SERVING *the* SOUTHEAST

A History of the Southeastern Power Administration
1990–2010

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FOREWORD

Southeastern Power Administration (SEPA) was established in 1950 with headquarters in Elberton, Georgia. The history you are about to read summarizes the great work and accomplishments the men and women of SEPA have achieved over the last 20 years. Their hard work and efforts helped recognize the importance and success of the Federal Hydropower Program in the Southeast.

There have been many challenges and changes during the past two decades. SEPA's employees, along with preference customers and U.S. Army Corps of Engineers, have communicated and worked collectively to meet these challenges with one goal in mind – to become good stewards and to ensure the benefits of one of our nation's most valuable renewable assets, hydropower.

Someone once said the achievements of an organization are the results of the combined efforts of each individual. I believe the growth and prosperity of SEPA is the direct result of our employees and customers. The people of Southeastern Power Administration are part of a successful program that promotes good policies and administers a renewable resource to more than 12 million ultimate consumers. We are proud of our accomplishments and look forward to continuing our federal service to the people of the Southeast.

Ken Legg
Administrator, Southeastern Power Administration
September 2012

Milestones in SEPA History

Items that appear in **blue** are milestones in Federal Power History.

1902 Bureau of Reclamation Act

1906 Amendment to BOR Act establishes preference power clause

1920 Federal Power Act created Federal Power Commission (now the Federal Energy Regulatory Commission) and solidifies the federal government's role as a power producer

1933 Through the Tennessee Valley Authority Act the federal government supplies power to states, counties, municipalities and non-profits

1936 Rural Electrification Act establishes the Rural Electrification Administration to assist rural areas in obtaining electricity

1937 Bonneville Project Act pioneers the federal power marketing administrations

1941 Federal power contributes seven percent of all US utility generation

1943 Southwestern Power Administration established

1944 Flood Control Act leads Corps to construct multi-purpose projects in the Southeast

1948 First units go online at Dale Hollow

1950 SEPA Established within the Department of the Interior

1953 SEPA loses battle to construct the Greenwood Transmission Line

1955 Brownell opinion requires private utilities to wheel public power over private transmission lines

1968 SEPA headquarters move to Samuel Elbert Building in historic downtown Elberton

1977 Department of Energy Established
SEPA transferred to DOE
Western Area Power Administration Established

1980 GA-AL-SC System Power Marketing Policy Issued

1983 Cumberland System Power Marketing Policy Issued

1985 Kerr-Philpott System Power Marketing Policy Issued

1986 Richard B. Russell conventional units go online

1991 Southeastern Federal Power Alliance formed

1992 Energy Policy Act facilitates deregulation
Team Cumberland formed

1993 New Cumberland System Power Marketing Policy Issued

1994 New GA-AL-SC System Power Marketing Policy Issued
SEPA establishes control center

1995 Alaska Power Administration Sale and Termination Act signed into law

1996 FERC Order 888 (OATT) mandates non-discriminatory transmission rates

1999 FERC Order 2000 encourages involvement in Regional Transmission Organizations

2000 Water Resource Development Act, Section 212 allows PMAs to use customer-funding for project rehabilitation.

2001 SEPA moves into new headquarters on Athens Tech Drive

2002 Richard B. Russell pumpback units placed in service

2004 SEPA, USACE and Cumberland System customers sign MOA for customer-funding of rehabilitation projects

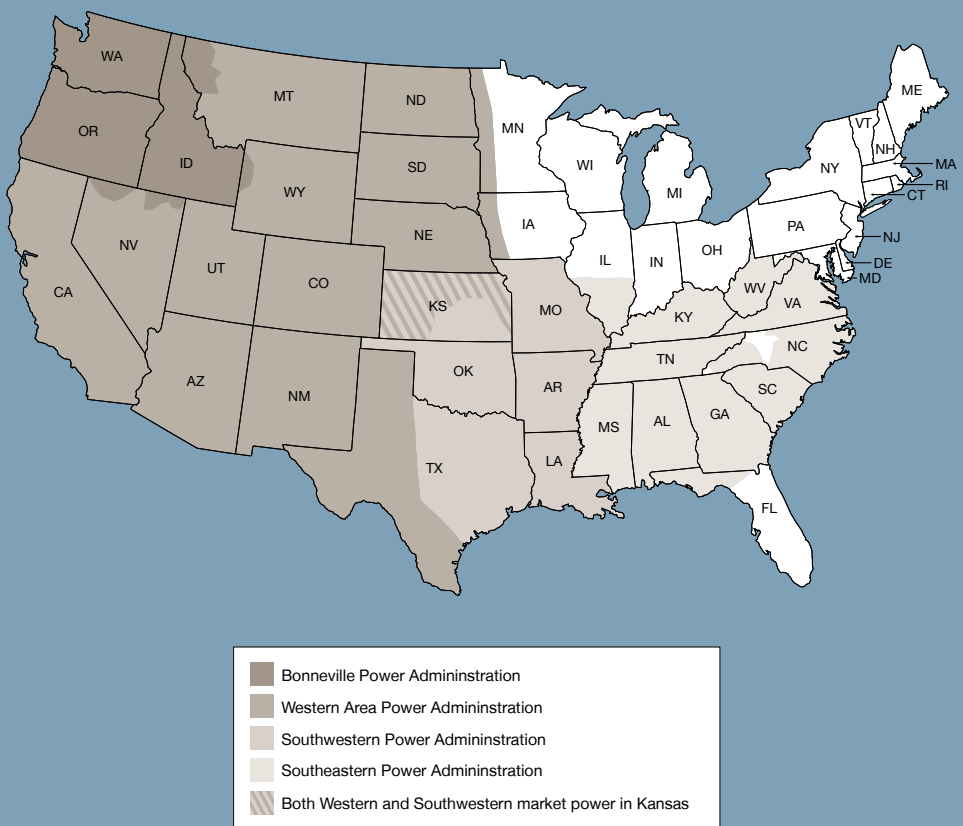
2005 Energy Policy Act directs NERC to formalize reliability standards

