to the War on Drugs. In both Latin America and in the U.S., the District experimented with partnering on fixed-price construction contracts.

In the mid-1980s, one of the District's primary missions was to support the anti-insurgency movement in Latin America. In the first years of the Carter administration, Communist-led guerillas took control of Nicaragua. The Sandinista victory, while no direct threat to the U.S., encouraged guerilla insurgency movements in Latin America, especially in Honduras and El Salvador.

The U.S. financed military training centers throughout the region as part of President Reagan's policy of insurgency containment. The District's support came in master planning and managing the construction of these facilities.

US Army South Headquarters in the Panama Canal Zone.

Eventually, the collapse of the Soviet Union dried up funding to the Sandinistas and other insurgency groups in the region. In 1990, El Salvador and Honduras declared an end to the war when the guerillas gave up.

At the same time, the Sandinista regime in Nicaragua was voted out of power.[1]

Even before the end of the Cold War, the Reagan administration recognized the danger to the U.S. by the widespread smuggling of illegal narcotics from South America. The 1970s and 1980s saw the rise of dangerously powerful drug cartels centered out of Medellin and Cali, Colombia. With the end of the Cold War, President George H. W. Bush turned his foreign policy efforts toward eliminating illegal narcotics smuggling. The "War on Drugs" campaign became so important that nearly all District activities in Latin America after 1990 supported counter-drug initiatives.[2]

Meanwhile, the District tested its new management approach on several large domestic military projects. By the summer of 1986, the Air Force convinced Congress to fund a new J-6 Large Rocket Test Facility at the Arnold Engineering Development Center (AEDC) at Arnold Air Force Base in Tullahoma, Tennessee. A Management and Technical Team from the Corps, the Air Force, and the Contractor was formulated at the District Office to oversee design, construction, and validation for J-6.

The AEDC did not have an airfield, and most of the work was done by government contractors. So much of the work done at the AEDC was related to rocket technology that the running joke was, "You always hear, 'it doesn't take a rocket scientist,' but at Tullahoma it does." J-6 was designed to test modern large rocket ignition systems. Prior to J-6, these tests were being conducted at the J-4 and J-5 test centers nearby. However, safety permitting was set to expire, and the older test facilities could not handle the larger and more advanced rockets.[3]

The J-6 project was an attempt to build a test facility that would allow the Air Force to horizontally test the upper stage large booster rockets in simulated altitude conditions. The contract was to last three years, with a budget of $178 million dollars. The facility would be capable of testing the nation's intercontinental ballistic missiles, such as the Minute Man and Peacekeeper. The facility had to have the capability of simulating atmospheric conditions to an altitude of 100,000 feet. It also had to be able to absorb and measure the test fires of solid rocket propellant with up to 500,000 pounds of thrust (the equivalent of detonating 100,000 pounds of TNT). [4]

The test facility was more than 700 feet long. At the end opposite the firing center was a 100-foot-high, 250-foot-diameter dehumidifier cooler with six-foot-thick concrete walls. Beyond that was the saturation cooler made of inch-thick steel, 31 feet in diameter. In addition, the site would include a three million gallon storage tank for cooling water that had to circulate one million gallons per minute. These units cooled the firing unit during and after each test.[5]

The site had three rocket diffusers, each weighing at least 200 tons, along with bridge cranes and mobile cart systems. The structure contained nearly half a mile of six-foot exhaust ducting, and liquid nitrogen systems, plus all the instrumentation and control systems to measure the effect of the explosion. The test firing area was walled off with a concrete blast wall 90 feet high, 165 feet long, and 40 feet thick to protect the rest of the center in case of an explosion.[6]

J-6 Large Rocket Test Facility.

Partnering and J-6

For the first time, the District experimented with the concept of partnering on a large military project. The District Program Management Group (PMG)—later called on other projects the Project Delivery Team—agreed to use the design/build approach in selecting a contractor. As Mike Abeln, resident engineer for J-6, later related, "Due to the complexity of J-6, a management decision was made to base the construction contract award on a technical request for proposal in lieu of the traditional lowest price invitation to bid."[7]

The design contract went to Parsons/DMJM, a joint venture from Pasadena, California. The designers had to locate the site away from other Arnold Center buildings while still making good use of the utilities and basic systems already on site. The design, completed in November 1988, included more than 4,000 pages of specifications.[8]

Due to construction difficulties with the J-4 and J-5 test facilities at Arnold, the Air Force demanded changes to the District project approach. J-5 had been a particularly difficult job, complete with cost overruns, lawsuits, and delays.[9]

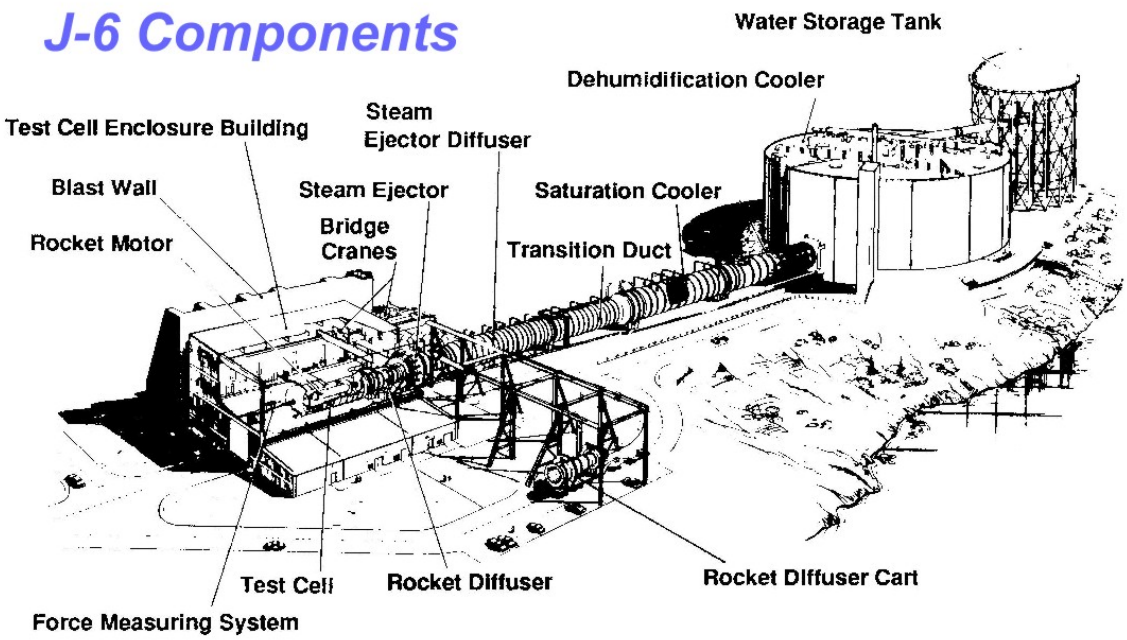
The new Life Cycle/Project Management team complied. In the Request for Proposals, the partnering clause read, "The government is willing to form a cohesive partnership with the contractor and its subcontractors. This partnership would strive to draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget, and on schedule."[10]

The PMG quickly learned to rely on contractors in the bid stage. Five contractors responded to the Request for Proposals. All five bids far exceeded the $145 million in the first fund allocation. In an unprecedented move, the PMG went back to the contractors and asked them for help in meeting the budget. "This was unheard of in Corps history," stated Abeln.[11]

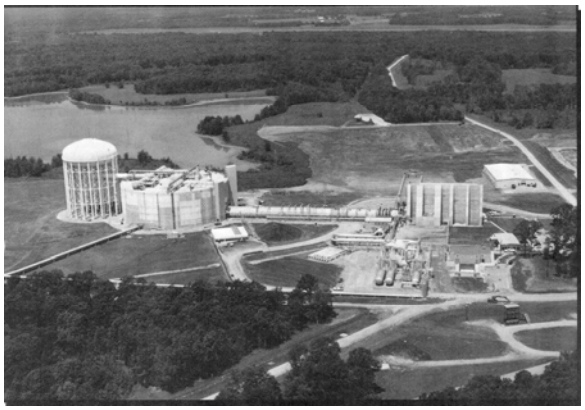
In the past, District procedure would have been to reanalyze the project or go back to Congress for more money. Since neither time nor funding was available, the PMG approached the bidders and asked them to assess the project, and show District engineers how to cut costs. Ablen acknowledged that this was one of the best decisions of the project. "We already agreed that if we were going to be partners, we had to be honest, frank, and admit we needed help."[12]

After a thorough review of the specifications with each of the contractors, and after agreeing with them on many of the changes, the District re-bid the project. The award was based on "technical merit and experience in addition to cost." The second bids were very competitive. In the end, the District selected the highest bidder, Ebasco/Newberg.[13]

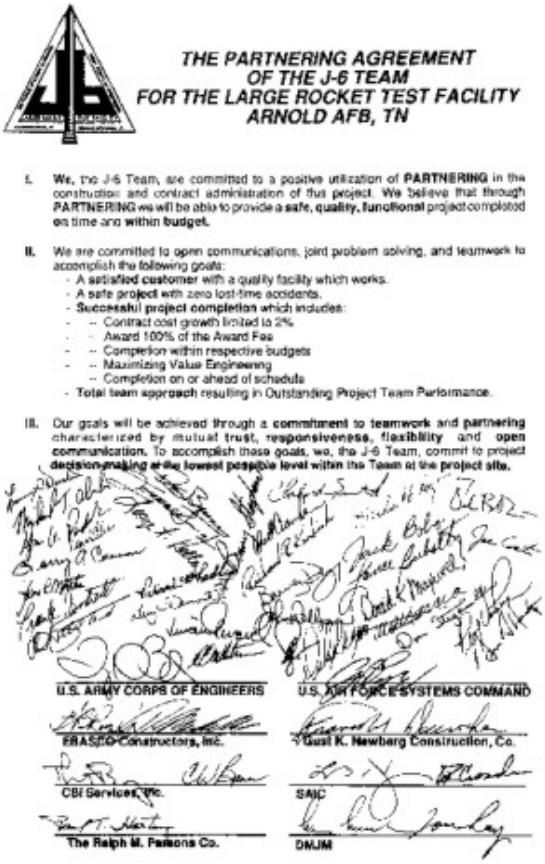
The Corps portion of the partnership included two oversight teams. The Senior Advisory Group consisted of members of the Air Force Systems Command, South Atlantic Division, and the Mobile District. This group provided oversight to the project and made all strategic decisions. The day-to-day decision-making was given to the PMG and consisted of Project Managers from the Air Force, the Mobile District, other key engineers from both agencies, and representatives from Ebasco/Newberg. This team handled the day-to-day affairs of problem solving and interacting with the subcontractors.[14]



On January 11, 1990, a partnership was formally entered into with Ebasco/Newberg to build the J-6 facility at Tullahoma and to do it within a fixed price and a specified time. The agreement contained a number of elements that gave the partnership substance.



Overview of the completed J-6 facility.



THE PARTNERING AGREEMENT
OF THE J-6 TEAM
FOR THE LARGE ROCKET TEST FACILITY
ARNOLD AFB, TN

I. We, the J-6 Team, are committed to a positive utilization of **PARTNERING** in the construction and contract administration of this project. We believe that through **PARTNERING** we will be able to provide a **safe, quality, functional** project completed **on time** and **within budget.**

II. We are committed to open communications, joint problem solving, and teamwork to accomplish the following goals:
- A **satisfied customer** with a quality facility which works.
- A **safe project** with zero lost-time accidents.
- **Successful project completion** which includes:
  - Contract cost growth limited to 2%
  - Award 100% of the Award Fee
  - Completion within respective budgets
  - Maximizing Value Engineering
  - Completion on or ahead of schedule
- **Total team approach** resulting in Outstanding Project Team Performance.

III. Our goals will be achieved through a **commitment** to **teamwork** and **partnering** characterized by mutual **trust, responsiveness, flexibility** and **open communication.** To accomplish these goals, we, the J-6 Team, commit to project **decision-making at the lowest possible level within the Team at the project site.**

U.S. ARMY CORPS OF ENGINEERS
U.S. AIR FORCE SYSTEMS COMMAND
EBASCO Constructors, Inc.
Gust K. Newberg Construction, Co.
CBI Services, Inc.
SAIC
The Ralph M. Parsons Co.
DMJM

A charter was developed and formalized in writing. To maintain open communications at all levels of the organization, both side agreed there had to be a "willingness to shed the traditional protective rhetoric and to develop trust to objectively address issues within the framework of the partnership." Work conferences were initiated immediately, and the PMG spent time working on group interaction skills together.[15]

Contractor, Corps, subcontractor, architect/engineering firm, and the Air Force were communicating freely, openly, and without territorial deterrents. There were a minimum number of contract modifications, crisis management was avoided, a team spirit was initiated and sustained, and the team made progress toward a timely delivery. Additionally, the project was half complete without a single lost hour due to a safety issue in nearly one million man-hours. "The contractor," Abeln later commented, "limited contract growth to 1.5 percent. Value engineering had saved the Corps more than $2 million. At the halfway point, Ebasco/Newberg was 60 days ahead of schedule." "And," he added, "people enjoyed coming to work."[16]

Ebasco/Newberg completed the project in 1993, 114 days early. The joint venture won the Contractor of the Year award both from the South Atlantic Division and Headquarters for the U.S. Army Corps of Engineers. J-6 was one of the safest multi-year projects in Corps history—four accidents in 2.7 million man-hours of work. Some add-ons by the Air Force did eventually push the cost from $178 million to $184 million. However, the contractor saved nearly $3 million through value engineering.[17]

Finally, the original contract contained a unique clause. At the discretion of the PMG, the contractor could earn an additional $3 million for excellent ratings in a number of areas. These areas included safety, responsiveness to requests for information, limiting cost growth of the contract to 2 percent, and meeting or exceeding the project schedule.

Nearly the entire $3 million was eventually awarded to Ebasco/Newberg. The Air Force and the District were satisfied that their testing facility was completed early and under budget. The designers, Parsons/DMJM, displayed their satisfaction at the annual Directorate of Engineering and Housing/Base Civil Engineer Conference in May 1993. A special event closed out the first day. Parsons/DMJM made a presentation to the District Engineer, Colonel Robert H. Griffin. A plaque, presented by the firm, stated that both Parsons/DMJM and Ebasco/Newberg, "concurred that J-6 has been the best-managed project that either firm had ever worked on."[18]

Design/Build at Redstone Arsenal

At Redstone Arsenal, the District expanded its understanding of the importance of using design/build contracts. The Sparkman Center was completed in 1997. The Wernher von Braun Complex was completed in 2003. By combining Project Management with the opportunities afforded by the design/build contract method, the District was able to rejuvenate the Army Arsenal with new state-of-the-art facilities. The District's expertise gave Redstone Arsenal a tool to attract commands and facilities evicted by BRAC.

Typically, the Corps used the design/bid/build method of construction. Under this traditional method, the Corps or an architect/engineering contractor designed the structure and wrote all the specs "down to the last bolt," using Corps manuals and approved methodology. Not only did this keep Corps engineers, estimators, and designers employed, but also gave the District total control over the specifications. Alterations could be lengthy and change orders difficult to obtain.

The method often led to communication breakdown, finger-pointing, and lawsuits.[19]

Design/build at Redstone allowed the District to set general standards for construction and outline the function of the finished product. The District designed approximately 35 percent of the project in-house. At this point, the Project Delivery Team submitted the unfinished plans to pre-approved contractor/bidders.

The contractors took the District's unfinished plans and presented a proposal that encompassed finishing the design and constructing the facility within the general parameters set in the request for proposal. As one Military Project Manager succinctly stated "early project delivery, limited planning and design funds, late starts, design authority moving projects forward in the programming process, and congressional inserts are driving our customers to look for alternative project execution tools. We [the District] had to change." Thus design/build entered the toolbox of the Project Manager at Mobile.[20]

Under design/build, the District pre-qualified prospective bidders with viable track records. Tom Clinton, Project Manager for Redstone Arsenal, noted that design/build required a "great deal of the work by the Corps to be done up front." "However," says Clinton, "we found this frees the contractor up to be creative in his approach, and we find we get an overall better project for the money. This is especially true if time is a crucial factor."[21]

By early 1990, the U.S. Army decided to consolidate a number of disjointed buildings and commands located at the U.S. Army Arsenal at Redstone, Huntsville, Alabama. The commands and sections located all over the 20,000-acre installation would be combined into one central complex called the John J. Sparkman Center.

In December of that year, the Arsenal contacted the District with funding for a 543,000-square-foot state-of-the-art Corporate Headquarters Facility that had to be completed by March 1995. When all the additions from phases two and three were completed in 1997, the facility encompassed 1,018,000 square feet, cost $108 million, and transformed some 80 acres into one of the most modern military facilities in the world. The delivery of the various levels of the projects on time and within budgets confirmed Project Management and design/build for future use by the District.[22]

In phase I of the Sparkman Center, the Redstone Arsenal Army management gave the District four years to design and build a complex that would normally take six years. In January 1991, the District was ordered to proceed with Sparkman Center using the design/build method.

The Sparkman Center at Redstone Arsenal, Alabama.

Design/build is not a panacea for every large construction project. The process has problems. The most notable problem is the potential for conflict of interest. The designer is also the builder. Some have compared it to going to a doctor who also is an undertaker.[23]

Clinton added that another drawback in the process is that it is best used when the owner is pursuing a fast track for construction. He noted further that, "It

does tend to keep contractors on time, and limit add-ons, but other than that it does not save a lot of money."[24]

Just as the request for proposals was being completed, Congress placed additional demands on the Product Delivery Team. Because of budget cutting and deficits, Congress attached language to the military construction appropriations for fiscal year 1992 directing the Corps to "obtain the most quality square footage possible within the available funds."[25]

Sixteen proposals were submitted in April 1992. The Redstone Project Delivery Team evaluated and let a $58.8 million contract to Centex-Rooney of Ft. Lauderdale, Florida. Smallwood, Reynolds, Stewart and Stewart of Atlanta, Georgia, served as the design firm. The deal included an expansion of the original design to 687,000 square feet and a 30-month delivery schedule.

The project included a multi-storied centerpiece building with three-story flankers. The design called for a 700-seat auditorium, an executive dining area, a fast food court, a physical fitness center, a training center, and a 35,000-square-foot computer center, along with command suites, and full two-story basements in all the buildings. All of these buildings were linked by environmentally controlled walkways. In addition, the design included more than 4,000 parking spaces and two landscaped retention ponds. The buildings were to be situated so that expansion for future needs could occur in an architecturally pleasing and efficient manner.[26]

The needs were not long in coming. The first phase of the center was completed in August 1994, nearly seven months ahead of schedule and within budget. In addition, the fast-track design/build method limited the "nice to have" additions that so often get tacked onto projects as they progress. Thus only 2.5 percent of the programmed 5 percent contingencies were used.

Completed Sparkman Center at Redstone Arsenal.

Even before Phase I was completed, the District received another large project. The Army needed another fast-track set of buildings to accommodate the Army Logistics Support Activity (LOGSA) then located in Letterkenny, Pennsylvania. The District used the Phase I building footprint, which included "the building exterior, and central core, but let the contractor design the interior to the customer's requirements," says Clinton.[27]

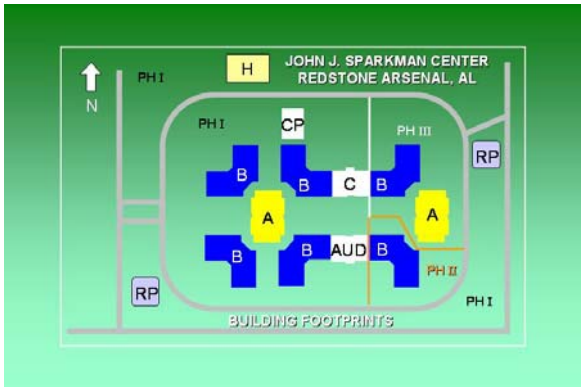
In May 1994, the Project Delivery Team let a design/build contract to two local firms: Universal Construction, with Goodrum-Knowles as the architect, and PDR as the engineering firm. The $12 million contract included a 95,000-square-foot adaptation to the original center. Since the Army Logistics Support Agency had to move by spring 1996, time was of the essence on the project. It was completed in December 1995, two months ahead of schedule.

The combined Phase I and II won a 1996 U.S. Army Merit Award for design and environmental excellence. The jury awarding the citation noted that "partnering conferences with the customer, the Corps, and the design team resulted in on-budget construction and a significantly improved delivery schedule." U.S. Army Corps Headquarters was considering the design/build process used at the Sparkman Center to be an Army standard.[28]

No sooner had Phases I and II been dedicated than another round of base closings created a need for additional space at Sparkman. The occupant, U.S. Army Aviation and Aviation Research and Engineering Center, needed to move in before school began for children in the fall of 1997.

A fast-track design/build contract was cut in April 1996 to add a 236,000-foot-building to the already existing site. This phase of the construction included a partnership agreement with Universal Construction and Goodrum Knowles again acting as the architect/ engineering firm.

Phase III created twice the space of Phase II, in less time. Clinton said this last phase of the Sparkman Center was particularly noteworthy for its partnership. "We partnered with both our customer and the contractor, and worked very closely with both, including them all in our proposal preparations, selection boards, design reviews, evaluations, and we made sure to set common goals." In addition, he added, when you want something specific, "never assume anything. If you want it, state it and describe it. Terms like 'good engineering practice' are meaningless in a contract. Your contractor and your customer must have specific details, if you need something very specific."[29]



A footprint of Redstone Arsenal, Alabama.

The District learned to use industry standard codes and specifications, and not to "tell the contractor how to do the project—tell them what the end project should be." They learned that the "more you dictate floor plans/building and site details, the more you limit your contractor innovation," Clinton concluded.[30]

In all three phases of the Sparkman Center, Project Management played a crucial role in gathering together teams to assess, design, and construct large multi-million-dollar state-of-the-art facilities with very tight time frames. In the Wernher von Braun Complex, the District applied design/build on an even bigger scale, one that would allow for expansions.

Wernher von Braun Complex under construction in 2002.

The Wernher von Braun Complex at Redstone was a 220,000-square-foot facility built for the Space and Missile Defense Command. This expandable complex will eventually exceed the Sparkman Center in

space. Phase I was completed in 2003, but with future base closings set to occur in 2005, Redstone anticipated future clients and additional expansion. This handsome structure can accommodate as many as four or five 200,000-foot extensions.[31]

An innovative use of partnering occurred in early 2000. The Army needed to get rid of its "Green Dragon." Green Dragon was a 1950s-era, highly volatile rocket fuel called pentaborane. The material had been stored in a bunker at Redstone for more than 30 years. Several thousand pounds of the material were destroyed at Edwards AFB in 1999, but four 800-pound containers remained at Redstone. The material was too volatile to be transported to Edwards, but the close proximity of the city of Huntsville, Alabama, made detonation destruction of the material a serious hazard at Redstone.

The District obtained the project in 1998 when it was determined that the material could be destroyed by non-detonation. District engineers created a partnership with the Alabama Department of Environmental Management, Redstone Arsenal Environmental Directorate Project Manager, and the environmental contractors led by Vista Technologies, Inc.[32]

To remove the material, the District had to conduct a treatability study, to develop a safety plan for surrounding population areas, and to establish sensors and air sampling techniques to monitor outside air. They had to oversee the safe removal of the material to a special chamber for destruction. The chamber and the full-scale treatment system were manufactured by Integrated Environmental Services of Atlanta. The chamber and system were set up near the bunkers where the pentaborane was stored to minimize movement of the material.

In February 2000, Redstone got the permit from the state to proceed, and in July, nearly 1,900 pounds of the material were safely destroyed. U.S. Army Aviation and Missile Command Commander Major General Julian A. Sullivan, Jr. noted that, "The successful completion of this pentaborane treatment marks the first time that a large-scale, non-detonation treatment of pentaborane has been performed anywhere."[33]

Cape Canaveral

At the time of J-6 another project also tested the limits of District partnering at Cape Canaveral. The space shuttle *Challenger* exploded in September 1986, forcing the grounding of all shuttle flights for several years. Thus, the Air Force had to devise another method to meet its time schedules for satellite deployment.

Modification of Titan IV rockets supplied that alternative. However, to achieve this goal, solid rocket boosters had to be added to the sides of the Titan IV, which permitted the rockets to deploy the larger and heavier Air Force satellites. Assembling these boosters and attaching them to the Titans required the construction of a special assembly area building at the Cape, the Solid Motor Assembly Building.

Solid Motor Assembly Building at Cape Canaveral.

Due to time constraints, the $48.8 million project was put on the fast track—an 18-month construction time frame. In September 1989, Martin- Marietta was selected as the operating contractor. Through partnering, the 59,000-square-foot, 240-foot-tall structure was completed under budget in October 1991.

As they had in J-6, the District and the Air Force felt that partnering would "focus efforts on cooperation and trust to improve working relationships [and] get rid of the adversarial role so often prevalent between the government and the contractor and make everyone work toward the finished goal."[34]

The success of the Solid Motor Assembly Building and the excellent reports coming out of both the J-6 and Redstone construction projects initiated partnering at the Centaur Processing Facility for Cape Canaveral. At Centaur, Life Cycle/Project Management and partnering helped solve a number of difficult issues that emerged as the project proceeded.

The Centaur booster is an upper stage rocket that can lift heavier loads into higher orbits. Typically, it is launched on either a Titan or Atlas primary rocket, after which the Centaur propels the payload, usually a satellite, further out into earth's orbit. The main processing center was to assemble, fuel, and instrumentally test the rocket.

Centaur was awarded to David Boland, Inc. The project encompassed construction of 970,000 square feet of parking drainage, fluid storage, and above- and below-ground site work. The tanking facility and the processing facility totaled 116,400 square feet of additional space for the multi-level rocket assembly facility. The Processing Facility included a 100,000-square-foot clean room. The clean room included a 20-ton compatible bridge crane with platforms and vertical lift doors.[35]

Not only was the project designed to be built in two stages, but changes in design of the "launch vehicle" required constant changes in the design of the facility. This threw the contractor off schedule and threatened both the budget and the timeliness of the project.

The Centaur Tanking and Processing Facility.

Boland received the first contract for the tanking facility in December 1992 and completed it on time November 15, 1995. In December 1994, the company was awarded the processing facility, which developed serious budgetary and time problems. By November 1996, Boland had fallen behind on the construction phase and was in danger of exceeding both the budget and the deadline. Engineers inside the Air Force were making major changes to the Centaur Rocket booster at the rate of one per month. These design changes in the rocket demanded major adjustments in construction and were forcing unreasonable delays on Boland.[36]

To "motivate the contractor to regain his schedule and to complete the building on time without accident," the Project Delivery Team decided to locate a Centaur Resident Office at the construction site. Thus the contractor drew on engineering and management support from members of the Project Delivery Team to aid in refocusing their efforts. The schedules were regained and the budget was not exceeded. The project stood as a reminder to District members that the purpose

of Project Management and partnering is to stay flexible, to communicate, to acknowledge problems as they develop, and to adapt to the changing needs of a dynamic situation.[37]

Base Realignment and Closure

In a different arena, the District Planning and Environmental Division was selected to manage USACE Headquarters support for the Base Realignment and Closure (BRAC). Planners and environmental officers used Project Management and various partnering innovations to help the Army and Air Force close and realign a number of bases in the early 1990s.

District work at Maxwell AFB, Florida.

On October 24, 1988, Congress passed the Base Realignment and Closure Act, Title II of Public Law 100-526. The law was substantially amended in 1990, 1994, and 1996. It established a procedure for closing or reducing the scope of activities at U.S. military bases. The act established a commission, appointed by the Secretary of Defense, called the Defense Base Realignment and Closure Commission, to determine which U.S. bases could be closed, realigned, or enlarged.[38]

In passing BRAC, Congress acknowledged the changing U.S.–Soviet relations and the opportunity to reduce the heavy cost of maintaining antiquated and unneeded bases. Additionally, the law settled a stalemate between Congress and the President that had existed since the Carter administration. Neither Congress nor the executive offices wished to bear the political cost of closing down bases in contested congressional districts. The fall of the Berlin Wall and the end of the Soviet Empire little more than a year later intensified the effort to end the stalemate. Congress and the President took advantage of popular opinion that called for a peace dividend in the form of reduced military spending.[39]

Drawing upon environmental assessments that had been prepared for troop repositioning in the 1970s, the District initiated a rearrangement of Environmental Planning staff in 1989. Jamie Hildreth became head of the Military Planning Branch of the Environmental Division, and Don Conlon became head of the Environmental Support Section. Both men had more than 15 years of extensive experience in preparation of Environmental Impact Statements and Environmental Assessments.[40]

District employees managed various environmental, economical, and real estate conveyance studies of the bases being closed or realigned. Over the next nine years, the District oversaw studies at such wide ranging facilities as the Letterkenny Army Depot in Chambersburg, Pennsylvania; the U.S. Army Depot System Command in Rock Island, Illinois; Ft. McClellan in Atlanta, Georgia; Army Materials Technology Lab in Wattertown, Massachusetts; Hamilton Army Airfield, in Marin County, California; Fort Dix, New Jersey; and the Presidio in San Francisco.

One of the larger studies involved a Programmatic Environmental Assessment of the Army's Force Structure Realignment published in 1995. This study evaluated the environmental and sociological factors relating to "force restructuring." The Army shrank from 12 active full-up divisions to 10. The resultant decisions demanded the reduction of 18,000

active personnel from nine locations. Generally, the environmental impact on such historic bases as Ft. Bliss, Texas; Ft. Carson, Colorado; and Schofield Barracks, Hawaii was "no significant impact." In fact, the report concluded that, "in many instances, the proposed action would result in moderately beneficial impacts to environmental resources." Although nearly all the bases lost personnel, Forts Bliss, Carson, and Lewis regained new commands due to the realignment.[41]

The environmental resources addressed included such issues as land and airspace use, air quality, geology and soils, water resources, hazardous and toxic materials, cultural resources, and socioeconomic resources. Regions of Influence (ROI) for each post had to be determined and the impact on such wide-ranging wildlife as mule deer at Ft. Bliss, greenback cutthroat trout at Ft. Carson, and gray bats at Ft. Knox, Kentucky, had to be assessed. Ft. Hood contained more than 2,300 archaeological sites, while also generating some 300,000 pounds of hazardous paints, photographic chemicals, and lead acid battery wastes each year. The Yakima Training center had 19 wildlife species of special concern, and adjoining Ft. Lewis had 258 buildings eligible for the National Register of Historic Places. Ft. Polk contained nearly 1,000 buildings with asbestos and lead-based paints. Additionally, Ft. Polk supplied jobs paying considerably higher than the surrounding counties. Although the report found no significant impact on the environment, socioeconomic impact was a different story.[42]

The Army's Economic Impact Forecast System used by District contractors addressed population and demographics, housing, employment, income, schools, and public services for each of the installations. The reports established 1994 as a base-line year for the socioeconomic data. It determined that the effect at posts like Ft. Polk or Ft. Knox would not be substantial. However, at Ft. Riley, Kansas, the report found that "implementing the proposed action would have a significant socioeconomic impact on the ROI." At Schofield Barracks in Hawaii, the study found that, the "realignment might have a substantial impact on population levels in the ROI."[43]

In support of BRAC 1993, the Navy had to speed up the relocation of the Naval Warfare Center in Trenton, New Jersey. This major transfer relocated the Center to the Arnold Engineering and Development Center in Tullahoma, Tennessee. The relocation required construction of a $47.9 million Navy Large Engine Environmental Test Facility.

The primary objective of the test facility was to test and evaluate corrosion and icing effects on Navy jet engines. Although the District had done work for other branches, most notably during the Panama Canal Treaty Implementation, working closely with both the Air Force and the Navy was a departure from the norm and presented its own set of difficulties.

View of the Navy Large Engine Test Facility (photo courtesy of Arnold Engineering and Development Center).

As with so much of the base closing work, time was of the essence. The design/build method of bidding the contract was used, and the Hensel Phelps Construction Co., of Austin, Texas, was awarded the "best value" contract in June 1996 and given 24 months

to complete the project. The project involved a sea level environmental test facility with ancillary electrical and mechanical measuring devices, fire control, power back up, fiber optic cables, and intercom and paging systems.[44]

The system design included demanding structural requirements such as bridge cranes, acoustical doors, jet-engine mounting floor stands, and T-9 noise suppressors. The suppressors were removed from North Dakota and Rome, New York, and modified for use at Arnold. The project had to integrate complex engineering systems such as expansion turbines, hydraulic power unit, control valves, and a stainless steel ducting system into the construction process. The construction work also had to include compressed air, steam heating, raw water, liquid air, gaseous nitrogen, aviation fueling, and RAM-air ducting systems.[45]

The project is one of the single largest of its kind the District ever attempted. The schedule was aggressive and contained major challenges with supply and material coordination. "Partnering," Area Engineer John Rollyson acknowledged, "has contributed significantly to the open communications that have existed from the onset and provided an extremely successful project on schedule and within budget."[46]

The District found that another side benefit to the design/build approach was safety. Making safety part of the agreement, contractors were spurred to conduct safety programs and audits and to erect work areas designed for employee safety. At the Navy Test Facility, Hensel Phelps logged 310,000 man-hours without a lost-time accident.[47]

An additional project related to BRAC but also completing the study in partnering at Redstone was the rehabilitation and upgrading of Redstone Building 5681. This older building was upgraded with a new façade and an entirely new interior to accommodate 650 relocating personnel from the Aviation Research Development and Engineering Center in St. Louis. The $8.1 million, 117,000-square-foot facility included interior and exterior demolition and renovation and construction of new administrative offices with general officer suites, data processing areas, and break and rest rooms.

The project finished early, and Major General James M. Link commented at the opening of the facility in August 1997, "I want to applaud the relationship, the partnership with the Corps. They've broken the paradigm. They've demonstrated a customer focus. That's all come together here at Redstone Arsenal."[48]

Panama Canal Treaty Support

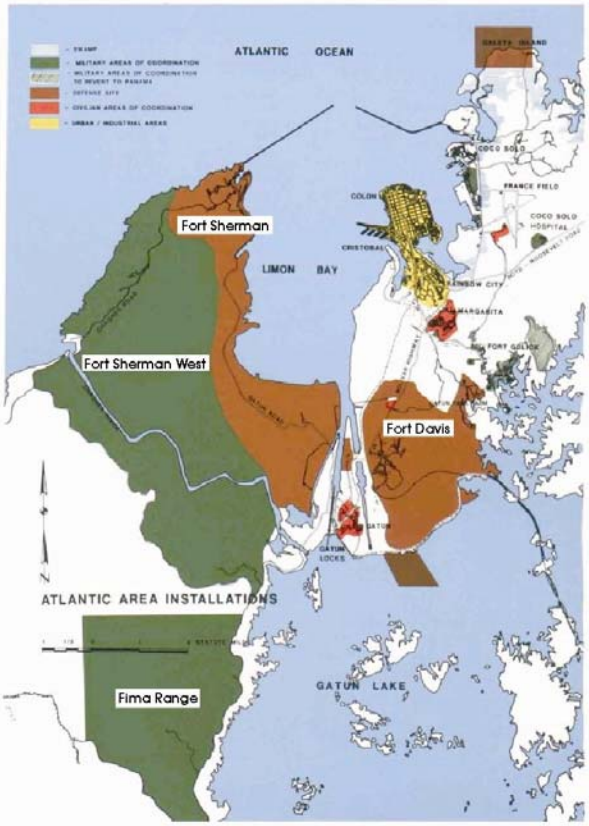
The District carried project management and partnering to an international level during support of the implementation of the Panama Canal Treaty. This time, the District partnered with multiple agencies from both the United States and the Republic of Panama. Although the treaty was ignored during most of the Reagan years, in 1985, the Secretary of Defense, in conjunction with the Secretary of State, ordered the U.S. Army Corps Headquarters to prepare a master plan for turning over the Canal. Headquarters chose the South Atlantic Division for the job, and the Division selected the Mobile District as the point of contact for all Corps of Engineers matters. In May 1989, a Memorandum of Understanding between the Army and the Corps of Engineers established the "relationships and procedures through which the U.S. Army of Corps of Engineers, Mobile District (CESAM), provides day-to-day technical support for execution of the Panama Canal Treaty Implementation Agency Master Plan."[49]

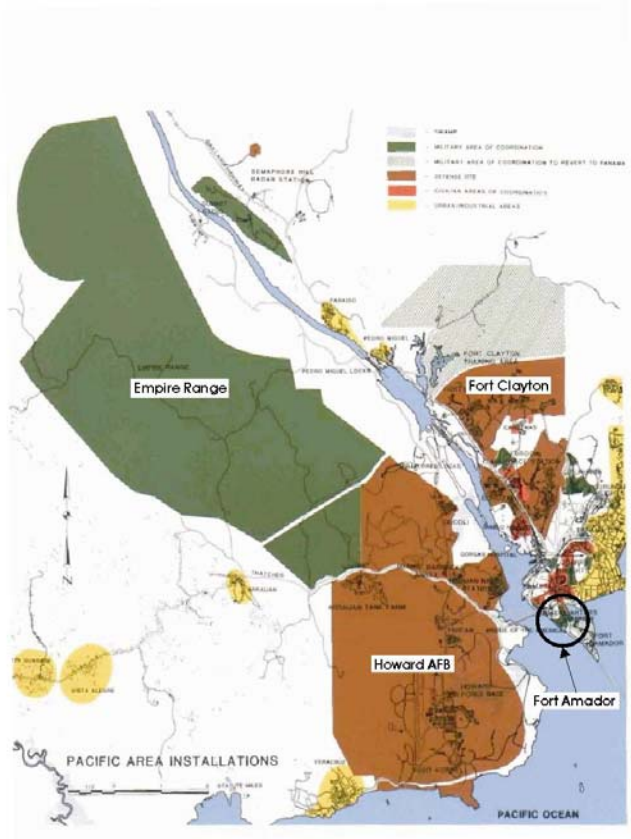
Washington authorized the District to use the Treaty Implementation Framework Plan developed by USACE Headquarters in 1988. From 1989–90, the District set up a Technical Support Office that prioritized phase-out and consolidation plans through final turnover on December 31, 1999.[50]

Difficulties emerged. At the time of the formation of the support office, the various branches of the military in the Canal Zone were operating under classified clearances and refused to share information with the District. In late 1990, classified clearance was granted to key District personnel and the Treaty Support Office moved out of the District Office in the Federal Building and down the street. Jamie Hildreth, Assistant Chief of the Planning Division, was selected to head the Treaty Support Office later renamed the Treaty Implementation Plan Management Office, or TIPMO.[51]

Hildreth and his team were tasked with preparing for the movement of the U.S. Army South (USARSO) and U.S. Operations Command South (SOCSOUTH) from Panama to Ft. Buchanan in Puerto Rico. Additionally, the U.S. Southern Command Headquarters (SOUTHCOM) was scheduled to move to Miami, Florida. Some 12,000 Naval, Air Force, Marine, and Army troops were to be permanently redeployed to other bases. Some of the troops were to be moved to locations in Latin America to support the counter-drug offensive. Others were realigned to new bases or simply phased out. [52]

Finally, until actual phase-out occurred, the District continued to maintain the locks, schools, hospitals, and other government facilities on the various bases. The U.S. government was particularly concerned with the elimination of hazardous chemicals in the Canal Zone. Finally, all government facilities had to have cultural resources studies prepared.[53]





U.S. Military installations at the Panama Canal.

In the meantime, the District was not only given responsibility for preparing the bases for downsizing, but also for preparing the Environmental Impact Statements for the new destinations receiving the US personnel and their dependents who were living in the Canal Zone.

The team, located in the South Trust Building in downtown Mobile, was required to coordinate information sharing with the Republic of Panama on the best use of the facilities. Maintenance and Operations faced a difficult problem due to the rapid deterioration of buildings and machinery in the tropical climate. One observer noted, "It did not take long, if buildings were not maintained and repaired, to have plants growing out of the walls.[54]

Almost immediately, the Republic of Panama pressured the District to help it develop the complexes on the Pacific coast. In addition, Panamanian officials were exploring the conversion of Howard Air Force Base into the primary airport for Panama City. Thousands of civilian employees working for the Canal Zone would need to be transferred to the Panamanian government upon changeover. Numerous employees chose to retire early in order to get their U.S. retirement, rather than risk their retirement on the whims of the Panamanian government.[55]

Hundreds of buildings had to be inspected; barracks and schools were upgraded and modernized. Asbestos was removed from dozens of buildings. Hazardous chemicals were removed and destroyed. Hospitals had to be maintained until the very end of the U.S. ownership. Major U.S. bases at Fort Clayton, Howard AFB, and Fort Armadour were gradually phased out and turned over to Panama.[56]

Whole U.S. military units caught up in the BRAC were completely deactivated; others were transferred to Roosevelt Roads, Fort Buchanan, and Camp Santiago in Puerto Rico. Working closely with all the branches, the District handled the phase-out with a minimum of adverse effects.

SOCSOUTH and USARSO were scheduled to move to Puerto Rico, but political wrangling held up the move until August 1998. This gave the District only one year to move both commands. Here, the Mobile District drew upon various other districts to use their expertise and help. Huntsville, Alabama, supplied expertise in Indefinite Delivery/Indefinite Quantity construction contracts. Jacksonville District supplied Contract Administration and Real Estate and Construction expertise; Omaha District provided support for specialty engineering and hazardous waste cleanup.[57]

The District met the SOCSOUTH time schedule, but not before more than forty buildings at Fort Buchanan in Puerto Rico were renovated. Additionally, power sources were upgraded, local area networks for computerization were installed, fuel tanks were procured and installed, and $3 million worth of furniture was requisitioned and delivered. Also, the District work crossed military agencies. In support of the Navy's removal from the Canal Zone, the District managed funding for Naval preparatory work in Puerto Rico.[58]

In the SOCSOUTH move, partnering expanded to working with other districts of the Corps as well as customers and contractors. Stretching the District's limits, Hildreth later explained, "We drew upon more than seven years of work with all the branches we had developed with the Treaty Implementation Management Office. This was one of the more ambitious projects, especially due to the short time frame"[59]

An additional task of the Panama Canal turnover was the movement of SOUTHCOM from Quarry Heights to Miami. SOUTHCOM is a joint-service

headquarters consisting of more than 700 Department of Defense civilians and military personnel as well as representatives from the Department of State, the Drug Enforcement Administration, and the U.S. Coast Guard. Its primary purpose was defense of the Canal and oversight of joint U.S.–foreign military operations in the region. In addition, SOUTHCOM supported U.S. drug control strategy for Latin America. In March 1995, the Secretary of Defense announced that Miami was chosen as the home for the new 155,000-square-foot site.[60]

The Project Management team for the SOUTHCOM move consisted of numerous military, federal, and local agencies. Included in these were representatives of SOUTHCOM, USARSO, and the General Services Administration, as well as the local support team from the city of Miami. The District also drew upon representatives from the Jacksonville District, the South Atlantic Division, and Headquarters USACE.[61]

The Defense Department offered developers a guaranteed long-term lease in exchange for a facility built to their specifications. Unfortunately, almost immediately, developers claimed that they could not supply the Army the needed space for the rent promised. Despite a hailstorm of negative press that challenged the Army's lease amount, the cost of the tract selected by the General Services Administration, and the list of requirements the Army had for security and technology, a request for proposals was issued in November 1995. The city of Miami cooperated fully with TIPMO and construction began on the building in July 1996.[62]

In November 1996, when the building was in its final stages of completion, the District had to adjust to last-minute security issues. Headquarters determined that the building was too vulnerable to attack, and authorized additional security precautions that had to be taken. The District added a 19-acre security buffer zone to the site, pop-up barricades, blast-resistant windows, controlled entry, and additional guards. The entire project cost $70 million, including employee and dependent relocation. The annual lease was estimated at $1.73 million, plus utilities and additional leases on the buffer zone.[63]

New SOUTHCOM offices in Miami.

One more facet of the move involved special provisions for Department of Defense family housing improvements needed in the Miami area. To help offset the expense of moving, the District drew upon the Capital Ventures Initiative (Public Law 104-106). This law allowed the impacted branch (the Air Force in this case) to donate land to private developers, who could then sell the land to Dade County under their Environmental Endangered Lands Program, generating some $5 million. The funds were applied to reduce costs needed for base housing. Half of the money was put into a fund to help reduce the cost of family relocations. This was an innovative use of new laws to help offset the costs.[64]

Hildreth noted that two things contributed to the efficiencies of the Treaty Implementation operations. One was the close working relationship the District had with all three military services. The second was the use of technology to communicate, including e-mail and video conferencing. These technologies permitted faster

responses to the needs of the military in successfully achieving the drawdown.[65]

The District involvement was gradually scaled back as well. In 1996, the Mobile Treaty Implementation Office was closed and moved to Washington for the final troop withdrawal. By then, some 420 buildings and nearly 16,000 acres of land had been transferred to the government of Panama. In addition, half of the 10,000 U.S. troops stationed at the Canal were permanently drawn down.

The work by TIPMO and Washington helped to produce the smooth transition of control to the Panamanian government. While most of the world's attention at the time was focused on celebrating the millennium and concerns about Year 2000 computer issues (Y2K), flags were quietly transferred at noon on December 31, 1999.[66]

President Carter and President Moscoso at the Canal Zone, 31 December 1999 (Associated Press).

Through eight years of involvement with the Panama Canal Implementation Team, the District furthered its partnering role with contractors and military customers. It made use of the design/build concept on several multi-million-dollar projects, and developed a reputation for adaptability and quality customer service. It successfully planned the U.S. drawdown from the Panama Canal, the largest turnover of U.S. facilities since the end of the Vietnam War. Finally, it adopted new congressional financing authorities to overcome obstacles for relocating families.

Support for the War in Iraq

International events prompted some of the most innovative use of technology after the terrorist attacks of September 11, 2001. In March 2003, U.S.-led coalition forces invaded Iraq to topple Saddam Hussein's regime. The District spent months planning for the invasion, and established a classified program to give instant support to the combat engineers on the ground when the invasion occurred.

An Iraq Infrastructure Assessment Team was put together and given highly classified status. A room on the first floor of the federal building inside the District offices was secured, and direct communications were set up with Corps officials in Washington and in the Middle East who were preparing for the attack. The team was part of the "reach back support" for the invasion force. This allowed engineers on the ground in Iraq to make quick and accurate evaluations of possible targets and to help the Army keep much of the Iraqi infrastructure operational during the fighting.[67]

The U.S. military attempted to minimize damage to civilians and non-military targets. "Field Force Engineering" provided the Corps of Engineers assault teams with the engineering expertise from across the Corps to focus on a specific situation. The objective of engineers in Mobile was to coordinate information from the operational area in Iraq to key districts who had individuals on standby to answer the questions posed by the engineers in the field. Assault teams had fast support to aid their engineering components in securing bridges, maintaining water supply lines, and preventing critical structures from becoming needless targets.