2010 SEPA's first year of Net-Zero Budgeting

FY 2011 PMA STATISTICS

	Transmission Lines (miles)	Substations	Powerplants[1]	Installed Capacity (MW)	Customers[2]	Total Revenue Power & Transmission (millions)	Sales (billion kWh)	Percentage of Marketing Area Sales
Bonneville	15,215	263	31	22,363[3]	276	$3,285[4]	83.1[6]	30%[7]
Southeastern	N/A	N/A	22	3,392	489	$265	6.2	2%
Southwestern	1,380	25	24	2,174	103	$171[5]	4.1	9%[8]
Western	17,135	321	57[9]	10,508	687	$1,202	42.4	6%
Total	**33,730**	**609**	**134**	**38,437**	**1,555**	**$4,923**	**135.8**	**N/A**

1. Plants are primarily owned by the Federal government and operated by the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation.
2. Includes firm, nonfirm power and project use customers.
3. Nameplate rating for federally owned generation from BPA's 2010 "White Book" on loads and resources.
4. Total operation revenue, as reflected on page 1 of BPA's 2011 Annual Report.
5. Not an audited number.
6. FY 2010 number from 2012 BPA Rate Case Wholesale Power Rate Final Proposal, Statements A-F, July 2011.
7. Approximate percentage from page 22 of BPA's 2011 Annual Report.
8. Calculated from 2010 data.
9. Includes 56 hydropower plants and 1 coal-fired plant.



GIFT *of the* RIVERS

The Southeastern Power Administration, 1950–1990

The Song of the Southern Appalachians might well be,
'Give us men and women to match our mountains and our rivers.'
The mountains spawned the rivers. People harnessed the rivers;
and the lights came on in the Rural South.

– GUS NORWOOD, *Gift of the Rivers*

SMALL BUT POWERFUL

Established on March 21, 1950, the Southeastern Power Administration (SEPA) is one of four power marketing administrations (PMAs) within the United States Department of Energy (DOE). Others include the Bonneville Power Administration (BPA), the Southwestern Power Administration (SWPA) and the Western Area Power Administration (WAPA). Each PMA, authorized by congressional legislation, is charged with marketing hydroelectric power produced at federal dams operated by the US Army Corps of Engineers (Corps) or Bureau of Reclamation (Reclamation) within a specific geographic region. By statute, the PMAs must give preference to public utility bodies and cooperatives, selling the power at the lowest rate consistent with sound business principles. Today, the electricity produced at federal impoundments accounts for approximately one-half of the hydroelectricity produced in the United States. Marketed by the PMAs, this hydroelectricity currently serves 60 million Americans in 34 states.[1]

SEPA is unique among the PMAs in several ways. With just over 40 employees and a budget of approximately $8.4 million, it is the smallest of the PMAs in terms of budget and manpower and is one of the smallest federal agencies in the country. Also, unlike the other PMAs, SEPA owns no transmission lines and, therefore, must contract with one of 18 public or private utilities to transmit electricity to its customers. Uniquely, SEPA is headquartered in a small, rural community of less than 5,000 residents. The organization may be small and relatively obscure, but as of 2010, the agency marketed federal power from 22 Corps hydroelectric projects to 491 preference customers across 11 states, reaching over 12 million power consumers.

Left: The four power marketing administrations serve over 60 million people in the United States.

POWER FOR THE PEOPLE

The concept of "preference customers" or "public power" began during the conservation movement of the early twentieth century. In 1908, President Theodore Roosevelt stood before the first annual Conference of Governors and spoke on the virtues of conserving the nation's natural resources. "The wise use of all of our natural resources," he said, "is the great material question of today." President Roosevelt understood that the nation depended on the health of its natural resources, and that each component, the soil, forests, and water, were interwoven. Furthermore, like his Chief Forester Gifford Pinchot, he believed that the nation's resources should be used for the greatest good of the largest number of people for the longest time.[2]

Beginning in 1902, the Roosevelt Administration pushed a series of legislative proposals based on this principle. Specific to the nation's water resources, he recommended passage of the Reclamation Act of 1902, which allowed for controlling the waters of the American West for irrigation. Conveniently, as one historian noted, "the enthusiasm for irrigation came at the dawn of the electrical age. Few suspected that the two would join in an amicable marriage and march hand in hand into the twentieth century."[3] In 1906, Congress passed an amendment to the Reclamation Act authorizing that surplus electricity from the federal dams should be sold to municipalities to help defray construction costs. The idea of public power, or preference customers, had been born.[4]

The federal government's dam initiative, however, was outpaced by private industries and utilities. Beginning in the 1880s, these entities constructed dams and hydroelectric developments at a rapid pace. Congress typically granted water power development rights in perpetuity, a practice that Roosevelt saw as allowing private utilities to monopolize the public's resources.[5] "Among these monopolies," Roosevelt wrote, "there is no other which threatens such intolerable interference with the daily life of the people as the consolidation of companies controlling water power."[6] To emphasize his message, the President used his veto power to prohibit a number of private hydroelectric developments, including early projects on the Rainy River, the James River, and another at Muscle Shoals on the Tennessee River. Roosevelt's decisions to veto those three early hydroelectric developments represented more of a determination to prevent unchecked monopolization of the nation's resources, rather than an outright advocacy of public power. Ironically, the Muscle Shoals site ultimately became one of the hydroelectric gems for the Tennessee Valley Authority (TVA). Completed in 1924 by the US Army Corps of Engineers, Wilson Dam at Muscle Shoals was the first public hydropower project in the southeastern United States.[7]

Throughout the first decades of the twentieth century, private utilities bitterly opposed legislation hampering water power development. The Water Power Act of 1920 confirmed the federal government's ownership rights and jurisdiction over the nation's waters and provided guidelines and fees for private development licenses. Importantly, it also enabled the government to build hydroelectric projects upon recommendation by a new Federal Power Commission. During the 1920s, public power forces attracted new supporters, but the public was generally more inclined to accept stringent federal regulation rather than outright government production of electricity. Senator George

At the first annual conference of governors in 1908, President Theodore Roosevelt stressed conservation of our nation's natural resources (National Park Service photo).

Norris of Nebraska proposed federal multi-purpose projects in the Tennessee Valley, but he had to wait for the election of 1932 to realize his vision. As one historian suggested, "the notion that the federal government would assume direct responsibility for financing and building dams…dedicated to generating electric power for public consumption…was not at all obvious prior to the 1930s."[8]

During the 1930s, though, President Franklin D. Roosevelt's "New Deal" agenda established a "mid-point correction" for electric utilities. Legislation included the Tennessee Valley Authority Act (1933); the Securities Exchange Act (1934); the Public Utility Act (1935); the Rural Electrification Act (1936); the Bonneville Project Act (1937); and the Flood Control Act (1938). In addition to providing protection for investors and customers, some of the laws were deemed necessary to provide social benefits, such as the creation of jobs through the construction of dams. Some of the legislation also enabled public cooperatives, through grants and loans, to provide electricity in areas deemed "unserviceable" by private utilities. Importantly, the Tennessee Valley Authority Act and the Bonneville Project Act both included strong provisions for preference customers such as rural electric cooperatives and other public bodies. For the government, "public power" was no longer a utopian concept, but a responsibility.[9]

Investor-owned utilities, however, viewed public power as an encroachment on what should be a private service. During the mid-twentieth century, the debate over public versus private power was peppered with charges that federal power was little more than "veiled communism." One contemporary critic even suggested, "Once public power has been firmly entrenched…the neighboring private power is doomed to eventual extinction." Proponents argued that the American people were more interested in the "adequacy of service and the price they pay for electricity" than the ideological debates.[10] The Southeastern Power Administration was born as this discourse reached its peak.

SEPA ESTABLISHED

Despite earlier failures to industrialize, the US South emerged from the financial prosperity of World War II determined to realize the full benefits of industry. Southern leaders and communities mounted a full court press of tax incentives, cheap and non-unionized labor force, and inexpensive raw materials to attract new businesses. Because of this post-war development, utilities were compelled to increase their load capacity. For private utilities, this generally came in the form of new steam stations, in addition to increasing the number of kilowatts (kW) produced by existing stations. Construction of new federal multi-purpose dams, of which hydropower was a beneficial byproduct, also contributed to "increasing cheap electricity" in the region.[11]

That federal hydropower was generated at projects constructed by the Corps of Engineers. The first projects were those designated in a study of the Ohio River Basin and the Flood Control Act of 1938. Projects authorized on the Cumberland River in Tennessee and Kentucky (part of the Ohio River Basin) included Wolf Creek, Dale Hollow, Center Hill, J. Percy Priest, Three Islands, and Rossview. With the intervention of World War II, Congress declared the construction of Wolf Creek, Center Hill, and Dale Hollow as vital to national defense, but the Corps soon suspended construction of Wolf Creek and Center Hill due to shortages of manpower and material. Dale Hollow dam was completed in 1943 using materials from the mothballed efforts at Wolf Creek and Center Hill, and played a vital role in reducing flood damages in the spring of 1945. When Dale Hollow went online in 1948, it became the first of the southeastern federal hydropower facilities authorized under the Flood Control Acts to begin producing electricity. Dale Hollow was followed by Center Hill in 1950 and Wolf Creek in 1951.[12]

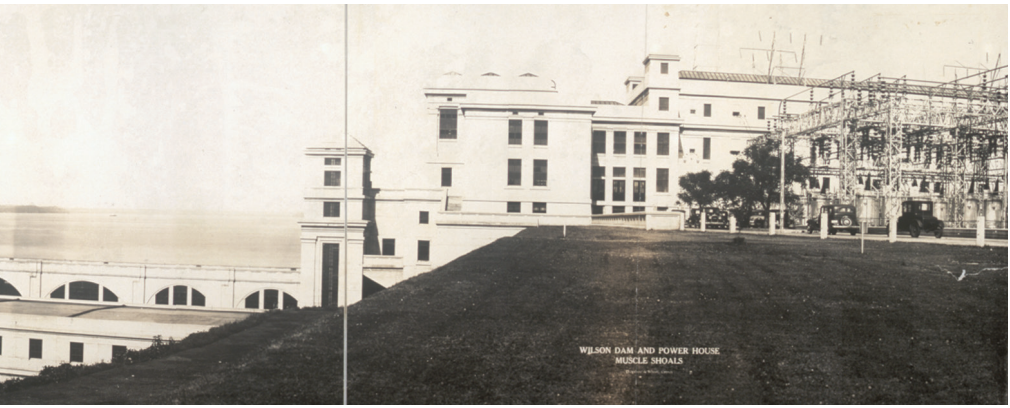
Subsequent legislation (Flood Control Acts of 1944, 1950, and 1966) authorized construction of additional multi-purpose projects in the Southeast, including several in the Savannah, Alabama, Apalachicola, and Roanoke River basins. The legislation stipulated that power in excess of that required for flood control and navigation was to be sold to public bodies and cooperatives or "preference customers" at the lowest possible rates.