The Corps members on the ground in Iraq had access to a "tele-engineering kit." This consisted of a laptop computer, a dial-up satellite telephone, and a

special video camera. The kit allowed personnel in the combat zone to dial up and immediately tap into the District Office, where a video teleconference provided live discussions.[68]

Corps of Engineers Tele-engineering Kit (USACE HQ).

Information Management team members inside the District set up a communication network, called the Tele-engineering Operations Center (TEOC) to enable the District to coordinate support for immediate issues and problems that the combat teams faced. A Base Development Team manned the center. The team consisted primarily of Mobile District officials, but they had counterparts available in several other districts for support. "Whenever the engineers in Iraq wanted to show us damage or have us do a visual inspection such as supports for a bridge, they just turned the camera on the bridge, and we were able to see what they were talking about," explained Carl Burgamy, Project Manager for the reach-back support team.

In fall 2003, Chief of Engineers Lt. General Robert B. Flowers, in congressional testimony, gave an example of how the project worked:

> "After U.S. forces seized control of the Baghdad International Airport, the TEOC received a call at 10:30 pm local time asking for the Corps's assistance in getting water and electricity to the airport. TEOC engineers set up communications between the military unit at the Baghdad airport, the headquarters unit in the rear, the lead infrastructure assessment team at the Corps's Mobile District . . . within 45 minutes, pictures and blueprints started coming in from Iraq, and discussions were initiated to quickly provide the answers the U.S. Forces needed."[69]

Burgamy filled in more details: "They gave us their questions and we had an entire team set up from all over the Corps offices working on their projects." There was more than one occasion when, as they were having discussions from a vehicle, the team would come under fire. "The team in Iraq had to get down, and we would continue the discussion, right there live," Burgamy went on. "This enabled the Mobile District to give 24-hours-a-day coverage and quick response to immediate needs."[70]

Each member of the Base Development Team had a specialty, and they called upon their sister districts for support in their specialty. For example, Burgamy explained, "we had districts from Alaska to Louisville working on problems. If they had toxic waste issues or weapons disposal questions, we sent a request to the Huntsville office. As another example, if the issue was bridge supports, they went to the Vicksburg office. In all, there were nine districts working night and day on their requests." Once a district had information, they forward it to the Base Development Team member who communicated it to wherever it was needed.

The District carried on daily conversations with Lt. Colonel Corrigan, the Deputy Commander in the Mobile District, who directed part of the Corps of Engineers' efforts in Iraq. Sometimes the meetings involved video conferencing from several locales, and some times just one "point to point." Each week there was a summary report of the week's work. "That way," said Burgamy, "we did not lose the big picture as well as the day-to-day support the fellows over there needed." Flowers concludes that the tele-engineering video teleconferencing system was "critical in helping to solve numerous engineering challenges in Afghanistan and Iraq by providing the warfighters with engineering

analysis from, and direct access to, subject matter experts throughout the Corps, DoD, other government agencies, academia, and private industry."[71]

USACE, Mobile in Baghdad.

The effort has been a close coordination of numerous aspects of the District, including its recognition for innovative use of its resources, the effective support of the Information Management to keep the District armed with the latest technology, and the customer focus the District has strived to achieve for nearly twenty years.

[1] For a brief summary of the U.S.'s changing role in Latin America in the early 1990s, see Statement of Nancy P. Dorn, in Senate Committee on Foreign Relations, *Hearings before the Subcommittee on Western Hemisphere and Peace Corps Affairs*, 102nd. Cong., 1st sess., 1991, 32-39.

[2] See Roger Simmons, *The Role of the Mobile District in Latin America and the Caribbean*, an undated and unpublished report, Strategic Initiatives & SFO Project Management Branch of the Programs and Project Management Division. See also Roger N. Simmons interview, October 24, 2003, Walter Ennaco interview, January 30, 2004, and Burgamy interview.

[3] Abeln interview.

[4] For a full discussion of the J-6 program, see Arnold Engineering Development Center and the Air Force Systems Command, *Project Book for PDC Number ANZY-870198, Large Rocket Test Facility (J-6). Vol. 1 of 2 Sections A-E.* Arnold Air Force Base, Tennessee, 1987; Lt. Col. Guy W. Demoret, Lt. Col. Peter B. Root, Michael T. Abeln, and Leonard F. Jones, Jr., "Partnering Brings Success," *The Military Engineer*, Vol. 85 no. 556 (May–June 1993), 4-7; Office of Public Affairs, Arnold Engineering Development Center, Arnold AFB, Tennessee, and Public Affairs Office, Army Corps of Engineers, Mobile District, Mobile, Alabama, *J-6 Large Rocket Test Facility*, an information pamphlet, not dated; Michael T. Abeln, "J-6: Partnering at Rocket Test Facility," *The Mobile*, Vol. 14 no. 2 (Feb. 1992), p. 6. For information on the management plan, see U.S. Army Corps of Engineers, Mobile District, South Atlantic Division and Arnold Engineering Development Center, Air Force Systems Command, *Management Plan for Design, Construction & Activation [of] Large Rocket Test Facility (LRTF) [at] Arnold Engineering Development Center, Arnold AFB, Tennessee*, unpublished report, June 1986. A copy was in the personal papers of Michael Abeln marked J-6 Procedures and Management Plan.

[5] The Dehumidification Cooler was a special challenge to the team. The huge, unlined, concrete cooling-tower building had to be airtight to support testing in vacuum conditions of less than 0.5psia. See J-6 Team Goals, a summary of the goals and key facts of the J-6 Project. Original is in Mobile District File Box, PM-M J-6 2408.

[6] Abeln, "J-6: Partnering at Rocket Test Facility," 6.

[7] U.S. Army Corps of Engineers, Mobile Alabama and Arnold Engineering Development Center, Air Force Systems Command, Tennessee, *Management Plan for Design, Construction & Activation Large Rocket Test Facility (LRTF) at Arnold Engineering Development Center, Arnold AFB, Tennessee*, unpublished report Rev. # 5, 1988. See also memo from Lawrence R. Green, PE, Chief Program Management Office dated June 12, 1989, Re: Partnering. A copy is located in Mobile District Files, marked PM-AA 1266, File 415-10 Design Partnering.

[8] Abeln, "Partnering at Rocket Test Facility," 6.

[9] To make matters worse, the J-5 facility exploded and was destroyed during a Peacekeeper motor test in November 1985. See Karen J. Weitze, *Keeping the Edge, Air Force Materiel Command Cold War Context (1945–1991)*, report for the U.S. Army Corps of Engineers, Ft. Worth District, EDAW, Inc., Ft. Worth, Texas, 18.

[10] Ibid.

[11] Abeln interview.

[12] Abeln, "Partnering at Rocket Test Facility," 6; see also Abeln interview.

[13] Demoret et al., "Partnering Brings Success," 5. Ebasco/Newberg was a joint venture made up of the EBASCO Constructors, Inc., and Gust K. Newberg Co. both based out of Pasadena.

[14] Mobile District et al., *Management Plan for Large Rocket Test Facility*, June 1986.

[15]Abeln interview.

[16]Abeln, "J-6: Partnering," 6. For Value Engineering results as of September 1991, see report "Value Engineering Proposals" in PM-M J-6, [file marked] 415-10F Contract with Parsons/DMJN.

[17]Abeln, "J-6: Partnering," 6, Demoret et al., "Partnering Brings Success," 7, also "J-6 Project Is Benchmark Success," *The Mobile*, Vol. 17 no. 2 (February 1995), 14. Mike Abeln tells something of the level of commitment to safety on the job: when the first man was hurt in the winter of 1991, he did not want to report the accident because he did not want to be the first accident on the job. Actual estimates authorized by Congress for the project amounted to $226 million, covering FY 1989–1992. See also Gretchen Greeson, "District Hosts DEH/BCE Conference," *The Mobile*, Vol. 15 no. 4 (May/June 1993), 9.

[18] "District Hosts DEH/BCE," *The Mobile*, 8-9. For the award fee program, see Ebasco/Newberg Joint Venture, *J-6 Large Rocket Test Facility, Award Fee Program, Contractor's Evaluation No.* 2, unpublished report prepared for the Mobile District, U.S. Army Corps of Engineers, September 1991. A copy was in the personal papers of Mike Abeln.

[19] Thomas A. Clinton interview and Abeln interview.

[20]Clinton interview, January 16, 2004.

[21] Ibid.

[22] Design/build has a number of flaws that must be addressed when using the contracting approach. It can make it difficult for owners to control important design details while retaining price control. Thomas Clinton, Mobile District Project Manager, observed that the answer to this is to do the majority of work up front, so the crucial design details are settled before the contractor begins.

[23] Herry et al., *Improving on Design/Build*, 68.

[24] Clinton interview.

[25] Thomas A. Clinton. "Redstone Arsenal: John J. Sparkman Center, A Design/Build Success," presentation to update the status on the Sparkman Center, 1998.

[26] Clinton interview; see also History of the John J. Sparkman Center at the U.S. Army Redstone Arsenal Webpage: http://www.redstone.army.mil/history/sparkman/welcome.html. (accessed December 9, 2004).

[27] Clinton interview.

[28] Design and Environmental Awards, *Engineer Update*, Vol. 20 no. 5 (May 1996), and also Clinton interview.

[29] Clinton interview and Clinton, "Redstone Arsenal, A Design/Build Success," not dated.

[30] Ibid.

[31] For more on the Wernher von Braun Complex, see Clinton, Wernher von Braun Complex Chronology, an undated report.

[32]The material could be processed into hydrogen and boron by a specially controlled remote control system. The hydrogen could be safely released into the atmosphere, and the boron converted into a harmless solution of boric acid and disposed off under normal conditions. See, "District helps rid Redstone of 'Green Dragon,'" *The Mobile*, Vol. 23 no. 1 (January–February 2001), 12-13.

[33] "Green Dragon," *The Mobile*, 12.

[34] "Rocket Booster Assembly Building Completed," *The Mobile*, Vol. 13 no. 8 (December 1991), 1.

[35] For information on the Centaur, see "Centaur Processing Facility Supports the U.S. Air Force Space Program," *The Mobile*, Vol. 19 no. 6 (December 1997–January 1998), 16-17 and Tim Dugan, "Corps Supports Air Force Rocket Booster Program," *Engineer Update*, Vol. 22 no. 5 (May 1998).

[36] "Centaur Processing Facility," *The Mobile*, 17.

[37] Ibid.

[38] For an excellent summary of the Base Realignment and Closure Act and its amendments, see Globalsecurity.org link: http://www.globalsecurity.org/military/facility/brac.htm. (accessed December 8, 2004). Also see Secretary of Defense, *Report of the Defense Secretary's Commission on Base Realignments and Closures* (Washington, DC, 1988), 1-15. Appendix B has a copy of the law as enacted. Similar reports were issued for BRAC 91, 93, and 95.

[39] Two works that examine this political hot potato are David S. Sorenson, *Shutting Down the Cold War: The Politics of Military Base Closure* (New York: St. Martin's Press), 1998, and Lilly J. Goren, *The Politics of Military Base Closings: Not in My District* (New York: P. Lang), 2003.

[40] See "Planning Division announces major staff appointments," *The Mobile*, Vol.11 no. 7 (July 1989), 3.

[41] See Mobile District, U.S. Army Corps of Engineers, *Programmatic Environmental Assessment for Army Force Structure Realignment*, report prepared for the U.S. Army by the Mobile District (March 1995), 1-3. A copy is in the Mobile District files, box marked CESAM-PM-LA # 179407.

[42] Mobile District, *Programmatic Environmental Assessment*.

[43] Ibid., 5-33 and 5-37.

[44] "Large Engine Environmental Test Facility nears finish," *The Mobile*, Vol. 20 no. 2, (April–May 1998), 9.

[45] Ibid, 9.

[46] Ibid.

[47] Ibid., 10.

[48] "BRAC Work: Officials Observe Redstone Project Milestone," *The Mobile*, Vol. 19 no. 4 (July–September, 1997), 5.

[49] Department of the Army, *Memorandum of Understanding*, and *TIP Background Briefing*, an undated presentation outlining the organizational role of the Mobile District in the Panama Canal Treaty Implementation, 1989.

Also see, "Col. Bonine gives District Update, Treaty Implementation Plan," *The Mobile*, Vol. 8 no. 10 (October 1988).

[50] Department of Defense Memo, Memorandum for HQDA, office of the Deputy Chief of Staff for Operations and Plans, subject: TIPMO Support of USSOUTHCOM Treaty Implementation. A copy is located in the Mobile District Files, marked CESAM PM-LA, File #3210-20b US SOUTHCOM Headquarters Relocation Briefings. Also see, Mobile and SAD tackle treaty implementation, *The Mobile*, Vol. 9 no. 4 (April 1989), 1.

[51] Hildreth interview.

[52] See Mobile District Files related to the Panama Canal Treaty, box marked CESAM-PM-LA #179407.

[53] Ibid.

[54] See Hildreth and Burgamy interviews.

[55] Hildreth interview.

[56] For examples of the ongoing maintenance of the facilities in the Canal Zone, see Mobile District Files, boxes marked CESAM-PM-LA # 094244, files marked 210-20b, 415-10f. These files include information on such topics as a study of humidity problems, repairs to cold storage, bridge replacements, asbestos removal, electrical system repairs and replacement, water line replacements, road repairs, etc. The scope of the work was so large that, despite the turnover, new construction continued. For an example, a full child development center was built to handle day care for workers at Fort Clayton in the late 1980s.

[57] "Mobile District Latin America team supports the U.S. Army South move to Puerto Rico," *The Mobile*, Vol. 22 no. 2 (March April 2000), 9.

[58] Ibid.

[59] Hildreth interview.

[60] Office of Assistant Secretary of Defense, *U.S. Southern Command Headquarters to Move to Miami*, News Release, Wash DC, # 161-95, dated March 29, 1995. For SOUTHCOM area of responsibility, see Office of the President of the United States, "Memorandum for the Secretary of Defense," dated December 28, 1995, a copy is in the Mobile District file marked, CESAM-PM-LA box # 179407, file marked, UCP.

[61] See Mobile District file box marked, CESAM-PM-LA, # 179407, unnamed file.

[62] See "Briefing for General Wesley Clark CINC U.S. Southern Command SOUTHCOM Relocation Briefing," dated October 3, 1996. A copy is located in the Mobile District File box marked, CESAM-PM-LA # 179407, file marked Command Engineer. In addition, a number of other reports prepared by the Mobile District or the United States Southern Command detailing the move to Miami are in the same file box. For complaints about timing and cost issues for the SOUTHCOM building, see "70-Plus developers and brokers huddle to eye SouthCom Bids," *Miami Today* November 30, 1995, "Bidders balk at SouthCom restrictions," *Miami Herald*, December 4, 1995, and "Developers ponder options as SouthCom deadline nears," *Miami Today*, January 4, 1996.

[63] See binder marked, "SouthCom Security Issues, October-November 1996," located in Mobile District file box marked, CESAM-PM-LA , #179407. Also see "SOUTHCOM Officials Move In," *The Mobile*, Vol. 19, no. 5 (October-November 1997), 1.

[64] US Army Corps of Engineers, Mobile District, *Briefing for Honorable Joe Reeder Under Secretary of the Army, SouthCom Relocation Briefing*, an unpublished report dated October 28, 1996. A copy is in the Mobile District file box marked, CESAM-PM-LA, # 179407.

[65] Hildreth interview.

[66] "U.S. Army South Move to Puerto Rico," *The Mobile*, 8-9 and Hildreth interview.

[67] Around the District, the room is known as the "Little Room" or the "Secret Room." See Rhoda A. Pickett, "Engineers repair Iraq from little room in Mobile Building," *Mobile Register*, April 23, 2003. Though everyone knew about the room, information about how the room was structured and authorized was still classified and not available to the authors.

[68] For more on tele-engineering, see U.S. Army Engineering and Development Center web page: http://www.erdc.usace.army.mil/pls/erdcpub (accessed December 9, 2004). Also see article by Wayne Stroupe and Dr. Larry Lynch, "Tele-Engineering: Quick Answers to Army Field Problems," U.S. Army Engineer Research and Development Center, Huntsville, Alabama, n/d.

[69] House Committee on Water Resources, Subcommittee on *Ports and Inland Waterways and the Intermodal Transportation System, Hearings*, 108th Cong. 1st sess., 2003, Testimony by Robert B. Flowers, Chief of Engineers.

[70] Burgamy interview.

[71] House Subcommittee on Ports, *Hearings, Flowers Testimony*.

A walking trail at a District-managed lake in Mississippi.

The District's Civil Works

Introduction

The Corps of Engineers has responsibility for the management of water resources in the U.S., including navigation, flood control, hydroelectric power, recreation, and environmental sustainment and restoration. The Mobile District has a civil works boundary that includes several major watersheds: the Apalachicola-Chattahoochee-Flint, the Alabama-Coosa-Tallapoosa, the Pearl, the Mobile-Tennesaw, and the Tennessee-Tombigbee Waterway. Additionally, the District has responsibility for seven deep and twenty-one shallow water ports along the Gulf Coast. Geographically, the civil works boundary covers nearly all of Alabama, eastern Mississippi, western Georgia, and the panhandle of Florida. The civil works boundary of the District is presented in the figure on page 3.

When a local entity, be it city, county, state, or other governing or local agency, desires a water-related project, they contact the local district. After funding has been authorized by Congress for a study, the district studies the proposed project and makes a recommendation to Congress about the merits of the project. The recommendation goes through the chain of command from the local District Engineer to the Chief of Engineers. If approved, the Chief of Engineers presents the project with the appropriate financing in his annual budget to the Assistant Secretary of the Army for Civil Works. The plan is then put before Congress to approve and appropriate funding. This process can take years; in the past, most large projects have taken decades. Even when funding is allocated, the funds are allocated only for a single year, and funding must be reallocated in each additional year until the project is completed.[1]

The Mobile District civil works projects provide a range of opportunities for observing the impact of the District's changes in management and technology. One of the largest was the William Bacon Oliver Lock and Dam replacement on the Black Warrior River in the

early 1980s. The Water Resource Development Act of 1986 affected funding for the dam. Additionally, the District Project Management office selected Oliver as a test project for Life Cycle/Project Management. Finally, District officials considered using partnering on the project. Thus Oliver afforded an opportunity to look at the changes in management approach, funding sources, and contracting methodology.[2]

Congress also used the WRDA-86 to fund the Tennessee-Tombigbee Waterway wetlands mitigation. The bill gave authority to the District to purchase 88,000 acres of bottomland hardwood forests in Mississippi and Alabama as mitigation for similar forests lost during the building of the waterway. Additionally, other mitigation work on the Tenn-Tom exposed the District to a host of environmental and cultural resource protection issues that reaffirmed its leadership nationwide in preparing and implementing environmental assessments.

The Regulatory Branch of the Planning and Environmental Division encountered more intense criticism than ever in pursuit of its assignments. An eastern U.S. version of "Water Wars" between three states over river systems that cross state boundaries threatened to end up in the U.S. Supreme Court. Courts expanded regulatory branch economic assessment tools as a result of casino development on the Mississippi coast. Environmental protection activity in the District included some unusual work creating wildlife habitats at Gaillard Island and along the Tennessee-Tombigbee Waterway.

The District manages 454 public recreation and natural areas on 27 major lakes and waterways, and hosts more than 20 million annual visitors at its facilities. This task gives ample opportunity for both protractors and detractors to offer to evaluate the District's work. For example, the state of Florida threatened to halt all Corps dredging in West Florida.

Oliver Lock and Dam

The William Oliver Bacon Lock and Dam Project involved the replacement of an existing lock and dam near Tuscaloosa, Alabama. Under the River and Harbors Act of 1909, the 17 existing locks and dams on the Black Warrior-Tombigbee Waterway were to be replaced with five new ones.[3]

The Oliver Dam and Lock, completed in 1940, replaced old locks 10, 11, and 12 with what was then a more modern 95 by 460 foot lock. After World War II, other locks were replaced with even larger 110 by 600 foot locks and up-to-date spillways. Thus Oliver became a bottleneck for barges being towed down the waterway in the early 1970s. To go through Oliver, eight-barge tows had to disassemble and bring the barges through in two loads. This caused additional delays. A 1983 study suggested that the Oliver Lock be replaced by a new lock and dam 2,300 feet downstream.[4]

The new lock and dam was to be 815 feet long with a crest of 123 feet above sea level. It was to have a modern Alabama Power Company powerhouse for hydropower generation. The District purchased some 268 additional acres on both sides of the river to build the project and permit spoil removal. Part of the purchase included about half of the existing land of the Country Club of Tuscaloosa, a local golf course. As compensation for the loss, the course was given land from the old lock redesigned at Corps expense. It was agreed that Tuscaloosa County would be deeded all roads after construction. In addition, special permits were obtained to reroute the Alabama Power transmission lines and cross the Illinois and Gulf Railroad Line that runs along one side of the river.[5]

Oliver was authorized by the Supplemental Appropriations Act of 1985, and amended by the Water Resource Development Act of 1986. The latter act had within its provisions a requirement that some $60 million of the project's cost was to be paid for by non-federal funds. However, Congress worked out a compromise that circumvented the act's changes in cost-sharing formulas and allowed the funding to be completed out of the Inland Waterways Trust Fund. This was the first sizable civil project to use the fund.[6]

Partnering became a critical component in the Oliver Lock and Dam project. In February 1987, the District contracting office awarded the initial contract for $70 million to Fru-Con Corporation of Baldwin, Missouri. At the same time, the new Life Cycle/Project Management Office selected the Oliver Lock and Dam as a trial project. District and Fru-Con officials drew up the partnering agreement. The Project Management Division hoped that the benefits being realized in military projects could be extended to civil works.[7]

The Contracting Office used the traditional design/bid/build method for selecting the contractor. Under this method, District engineers designed the project and then put it out for bid. Meanwhile, the District set up a Project Delivery Team and placed the Oliver Lock and Dam under Project Management for execution.[8]

Immediately, the Project Delivery Team suspected that Fru-Con had bid irresponsibly low to obtain the work. District estimators placed the cost several million dollars higher. Furthermore, although Fru-Con had good heavy construction experience, project geologist Juan Payne noted in his report that this project was the company's first lock and dam project.[9]

Payne noted in an after-the-fact assessment that the District erred in providing no additional financial incentive to the contractor for their continued participation in the partnership agreement—the only benefit was publicity. Payne concluded, "With these [weaknesses] in mind, the strained relationship that developed led to a 'claim' environment that was inevitable."[4] In addition to this, District construction field personnel were often left out of discussions with Fru-Con.[10]

No sooner had construction begun on the project than problems arose with the excavation work. The contractor excavated a number of sections too deeply. Additional concrete was needed to fill the additional space, and the District refused to approve the extra compensation. The contractor, realizing they had underbid the job, attempted to make adjustments in the blasting for foundation setting. They selected a subcontractor with limited experience in controlling blasting in open air dams. Instead, a series of errors culminated in careless handling of an explosion too close to workers. Fru-Con dismissed the blasting company and then called in their own expert from Germany. Unfortunately, this put the contractor off budget and 14 days behind schedule.[11]

At the same time, the contractor discovered that improper blasting had created the additional burden of removing extra rock. Workers were discovered erasing sections that Corps inspectors had marked to be removed. Other contractor shortfalls resulted in a December 1990 claim of $1.7 million in overruns and a request for a 61-day contract extension.[12] The situation did not improve when a new District Engineer arrived in Mobile. It was the opinion of the project geologist that the contractor exploited the partnering agreement, convincing another contracting officer to conduct a second review of Fru-Con's position.[13]

Other problems developed inside the District. First, the District, sympathetic to the contractor's financial constraints, assumed the quality control functions for the project. Next, a review of the District field office documents revealed discrepancies in reporting. This caused the contracting officer concern about District liability. He suggested negotiating a settlement to nine separate claims. Both sides agreed to a final settlement in 1991 of $950,000. Fortunately, the lessons learned in the foundational stages were not repeated, and the lock was opened in August 1991 without additional problems. [14]

The completed Oliver Lock and Dam.

Fru-Con completed the dam portion of the project without incident in December 1992. Cost overruns were minimized, with the cost by the end of fiscal year 1993 at about $120 million. Additional work pushed final completion to 1996, bringing additional costs of $5 million, but these costs were beyond the scope of the original agreement.[15]

Budgetary concerns aside, a number of issues surrounding the building of Oliver Lock inaugurated a different approach to contracting. The Contracting Office settled on the 35 percent design/build fixed price incentive contract for future work. Experience in the private sector, at J-6, and Redstone Arsenal convinced District contracting officers that design/build contracts would be more effective in controlling costs and subcontractors in the future.

Mitigation on the Tennessee-Tombigbee Waterway

Probably no project stirs up more feelings of elation and heartburn inside the Mobile District than the story of the Tennessee-Tombigbee Waterway. This massive earth-moving connection of the Tennessee and Tombigbee Rivers was the largest civil project of its kind ever undertaken by the Corps of Engineers. A detailed description of the work on the "Tenn-Tom" is undertaken in the previous District history by Jeane and will not be repeated here. In January 1985, the *Eddie Waxler* became the first commercial user of the new waterway.[16]

A barge on the Tenn-Tom.

A financial, political, economical, and environmental fight for decades, the project was completed two years early and within budget. However, the Tenn-Tom helped initiate Corps-wide changes in the way U.S. environmental policy would be implemented. The Tenn-Tom opened the door to new approaches to wildlife mitigation, established the Tenn-Tom Economic Development Office, and expanded wetland management in the District.[17]

A map of the Tennessee – Tombigbee Waterway.

Successfully constructing the Tenn-Tom Waterway required creativity and leadership. To satisfy congressional demands for mitigating wetlands loss, the District had to garner support for projects, negotiate and manage a huge amount of additional real estate, and locate local partners to share in funding. In addition, the District had to attempt to work out an acceptable means for measuring the losses created by the waterway against the gains created in setting aside large tracts of land for forests, parks, and recreation areas. Finally, the District Planning Division continued an aggressive cultural resources program initiated during construction. District officials obtained invaluable experience that allowed them a leadership position in future projects with BRAC and the Panama Canal Treaty Implementation.

Congress authorized the District to purchase 88,000 acres of land under the WRDA-86 to offset losses from the building of the waterway. Of this land, 20,000 acres were purchased in the Mobile-Tensaw Delta, Alabama, and 25,000 acres in the Pascagoula, Pearl, and Mississippi River deltas in Mississippi. In addition, the balance of the 34,000 acres of bottomland hardwoods could be acquired anywhere in the two states.[18]

The Corps developed mitigation implementation plans to earmark areas for land acquisition. These plans were developed in conjunction with the U.S. Fish and Wildlife Service and the wildlife departments of the two states. The agreements allocated 13,000–16,000 acres to be purchased in Alabama and 27,000–30,000 acres to be purchased in Mississippi. Both states agreed that these numbers were "guides with final acquisition recommendations being based upon an evaluation of the candidate lands." In addition, target areas were set up by the two states that emphasized the rivers systems and areas established in WRDA-86.[19]

Funding for the 88,000 acres came directly from the WRDA-86, which authorized $66.2 million for the project. The cost to complete the purchase of the acreage after inflation and other factors, exceeded $92 million.[20]

The Tenn-Tom Wildlife Project gathered a collection of disciplines on its Project Delivery Team, including U.S. Fish and Wildlife Service biologists and biologists from the respective state wildlife services. The Mobile District provided foresters, civil engineers, an architect, a hydraulic engineer, an attorney, a realty specialist, an archaeologist, and resource managers. More than 150,000 acres were either put under their management or their direction. The Project Delivery Team became responsible for wide-ranging activities such as hunting programs, waterfowl impoundment, bird and wildlife management, agricultural planting, wetland controls, and other aspects of forestry management. [21]

In addition, since the region is located in an economically disadvantaged area, education of area residents became a high priority. The system has two environmental educational facilities at Bay Springs Lake and Plymouth Bluff, Mississippi. Here, cabins, nature trails, gazebos, classrooms, and eating facilities are maintained by an educational consortium of a number of Mississippi universities.[22]

At Pickensville, Alabama, the Bevill Visitor Center serves as a replica of an antebellum plantation home and depicts the historical importance of navigation on inland waterways in the Southeast. Behind the center is one of the region's National Historic Landmarks — the U.S. Snagboat *Montgomery*. The steam-powered sternwheeler is an 80-year old Corps of Engineers ship that cleared the waterways of the Southeast of trees and other dangerous debris.[23]

In northeastern Mississippi, near Fulton, is the Whitten Historical Center, which displays the federal government's influence in bringing development to the region. The center focuses on the influence in Mississippi of such diverse agencies as the Tennessee Valley Authority, the U.S. Army Corps of Engineers, and the National Park Service. Overall management of the project is located in Columbus, Mississippi, at the Waterway Management Center, while the Bay Springs Resource and Visitor Center concentrates on recreational and natural resources of the Tenn-Tom.[24]

Other special projects that involved close partnering between federal and state agencies brokered by the District include the Federal Eagle Hacking Program (hacking is the term used for reintroducing a species into its natural environment). Responding to a federal directive to attempt to reintroduce bald eagles to Alabama and Mississippi, the Project Management Team joined with the Sutton Avian Research Center in Bartlesville, Oklahoma, to "place fledglings hatched in captivity into artificial nests in an attempt to encourage the bald eagles to return to the area after they depart." Towers were erected on lands along the Tenn-Tom holding cages that simulate natural nests. In 1992, 46 immature eagles were placed in the towers at several points along the waterway and nearby lakes. After banding and a 13-week wait in the cages, the birds were released into the wild. Within a year, nearly a dozen banded pairs of eagles were nesting in the areas where they had been released.[25]

The Plymouth Bluff Facility on Aliceville Lake in Mississippi represents a combined effort by the Project Management Team and the Mississippi University for Women. The facility joined with the Nature Conservancy to preserve an ancient fossil bed and erected a $4.75 million facility stressing environmental awareness and education. Management and maintenance came from the university. Along with the cabins, conference center, open-air auditorium, and trails, there are scenic views of the Tombigbee River and the Plymouth Bluff Paleontological site. The museum contains fossilized mollusks, foraminiferans, and sharks' teeth some 65–100 million years old. The site, which opened in the summer of 1996, was almost destroyed in the initial plans for the Tenn-Tom. To avoid cutting

directly through the Bluff, the waterway route was altered.[26]

Archaeologists Come to Tenn-Tom

The Tenn-Tom created opportunities for archaeologists to ply their trade, and, due to its lengthy construction time, to see great changes in the legal obligations of government agencies.

The passing of the Archaeological and Historical Preservation Act of 1974 authorized 1 percent of a project's costs to go to "survey, recover, protect, and preserve archaeological and historical resources." The act was significant because 1 percent on the Tenn-Tom amounted to $20 million. The fights that Corps archaeologists had with District personnel to save, protect, and properly excavate prehistoric and historic sites along the Tenn-Tom are beyond the scope of this narrative. However, archaeologists experimented with a form of project management and partnering years before the idea was introduced to the District.[27]

As early as 1977, Jerry Nielson had formed a project management team of archaeologists, historians, architects, federal project managers, real estate specialists, and engineers to have "free and candid debate of the issues" affecting site preservation along the waterway. Numerous issues were discussed at his early meetings, but the most important outcome of the meetings was "generating enthusiasm for the program, resolving misunderstandings, and reaching acceptable compromises in developing the mitigation plan." Although frequently overlooked in the early years, the impact on District understanding of the advantages of team decision-making and partnering quietly affirmed many of the ideas Colonel Dunn would introduce to the District in the mid-1980s.[28]

Work on Tenn-Tom sites continued even after the waterway was opened. By providing funding and a large number of projects, the Tenn-Tom allowed District archaeologists to formulate a road map for their work into the 1990s. The work allowed them to develop research questions, look at scopes of projects, stimulate public awareness of the past, and develop meaningful partnerships with contractors.

For example, District plans had never included excavating everything on a site, or even disturbing the site if it were not necessary. Rather, as Nielson later pointed out, the site's context was as important as the artifacts. Before entering into data recovery (the actual excavation portion of an archaeological project), Nielson believed a series of research questions needed to be posed to those managing the project. Nielson wanted the archaeologist to understand why he was excavating and limit his work to his objective. The objective was not to salvage everything possible. One of the biggest problems Corps cultural resource officers have encountered over the years is to get their contractors to understand this.[29]

Another aspect of the Corps work in recent years has been to counter the criticism that archaeologists do not make their work publicly accessible. Archaeological reports are complex and full of technical jargon. Artifacts are stored in state historic preservation office warehouses and never seen again. As cost-sharing has become a larger factor in District work, so has the question of what the public derives from these data recovery expenditures. Why should the public continue to support activities that offer no tangible results? District officers demanded that their contractors write their reports in more user-friendly interpretive volumes. In addition, they are sponsoring interpretive public history to explain to visitors not just the site or its components, but its wider historical significance. For example, to better understand the impact of inland

waterways on Southern development, the cultural resources office restored the U.S. Snagboat *Montgomery* and opened it as an interpretive museum.[30]

The U.S. Snagboat *Montgomery* is a floating museum today along the Tennessee-Tombigbee Waterway.

In the late 1990s, District archaeologists and their contractors became more involved in ongoing work with Native American tribes. These activities have focused on the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001). This act authorizes federal agencies to return to the tribes thousands of remains disinterred from excavations over the last century. The District archaeologists and their contractors have formed a working relationship with the Southeastern tribes. This team meet regularly and informally to discuss and settle on processes for returning the remains.[31]

Budget cutbacks affected cultural resources activities. Archaeologists who left were not replaced, and the staff at the District office gradually declined. The District turned to contractors for much of the ongoing survey and data recovery workload. This put District archaeologists into the often undesired role of contract administrators. The District stands to lose expensive and valuable experience should the scale-back continue.

This brings to the forefront two questions. District Engineer Colonel Robert Keyser (2001–04) asked if the District got to a point where it hires a contractor to watch contractors. The second question is: Is the Corps sacrificing "core competencies" within its mission in favor of cost reductions?[32]

Private companies generally contracted out "non-core competencies" in the 1980s. For example, manufacturers began to contract out not just traditional services such as cleaning, landscaping, and maintenance, but logistics, inventory management, and even assembly operations. The objective was to focus management and employee attention entirely on the critical elements of the product or service the business provided.

If the Corps finds that archaeological surveys and data recoveries, important as they are, are not core competencies, then contracting them out would be in line with business practice. As the Corps employees who currently have this expertise continue to leave the agency and are not replaced, then the ability to manage technically complex aspects of an archaeological project will be lost. As Keyser states, the Corps will end up hiring contractors to manage other contractors.

This discussion is framed by a larger question about the proper place of the U.S. Army Corps of Engineer's civil works mission. Many Corps critics believe that the civil works responsibility belongs under another federal agency, since it is a non-military mission. The Corps of Engineers has historically countered this argument by continually reminding Congress that the civil works training keeps military engineers from "becoming rusty" during peacetime. Although this logic has held up in recent decades, Congress on-going determination to reduce costs and streamline Federal agencies keeps the debate over the Corp's civil works future in the public eye.

Wildlife Management and Recreation

One of the larger wildlife mitigation plans for the Tenn-Tom was the Okatibbee Lake Project. The Water Resource Development Act of 1986 provisions required that since the Tenn-Tom Waterway destroyed primarily bottomland hardwoods, mitigation should focus on these wooded tracts. Some 8,235 acres on Okatibbee Lake, primarily bottomland hardwood, were identified as a subject of the mitigation effort. This Mississippi lake and adjoining forest were designated to have "the states reimbursed for the costs of their wildlife management actions and a more intensive level of management undertaken."[33]

Mississippi asked that the Corps pick up the entire cost of additional management efforts on the lands around Okatibbee Lake. The District agreed and set about a program of more intensive management, designing and constructing food plot clearings and plantings, wood duck nesting boxes, parks and roads, waterfowl impoundment areas, and trails. They also absorbed the cost of equipment maintenance and repairs as part of the mitigation program.[34]

Beginning in 1992, initial investment in Lake Okatibbee exceeded $900,000 in the initial construction and expansion of wildlife habitat and educational opportunities. The opportunity to be creative in helping the states manage their land resources generated new ideas on how mitigation could be carried out.[35]

One of the benefits of the Tenn-Tom to local residents was the recreational use of the waterway. Prior to the waterway, the region had no camping facilities. The Tenn-Tom Waterway mitigation efforts created some 40 recreational areas, several of which permit overnight camping. Also, the District created several beaches, though none were in the original plan. Facilities for handicapped fishermen were erected along the banks and included easy access to deep water in specified areas. A former manager of the waterway for the Corps remembered, "In 1988, we initiated special hunting days in early deer and turkey season to give the immobilized handicapped a chance to hunt. Relatives and on-site biologists help the hunters in an area set aside near Gainesville, Alabama." [36]

Safety programs also increased within the recreational areas. When the waterway opened in 1985, the waterway averaged 16 water-related fatalities per year. Since the manned recreational areas were completed in 1995, the yearly average dropped to one. "One of the big educational points we emphasize is public safety," relates Connell, "safety around and in the water, especially with regard to using life vests and mixing alcohol and recreation." In addition, the recreational areas continue to grow, with user fees totaling more than $700,000 in 1997.[37]

Despite the fact that the waterway goes through some of the most rural areas in the eastern U.S. and has no major cities from which to draw visitors, it attracted some 3.1 million visitors a year by the late 1990s. By 1998, the waterway project ranked fifth in fees among all the Corps projects nationwide. One of the rationales for developing the waterway was the services and jobs the underemployed region might secure.[38]

Critics of the project were quick to point out that the fees collected hardly offset the millions that it takes to run the project. In addition, they said that in the first ten years of operation, the promised economic development did not materialize. To add fuel to the criticism that the project was a "billion dollar boondoggle," the much-proclaimed barge traffic failed to materialize.[39]

In the years following the opening of the Tenn-Tom Waterway, coal shipments did not meet

expectations—1.7 million tons per year as compared with the projected 21 million tons. This gave grist to claims that Tenn-Tom was "the very epitome of pork barrel, the point of reference against which all other backyard projects were measured." Others were just as critical, calling it the "nation's largest wet elephant," and accused Congress of creating a "two billion dollar fishing hole." Even barge captains admitted it was still cheaper to use the Mississippi, where they could expand to thirty and even forty barge tows, and did not have locks to contend with.[40]

Although the Mobile District has gone to great lengths to answer its critics, the Tenn-Tom focused attention on whether the waterway was a planning failure. Colonel Dunn carefully observed in 1985, the same year the huge waterway was completed, that the era of large civil projects planned, designed, constructed, and run by the Corps without challenge, question, or competition had come to an end. The project's most thoughtful writer, Jeffery K. Stine, summarizes the project well. "The Tenn-Tom," he wrote, "was a political issue from start to finish…the engineers who built the waterway did their job and did it well. Whether they should ever have been asked to do that job is a political question, an environmental question, an economic question."[41]

Politics of the Tenn-Tom aside, the District did not set policy, though it did do the planning for the project. Herein lies the root of the issue: Congress and the general public are often forced to rely upon the Corps findings to justify a project. Thus the Corps is often accused of slanting the economic or even environmental data to provide themselves and their congressional districts with work. If that is indeed what District officials did on the Tenn-Tom, they certainly paid the price for it in the public backlash. Unfortunately, one of the legacies of the Tenn-Tom was more legal and political challenges to Corps of Engineers projects in the future. Senator Muskie's comment about the fox becoming a hen certainly was not widely accepted in the environmental community. In the future, more, not fewer, challenges confronted the Mobile District.

On the other hand, the completion of the Tenn-Tom, the aftereffects of congressional changes, and the massive mitigation efforts better equipped the District for the future. In the nearly twenty years since the waterway opened, District employees accumulated a vast collection of knowledge and understanding of complex and ever-changing bodies of law. They have been challenged, but not often overcome.

The Corps continued to have one of the most difficult balancing acts of any federal agency. It must address flooding and hydroelectric power issues while protecting recreational and wildlife areas and keeping the waterways and harbors open to ship and barge traffic, and it must balance these missions with political winds that change at least every two, four, and eight years.

Water Wars in the East

District officials found the water allocation issue along the Apalachicola-Chattahoochee-Flint River System one of the most difficult to resolve. The struggle over water allocation, something somewhat foreign to the normally water-rich Southeast, has been dubbed the "Water Wars" by the media.

Emanating in north Georgia above Lake Sydney Lanier, the Chattahoochee River flows south-southwest 540 miles to the Gulf of Mexico. During its long trip south, the river forms part of the border between Alabama and Georgia, and at the Alabama-Georgia-Florida junction it joins the Flint River, which originates in west-central Georgia. The two rivers become one and get a new name, the Apalachicola. Here, the

Apalachicola River flows south through western Florida to Apalachicola Bay on the Gulf of Mexico.

The water allocation issue began in the 1980s. The droughts of 1981 and 1986–1988 brought abnormally low levels of water to the river basin. The droughts depleted reservoir reserves and shut down navigational river traffic along the system. Metropolitan Atlanta communities requested that the District open Lake Lanier as a source for drinking water. In addition, development along the shoreline of the lake increased pressures for recreational pursuits.[42]

Buoy marker at Lake Lanier, Georgia during the 1986–88 drought.

The impact of the drought on agriculture in the area was severe. During the 1986–88 drought, Alabama farmers lost nearly $1 billion. Water became so critical that the National Guard was called to truck in potable water to municipalities along the watershed. In addition, navigation was curtailed twice during the summers of 1986 and 1988, stopping the flow of bulk products such as fertilizers, sand, gravel, and petroleum products to the region. Finally, recreational pursuits were limited, fish and wildlife habitats were destroyed, and nearly all the residents of the area suffered as the lakes were drawn down to keep the river flowing.[43]

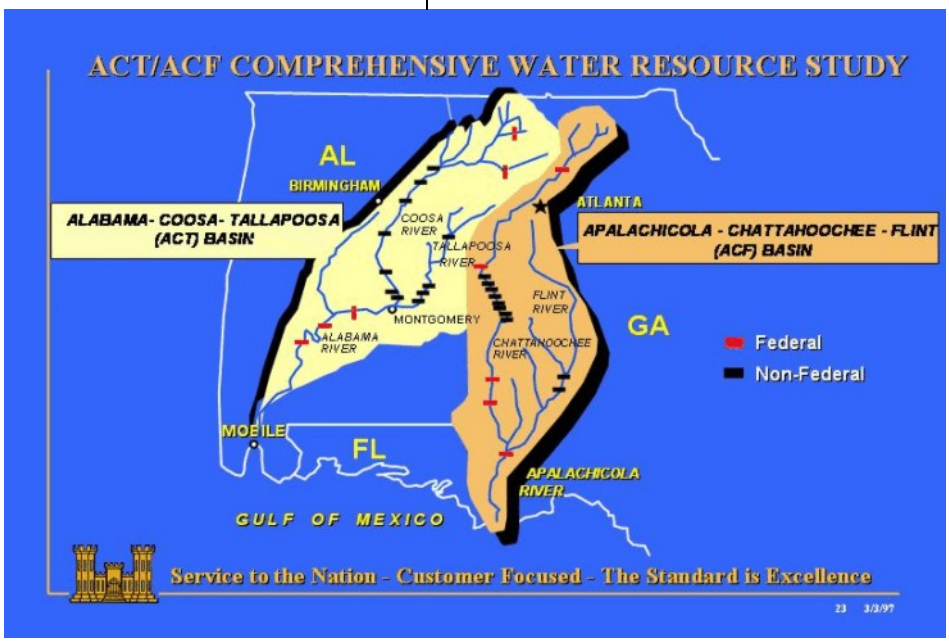
In 1983, the Corps and the governors of the three states signed a memorandum of agreement to develop a water management system for the Apalachicola-Chattahoochee-Flint River System. A plan completed by the District in 1988 established a water budget for the basin, a long-range drought management plan, and an interstate coordination mechanism. However, lack of funding prevented the long-range studies that were needed to implement the plan.[44]

Meanwhile, metropolitan Atlanta communities requested withdrawals from Lake Lanier and from Lakes Allatoona and Carter in the Alabama-Coosa-Tallapoosa River System north of Lanier. Alabama state officials became concerned that the District's conceptual study was insufficient for their needs. When Georgia filed a petition to implement the original plan of study in May 1990, the state of Alabama filed suit to stop the petition and maintained that the original plan of study was inadequate for the water allocation. District officials initiated discussions between the two states to prevent litigation. Florida joined the discussions that September at the invitation of the District Engineer in Mobile.[45]

Florida's entrance brought a new perspective. Representatives of that state insisted on eliminating the use of the Apalachicola River for barge traffic and restoring the river to its natural state. Additionally, Florida had fishery problems. Apalachicola Bay is one of the largest bays in the world for oystering. Oysters require a blend of fresh and salt waters, thus complicating the demands on the allocation efforts.

All three states agreed on two points: a federally funded, impartial, comprehensive study of both river systems should be completed to help resolve the conflict, and both river systems needed to establish a long-term plan for water allocation. Concurrently, they agreed that litigation would be the least desirable way to solve the problems. In January 1992, the governors of all three states signed another memorandum of agreement. The Assistant Secretary of the Army for Civil Works represented the Mobile District.

District Engineer Colonel Michael Thuss (1990–92) acknowledged at the time that the study of the two river basins was both unique and challenging. Thuss



The ACT and ACF waterways study area.

hoped that a real "partnership" could be formed to resolve the issue through a joint effort."[46]

Out of the second memorandum of agreement came a series of meetings, discussions, and five supplemental agreements. All three states agreed on each step of the process. In 1996, the meetings between the states and the District resulted in the ACF River Basin Compact and a similar compact for the ACT River Basin. The three state legislatures and Congress agreed on the compacts, and President Clinton signed them in November 1997.[47]

The ACF Compact established an ACF Basin Commission, composed of the governors of the three states and a federal commissioner appointed by the President. The purpose of the Commission was to "develop an allocation formula for equitably apportioning the surface waters of the ACF Basin among the States while protecting the water quality, ecology, and biodiversity of the ACF, as provided by the Clean Water Act…and other applicable federal laws."[48]

After an allocation agreement was developed, the federal commissioner had 255 days to issue a concurring or nonconcurring decision. If he concurred, the formula became federal law. If he did not concur, the entire process was dropped and the states were free to pursue litigation. A similar arrangement was agreed to for the ACT. The two commissions differed only in the role of the governor of Florida. Florida served as a non-voting member of the ACT Commission, since the ACT water system did not cross into that state.