Completed in 1924, Wilson Dam at Muscle Shoals on the Tennessee River was the first public

Monies generated from the power sales were to be deposited into the US Treasury to help defray costs of the authorized projects.

While the Flood Control Act of 1944 provided authorization for additional hydroelectric developments, it did not engender any particular agency to market the sale of electricity.[13] By 1947, the Bonneville Power Administration and the Southwestern Power Administration had already been established in the northwestern and southwestern United States. In the Southeast, the Department of the Interior advised the creation of another power marketing administration. During the Eightieth Congress (1947-1948), however, the proposed "Southeastern Power Administration" faced vehement opposition by political leaders and private utility representatives.[14] After vigorous debate, public power prevailed and the Department of the Interior established the Southeastern Power Administration on March 21, 1950. One of the new agency's strongest supporters was Congressman Paul Brown, who authored legislation to establish SEPA headquarters in his hometown of Elberton, Georgia.

The post-World War II period proved to be a "golden age" for electricity providers. However, while public power received public support, it was often viewed as a competing force with unfair market advantages. At the onset of World War II, private utilities controlled about eighty percent of the nation's power supply, and with the shortages of labor and materials, the United States temporarily suspended much of its public power program. Private utilities emerged from the war in a good financial position and were wary of renewed calls to broaden the federal power program. In the Southeast specifically, private utilities feared that a federal power marketing administration, interconnecting government-owned hydroelectric projects from Kentucky to Florida, would be the "last link of a public power chain that threatened to strangle them." In fact, the vehement opposition to public power by private utilities in the South ultimately left SEPA at a unique disadvantage among the PMAs in that they owned no transmission lines.[15]



hydropower project in the southeastern United States (Library of Congress photo).

SEPA's Enabling Legislation

Section 5 of the Flood Control Act of 1944

Electric power and energy generated at reservoir projects under the control of the War Department and in the opinion of the Secretary of War not required in the operation of such projects shall be delivered to the Secretary of the Interior, who shall transmit and dispose of such power and energy in such manner as to encourage the most widespread use thereof at the lowest possible rates to consumers consistent with sound business principles, the rate schedules to become effective upon confirmation and approval by the Federal Power Commission. Rate schedules shall be drawn having regard to the recovery of the cost of producing and transmitting such electric energy, including the amortization of the capital investment allocated to power over a reasonable period of years. Preference in the sale of such power and energy shall be given to public bodies and cooperatives. The Secretary of the Interior is authorized, from funds to be appropriated by the Congress, to construct or acquire, by purchase of other agreement, only such transmission lines and related facilities as may be necessary in order to make the power and energy generated at said projects available at wholesale quantities for sale on fair and reasonable terms at conditions to facilities owned by the Federal Government, public bodies, cooperatives, and privately owned companies. All moneys received from such sales shall be deposited in the Treasury of the United States as miscellaneous receipts.

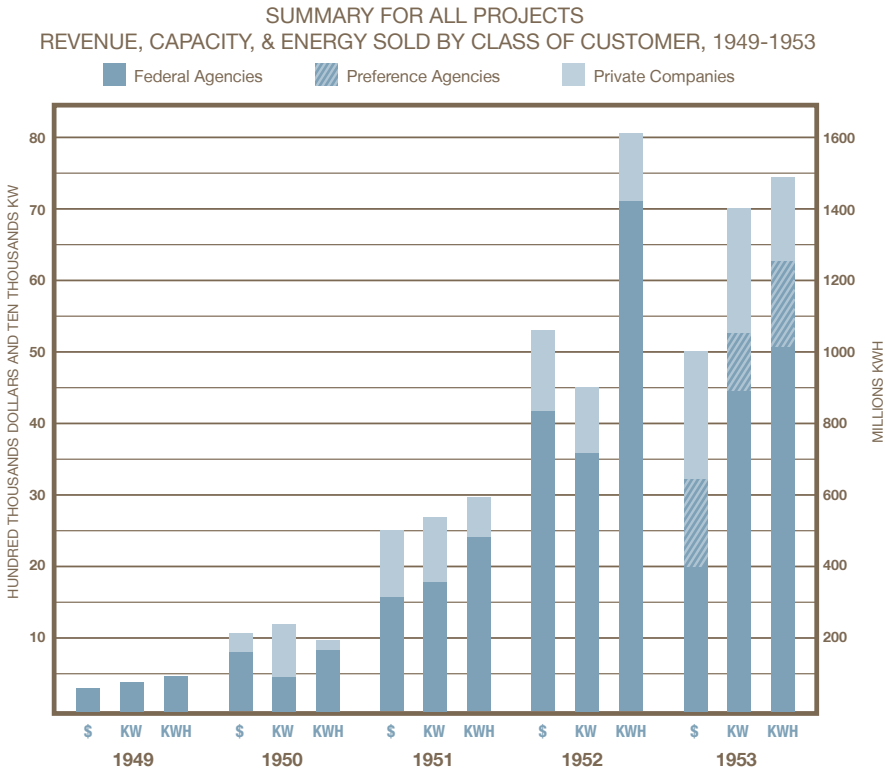
NEGOTIATING TRANSMISSION WITH PRIVATE UTILITIES

Despite opposition from private utilities, the Southwestern and Bonneville Power Marketing Administrations won Congressional support to construct transmission lines, principally because a sufficient grid system did not exist in the western United States. The Southeast, however, already possessed large and widespread transmission lines capable of handling increased loads. Private utilities argued that, among other criticisms, if the federal government constructed new transmission systems, customers would, in effect, be forced to pay for a redundant service. Therefore, until lines could be constructed or other arrangements made, the Department of the Interior was forced to negotiate transmission with private utilities, historically known as "wheeling."

An unchallenged 1948 contract between the Department of the Interior and the Georgia Power Company allowed Georgia Power to purchase and transmit all power from the Allatoona project in the Coosa River basin at the busbar, although the federal preference customers could purchase up to a guaranteed 2.5 kW per week. This precedent, of allowing a private utility to directly purchase federal power, contributed to a number of subsequent disputes in the Southeast. For its part, SEPA reassured preference customers that regardless of the transmission, they would be granted the lowest possible rates.[16]

When the Clarks Hill project began producing electricity in 1950, Georgia Power offered a proposal similar to the Allatoona contract. That proposal would allow utilities to again purchase power at the busbar. In return, Georgia Power agreed to transmit the power and sell the electricity to preference customers at the government rate plus a surcharge for transmission services. SEPA's first administrator, Ben Creim (1950-1952), rejected the proposal, fearing alienation of preference customers and that future customers would be limited to only those who might receive power from any government-owned transmission lines. Moreover, he insisted, the proposal violated the 1944 Flood Control Act by transferring the government's sale and marketing responsibilities to a "middleman," which could ultimately put the preference customers at risk.[17]

In 1955, US Attorney General Herbert Brownell, Jr. reaffirmed the preference clause of the 1944 Flood Control Act. His opinion stated that the Secretary of Interior was obligated to contract the transmission of power to preference customers within a



While SEPA largely markets to preference customers today, its earliest sales were to other federal agencies and private companies. Because Wolf Creek, Center Hill, and Dale Hollow were the first Corps projects to begin producing hydropower, TVA was one of SEPA's biggest customers.

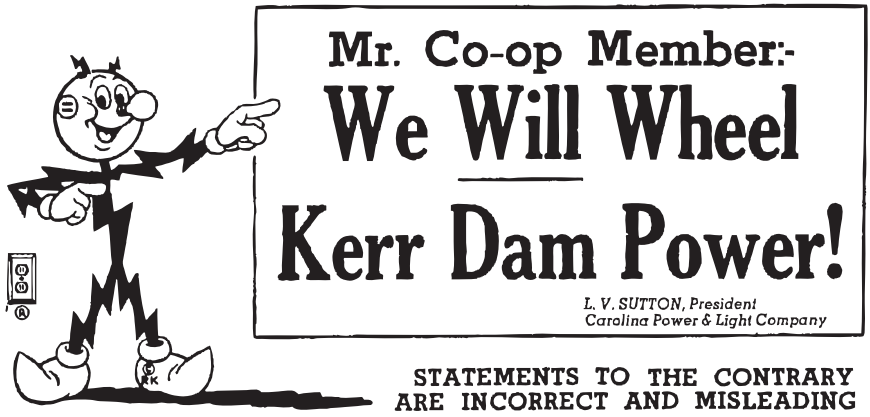
reasonable time. The Brownell opinion proved to be the lynchpin to finalizing negotiations between SEPA and Georgia Power. In 1956, the two entities settled the terms of the Clarks Hill transmission agreement that allowed for preference customers to purchase power directly from the federal government and the government would pay the Georgia Power Company a fee for transmission. Any power in excess of what was required to fulfill the preference customer contracts would be sold to Georgia Power. The "Battle at Clarks Hill" was over, and on May 20, 1956, federally generated electricity began flowing over Georgia Power transmission lines to the first two preference customers, the City of Elberton and the Tri-County Electric Membership Corporation (EMC) in Gray, Georgia.[18]

These early years of SEPA's history were characterized by numerous negotiations with private utilities. Another incident involved transmission negotiations with the Virginia Electric and Power Company (VEPCO). The debate with VEPCO resulted from the government's need to transmit power from the Bugg's Island (renamed John H. Kerr) development on the Roanoke River to Langley Field, Virginia. VEPCO refused outright to transmit power for the government. As a result, SEPA and the Department of the Interior requested funds to construct a 146-mile transmission line from Bugg's Island to Langley Field. Once Congress appropriated the construction funds in 1951, though, negotiations between SEPA and VEPCO began in earnest. Those negotiations ended with SEPA paying 1.375 mills per kilowatt hour (kWh) for transmission and also resulted in service to 17 additional preference customers in Virginia and North Carolina. Through these early negotiations, SEPA established a long-term precedent for transmitting power to its preference customers.[19]