The Commission was tasked with determining how the District field offices at the lakes in North Georgia allocated the water. Their decision was expected to change the current allocation. "The pressure was really on all the players," said Joanne Brandt, an environmental biologist with the District, "to come to an acceptable conclusion." The District's immediate role would be to prepare Environmental Impact Statements (EIS) once the states reached agreements. The EIS had

to be prepared and presented to the federal commissioner before the 255-day period passed. District representatives watching the process believed that the 255 days allowed for preparation of the statements was inadequate for such an exhaustive study.[49]

The District initiated the EIS before the compact was signed by President Clinton in 1997. By October 1998, they completed a draft EIS. Unfortunately, the ACF Commission could not agree on an allocation formula. They agreed, instead, to extend the time period allowed by Congress to negotiate.

The EIS was complicated in that it could not be finalized until the states agreed on an allocation formula. To deal with this, the District decided to prepare the EIS using a three-tiered approach. The District looked at the three most likely options that the ACF Commission would choose, and completed their preliminary statement gambling that the Commission would likely choose one of the three models they developed.[50]

In 2002, all three states found themselves with governors of the same political party, who committed themselves to resolving the issue. Unfortunately, in the summer of 2003, the governor of Florida concluded that his state would be best served through litigation. He withdrew from the discussions.[51]

With the negotiations dead, Alabama immediately reinstituted the 1990 lawsuit against the District. Florida prepared an appeal to the United States Supreme Court, which could leave that body with having to determine the water allocation decisions. Meanwhile, the water allocations along the two systems continued to operate to no one's satisfaction, as they had for more than forty years. From 1999–2002, the Southeast suffered through another terrible drought while the District prepared to go to court. As of the end of 2003, the case had not been argued before the U.S. Supreme Court.[52]

Casinos on the Gulf

In another controversial program, the Mobile District became involved in an economic and social impact study of the Mississippi coast. This time the subject was casinos. In 1990, the State of Mississippi passed a Gaming Control Act legalizing dockside gaming casinos in Mississippi Sound waters. Each of Mississippi's three coastal counties could decide whether to permit gaming. Hancock and Harrison Counties authorized gaming, but Jackson County did not. As of 2003, some twelve operating casinos were located in the two counties.[21] Since the casinos are all on the water, the District must issue all permits for development and docking on the coast.[53]

As a result of casino construction, large-scale development began in earnest in the early 1990s. This presented problems for three counties that for decades had been rural, quiet beach communities with seafood-related industries. Between 1990 and 2000, Hancock County grew a whopping 35.3 percent, nearly three times the national average. Jackson and Harrison also saw double-digit growth patterns. Some of the growth came as the result of expansion at the Stennis Space Center and Keesler Air Force Base nearby, but most of the population influx was a result of the gaming industry.

Grand Casino added 5,460 jobs to Biloxi in Harrison County, and Beau Rivage, just a short distance down the coast, added an additional 4,150 jobs. Three casinos made up nearly 12,000 of the 19,000 new jobs added in Harrison County. During that same period, 17,500 new homes were added to the three-county region. That was more than the entire work force in Hancock County in 1990.[54]

When the District issued permits for the first casinos, most observers believed they would be an improvement to the area. However, development quickly expanded, especially with the completion of the Beau Rivage Resort and Casino in Biloxi in 1999. Issues began to arise when development spilled over into mostly rural Jackson County, west of the Pascagoula River.[55]

Some Jackson County residents were troubled by the development since they chose not to have the casinos. The county filed suit against the District. The suit claimed that the EIS prepared for many of the casinos did not adequately evaluate the "cumulative" effect of the gaming industry on the environment of coastal Mississippi. The court ordered a new statement for three new casinos proposed for the three-county area. In addition, the court challenged the District to develop new tools to measure impacts on growth.[56]

The District complied and developed new tools that included growth rate scenarios, trend analyses, and resource change trends. These were adapted to an EIS that covered the entire coast of Mississippi as ordered by the court. The draft EIS was completed in 2003.

Dr. Susan Rees, chief of the Coastal Environmental Team, noted that since 1995, "the Mobile District has seen the evolution or growth of environmental concerns, and at the same time, we have seen larger and larger projects along the coastline. It used to be we saw subdivisions in our coastal area for 50 residents, now we are seeing requests for 5,000."[57]

The state of Mississippi unknowingly compounded the problem. Mississippi law required the casinos to provide for the influx of visitors. The owners gladly complied, adding hotels, parking garages, and resort destination packages to the water-borne casinos. This only increased the stream of tourists. People visiting to game soon decided to stay. Contractors began building new subdivisions to house the growing work force and the new full-time residents. District studies, developed primarily to assess the impact of the casino, did not adequately address the impact of population growth.[58]

In 2003, the District's thrust was to provide a framework for how development should occur in coastal Mississippi. Although growth patterns seemed to level off by 2002, the casinos continued to draw newcomers to the area, and many chose to become full-time residents. Dr. Rees's studies indicate that growth will continue but will be driven less and less by the casinos.

Of deeper concern to many residents was the conversion of an area once known for being "very laid back and rural" into a populated area of retirement homes, golf courses, and large subdivisions. Not all shared the concern. Although the District had been criticized for allowing unchecked growth, one regulator commented that the casinos have tried to "remove their tacky look, and blend into the area. What was once a run-down, even abandoned, oyster factory is now a very nice attractive beach hotel complex."[59]

Managing Is for the Birds

Along with the environmental work on the Oliver Lock and Dam, the Tenn-Tom, the ACF River System water allocation, and casino permitting, other changes have occurred in the regulatory arena. One success story is the creation of Gaillard Island in Mobile Bay.

Gaillard Island, once a dredge spoil island, was converted into a habitat for the endangered brown pelican. The pelican never nested in any of the waters off Alabama in historic times. District officials planted vegetation on the spoil island to create a wind and water barrier against erosion and to create a habitat suitable for the birds. Although gulls, terns, and skimmers quickly

appeared on the island, no pelicans came until 1983. By 1988, some 600 adult brown pelicans had nested on the island, and nearly 1,400 young survived. By 2003, the colony had grown so large that several thousand pelicans annually roosted on the island, and the brown pelican was removed from the endangered species list. Members of the District humorously referred to the project as "managing is for the birds."[60]

The Brown Pelican on Gaillard Island (photo courtesy of Dr. Susan Rees).

A similar operation in 1995 at Dauphin Island's Sea Lab Consortium successfully replanted the salt marsh. The experiment involved a 50-50 cost-sharing split between the federal government and the state of Alabama. In this instance, the non-federal cost-sharing partner was the Marine Environmental Sciences Consortium. The District used Section 22 of Public Law 93-251, Planning Assistance to States, which permitted it to aid the states to conserve water and related land resources. The District's role was to design the wetland and to prepare the plans and specifications. The District also helped Sea Lab obtain funding from the Environmental Protection Agency.[61]

A number of groups were involved in the project, including the Marine Environmental Science Consortium, which operates Sea Lab, the Alabama Department of Economic and Community Affairs, the U.S. Fish and Wildlife service, the Environmental Protection Agency, and the U.S. Army Reserves.[62]

Not all the District projects worked out so well. At Garrows Bend, just a few miles away from Gaillard Island, local media once again raised the issue of credibility. The District drafted an EIS that found the marshes at Garrows Bend to be "low quality and dominated almost exclusively by a couple of common or invasive non-native plant species." In fact, the report went on to say that contamination in the shellfish reefs located there is so bad that the marsh must be filled in as part of environmental restoration.[63]

The *Mobile Register* took issue with the EIS, implying that the Corps was catering to the Alabama State Ports Authority. The paper asserted that the Ports Authority wanted the land filled so it could build a new railroad terminal over it. The local paper found what they called "discrepancies" in methods used by the District to determine the vitality of the marshes. They concluded that the area was one of the last undisturbed salt marshlands in the Bay of Mobile. The implication of catering to the Ports Authority was challenged by the District Engineers' office.[64]

The District continues an ongoing struggle to balance its many-sided mission. Environmental groups clamor for more consideration in Corps planning, whether at Garrows Bend or along the Tennessee-Tombigbee Waterway. Business interests want clear and safe water levels for shipping goods. Owners of property near the recreational lakes call for maintaining high water levels during the summer months so tourism does not suffer. Meanwhile, as the Albany, Georgia, flood of 2003 revealed, flood control is still a critical component of the District's mission. Finally, those who oppose large reservoirs sometimes forget that hydroelectric power is the least expensive and least environmentally polluting power source. Maintaining these facilities is absolutely critical to millions of citizens in the District.

The Corps acknowledges that sometimes only the threat of litigation has changed its policies. Ultimately, the ACF/ACT question may have to be resolved through the U.S. Supreme Court. A court decision demanded that the District expand its evaluation of the impact of development on the Mississippi coast. The Corps would probably never have given thought to such projects as Gaillard Island or the extensive mitigation along the Tennessee-Tombigbee Waterway had not government legislation and financing demanded it. Finally, the District continues to work to convince the legislative, executive, and judicial branches of the U.S. government that the role of the nation's water manager is best kept inside the Corps. The future of water management will not be easy. But in the years after 1985, District officials discovered that project management and advanced technology contributed substantially to their ability to successfully adapt in their civil works mission.

[1] For a brief discussion on various authorities and policies of the Corps's water resources responsibilities see, Planning and Policy Division Directorate of Civil Works Headquarters USACE, *Civil Works Policy of the U.S. Army Corps of Engineers Pocket Reference*, Washington, D.C. (not dated). The Mobile District also publishes a small projects brochure that explains how these projects are originated and financed. See Mobile District, U.S. Army Corps of Engineers, *Small Projects Programs*, Mobile, Alabama (not dated). For more information, see the Mobile District civil works web page http://www.sam.usace.army.mil/PA/civil.htm (accessed August 10, 2005.).

[2] A good summary of the Water Resource Development Act of 1986 and the impact on the Mobile District is in Roger A. Burke, interview, January 13, 2004.

[3] Also, see U.S. Army Corps of Engineers, Mobile District, *Black Warrior-Tombigbee Rivers, Alabama Interim Feasibility Report and Environmental Impact Statement for the Oliver Lock Replacement*, report prepared by the Mobile District, U.S. Army Corps of Engineers, 1983.

[4] Department of the Army, *Annual Report Fiscal Year 1988 of the Secretary of the Army on Civil Works Activities (October 1, 1987– September 30, 1988)*, (Washington, D.C.: GPO, 1989), 10-6.

[5] Donald L. Burchette, *Oliver Lock Replacement Black Water River, Alabama, Design Memorandum No. 3*, an unpublished report by the U.S. Army Corps of Engineers, Mobile District, Mobile, Alabama (1985), 1-4.

[6] Although the original authorization excluded local cooperation, a Senate majority/Reagan administration compromise demanded local cooperation. The compromise acknowledged the local cooperation, but made allowance for the funding from the inland waterways trust. The trust, created by fuel fees, had never been tapped by Congress, and ultimately contributed about half the cost of the project. Department of the Army, *Annual Report Fiscal Year 1987 of the Secretary of the Army on Civil Works Activities (October 1, 1986–September 30, 1987), Vol. II*, (Washington, D.C.: GPO, 1988), p. 10-33. A brief summary is given in Burchette, *Design Memorandum No. 3*, 2-3, and see also "Water Act passage assures District of major project," *The Mobile*, Vol. 8 no. 11, 1-2.

[7] Mobile District, *Guide to Partnering*, attachment E, and Green, memo re. Partnering. For a general look at environmental partnering, see "What is Environmental Partnering?" *Military Engineer*, Vol. 86 no. 563 (May 1994), 67-69.

[8] Ibid.; see also Juan Payne, *Oliver Lock Replacement Black Warrior River, Alabama, Foundation Report*, report for the U.S. Army Corps of Engineers, Mobile District, July 1994, 5.

[9] Edward M. Slana interview, January 21, 2004. See also Payne, *Foundation Report*, 5.

[10] Payne, *Foundation Report*, 5

[11] Ibid., 15-18.

[12] Ibid.

[13] Ibid. and Slana interview.

[14] Ibid., 29, see also Department of the Army, *Annual Report Fiscal Year 1993 of the Secretary of the Army on Civil Works Activities (October 1, 1992–September 30, 1993)*, (Washington, D.C: GPO, 1994), 10-9.

[15] Ibid., 10-10 and Department of the Army, *Annual Report Fiscal Year 1996 of the Secretary of the Army on Civil Works Activities (October 1, 1995–September 30, 1996)* (Washington, D.C.: GPO, 1997), 10-10.

[16] Jeane, *Mobile District.* The most adequate historical work on the Tenn-Tom is Jeffrey K. Stine, *Mixing the Waters: Environment, Politics, and the Building of the Tennessee-Tombigbee Waterway* (University of Akron Press, Akron, Ohio, 1993).

[17] Nathaniel D. McClure IV and Norman L. Connell, Sr., Environmental Restoration Measures On the Tennessee-Tombigbee Waterway (Tenn-Tom). Paper presented at the North American Water and Environmental Congress, Anaheim, California (1996).

[18] Mobile District, *Wildlife Mitigation Project*, 1-2.

[19] *Water Resources Development Act of 1986 (PL 99-662)*, Section 601 (a).

[20] Ibid. and Mobile District, *Wildlife Mitigation Project*.

[21] N.D. McClure IV and N.L. Connell, Sr., Environmental restoration measures on the Tennessee-Tombigbee Waterway-an update, *Environmental Geology* Vol. 40 no. 4-5 (February 2001), 567-568.

[22] Ibid., 568-69. For an example of the type of work the District was performing, see U.S. Army Corps of Engineers, Mobile District, *Tennessee-Tombigbee Waterway Wildlife Mitigation Project for the Okatibbee Lake Project and Nanih Waiya Wildlife Management Area, Mississippi*, F20-27.

[23] See snagboat *Montgomery* webpage at http://tenntom.sam.usace.army.mil/snagboat.html (accessed February 15, 2005).

[24] See "Tenn-Tom Waterway Project marks 13th anniversary of opening," *The Mobile*, Vol. 20 no. 1 (February–March 1998), 11.

[25] See McClure and Connell, *An Update*, 567-68 and "Restoring a Symbol, Corps helps bring Bald Eagle back to southeast," *The Mobile*, Vol. 17 no. 8 (August 1995), 8-13.

[26] See "Plymouth Bluff Environmental center opens in north Mississippi," *The Mobile*, Vol. 18 no. 7 (July 1996), 5-8.

[27] Jeffery K. Stine, "The Tennessee-Tombigbee Waterway the Evolution of Cultural Resources Management," *The Public Historian*, Vol. 14 no. 2 (Spring 1992), p. 12

[28] Ibid.

[29] Ibid., 24.

[30] Ibid.

[31] Ernest W. Seckinger, Jr. interview, March 31, 2004.

[32] Robert B. Keyser interview, January 15, 2004.

[33] Mobile District, *Okatibbee Lake Project*, 3-4.

[34] For a full discussion of the effort, see Mobile District, *Okatibbee Lake Project*, 1-23.

[35] Department of the Army, *Annual Report Fiscal Year 1993*, 10-9.

[36] 13th Anniversary, *The Mobile*, Vol. 20 no. 1 (February–March 1998), 11-12. This had been one of the biggest criticisms of the project that in fact proved to be true. For its first ten years of operation, the waterway had far more recreational than commercial boats.

[37] 13th Anniversary, *The Mobile*, 11-12.

[38] For more on the claims of the proponents of the Tenn-Tom, see Stine, *Mixing the Waters*, Chapter 1.

[39] The fees from the recreational facilities were never meant to cover the costs of operations. Critics of the project merely use the numbers to point out that despite the Corps best efforts, there is a huge discrepancy between the benefits and the costs of the waterway.

[40] Stine, *Mixing the Waters*, 248.

[41] For an example of Corps officials answering critics such as Stine, see Nathaniel D. McClure IV, "A Summary of Environmental Issues and Findings: Tennessee-Tombigbee Waterway," *Environmental Geology and Water Sciences*, Vol. 7 no.1/ 2 (1985). For example, the Clean Water Act of 1972, the Archaeological and Historical Preservation Act of 1974, the Clean Water Act of 1977, and a number of court cases such as *Zabel* v. *Tabb* (1972) and *Kalur* v. *Resor* (1971) all strengthened environmental protective laws against development interests. See Stine, *Mixing the Waters*, 255, for his conclusion on the project.

[42] Much of the following information on the ACF and ACT water allocation is found in the U.S. Army Corps of Engineers, Mobile District, *Draft Environmental Impact Statement for Water Allocation for the Apalachicola-Chattahoochee-Flint (ACF) River Basin, Alabama, Florida, and Georgia, Main Report.* A report prepared for the U.S. Army Corps of Engineers by the Mobile District as lead agency, (1998) and U.S. Army Corps of Engineers, Mobile District, Le*ssons Learned, Alabama-Coosa-Tallapoosa (ACT) Apalachicola-Chattahoochee-Flint (ACF) River Basins Comprehensive Study Final Report.* A report prepared for the Mobile District, U.S. Army Corps of Engineers by Volkert Environmental Group, Inc., Mobile, Alabama (1998).

[43] Ibid.

[44] Ibid.

[45] Ibid.

[46] "Interstate water agreement signed," *The Mobile*, Vol. 14, no. 2 (February 1992), 1-2.

[47] Mobile District, *Water Allocation for ACF*.

[48] Ibid. The first federal commissioner was Lindsey Thomas, former head of the Atlanta Olympic Committee, someone very used to large complex, many-sided projects.

[49] Ibid. and Joanne U. Brandt interview, January 12, 2004.

[50] Brandt interview.

[51] Mobile District, *Water Allocation for ACF* and Brandt interview. Constitutionally, the U.S. Supreme Court has jurisdiction when disagreements between states cannot be satisfactorily settled.

[52] Ibid.

[53] Much of the material on this topic comes from U.S. Army Corps of Engineers, Mobile District *Draft Environmental Impact Statement, Enhanced Evaluation of Cumulative Effects, Associated with the U.S. Army Corps of Engineers Permitting Activity For Large-Scale Development*

in Coastal Mississippi, Vol. I. A report prepared for the Mobile District, U.S. Army Corps of Engineers and related Agencies by Tetra Tech, Inc., Fairfax, Virginia. Additional information was supplied in Dr. Susan Rees interview, January 15, 2004, and Ronald A. Krizman interview, January 16, 2004.

[54] Ibid.

[55] Krizman interview.

[56] The Jefferson Davis home at Beauvoir near Biloxi is a National Historic Landmark that was partially threatened by the fast-paced development in the area.

[57] Rees interview.

[58] Ibid.

[59] Krizman interview.

[60] Rees interview and U.S. Army Corps of Engineers, *Partners for America's Future: Our Environmental Commitment*, brochure prepared for the U.S. Army Corps of Engineers (Washington, D.C.: GPO 1994).

[61] "Marsh establishment, wetlands restoration involves diverse partners," *The Mobile*, Vol. 17 no. 5 (May 1995), 8-12.

[62] Ibid., 8.

[63] "Marsh Growth Appears Diverse," *Mobile Register*, Sunday January 4, 2004.

[64] Ibid., and Keyser interview.

Honduran troops training at a Mobile District–built firing range c. 1985.

Leftists, Drugs, and Diplomacy:

The District in Latin America

The War on Communism

In the 1980s, U.S. government foreign policy in Latin America supported countries in their fight against leftist insurgency movements. The fall of Nicaragua in the late 1970s to leftist Sandinistas alarmed many inside the U.S. From 1979 to 1990, El Salvador fought a Sandinista-supported guerilla war; American military efforts in the last years of the Cold War were aimed at neutralizing this threat. By the early 1990s, District activity in Latin America supported the U.S. war on illegal narcotics trafficking.

District support for Central American countries fighting guerilla insurgency in the 1980s varied with each country's needs. In Honduras, the District upgraded Honduran naval and air force facilities. In El Salvador, the District built training centers. By 1985, U.S. military construction work in the region increased to some $38.5 million per year from nearly nothing five years earlier. The District built military medical facilities at San Salvador and San Miguel, El Salvador, and supervised bridge work as well as building tactical training centers in Costa Rica. In 1986, the District opened a field office in Costa Rica[1].

A typical example of District construction support for the region was the National Basic Training Facility in El Salvador. Congress allocated some $23 million in 1985, but mandated that the funds not be used for U.S. troop involvement other than training. District records indicate that the funds were used for building and upgrading the existing facility and purchasing training equipment, such as weapons, ammunition, and other military hardware. The District built a vehicle maintenance facility, warehouses, classrooms, bunkers, a target range, and wells and water purification facilities. The training included live-fire infiltration techniques, explosives use, ambush techniques, and obstacle courses. The perimetered site included guard towers and barracks for housing up to 6,500 recruits per year.[2]

Most of the construction during these years resulted in temporary wooden and canvas camps, which were relatively inexpensive. In Honduras, the largest U.S. customer, the District oversaw work at the Puerto Cortes Naval Facility, the 15th Infantry training ground at "Camp Dakota," Palmerola and La Mesa Air Force Bases, and El Bijagual. Work ranged from repair and construction of runways, hangars, barracks, and containment facilities to infrastructural work on roads, sewage and water lines, and erection of small boat docks and ramps. A seemingly ordinary and minor activity common on all District sites in Latin America was the Corps policy of drilling for clean water.[3]

Palmerola Air Force Base in Honduras in the 1980s.

Most of the funding for the District work came through the Defense Cooperative Assistance Agency. Congress was very concerned that U.S. involvement not deepen into another Vietnam. As a result, the Senate Appropriations Committee on Military Construction kept close oversight of the District's activity. This led to a politicized environment in which Democrats constantly challenged the administration's anti-Sandinista activities. Reagan administration officials constantly defended the construction of the bases and attempted to assure a wary public that the activity was only temporary.[4]

For example, Senator James Sasser (D-Tenn), head of the Subcommittee on Military Construction, made several trips to Palmerola Air Base in Honduras in the mid-1980s. In 1986, Senator Sasser became concerned that permanent concrete buildings were replacing the temporary wood and canvas structures. The District defended the work, noting that the pre-formed concrete structures could be broken down and removed if the U.S. decided to evacuate the area. U.S. Southern Command (SOUTHCOM) maintained that the U.S. troops doing the training needed more substantial buildings as they were often posted in the region for up to 18 months.[5]

Detractors challenged the need. If the U.S. was there only temporarily, as Congress had authorized, why were "these structures built to last up to 15 years or beyond, and worse," they wondered. Raising the specter of military deceit, an aid to Sasser added, "The permanence is not evident in the paperwork that shows up in Washington." Another advisor acknowledged that "SOUTHCOM now has its tactical intelligence center and the capability to monitor the war and to run the war in Central America."[6]

District constructed anti-drug base at Ibuela, Bolivia.

District Diplomacy

The District obtained a substantial asset by learning to work in Latin America. Cultural differences in the manner of conducting business often baffled well-meaning Americans. Language differences also created a barrier. "For one thing, El Salvadorans do not like it when you put them in with Hondurans, and vice versa," observed one Information Management chief when asked to set up communications at one of the bases. "The first time we tried to mix the two national groups at a training camp, they fought with each other," she stated emphatically.[7]

In addition, there were political issues that threatened the District's work. Just as the U.S. gained support in Honduras, it lost an ally in Costa Rica. Political support for the war in Costa Rica was only marginal and many inside the country blamed violence along the border with Nicaragua on the presence of Contra camps inside the country. Walter Ennaco, then a field engineer in Tegucigalpa, added, "After Iran-Contra came to light [in 1986], Costa Rica pulled out of our initiative. They had no serious guerilla problem, and they had no army, just a police force, so they saw no need for becoming involved."[8]

Project delivery team meeting in Latin America.

Adapting to cultural differences, overcoming communication problems, working in tropical environments, and learning not to offend natives were just a few of the issues facing the District in building and managing in Latin America. One of the methods the District found highly successful was to "write [plans and specs] using local standards, hardware, and construction techniques. The specs were customized to the situation while maintaining our own safety standards and policies." Experience gained in the 1980s in Central America paid off several years later in South America.[9]

The successful jobs that the District built in Latin America required a close-working team. "We were innovative because we had to be to get things done. If we did not work closely with our Architectural/ Engineering Firms, Contractors, our local military and civilian counterparts, our transportation network, planners, and other team members back in Mobile, we would never have been able to accomplish what we did," Ennaco related years later. "We had a real cadre of resourceful, astute contract managers who looked both for jobs and funding," said Ennaco. "When the District proposed going to Life Cycle/Project Management in the late 1980s, we were already doing it in the LATAM [Latin American Initiative], and that gave us an edge to support the concept." Ennaco remained convinced that, "We brought our experience back with us and as team members filtered into other areas of our District and convinced others that teamwork could work."[10]

The Drug Wars

After the fall of the Soviet Union and the end of guerilla warfare in Latin America, the focus of U.S. involvement moved away from anti-Communist insurgency and toward countering illicit drug smuggling. President George H. W. Bush's declaration of a war on drugs highlighted this effort. One noted event of this new "war" was Operation Just Cause, which ousted Panamanian dictator Manuel Noriega in 1989. Noriega was under indictment in Miami and Tampa, Florida, for illegal drug trafficking activities.[11]

After Operation Just Cause, the District changed geographical focus. Although efforts continued in Central America, the District became deeply involved in South America in the 1990s. The District picked up a job in Bolivia in 1989 in the small town of Trinidad. Here, a simple runway improvement for the Bolivian military led to a $50 million annual investment before the end of the 1990s.[12]

The Bolivian government sensed that the U.S. would supply South American countries with military aid in exchange for assistance in stopping drug smuggling into the U.S. In late 1989, the Bolivian government approached the U.S. for help with their "River War" on the smugglers. The Bolivians had established their own anti-drug river patrol unit, called the "Blue Devil Riverine Task Force." The Blue Devils patrolled Bolivia's northern river region, attempting to stop smugglers. The District's first project for the Blue Devils was small: design and construct a marine railway for the Puerto Villarroel River Base. The site for the railway was a heavily eroded section of the River Beni in central Bolivia. The Bolivian navy needed the railway to lift "mother ships" out of the water for maintenance. These "mother ships" supplied smaller river gunboats that patrolled the region. The work scope was for $100,000.

Most of the funding came out of the Foreign Military Sales (FMS) program handled by the Defense Department through SOUTHCOM. Latin American countries often chose this method of sales in order to obtain better pricing and U.S. military advisory help and to prevent congressional questioning of the transactions. However, as time progressed, other U.S. agencies, such as the Drug Enforcement Agency, provided funding for projects. Additionally, in more recent years, the Andean Counter-drug Initiative and the Foreign Military Fund has handled some of the costs involved.[13]

The project was a test effort to shore up Bolivian efforts to "deny the uncontested use of Bolivian waterways for illicit movement of drugs, precursor chemicals, or other contraband." The brief project took only six months to complete but opened the door to a new field of work for the District.[14]

In the fall of 1991, the District opened the first district field office in South America in Bolivia. The small four-man office was located inside the U.S. embassy in La Paz and concentrated on backup maintenance and construction for the Bolivian armed forces. Two more bases, one at Riberalta and one at Guayaramerin, were added to the Bolivian Blue Devils program and represented a substantial expansion of the Bolivian effort. The bases were further north, near the Brazilian border, which put District support much closer to the smuggling activity. The projects also involved more than construction of a small boat lift.[15]

Riberalta, a jungle town of 20,000 at the junction of the Beni and Madre de Dios Rivers, was the home of a marine infantry battalion of the Bolivian army and a small naval base. The town is isolated and accessible only by air or boat, except for a single highway. The District was authorized to erect a small riverine task force base between the naval base and the Bolivian marine base. The work included fuel storage tanks, emergency generators, a distribution system to the existing base piers, a boat dock and ramp, and several new buildings. In addition, just as at Puerto Villarroel, erosion on the banks of the Beni River was causing structural problems to a number of existing facilities, and site work had to include bank stabilization. This time, the District's investment was much greater, nearly $1 million.[16]

A similar facility at Guayaramerin was planned for the fall of 1992. The project included a 30-man riverine base camp for the Blue Devils. The camp needed permanent facilities that included barracks and

related structures, officer's quarters, a sewer system, a chlorination system, water tanks, a power system with backup generators, and all the site work.[17]

Construction managers for the projects faced a number of different issues. Major supplies had to be brought in by air onto a dirt landing strip. As in Riberalta, road travel was limited and dangerous. Bandits and guerillas traversed the area regularly. The field office overseeing the construction approved an aggressive 13-month start-to-finish time frame with a budget of $500,000, and the camp was completed on September 21, 1993.[18]

By spring 1993, Peter J. Van Parys, chief of the Military Support for Others projects, informed the South Atlantic Division Commander that the District had more than $6 million in projects in Bolivia alone, and the investment was growing.[8] Construction crews expanded airfields at Chimore and Santa Ana to accommodate larger U.S. surveillance planes. They also constructed storage facilities for military support equipment at Santa Cruz. At Santa Cruz, the District was spending more than $1 million per year by the middle of the decade.[19]

District work at Tres Esquinas base in Colombia.

After Howard Air Base in Panama closed in 1999, a Forward Operating Location (FOL) was opened at Manta Air Base in Manta, Ecuador. With Ecuadorian support, the District extended runways and improved facilities for "detection and monitoring" of the "airborne routes" of drug cartels. Department of Defense officials testifying in July 1999 conceded that, "We cannot begin to attack this infrastructure without the flexibility provided by the FOLs. In particular, the FOL at Manta, Ecuador, allows us to reach this infrastructure deep in the Colombian source zone."[20]

Colombia proved to be the most challenging country for the counter-drug offensive. The U.S. government entered into a ten-year agreement with Colombia to use Tres Esquinas Air Force Base to monitor drug trafficking from Medellin and Cali. In South America, the experience would expand to "that of negotiator, diplomat, and honest broker, as the District hammered out the country-specific agreements involving the Corps, SOUTHCOM, International Narcotics and Law Enforcement, and the host country for authority on these programs."[21]

The District faced an entirely new set of construction issues in South America. For example, there were infrastructure problems that did not exist in Latin America. Many of the bases were located in remote and hard-to-reach regions of the country. Roads were poor or non-existent. Contractors were hard to find because of the danger from bandits and drug-supported guerillas. Sometimes, travel alone required security escorts, and even then machinery might not get through.

One of the great difficulties of working in Colombia was dealing with the powerful drug lords. They had the funding to plan attacks and kidnappings, to bribe local officials to prevent or hold up shipments, and to blatantly ignore the law. To illustrate the danger of work in Colombia, from June to November 1999 there were six attacks on District contractors in the Tres Esquinas/Florencia region. The attackers killed four contractors, wounded two more, burned and looted two

trucks, and forced several more vehicles to return to their bases after hours of delays. At the same time, a number of other trucks made the dangerous trip to Tres Equinas, but only after they paid heavy tolls to bandits. Other troubles, like bank failures and martial law, could derail a project for months and even years.[22]

Banditry was not the only issue facing District work in South America. Another problem was miscommunication. To solve this issue, the Bolivian Field Office moved toward using contractors and the 35 percent design/build agreements, similar to those used at Redstone Arsenal. This prevented District officials from "designing one thing, and the local suppliers not understanding what we wanted," relays Ennaco, who by the early 1990s was chief of all military projects in South America. "We would design using concrete block and they did not know what that was. They were used to using a large brick tile."[23]

Safety was another issue. Employees were constantly getting hurt and even killed on projects because Bolivians in the rural areas had no concept of safety. Eventually, safety programs were initiated on all projects, and workers had to wear safety helmets, lifelines, eye protection, and safety shoes.[24]

Bolivian riverine patrol floating maintenance barge.

By the end of the decade, work in Colombia had superseded counter-drug work in Bolivia. In Colombia, riverine base camps were erected along the borders with Venezuela and Peru and near the drug center at Cali. Floating maintenance facilities were built in Nueva Antioquia near the Venezuelan border, and floating base hangars were launched along rivers emptying into the Pacific. The District also built classrooms, runway extensions, national police bases, and force protection bases. In 1999, District officials reported that in Colombia alone the ongoing military projects totaled $16.9 million annually.[25]

At the same time, opportunities opened up in Peru, Ecuador, and Venezuela. By 1999, in Peru alone, an additional $8 million was spent on hangar and runway construction and repair and riverine training centers. Nearly $5 million more was earmarked for support bases, especially river patrol maintenance and expansion. The District coordinated all these efforts, which by the end of the century amounted to nearly $50 million per year in projects.[26]

To make matters more complicated, the District had to learn how to work with U.S. embassies. Officials learned to negotiate important issues like customs duties with custom officials, and security plans with general staffs of foreign military. The District activity in Latin America proved formidable. District-managed crews built camps and bases deep in guerilla-infested jungle regions, managed international banking requirements to guarantee performance, and enlisted the good will and support of local businesses and populations.[27]

Chapter 8 will discuss how the District expanded outside its traditional military role in Latin America. The District made an earnest attempt to use their engineering skills to help build nations in the southern hemisphere. Yet the results were mixed, and by the end of the century top U.S. military officers were questioning the effectiveness of U.S. efforts in the region.

[1] After 1986, Costa Rica pulled out of the Latin American initiative anti-insurgency effort, but continued to employ District officials for non-military Support for Others projects.

[2] See Mobile District file marked PM-LA Box # 099131, file marked 1515-13 FY84/85 CR/ES/Hon. The term used most often in the public documents is "self-sufficiency." That is, the Hondurans and El Salvadorans were theoretically being trained by U.S. personnel to fight their own war. Federal law prevented U.S. troops from any active participation. Here, in 1985, the Army deployed its Remotely Piloted Vehicle (RPV) to serve as lookout along the Nicaraguan border, and, if need be, venture into Nicaragua. For more on the RPV, see U.S. Army Corps of Engineers, Office of the Chief of Engineers, *Army Force Modernization Facility Support Plan RPV Remotely Piloted Vehicle*, report prepared for the U.S. Army Corps of Engineers, Huntsville Division, Force Modernization Team, Huntsville, Alabama, May 1982. For other public debate over U.S. anti-Sandinista involvement in Central America, see Anne-Marie O'Connor, "Honduran military split over how much nation should toe U.S. line," *Christian Science Monitor*, February 21, 1985, 9; Joanne Omang and Edward Cody, "An Uneasy Partner: Honduras Wary of U.S. Policy, Support for Nicaraguan Rebels, El Salvador Raises Concern," *Washington Post*, February 24, 1985; Joanne Omang, "Lengthy U.S. stay in Honduras Indicated," *Washington Post*, July 17, 1985.

[3] See Mobile District File boxes marked PM-LA 097800, 099131, and 099903; files are marked with individual base projects. See also Simmons and Ennaco interviews.

[4] Utilization of FY 84/85 op. cit. and "Memo for Commander Mobile District Corps of Engineers, re. Center for Superior Studies for the Salvadoran Armed Forces," Mobile District File Box 0999903 671 PM-LA D10/03, file 415-10F

[5] For Sasser quote and District response, see copy of comments in Mobile District file, box marked PM-LA 099131, file marked 415-10F Corr. See also Joanne Omang, "Fight over Aiding Nicaraguan Rebels Resumes in House," *Washington Post*, April 9, 1986.

[6] Ibid., and for other comments on the Honduran construction, see "U.S. to Spend $50 Million to Build Honduras Facilities," *Washington Post*, February 7, 1986, and "Entrenching in Honduras," *Washington Post*, February 18, 1986, "Containment in Nicaragua," *Washington Post*, April 2, 1986.

[7] Russell interview.

[8] William L. Furlong, "Costa Rica: Caught Between Two Worlds," *Journal of Interamerican Studies and World Affairs*, Vol. 29 no. 2 (Summer, 1987), pp 119-154; James LeMoye, "Costa Rica's return to neutrality strains its ties with Washington," *New York Times*, March 22, 1987; Ennaco interview.

[9] Winnie L. Smith, "Success stories in Central America," *The Mobile*, Vol. 9 no. 3, 4-5. Smith is quoting, District Major Andy Hamlin, resident engineer at the Costa Rican Civil Guard Training Center project.

[10] Ennaco interview. Ennaco noted that one unique asset was Ann Cataldo. This Latin American attorney was also a U.S. citizen and worked for the Counselor's Office. Having an attorney skilled in both American and Latin culture and customs gave the District critical help in negotiating agreements, working out financial arrangements, solving tax problems, and handling difficult communication.

[11] For a general academic look at the U.S. and Panama, see Michael L. Conniff, *Panama and the United States: The Forced Alliance* (Athens, GA: University of Georgia Press, 1991). Chapter 9 summarizes Noriega's illicit activities. Two well-written works that explore Noriega's involvement in drug trafficking are John Dinges, *Our Man in Panama: How General Noriega Used the United States—and Made Millions in Drugs and Arms* (New York: Random House Publishing, 1991) and Kevin Buckley, *Panama: The Whole Story* (New York: Simon & Schuster, 1991).

[12] For a good summary of the Bush administration's logic on the change from anti-insurgency to anti-narcotics, see House Subcommittee on Western Hemispheric Relations, *United States Interest in post–Cold War Latin America and the Caribbean*, Testimony of Nancy P. Dorn, Deputy Secretary of Defense for Inter-American Affairs, 102nd Cong., 1st sess., 1991, 32-39. For info on the first anti-drug construction project in Bolivia, see Mobile District file box marked PM-LA box # 111493, file marked 121-5a FMS Case D1-B-HAC Marine Railway Puerto Villarroel, Bolivia.

[13] Ibid. All Foreign Military Sales (FMS) were publicly recorded; sometimes foreign governments desire this approach to prevent congressional investigations later. For information on FMS, see Latin American Working Group Educational Fund and the U.S. Department of State web pages: http://www.ciponline.org/facts/fms.htm and http://www.state.gov/s/d/rm/rls/cbj/2006/ (both accessed August 12, 2005).

[14] Ibid.

[15] For information on the expansion of the riverine force in Bolivia, see Mobile District file box marked PM-LA, box # 11493, files marked 12-5a FMS Case D1-B-HAE Boat Ramp & Base Improvements, FMS Case D1-B-HAO Riverine Base Camps. For the first District field office opening in South

America, see Tim Dugan, "Bolivia Office Opens Project at Airfield," *The Mobile*, Vol 13 no. 5 (September 1991), 3.

[16] Ibid.

[17] See Mobile District file box marked CESAM PM –LA, box # 158159, file marked 12-5a FMS Case D1-B-HAO Riverine Base Camp Corr.

[18] Ibid.

[19] Memorandum for EN from Van Parys, in Mobile District file box marked 158159 CESAM PM-LA, file marked 12-59 FMS Case D1-B-HAO Riverine Base Camp Correspondence.

[20] Senate Subcommittee on Defense and Military Construction, *Hearings before a Subcommittee of the Committee on Appropriations*, Testimony of Hon. Walter Slocombe, Undersecretary of Defense (policy) DOD Counter-Drug Forward Operating Locations, 106th Cong., 1st sess., 1999.

[21] Simmons, *Mobile District In Latin America*. For a typical example of Colombian work, see Mobile District file box marked, PM-LA 111493, files marked, 415-10F Correspondence modified Record Fire Range Colombia.

[22] Simmons and Ennaco interviews.

[23] Ennaco interview.

[24] Ibid.

[25] See Simmons, *Mobile District In Latin America*, and Roger Simmons, *Strategic Initiatives/SFO Project Management Branch*, a report prepared for public presentation.

[26] Ibid.

[27] Simmons interview.

District-built Mango processing plant in Honduras.

Support for Others:

From Mangoes to Marines

Support for Others in Latin America

In the early 1980s, Corps work in Latin America supported local military forces. Construction projects in the region were mechanisms to support U.S. foreign policy directed at restricting leftist guerilla activities. When the Iron Curtain fell in 1989, the Soviet Union ceased to support leftist movements in the region. Without Soviet financial and technical assistance, most of the guerilla activity stopped. U.S. foreign policy also changed.

After 1990, the District supported a new U.S. foreign policy agenda in Latin America: the War on Drugs. As mentioned earlier, District activity in Latin America provided an opportunity to evaluate Project Management in an arena that demanded flexibility and adaptability. Here, organizations as diverse as the government of Brazil, the United States Agency for International Development (USAID), and the World Bank provided projects for the District, all anti-drug related. U.S. foreign policy experts saw that the economically backward region provided fertile soil for local residents to support the illegal drug dealers. Well financed and well organized, the drug dealers supplied a continual flow of cash to the peasants of the region. However, the Support for Others in the region started with an earthquake and the search for clean water.

Damage done by 1986 earthquake in El Salvador.

In the early 1980s, before Hilton Dunn's call to change, District Engineer Colonel Patrick Kelley (1982–85) observed that the Operations Division needed to take

an increasingly important role in the District's work. In 1986, an earthquake in El Salvador devastated the country, and the District was called upon to respond to the emergency.

As District employees arrived in the devastated country, their first objective was to locate a source of potable water. Just prior to the earthquake, the District had completed work for Save the Children in El Salvador drilling wells for potable water.[1]

As District officials dug wells and rebuilt roads and buildings in the small nation, field office officials sensed a long-term opportunity. They applied through Corps channels to the administration to provide funding to help other Central American communities tap into potable water. In addition, a number of other small construction and irrigation projects were completed around the region, mostly near small towns and communities where the District was erecting military installations.

Unfortunately, the administration's focus prior to 1990 was entirely on anti-insurgency activities. The need for clean wells and potable water went almost unnoticed by other U.S. agencies. However, Latin American governments put a high priority on locating clean water.[2]

Another earthquake struck Central America in April 1991. This time, Costa Rica called for U.S. help. The Federal Emergency Management Agency (FEMA) requested the District to rebuild several damaged bridges and to oversee work on the road system in the port city of Limon. Temporary bridges were quickly thrown up over the Vizcaya, Aananito, Estero Negro, and Estrella Rivers by June to allow limited traffic. District contracts included 40 kilometers of roadway, repair or replacement of four major bridges, and repaving half of the Limon airport's runways.[3]

An unfinished waterline set the stage for a new District effort. At the time of the Costa Rican earthquake, the District assumed responsibility for construction of a fresh water line that USAID had been trying for several years to complete. The project was complex due to the terrain. "We had to carry the piping in what amounted to us at the time as a non-conventional mode of transportation. We put pipes on the backs of donkeys due to the poor quality of the roads in that area," notes Project Manager Walter Ennaco. "USAID, FEMA, and the local villages noticed that as we built the pipeline, we would come into a village and the first thing we did was drill for clean water. Then when we left, we left the water line to the local villagers." Ennaco went on, "Almost by accident we had a customer and a project—drilling for water." The idea caught on, and by the mid-1990s, the District was performing annual studies in nearly every Latin American country for clean and potable water with a $500,000 budget.[4]

Pack mules used by the District in Colombia in 1999.

As traditional civil work dried up in the early 1990s, U.S. administrations loosened the restrictions on the Corps and allowed districts to pursue "non-traditional work," especially in Latin American nations. U.S. policymakers were very interested in helping Latin American countries develop sources of revenue other than cocaine and other narcotics. This idea of "nation building," though not new, got the District in some trouble with Bush administration officials.

State Department officials fretted over District activity that appeared to them to be setting foreign policy. In the early 1990s, Assistant Secretary for Civil Works Nancy Dorn voiced concerns that the Mobile District was "out there on their own, flacking this nation building thing." Dorn explained herself further: "The Corps of Engineers is not in the foreign policy, defense-building arena. The State Department is the appropriate agency for foreign policy, not the Corps of Engineers."[5] Despite Dorn's concerns, the District continued to expand its work in the region.

During this time, USAID began to appreciate two aspects of the District's work in Latin America. One was flexibility. District officials in the region showed the ability to work within regional cultural demands, using local building materials and methods. The second was the Corps' expertise in hydrology, civil engineering, water management, and its sensitivity to environmental protection.

As Roger Simmons, Chief of the Strategic Initiatives, commented, "In the beginning USAID hated the Corps of Engineers. They saw our relationship at best as adversarial. We were the bad guys to them." Simmons goes on, "We had to win them over." When Corps material specifications did not match Latin customs, engineers went with the local custom. When time frames did not work, the Corps worked within the time frames permitted within the local tradition, even when they did not coincide with contracts. When contracting needed flexibility, the District complied.[6]

Nearly every agreement used the 35 percent design/build procedure. The District officials became flexible and were able to capitalize on the host country contractor's expertise. For example, when landslides caused soil instability for machinery, the District officials used local sure-footed mules. When concrete breakwaters were both inadequate and too expensive to stabilize a river bank, the local populace in Bolivia introduced the Corps to rock-filled wire gabions. The gabions were just as efficient and much less expensive. The District learned to partner with their contractors, with U.S. agencies like the Drug Enforcement Administration, and with local police forces like the Public Forces of Costa Rica. By 2003, the workload in South America had grown to more than 120 projects, either in study or construction. This represented an investment of more than $129 million throughout the region, and the District was involved in 11 countries.[7]

Hurricane Mitch was a particularly tough test for the District. In late October and early November 1998, Mitch tore through Nicaragua and Honduras, killing at least 8,000 people and leaving millions homeless. The District, in conjunction with the Navy Seabees, opened roads, erected temporary bridges, and drilled wells for clean water. The District helped to move supplies and provided quick studies of critically needed long-term repairs to the countries' infrastructure. Brian Attwood, an administrator for USAID, acknowledged the role of the District, saying, "Our government will keep the Army Corps of Engineers and the Seabees in the region working primarily on the transport sector, meaning roads and bridges." The next February, Mark Schneider, Assistant Administrator for Latin America and the Caribbean, testifying before a House Committee, said, "Most of the primary roads are open, due to the tireless efforts by the host countries, often assisted by the U.S. military."[8]

Despite the effort, South America continued to be an enigma to American aid proponents. Congressional testimony from SOUTHCOM Commander General Charles E. Wilhelm painted a mixed picture of the region in 2000. Wilhelm told a House subcommittee in March of that year that despite the tremendous financial, military, and economic aid given, "I have detected a growing malaise in attitudes

toward democratic reform which is fueled and compounded by the adverse social, economic, and political conditions, spawned wholly or in part by drug trafficking." However, he noted, "We cannot be discouraged by this turn of events…our needs are modest but the return on investments will pay significant dividends." He went on to urge Congress to continue "support for our theatre architecture requirements."[9]

Erosion control in Bolivia.

During the work in the 1980s, the District's lack of experience with foreign corporations and concern about work quality limited the number of contracts to host country firms. As the Latin American work grew in size and scope, U.S. and host country companies began to form joint ventures. By the early 2000s, the District was contracting large portions of the work to Latin national companies.