SYSTEMS AND CUSTOMERS

In 1952, Congress appropriated $320,000 for construction of a transmission line to integrate the Clarks Hill development with the Greenwood County Electric Power Commission in Greenwood, South Carolina. The following year, SEPA's second administrator, Charles W. Leavy (1952-1969) proposed additional funding for 375 miles of transmission lines to interconnect the projects at Allatoona, Buford, and Clarks Hill. The purpose, according to Leavy, was to combine the electrical output thereby creating economies of scale. By this time, and under pressure from private utilities, Congress and the administration of newly elected President Dwight Eisenhower expressed little interest in funding federal transmission lines in the Southeast. In 1953, the Eisenhower budget eliminated funding for both the Greenwood line, which was under construction, and the proposed interconnection of the projects at Allatoona, Buford, and Clarks Hill projects. Later that year, the Department of the Interior sold the partially-completed Greenwood transmission line to the Greenwood Commission.[20]

While President Eisenhower's budget eliminated SEPA's efforts to physically connect the Allatoona, Buford, and Clarks Hill projects by transmission lines, Administrator Leavy began looking at alternative means of integrating the electrical output. He proposed operating the dams in groups or "systems." His proposal was based on the fact



During its early years, SEPA faced stiff opposition from private utilities with whom they were forced to negotiate transmission costs. In this 1955 promotional in The Robesonian *(Lumberton, North Carolina), Reddy Kilowatt responds to EMC customers.*

that each hydro project is different. Each project has its own flow, output, environmental constrictions, and weather conditions. Some operate in run-of-the-river mode while others have a high-head reservoir capacity. Studies suggested that grouping the projects would result in a more dependable capacity with substantial rate savings of approximately $9.00 per kilowatt. SEPA developed the first "system" by consolidating the Allatoona, Buford, and Clarks Hill dams in what was termed the "ABC" contract. While ABC was supplanted in subsequent years by newer systems, it proved that integration was an effective way to keep rates low and generate additional revenue. In addition, because customer rates assume amortization costs for the hydro projects themselves, SEPA insisted on a fair allocation of costs among the project uses. By doing so, SEPA managed to keep rates low while still meeting each of its repayment requirements.[21]

The concept of integrating the systems became even more important during the 1960s and 1970s as additional hydro projects went online. At this time, SEPA also assumed greater responsibilities for marketing power generated at Corps projects in the Cumberland River basin. As the first of those projects went online during the late 1940s, the Department of the Interior signed an agreement transferring marketing and transmission responsibilities to the TVA. In the late 1950s, however, Congress froze TVA's service area and, in 1963, SEPA sought to re-negotiate the contract. Under the revised agreement, SEPA began marketing outside of the TVA service area, specifically to generation and transmission cooperatives in Kentucky, southern Illinois and Mississippi, with TVA providing transmission.[22]

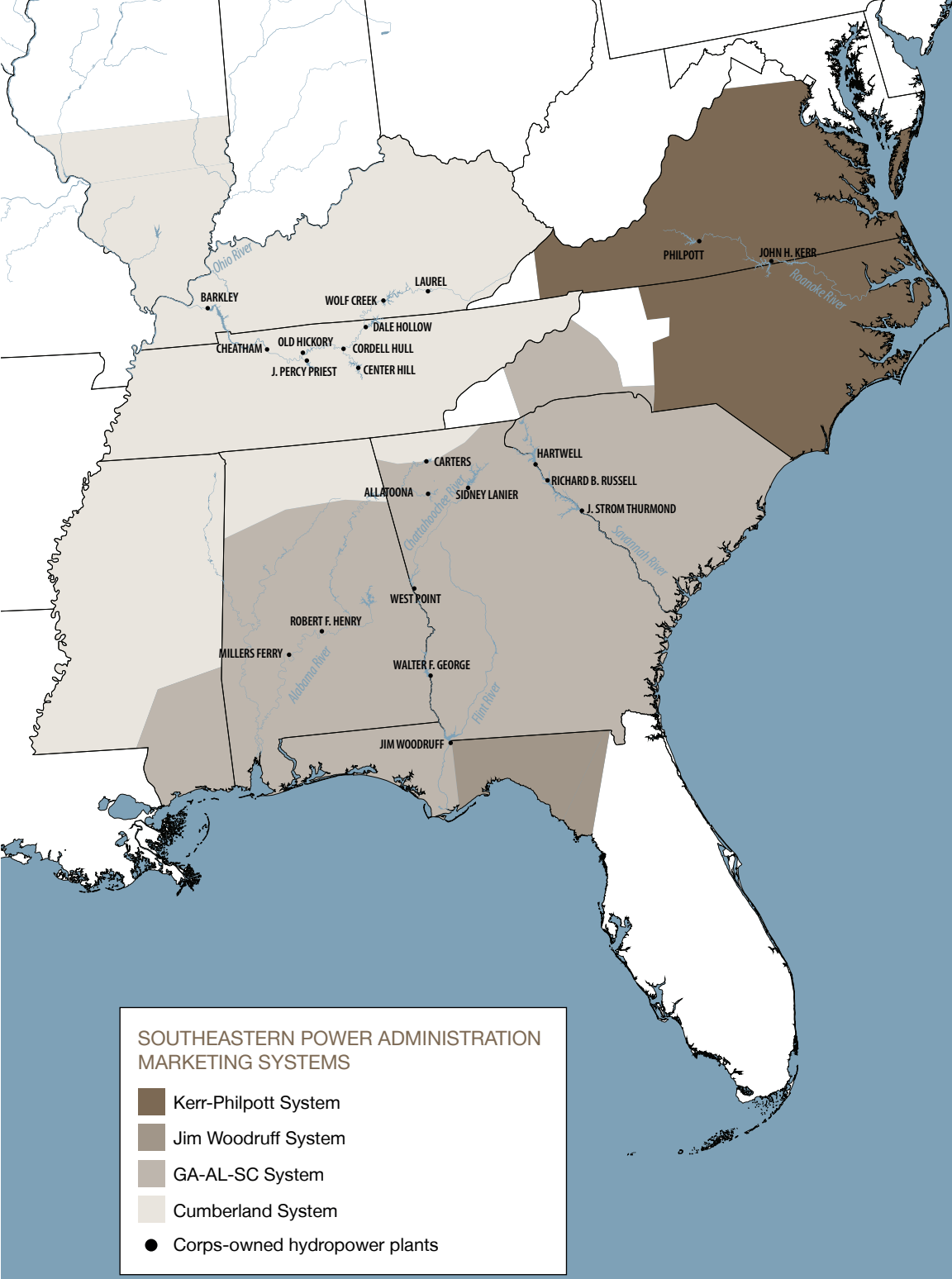
Another Corps project, Richard B. Russell Dam and Lake on the Savannah River, involved additional disputes with a private utility, but highlighted the growing influence of preference customers. The extent of the Russell project, as planned by the