The District performed varied and widespread tasks. In Guatemala, District engineers oversaw the rebuilding of irrigation systems for local farmers. In El Salvador, they built new schools. In Colombia, the District oversaw the rebuilding of roads and cleared a river dammed by a landslide. In Honduras, the District built a mango processing plant for a local cooperative. In Peru, the District built a 172-kilometer road through mountainous and guerilla-infested terrain.[10]

The Colombian landslide provided the District with a unique use of local building methods to stabilize the side of a small mountain. The landslide, near the town of Pereira, created a partial dam across the city's source of water. Engineers had to move quickly to stabilize the landslide from the top so the dam could be cleared. When vehicles were unable to get to the top of the slide, District officials made use of 12 local pack mules to build a road to the top of the mountain. The mules brought supplies up from the base and removed 3 tons of earth a day. Once the road to the top was completed, workers could move vehicles to the top to secure of the side of the mountain.[11]

The District supported nearly every Latin American country in the search for clean potable water. In Nicaragua, a former enemy, District engineers provided more than $2 million in disaster relief from Hurricane Mitch. They also worked for such Nicaraguan government entities as the Agency for Rural Development, the Nicaraguan Mapping Agency, and the Catholic Relief Agency. Construction teams inspected bridges and dams, and engineers provided technical support for reconstruction projects such as medical clinics, schools, and a water resource recovery program.[12]

By the end of the 1990s, Latin American initiatives numbered over 50 projects per year, with a monetary commitment of more than $50 million annually—nearly 10 percent of the District's work. "By partnering with our hosts and other agencies, we have broken a paradigm that has not only allowed the District to assist in their projects, but now they call on us for them," summarized Simmons.[13]

The District Goes Around the World

The extraordinary use of SHOALS technology, developed at Mobile in the 1990s, expanded the District's mission of Support for Others. The lidar bathymetry technology was particularly effective in measuring depths of large bodies of water, such as bays

and inlets, to detect shoaling. In 1997, SHOALS tested the Lake Worth, Florida, inlet for the U.S. Coast Guard and revealed in a few hours what engineers had suspected for months. Not only did the survey give an excellent view of the inlet, but it also revealed scouring inside the inlet and the buildup of a shoal just offshore. The SHOALS data was used by Corps engineers to quantify dredging requirements for the 33-foot-deep channel without having to schedule slow and cumbersome ship soundings on a regular basis.[14]

A year earlier, the SHOALS unit surveyed the manmade harbor at King Harbor, California, for the National Oceanographic and Atmospheric Administration (NOAA). The objective of this mission was to survey breakwaters that were too dangerous for ships to approach.[15]

At the same time, the SHOALS unit completed a lengthy three-month survey of the Yucatan Peninsula for the Mexican navy. This project covered 500 square kilometers and involved more than 100 million depth findings.[4] One of the problems, one of the engineering technicians later confessed, was that SHOALS was providing too much data. The computers back in Mobile could not process the data fast enough.[16]

One of the more fascinating SHOALS projects involved joint U.S. Navy/NATO landings on Pinheiro da Cruz, Portugal, and Porto Santo on the island of Madeira. Madeira was particularly dangerous, as two of the Portuguese marine landing areas were perched between rock headlands. SHOALS technicians were to map both landing areas because they could provide "quick, high-resolution results seamlessly across the land/water interface with much reduced exposure to hazards."[17]

A Portuguese Marine signals to shore during the landings at Pinheiro da Cruz.

At Pinheiro, despite rough seas, 25-30 knot on-shore winds, rain, and generally poor conditions, the SHOALS plane was able to complete the mission. Data was collected, edited, and turned into three-dimensional elevation maps of the coastline. The SHOALS system took 100,000 readings, edited the data, prepared the maps and charts, and handed them over to NATO representatives within 36 hours of arriving on the scene. The purpose of the exercise was to demonstrate SHOALS capabilities in a combat-like environment, where speed and accuracy in adverse conditions are critical.[18]

Latin America is not the only region in the world where the District has found new job opportunities. The South Atlantic Division and the Mobile District in particular were deeply involved in efforts to rebuild Kuwait in the early 1990s. The effort in Kuwait involved teaching Corps engineers and Kuwaiti planners to develop a workable partnership.

In August 1990, Saddam Hussein of Iraq invaded neighboring Kuwait, catching U.S. and European military planners by surprise. A dispute over oil rights between the oil-rich kingdoms precipitated the

invasion, although Iraq had for decades claimed the right to annex Kuwait as a province. A massive buildup of military forces in Saudi Arabia and other smaller Arab states led by U.S. President George Bush in the fall and winter of 1990–1991 was followed by a crushing invasion of Kuwait and southern Iraq, liberating Kuwait.

Corps workers putting out fires in Kuwait in 1991.

Six months of Iraqi occupation and fighting to free Kuwait resulted in a large number of damaged or destroyed buildings in Kuwait City. U.S. rebuilding efforts were led from U.S. Army Corps of Engineers Headquarters. General Patrick J. Kelley, a one-time District Engineer at Mobile, recognized that the South Atlantic Division had particularly valuable expertise in emergency management. Many District members took an active role in the rebuilding effort. One of the more noteworthy members was Joseph Birendelli, who helped initiate the partnership agreement between the Kuwait national government, the Corps, and the contractors selected to rebuild the Kuwaiti Parliament Building.[19]

Much of the work in Latin America has coincided with the development of the Mobile District's Emergency Operations Office. An extraordinary number of natural disasters struck Latin American countries in the late 1980s and '90s: the El Salvadorian earthquake in 1986, Hurricane Hugo in 1989, the Costa Rican earthquake in 1990, an Ecuadorian landslide in 1993, the Haitian Boat People Refugee Relief in 1994, the Nicaraguan volcano eruption in 1995, and finally Hurricanes Mitch and Georges in 1998. Most work in this arena came as directives from FEMA, with the District working as a primary contractor under their jurisdiction. This work fell under the Corps Support for Others program. In the next chapter we will look at the development of the Emergency Operations and its close relationship with the Mobile District.

District-brokered partnership agreement to rebuild the Kuwaiti National Assembly Building after the Gulf War in 1992.

[1] Simmons interview. Several District officials were in the capital when the quake hit, and gave a firsthand description as well as engineering support to the government in the weeks that followed. See Samuel R. Green, "District aids El Salvador when quake hits," *The Mobile*, Vol. 8 no. 11 (December 1986).

[2] Simmons and Ennaco interviews.

[3] "Corps responds to earthquake," *The Mobile*, Vol. 15 no. 1 (January 1993), 20.

[4] Simmons, *Mobile District In Latin America* and Ennaco interview.

[5] Dorn interview, December 18, 1996, 28-32.

[6] Simmons interview.

[7] Southern Command and Mobile District, South Atlantic Division, U.S. Army Corps of Engineers, *USACE in the Southern Command Area of Operations*, report prepared for SOUTHCOM, Department of State, USAID, United States District Attorney, Embassies and Host Nations. Mobile District, (U.S. Army Corps of Engineers, Mobile, Alabama, 2002).

[8] Briefing by Brian Atwood, Administrator, Agency for International Development on Hurricane Mitch Relief, *Federal News Service*, November 19, 1998, and House Subcommittee on Western Hemisphere Affairs, *Prepared Testimony of the Honorable Mark L. Schneider, Assistant Administrator for Latin America and the Caribbean, U. S. Agency for International Development before a subcommittee of the House Committee on Internal Relations*, 106th Cong., 1st sess., February 24, 1999.

[9] House Armed Services Committee, *Hearings on the National Defense Authorizations Act for FY200*, Prepared Statement of General Charles E. Wilhelm, United States Marine Corps, Commander in Chief, United States Southern Command, 106th Cong., 2nd Sess., March 23, 2000.

[10] Simmons, *Mobile District in Latin America*, p. 1, Elena H. Alvarez, Economic Development, Restructuring and the Illicit Drug Sector in Bolivia and Peru: Current Policies, *Journal of Interamerican Studies and Wold Affairs*, Vol. 37 no. 3, (Autumn, 1995), p. 133, 142 and LATAM Office, Mobile District, "US Army Corps of Engineers Latin America/Caribbean," a presentation prepared for public presentation by the Mobile Distrcit, US Army Corps of Engineers, (2002) and Simmons interview.

[11] Janet Shelby, "Mules help repair earthquake damage," *Engineer Update*, Vol. 26 no. 2 (February 2002).

[12] *USACE in the Southern Command of Operations, USSOUTHCOM, DOD, USAID, USDA, Embassies and Host Nations*, U.S. Southern Command Engineers and the Mobile District, U.S. Army Corps of Engineers, report prepared for the Congressional Delegation of the Mobile District, 17. Congressional Delegation, February 2003.

[13] Simmons, *Mobile District In Latin America*.

[14] Jeff W. Lilycrop, Jennifer L. Irish, and Larry E. Parson, "SHOALS System," *Sea Technology*. (June 1997) 19.

[15] Whittington and Culpepper interviews.

[16] Lilycrop et al., "SHOALS," 20-21.

[17] Lilycrop et al., *GPS sends in the Marines*, 5

[18] Ibid., 6.

[19] Wynne Fuller, Chief of the Mobile District Emergency Management Office at the time, was ordered to lead the planning team. Fuller and another South Atlantic Division member, Ronald Moore, were selected due to their experience in helping to rebuild the Virgin Islands after Hurricane Hugo. Kelley had served as DE at Mobile from 1982-85 and knew of the District firsthand. See Janet A. McDonnell, *After Desert Storm: The US Army and the Reconstruction of Kuwait* (U.S. Government Printing Office, Washington, D.C., 1999), Wynne Fuller interview, January 16, 2004, and Birendelli interview.

Ground Zero, September 2001.

The Mission from Hell:
Ground Zero

The New Cavalry: DTOS

The Corps had obtained its emergency management authorization from Public Law 84-99, commonly referred to as the Flood Control and Coastal Emergencies Act. The actual authorization came from the 1988 Stafford Act, which established the Federal Emergency Management Agency (FEMA). FEMA tasks the Corps of Engineers districts via a divisional response. The Mobile District serves as member of the South Atlantic Divisional Emergency Response team inside the SAD. The District also serves as home to one of the two USACE Emergency Operations Centers (UOC).[1]

Historically, a district's Emergency Operations Center assesses damage to public utilities as well as general damage and extent of injuries and deaths as soon as a disaster has passed. The Corps of Engineers supplies critically needed items such as water, ice, and temporary shelter. Through FEMA, the Corps also provides emergency power restoration and debris removal. Although most calls are initiated from FEMA to the Corps, local districts could also respond to a governor's request.[2]

Until the mid-1980s, the Emergency Operations Center in the District was a small section, but the importance of the office increased after Hurricane Andrew hit southern Florida in 1992. Due to the devastation of Andrew, the Corps of Engineers sought a more aggressive approach to emergencies for the future. The Mobile District became a key player in that approach, which involved lessons in team-building, project management, and use of the latest technology.[3]

Hurricane Andrew, 1992

Hurricane Andrew was the most devastating storm to hit the U.S. mainland since the 1930s. The hurricane completely destroyed the Homestead area of southeastern Florida. The Category 4 storm struck Florida at 4:45 a.m. on August 24, 1992, with sustained winds of 140 miles per hour and gusts up to 175 miles per hour. The storm devastated southern Dade County, causing some $20 billion in damage. Andrew leveled 82,000 homes and buildings and left 160,000 people homeless before crossing the Florida peninsula. Two days later, in a weakened state, Andrew smashed into southern Louisiana. Fortunately for the District, storm damage along the Gulf States was minimal.[4]

Nearly every house in Homestead was destroyed or severely damaged. In addition, Homestead Air Force Base was blown apart. State and local officials were overwhelmed with the scope of the destruction. One Corps employee stationed at Homestead at the time said he had not seen devastation like this since seeing Japan in the days following the end of the Second World War.[5]

The Mobile District's responsibility was to aid the Jacksonville District, which had primary responsibility for Florida. "In those days the Districts were somewhat parochial. They had their own responsibility for such items as delivery of clean water, ice, setting up shelters, bringing in power supplies, and contracting responsibilities to initiate debris cleanup for the affected areas," says Pat McFarlane, Mobile District Chief of Emergency Operations Center. Hours after the storm passed, the District was assigned to provide emergency water, ice, and technical assistance for damage assessment. However, it quickly became obvious that such mundane activities as garbage removal, laundry services, sanitation, and temporary shelters for thousands of displaced persons stretched every federal agency on the site.[6]

The Corps of Engineers response group found that they had to work in cars, underneath makeshift sheds, in tents, and even on pieces of wood placed across sawhorses to let some $380 million in recovery contracts for FEMA. Leo Hickman, one of the first District officials on the scene, described his first conference a few days after the storm. "The first conference for a debris removal contract was done out of our car. I was standing on top of the hood of a government vehicle with 79 contractors standing around at the front gate [of Homestead Air Force Base]." [7]

Contractors had no place to set up to get bidding information or to deliver bids for more than a week after the storm. Logistical support was nonexistent, and critical time was spent securing simple items. Reports got duplicated, tasks went undone, and coordination became extremely difficult. Landlines were down but cellular phones worked; they were soon overtaxed by extensive use. The presence of toxic waste and asbestos made cleanup in some areas slow, since special teams and gear to clean up the material took time to procure. One Dade County official expressed the emotions of many of the residents, proclaiming to the national media, "Where the hell is the cavalry on this one?"[8]

The Corps asked the District to assess the damage to the Homestead Air Force Base, and by August 28, the first contracts were let to repair the base conference center. District-led efforts on the base included demolition of unsafe buildings, temporary protection and repair of damaged buildings, airfield lighting, water distribution system repairs, and removal of hazardous wastes, especially asbestos. The District team awarded some 20 contracts by September 30

totaling over $9.1 million. In November, District officials assessed 135 buildings on the base for repair or replacement.[9]

Security was another problem on the base. Nearly all the gates and fencing were down, allowing easy access to sensitive areas. Although emergency generators provided some power for the base, it was wholly inadequate to protect the facility with all the security fencing destroyed.[10]

Corps officials recognized the need for an on-site Corps command and distribution center. This quickly became a political problem for the Bush administration; Hispanic and African Americans complained that large contracts were being let by the Corps to white-owned, non-Florida businesses. Hispanics complained that they did not hear about the pending contracts in time to submit a bid. Contractor confusion over the location of the command center during the immediate aftermath of the storm lent credence to their complaints. Eventually, Corps officials let contracts to small or disadvantaged companies for 5 percent of the $100 million spent by November. Seventy-six percent of these funds went to Florida firms. [11]

During the disaster relief and cleanup of Homestead after the hurricane, the Mobile District supplied 75 personnel to help the Jacksonville District. In addition, the District also dispatched 25 more people to aid Homestead Air Force Base in its cleanup efforts. This portion of the activity was directly under Mobile's control, as Homestead was in the Mobile District military construction boundary.[12]

After Hurricane Andrew, the South Atlantic Division switched to a different organizational format for emergency services. The new approach gave each district office control over one facet of emergency management. For example, the Mobile District took primary responsibility for debris removal, Wilmington for water supply, Charleston for ice supply, Savannah for power and temporary housing, and Jacksonville for temporary roofing. Members of the team also initiated "lessons learned" on the issues they confronted while in Homestead.[13]

Development of UOC

Mobile officials observed that in disaster relief, space is at a premium. They also noticed that when FEMA officials arrived at Homestead, they brought with them a small portable trailer. The District attempted to emulate the portable FEMA trailer they observed at Homestead. The District Emergency Operations Center managed to locate an abandoned house trailer. They stocked the trailer with supplies and equipment and created a meeting room for contractors.[14]

The first trailer had some deficiencies. As it was not built for regular travel, computer monitors moved around and got smashed. Flat tires occurred regularly. "We broke more axles than you can imagine hauling that old thing up and down the roads in the eastern U.S.," said Nestor. [15]

One of the District's Emergency Tactical Operations Centers (ETOC) vehicles.

Throughout the early 1990s, District personnel were called to respond to emergencies all over the U.S.

They hauled their makeshift trailer from Red River flooding in North Dakota to ice storms in Missouri to hurricanes in North Carolina. The Savannah District also manufactured a mobile trailer. The South Atlantic Division authorized the two units as FAEST: Forward Area Emergency Support Trailers. They had a meeting space, laptop computers, VHF phones, satellite hook-up capacity, their own restrooms, and a generator for power. The trailer was pulled behind a small truck that carried spare parts and small tools. [16]

By 1996, word reached USACE headquarters that the small trailer units were very effective as a command and control center in emergencies. In 1996, the Deputy Chief of Engineers, Major General Russell L. Fuhrman, saw the unit and managed to allocate $6.5 million to properly outfit a national-level USACE Emergency Operations Center (UOC) within the Mobile District with modern communications and vehicles. Over the next two years, the Mobile Emergency Management Office began coordination of one of the most highly sophisticated mobile communications centers in the U.S.[17]

A "Flyway DTOS" kit.

In addition to the new equipment, Headquarters developed a series of leveled responses for the National Emergency Management Office. The "Flyaway DTOS" kit was a handheld, suitcase-sized unit containing a laptop computer, two VHF radios, a GPS unit, and a digital camera. Every Corps district had several of these. Officials used these for drive-by reconnaissance of a local area to assess damage.

At the next level, the Corps assigned six strategic regions a "Rapid Response Vehicle." These were small, 35-foot motor homes with laptops and VHF phones. They had satellite link-up capability and contained small power generators. These units were used primarily for communications for small-scale operations. For example, the Nashville and Baltimore Districts received Rapid Response Vehicles. These vehicles responded to local or regional emergencies where the hand units were not sufficient. Typically, this unit would be dispatched to emergencies such as local ice storms or floods not requiring a national response.[18]

The Mobile and Sacramento Districts were selected to get the national level system, called the Tactical Operations Center. The five-vehicle team was dubbed DTOS: Deployable Tactical Operations System. Each DTOS included an Emergency Tactical Operations Center (ETOC). This was a motor home similar to the Rapid Response Vehicles. The system included an Emergency Control and Command Vehicle (ECCV), a 37-foot, 14-wheel tractor-trailer rig. Each DTOS also included an Emergency Support and Sustainment Vehicle (ESSV), which served as the supply vehicle for maintenance support and pulled a 10-foot antenna for satellite hook-up.[19]

The two Districts each received two full DTOS systems. This enabled both Mobile and Sacramento to respond to two emergencies at a time. Each five-unit response vehicle team was kept at a high state of readiness. The units were assembled so that within 90 minutes of arriving on a disaster scene, they could be fully operational, with communication lines active and

Mobile District DTOS vehicles. The tractor-trailer unit is the ECCV, the second vehicle with the antenna unit is the ESSV, and the last unit is the ETOC.

Computers fully functioning. Inside the ECCV and the ETOC were a dozen laptop computers, VHF and satellite phones, printers, and fax machines/copiers. In addition, the Command and Control Center housed an open meeting area and a small commander's office.[20]

The District's Information Management Office was very involved with the DTOS. The key objective of the team was to provide a place for communications, information processing, and command in emergency situations. Naturally, since the units were stationed in the Mobile District, Information Management personnel from the District provided most of the technological support and served as volunteers when the units were deployed.[21]

The vehicle units also were teamed with a group of volunteers from within the surrounding districts. The National Center was located in Mobile, since that district had the initial experience with FAEST, and since the Southeast was so prone to hurricanes, flooding, and tornadoes. The Sacramento District's primary responsibility was to respond to needs in the western U.S.[22]

As the 1990s progressed, a number of hurricanes and storms tested the efficiency of the operations. In 1998, Hurricane Mitch in the Caribbean provided the opportunity to use a modified version of the Rapid Response Vehicle. This unit is a full Rapid Response Vehicle, but without wheels, boxed and ready to ship by cargo plane. On a separate pallet is the internal equipment for the RRV—computers, printers, phones, fax machines, and satellite hook-up as well as spare batteries.[23]

By 1998, Corps of Engineers headquarters in Washington determined to update all of its computers for potential problems with the year 2000 "bugs." The Emergency Management Office got the newest electronic equipment. That same year, Hurricanes Bonnie and Georges tested the response level, which proved effective. Allan Morse, Mobile District Readiness Chief, became the USACE Operations Center's chief for the Tactical Support Centers. He

stated that the District's response had improved so much that "We had five truckloads of water and five truckloads of ice in a staging area before the storm [Bonnie] even hit."[7] Flooding from Hurricane Bret in central Texas and from Hurricane Floyd in North Carolina also provided opportunities for the units to deploy and test their systems in live environments.[24]

In June 2000, General Fuhrman introduced the new Tactical Support Center to the Corps by formally launching the two centers in Mobile and Sacramento. At Mobile, he summed up past experience with emergency management, saying, "Each district, each region had its own doctrine, its own equipment…they were great, but they were built on a shoestring…there was no nationwide doctrine." He acknowledged Mobile's lead when he commented, "Clearly the brainpower wasn't in the headquarters. It was out in the field and we recognized that." He went on to say that the DTOS units and Readiness Branch had improved due to the active part played by the District. "You worked hard at it and the nation will be appreciative of it." Morse ran both Tactical Support Centers (TSC) out of his office in the Mobile District.[25]

The District Responds to 9/11

Mike Miller and Doug Nestor had just entered Palmer's Convenience Store on Highway 90 in Irvington, Alabama. Both men worked at the Mobile TSC. As the two bought their morning coffee and snacks, they began a conversation with the store's manager, V. J. Patel, whom they had come to know over the years. A trip to Patel's store was routine for the two after the early morning reports were completed. Suddenly, as V. J. watched the store television, a look of concern and disbelief spread over his face. At first, the two friends paid no attention.

Shortly, V. J. called them over to listen to the TV announcer, who had broken into regular programming. There, to the horror of all, was one of the World Trade Center buildings in downtown New York on fire. People were jumping out of the windows to their deaths, as it became painfully obvious that a jet had crashed into one of the towers. As the three stood staring at the scene, mouths agape, a second plane flew from the left of the screen and smashed into the second tower. The War on Terror had begun.[26]

Palmer's Convenience Store outside Irvington, Alabama (photo courtesy of Doug Nestor).

Miller and Nestor raced back to the center, only five minutes away. They watched as additional confused reports came in over their office television and awaited word from UOC in Washington. Within twenty minutes, they received the anticipated call. There was confusion about other planes down in the Washington, D.C., area, and even a report about a hijacked plane crashing in Pennsylvania. On a verbal notice, Miller and Nestor were told to assemble their team and be prepared to move, probably to New York. The office personnel began contacting the team members, all of whom were volunteers scattered over several states.[27]

Miller and Nestor were not sure where they were going or what their mission might be. Nestor would reflect later that Emergency Operations had come a long way since Hurricane Andrew in Florida in 1992. Doug

Nestor, a man with a long association with dangerous work, suspected that this was going to be something the likes of which he had never seen. For Doug Nestor, Mike Miller, Allan Morse, the emergency management team, the Mobile District, and the rest of the country, it would become the "Mission from Hell."[28]

While Miller and Nestor waited, a U.S. Air Force jet was winging its way to St. Thomas in the U.S. Virgin Islands. It had a special mission. Due to the terrorist attacks on U.S. territory, all domestic and international flights were immediately cancelled and all planes grounded. Only military aircraft were permitted in the air. Allen Morse was on vacation that week in the Virgin Islands. The Deputy Chief of Engineers requested the Air Force locate and fly Morse by special jet to New York City.[29]

By mid-morning on September 11, the Corps of Engineers Headquarters had decided that the most immediate need for the DTOS units was in New York City. One of the Mobile District DTOS units was ordered to immediately deploy to downtown New York. The Sacramento units were ordered to stand fast as the Army mobilized for a possible need elsewhere. The first DTOS vehicle team was on the road to Ground Zero by the afternoon of September 11. The team arrived in New York 26 hours later and was assigned to Lower Manhattan on the morning of September 13.[30]

The UOC ordered the DTOS units to report to the New York Fire Department, which was handling the rescue operations. At the same time the DTOS unit was on the road, the Baltimore and Nashville Rapid Response Vehicles were deployed to the New York area. Baltimore was ordered to Fort Hamilton, New York, to serve as the Corps' overall communications and control center. The Nashville unit was ordered to Pier 90, on New York City's west side. A second complete DTOS unit left Mobile late in the afternoon of September 14 and arrived in New York on the 16th. Meanwhile, Morse arrived in New York on the military jet and took charge of the overall operations of DTOS at Fort Hamilton. Mike Miller and Doug Nestor arrived with the second unit on the 16th.[31]

Nestor relates his experience of arriving at Ground Zero on the morning of the 16th:

> The FDNY was doing the best they could. They had already organized the area into four quadrants, each named after a street. They were in the ruin attempting to find those still alive. It became apparent that their most pressing need was communications. The firemen had a couple of radio phones, but the cellular system for lower New York City had gone down with the Trade Center, and the collapse had also severely damaged traditional phone lines. There was no way the men in the site could communicate with their backup except by yelling.
>
> The site was ghastly. Here was a hot 100-foot-high pile of twisted steel, concrete, glass, dust, smoke, burning flesh, and the pallor of death hanging over it all. The firemen had cranes with hoses poised over sections of the ruin, pouring water on it, while desolated and damaged buildings ringed the entire site. Smoke was pouring out of dozens of places from inside the ruin and it was the smell you will never forget. Surely, this was going to be the mission from hell.[32]

DTOS reported to the Commander of the Fire Department, but immediately ran into difficulties. The FDNY did not want the brand new white and red USACE trucks pulling up and attempting, as they thought, to take over their operations. The Fire Department's work was made more difficult in that more than 300 New York Fire Department and 50 New York City Police Department officers had been killed. "The Army Corps of Engineers," said Nestor, "was simply not wanted. They could handle it without us." Miller and his crew located a large NYFD sign and placed it over the Corps signage on the truck. This seemed to placate some of the concerns of the firemen, who quickly

showed interest in the sophisticated units being put at their disposal.[33]

Next, the tall buildings in downtown New York interfered with the use of the satellite. The portable unit was towed out to the piers nearby, where the dish could properly operate. A manual line ran the two blocks to Ground Zero. The next problem was to get the units operational and especially the cell phones working. The DTOS units provided the firemen a command center for directing their operations.

***ECCV* Unit serves as command post for FDNY at the Church St. corner of Ground Zero.**

Nestor continued:

> They [the phones] worked perfectly, and the firemen seemed overwhelmed that we would just hand not only the phones, but our unit and all the support to them. We showed them how to get running and before the end of the day they were already communicating directly into the [Trade Center] site.
>
> Not only did we supply them with communications, we became an on-site command and gathering center for the firemen to store their gear and rest. We had offices in the units that could be used privately, and in one of the units we set up a "cry room." You just can't imagine the impact this event had on New Yorkers. Every day, people, many of them big husky firemen, would just break down. They had lost friends, relatives, and loved ones. It was a very emotional time. Then, after a week or so, family members were permitted to come and look, and of course that was heartbreaking.[34]

NY City Firemen rest near a DTOS unit at Ground Zero.

The Mobile District had 50 or so DTOS people stationed at the units. Each of the four corners of the site had either an Emergency Tactical Operations Center vehicle or an Emergency Command and Control Vehicle on it. Nestor continued his narrative:

> "I was on 1010 Church [Street]. Our people also broke down after awhile, and we had to keep rotating them in and out, because I worried about them. We had politicians, officials, military generals, and people that you know had seen just about everything in life, and they would come and see the site and just be in awe."[35]

As Nestor noted, volunteers made up most of the team. It was difficult keeping them for more than a few days due to other obligations. Members were rotated in and out as often as the team could get a replacement. One group that was especially helpful was Information Management."[36]

Along with communications, the computer specialists helped the Fire Department by setting up programs to record their work. They recorded each section of the site, using the computers as they worked through it. One of the more gruesome, but utterly necessary, parts of the work was the cataloging of every body part and personal item. Credit cards, purses, and

pieces of clothing: they all had to be accounted for. This was not only a manmade disaster, but the largest crime scene in the history of the United States.[37]

Nestor gave the computer experts particular praise:

> We also had our IM specialists write or alter programs so the FDNY could adapt programs to their need. Our guys ran lines, developed programs, fixed computers, and made the operation work. This allowed not only the Fire Department but the Corps to be updated with events as they proceeded.[38]

Teresa Russell, an Information Management section chief, sent her specialist off on the afternoon of September 11 with what proved to be prophetic words, "Go and do what you do so well, and remember, when 200 million Americans want to do something, and can't: you can!"[39]

Other issues also complicated the task that eventually went from rescue to debris removal:

> We had just gotten operational, and the firemen were using the computers, and then a warning came from the FBI that a serious threat to the Trade Center site was anticipated and we had to formulate an evacuation plan. So, in the midst of the chaos, the fatigue, and the exhaustion, we had to learn about New York quickly and figure a way to remove our people and the units if such a warning occurred.[40]

After about a month, it became obvious that no one else was alive, and despite protests from the New York Fire Department, the task was turned over to the New York City Public Works to remove the debris. FEMA gave the Corps authority to initiate debris removal. The Fresh Kills Landfill on Staten Island was selected to receive the material. This aspect of the task required additional support.[41]

With all the phone lines down, communication with the cranes at Ground Zero and the officials at the debris-dumping sites on Staten Island needed to be established. Here the Nashville unit formed a part of the communications link. Located at Pier 90, the unit established direct communications between the FDNY and NYPD at Ground Zero, and the FBI and other state and federal agencies on Staten Island. Working 24 hours a day, the units did not miss a phone call. In addition, debris-removal specialists from Mobile aided removal from Ground Zero and supervised the offloading from trucks to barges at Pier 90. From there they coordinated the offloading from the barges to the investigative site on Staten Island.[42]

The DTOS units' deployment was only temporary. As soon as more permanent arrangements could be made, the units were to return home. Since the site was expected to take months to clean up, new, more permanent trailers were brought to Ground Zero in early October. Once the equipment was installed, the state of

New York took over operations and the DTOS units were free to return home.[43]

Before the units left, they joined the United States Fire Service and the New York Fire Department in a service to commemorate the firemen who died at the site and to honor the members of the DTOS teams for the services they had rendered. U.S. Fire Service officials made several members of the District honorary U.S. firemen. "When we first pulled up, they didn't want us, now they didn't want us to go. But in this business that is the way we have found it to be," summed up Nester. The last unit left the city after the ceremony on October 6 and arrived back in Mobile on the evening of the 8th.[44]

Signs from local schoolchildren decorate one of the DTOS units at Ground Zero.

The events surrounding the September 11 terrorist attack created a new "mystique" for the District DTOS operations. Subsequently, DTOS has operated at the California wildfires, Oklahoma tornadoes, and Mississippi floods.

The flexibility of the District, the aggressive pursuit of the best technology, the esprit de corps that permeated the offices, and the emphasis on teamwork for the betterment of the customer paid off at New York's World Trade Center in September 2001. One member said it this way:

> At 9/11 and the weeks afterward, we were really part of something big. Our country needed us, and we responded. We will probably spend the rest of our lives living up to that.

Bo Hanna, a debris removal specialist, summed up the EOC at Mobile succinctly when he said recently, "If you want to work in emergency management and go out to disasters, come to Mobile."[45]

New York skyline, September 11, 2001.

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[1] For Corps of Engineers Emergency authorization, see U.S. Army Corps of Engineers, *Your Partner in Emergency Response* (Washington, DC, n/d). A copy is found at the following web site: http://www.iwr.usace.army.mil/iwr/pdf/2003%20Emerg_Resp_insert.pdf#search='emergency%20flood%20control%20act (accessed August 16, 2005). For how the Corps of Engineers chain of command works in emergencies, see Janet McDonnell, *Hurricane Andrew Historical Report* (Office of History, U.S. Army Corps of Engineers, Fort Belvoir, Virginia, 1993), 3-9, and Wallace E. Stickney, "FEMA vs. Mother Nature," *The Military Engineer*, Vol. 547 (January–February 1993), 10. For how the DTOS fits into the Corps Emergency Management, see "Corps unveils new emergency response system," *The Mobile*, Vol. 22 no. 4 (July–August 2000), 12.

[2] The District support for debris removal is limited to a certain dollar amount without higher authority per the Flood Control and Coastal Emergencies Act.

[3] Robert McFarlane interview, January 16, 2004.

[4] McDonnell, Hurricane Andrew, 2. For the impact on Homestead Air Force Base, see Special Hurricane edition, *The Mobile*, Vol. 14 no. 11 (Fall 1992).

[5] Quote was from Harry Cronin, who was a Corps construction representative with the District's Homestead Office. See "Construction representative rides out storm in bathtub," *The Mobile*, Vol. 14 no. 11 (Fall 1991), 4.

[6] McFarlane interview.

[7] Leo Hickman quoted in Special Hurricane edition, *The Mobile*, 7.

[8] Ibid., and McDonnell, 5, 22, 25.

[9] McDonnell, 45.

[10] Hurricane edition, *The Mobile*, 9. See also McFarlane interview.

[11] McDonnell, 49 and U.S. Army Corps of Engineers, Mobile District, *Hurricane Andrew, After Action Report*, memorandum compiled for the U.S. Army Corps of Engineers Mobile District, 1992. President George H. W. Bush was running for reelection and badly needed the Hispanic South Florida vote. He won Florida, but lost the election to Bill Clinton in November.

[12] Special Hurricane edition, *The Mobile*, 2.

[13] Ibid. and McFarlane interview.

[14] McFarlane and Nestor interviews.

[15] Nestor interview.

[16] Ibid.

[17] McFarlane interview.

[18] The units were located in Baltimore, MD; Nashville, TN; Ft. Worth , TX; Los Angeles, CA; St. Louis, MO; and Portland, OR.

[19] See "Corps unveils," *The Mobile*, 12 and "District tests deployable tactical operations system," *The Mobile*, Vol. 21 no. 5 (September–October 1999).

[20] Ibid.

[21] "Corps prepares for disasters with Readiness 2000," *The Mobile*, Vol. 20 no. 4 (August–September, 1998), 15.

[22] McFarlane interview.

[23] "Readiness 2000," *The Mobile*, 15 and "District tests system," *The Mobile*, 4.

[24] "Districts tests system," *The Mobile*, 5.

[25] "Corps unveils," *The Mobile*, 14-15.

[26] Nestor interview.

[27] According to the after-action report, HQ USACE notified the Mobile DTOS office at approximately 9:00 a.m. on September 11 of a proposed activation of RRV 2 and 3 and DTOC 1 and 2, the entire force available at the Mobile DTOS office. See the U.S. Army Corps of Engineers, Mobile District, *After Action Report World Trade Center Response, U.S. Army Corps of Engineers, Tactical Support Center, Deployable Tactical Operations System*, report prepared by Deployable Tactical Operations System for the U.S. Army Corps of Engineers on their response to the World Trade Center Attacks, (2001).

[28] Nestor interview. Nestor's experience in emergencies goes back to his college days when he worked as a diver for the Mobile County Sheriff's office looking for bodies. In addition, over the years he has been twice decorated by state and federal agencies for saving lives. See *The Mobile*, Vol. 21 no. 5 (September–October 1999), 1.

[29] McFarlane and Nestor interviews.

[30] In doing the oral interviews for the District's role in the World Trade Center attacks, nearly everyone suggested that the authors speak with Allen Morse or Doug Nestor. Much of the material for the balance of the section was taken from the interview with Doug Nestor. In addition, material was taken from U.S. Army Corps of Engineers, Mobile District, *After Action Report World Trade Center Response*, report prepared by the Mobile District, Deployable Tactical Operations System for the U.S. Army Corps of Engineers on their role in their response in the World Trade Center attacks, 2002.

[31] Ibid.

[32] Nestor interview.

[33] Nestor interview and Mobile District, *After Action World Trade Center Attacks*.

[34] Nestor interview.

[35] Ibid.

[36] Ibid. and Mobile District, *World Trade Center attacks*.

[37] Nestor interview.

[38] Nestor interview.

[39] Russell interview.

[40] Nestor interview.

[41] Mobile District, After Action Report World Trade Center attacks, and George Werneth, "Mobilian Assists Debris Removal," *Mobile Register*, October 8, 2001.

[42] Ibid.

[43] Mobile District, *World Trade Center attacks*. Nestor's comments were not totally accurate. The Headquarters unit at Ft. Hamilton had difficulty linking up with the ground units in Manhattan. However, between the units at Ground Zero, Pier 90, and Staten Island, no breakdowns occurred.

[44] Nestor interview.

[45] Billy D. "Bo" Hanna interview, January 16, 2004.

Conclusions: ***"As Mobile Goes"***

A Bright Future for Mobile District?

Structural and philosophical changes have dominated the Mobile District since 1985. The year was a watershed. The Tennessee-Tombigbee Waterway construction came to an end and a new District Engineer called for a radical change in focus. For the first time in ten years, Congress debated an omnibus water resource bill that passed in 1986. In addition, with the exception of the Oliver Lock and Dam, the era of large multi-purpose water projects seemed to be ending. Partnering with other agencies and local governments became commonplace. Tighter budgets and more intensive local involvement forced the Mobile District to learn a team-building approach to projects. Gone were the days when the Corps dictated how and when work was performed.

Florida asked the District not to complete any more dredging projects inside its western section. While Alabama, Georgia, and Florida argued over future use of the ACF river system, the District embarked upon different but no less challenging work. As Dunn predicted, the environmental, regulatory, and operational missions of the District took on a major role. This role does not seem to be diminishing.

Military construction became a major function of the District as projects at Arnold Engineering Development Center, Redstone Arsenal, Cape Canaveral, and throughout Latin America illustrate. Construction and contract innovation gave project managers new tools.

What began as relatively small support for anti-insurgency movements in Central America in the early 1980s blossomed into a completely new direction. By 2003, nearly 10 percent of the District's work was in Latin America. The number of field offices grew from one in Honduras to one in nearly every country. By the 1990s, the work in South America focused on the War on Drugs.

District work in the region required flexibility. The District employed new types of construction and contracting. It adapted to local conditions that required innovative use of local materials and methods. It learned to build contacts and relationships with client countries and agencies on its own. The region's need for better economic development remained a strategic affair over which the District had little influence. However, District officials learned to successfully transact business in Central and South America to ensure future work. In what may yet be an extremely large and complicated project, in 2003, the District was asked to take part in a Corps-wide effort to prepare a proposal to the Panamanian government for a new set of locks for the Panama Canal.

The Planning and Environmental Division greatly influenced District thought. Many of the philosophical changes involving Project Management were already being adopted long before the Project Management Office was created. The first two Chiefs of Project Management in the District came from the Planning and Environmental Division.

Today, continuing programs in the river basins and along the coasts demand more and more attention as development pressures steadily increase along the waters and the coastlines of the District. Environmental activities such as the Tenn-Tom mitigation efforts, the ACF and ACT River water allocation, dredging and harbor improvements, and casino-based development along the Gulf coast assure the District of future work. The experience gained by the District in these project areas contributed to the successful navigation of the political morasses inherent in its complex missions.

Engineering Division saw a decline and a change in its work. Project Management initiated an era that demanded both effective people and engineering skills. As Redstone Arsenal, Cape Canaveral, Oliver Lock and Dam, and J-6 demonstrated, the design/build method was a successful contractual tool. No longer did engineers design most of their projects down to the last bolt. Instead, the District learned to give contractors more freedom to use their skills in scoping and building projects. The advent of design/build, tighter budgets, fast-changing technology, increased competition, project management, partnering, and cost-sharing contributed to the District's need for multi-faceted employees.

To work in the Mobile District today, engineers find themselves managing budgets, building teams, working out compromises, negotiating and administrating contracts, as well as performing traditional designing and planning. PCs and real-time data completely changed not only working tools, but the work itself.

The Support for Others mission saw spectacular growth. Whether it was using CHARTS to make soundings of the Gulf Coast, building clean water lines for a Nicaraguan town, or fighting a California wildfire, District personnel contributed in new and innovative ways to help advance U.S. interests around the globe. The Emergency Management Office was particularly busy as support for the FEMA grew and changed.

Growth in support for other agencies like NOAA, USAID, and the U.S. Fish and Wildlife Service enabled the District to develop expertise in building multi-disciplinary teams to address various issues. Preparation of Environmental Impact Statements for base realignments vastly added to the District's understanding of complex environmental problems. Technological advances enabled the District to lead the Corps in their "reach back support" for U.S. forces in Afghanistan and Iraq.

One of the objectives of this history of the Mobile District is to examine the impact Project Management and Information Management had on the

growth and evolution of District culture and philosophy. *As Mobile goes, so goes the Corps* looks at these changes and their effects on the District since 1985.

Life Cycle/Project Management, known today as Project Management Business Plan, was implemented in the 1990s. Today, a Deputy Engineer for Project Management sits in the District Engineer's office. Project Managers function as facilitators on their Project Delivery Teams. Project Delivery Teams attempt to create "quality customer care" for both internal and external customers. Many of the old fiefdoms or "stovepipes" are gone, and a new flexible and more adaptable District has emerged.

Technology changes brought on by computers and Information Management brought nothing short of total revolution to the District. The District has adapted to the ever-changing environmental world it must face.

However, with all the changes experienced by the District, troubles remain. The Reduction in Force attacked a very basic security that most government employees held dear. Should an agency that demands a special allegiance make special arrangements for the protection of the work of its employees, even at the cost of efficiency? In line with the Corps drive to be more business-like, has it become too much so? An observer could not miss the preoccupation with budgets, efficiencies, time schedules, and how deeply these concerns permeated the agency.

Is the District losing critical expertise that may reduce it to an agency of contract managers? If that is the direction for the Corps, one would wonder if the critics who believe that the civil works mission belongs under another agency may be correct.

Although District employees concluded that the technology revolution has made aspects of their work better, it did not substantially reduced workloads. New technologies have increased work, caused burnout, and resulted in earlier retirement—the average career length at the District has dropped from 40 to 30 years since the mid-1980s. Unfortunately, for all their advantages, computers cannot replace the personal touch. The more recent decisions Corps Headquarters made to centralize the personnel and payroll offices and unleash the unpopular Promiss II software heightened fears of further detachment from Headquarters.

Project Management, renamed in 2003 as Project Management Business Plan, could easily become just another "stovepipe"—inflexible, inadaptable, and as autocratic as past systems. The objective of PM, one former member observed, was to make the Corps ready for a constantly changing world. If PM declines into just another inflexible program, then its effectiveness will be negated. District members may be found guilty of "carrying out the letter, but not the spirit of the law."

When Colonel Dunn presented his thoughts about the future of the District, he summarized his discussion by saying that in the future, the District will need to find ways to be "flexible and effectively manage varied, complex national engineering challenges." If the Mobile District can remain adaptable, customer-focused, team-conscious and technologically astute, it stands an excellent opportunity to continue to be a lead district in the Corps. "As we all know, as Mobile goes, so goes the Corps," General Ballard once commented. If true, then Corps watchers interested in knowing the future, for good or for ill, should continue to keep an eye on the Mobile District.

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List of Interviewees

Jimmy R. Lakey	CESAM-SC	2 Aug 2002
Donald M. Conlon	CESAM-PD	8 Aug 2002
Neil Robison	CESAM-PD-EI	6 Aug 2002
Alan Galdis	CESAM-IM	23 Oct 2003
Curtis M. Flakes	CESAM-PD	23 Oct 2003
Betsy A. Hicks	CESAM-RM-B	24 Oct 2003
Evelyn D. Bouie	CESAM-PM-C	24 Oct 2003
Robert A. Schodlbauer	CESAM-PM-AF	24 Oct 2003
Roger N. Simmons	CESAM-PM-I	24 Oct 2003
James H. Stanfield	CESAM-OP-TI	12 Jan 2004
Joanne U. Brandt	CESAM-PD-I	12 Jan 2004
Michael J. Eubanks	CESAM-PD-I	12 Jan 2004
Marvin G. Whitley	CESAM-RM-M	12 Jan 2004
Michael T. Abeln	CESAM-CD	12 Jan 2004
Teresa E. Russell	CESAM-IM-I	12 Jan 2004
Steven W. White	CESAM-IM-I	12 Jan 2004
Carl L. Burgamy, Jr.	CESAM-PD	13 Jan 2004
Audrey Imsand	CESAM-PRM	13 Jan 2004
Roger A. Burke	CESAM-PD-F	13 Jan 2004
Michael H. Thompson	CESAM-EN	13 Jan 2004
George Burge	CESAM-CD-Q	13 Jan 2004
Sissy J. Scott	CESAM-PD	14 Jan 2004
Joseph Birendelli	USACE-Retired	14 Jan 2004
Robert N. Scott	CESAM-EN-G	15 Jan 2004
Susan I. Rees	CESAM-PD-EC	15 Jan 2004
Hugh A. McClellan	USACE-Retired	15 Jan 2004
James B. Kastner	CESAM-PM-M	15 Jan 2004
Ervin P. Robbins	CESAM-PA	15 Jan 2004
Robert B. Keyser	CESAM-DE	15 Jan 2004
Mary Whittington	CESAM-OP-J	16 Jan 2004
Edward Culpepper	CESAM-OP-J	16 Jan 2004
Ronald A. Krizman	CESAM-OP-S	16 Jan 2004
Wayne W. Fuller	CESAM-OP	16 Jan 2004
L. Douglas Turney	CESAM-DP	16 Jan 2004
Robert A. McFarlane	CESAM-OP-RS	16 Jan 2004
Billy D. Hanna	CESAM-OP-RS	16 Jan 2004
Thomas A. Clinton	USACE-Retired	16 Jan 2004
Nathaniel D. McClure IV	USACE-Retired	20 Jan 2004
R. Douglas Nestor	CESAM-OP-RS	20 Jan 2004
George A. Vella	CESAM-IM	21 Jan 2004
Edward M. Slana	CESAM-CT	21 Jan 2004
W. Jeff Lilycrop	CESAM-OP-J	21 Jan 2004
Adrienne Davis	CESAM-OC	22 Jan 2004
James B. Hildreth	USACE-Retired	22 Jan 2004
C. Hilton Dunn	USACE-Retired	27 Jan 2004
William S. Vogel	USACE-Retired	29 Jan 2004
Walter Ennaco	USACE-Retired	30 Jan 2004
O. B. Earnest	USACE-Retired	30 Jan 2004
Lawrence Green	USACE-Retired	2 Feb 2004

Lawrence Bonine	USACE-Retired	2 Feb 2004
Michael F. Thuss	USACE-Retired	3 Feb 2004
Albert Wise	USACE-Retired	4 Feb 2004
J. David Norwood	USACE-Retired	20 Feb 2004
Ernest W. Seckinger	CESAM-PD-EI	31 March 2004
Dorothy H. Gibbens	CESAM-PD-EI	6 April 2004