SEPA MARKETS POWER FROM 22 HYDROELECTRIC PROJECTS MANAGED BY THE US ARMY CORPS OF ENGINEERS.[23]

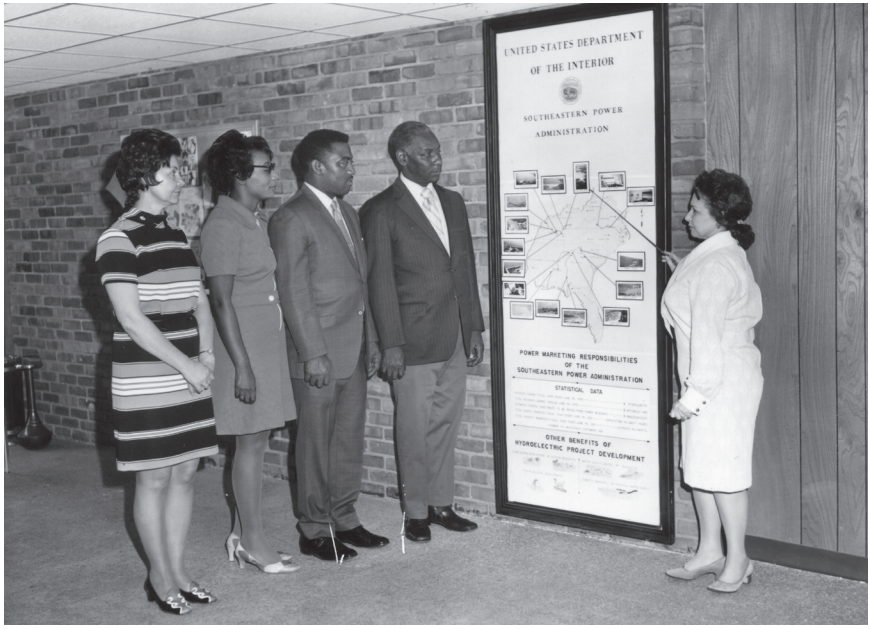
Project	Purpose	Year Authorized	Construction Commenced	First Unit Online	Last Unit Online	Power System	Nameplate Capacity (MW)
WOLF CREEK	FC-P	1938	1942	1948	1953	Cumberland	270
DALE HOLLOW	FC-P	1938	1942	1950	1951	Cumberland	54
CENTER HILL	FC-P	1938	1942	1950	1951	Cumberland	135
ALLATOONA	FC-P *	1941	1944	1950	1950	GA-AL-SC	74
JOHN H. KERR	FC-P	1945	1946	1952	1953	Kerr-Philpott	204
J. STROM THURMOND	FC-N-R-P	1944	1946	1953	1954	GA-AL-SC	280
PHILPOTT	FC-P	1945	1948	1953	1953	Kerr-Philpott	14
JIM WOODRUFF	N-P	1947	1948	1957	1957	Jim Woodruff	30
OLD HICKORY	N-P	1947	1952	1957	1957	Cumberland	100
BUFORD	FC-N-P**	1947	1950	1957	1957	GA-AL-SC	86
CHEATHAM	N-P	1947	1950	1959	1960	Cumberland	36
HARTWELL	FC-N-P	1950	1956	1962	1983	GA-AL-SC	344
WALTER F. GEORGE	N-P	1946	1956	1963	1963	GA-AL-SC	130
BARKLEY	FC-N-P	1955	1957	1966	1966	Cumberland	130
MILLERS FERRY	N-P	1945	1963	1970	1970	GA-AL-SC	75
J. PERCY PRIEST	FC-P-R	1946	1963	1970	1970	Cumberland	28
CORDELL HULL	N-P-R-ARA	1947	1963	1973	1974	Cumberland	100
CARTERS	FC-P	1945	1963	1975	1977	GA-AL-SC	500
R.F. HENRY	N-P	1945	1967	1975	1975	GA-AL-SC	68
WEST POINT	FC-FW-N-P-R	1962	1966	1975	1975	GA-AL-SC	73
LAUREL	P-R-ARA	1961	1965	1977	1977	Cumberland	61
RICHARD B. RUSSELL	FC-P-R-FW-ARA	1966	1975	1985	2002	GA-AL-SC	600

Legend:
FC: Flood Control P: Power N: Navigation FW: Fish and Wildlife
R: Recreation ARA: Area Redevelopment

** As of 2011, Allatoona is in litigation over water supply operations.*
*** According to a 2011 ruling by the 11th Circuit Court of Appeals and a 2012 legal opinion by the Corps, Buford is also authorized for water supply.*



SEPA markets the electrity produced at 22 Corps-owned hydropower plants in the Southeast.



SEPA open house, 1972. Before being transferred to the Department of Energy, SEPA was under the administrative purview of the Department of the Interior (SEPA photo).

Corps, incorporated two of an original 11 sites in the Savannah River basin proposed by the 1944 Flood Control Act. Duke Power Company opposed the plan unless it was allowed to build the Keowee-Toxaway Hydroelectric Project on an upriver tributary. Duke Power's plans were opposed by the Southeast Power Resources Committee (SEPRC), which consisted of regional rural electric cooperatives. The cooperatives charged that Duke's Keowee-Toxaway Project violated the priorities of the 1944 Flood Control Act as well as anti-trust laws. Eventually, attorney William P. Crisp, working on behalf of the cooperatives, convinced Duke Power officials that construction of both projects was possible at no harm to each of the parties. Russell Dam was authorized in 1966, a tribute to the influence of the rural electric cooperatives and their collaboration with federal power partners.[24]

When it was established in 1950, SEPA was placed within the Department of the Interior. During the energy crisis of the late 1970s, newly elected President Jimmy Carter proposed a new cabinet-level department to carry out his administration's energy policies. The Department of Energy Act was signed into law on August 4, 1977 and oversight of the four existing PMAs (SEPA, SWPA, BPA, and Alaska Power Administration [APA]) transferred from the Bureau of Reclamation and Department of Interior to the new Department of Energy. In addition, the enabling legislation established a fifth PMA, the Western Area Power Administration, removing power marketing responsibilities in the west from the Bureau of Reclamation.[25]

Leaders During the First Fifty Years

Ben Creim
1950 - 1952

Charles W. Leavy
1952 - 1969

Jan Fortune
1969 - 1978

Harry F. Wright
1978 - 1981

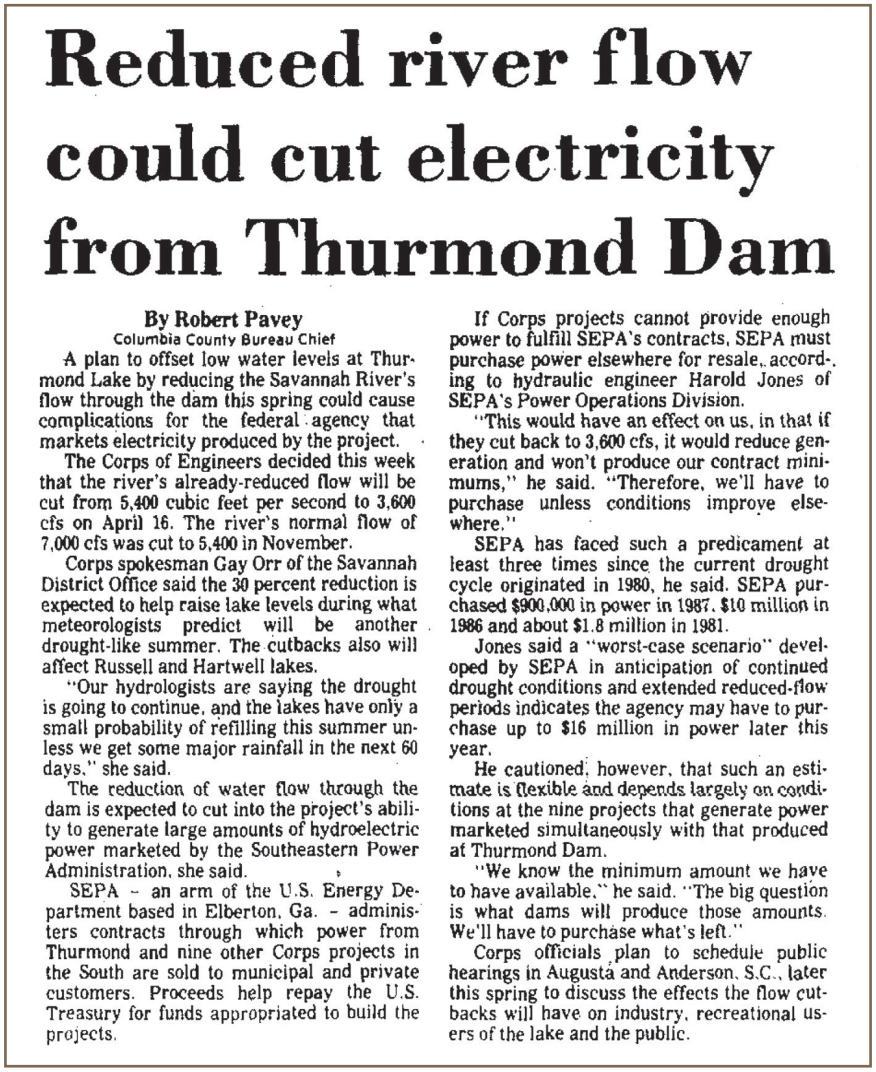
Harry C. Geisinger
1981 - 1989

Although the structural organization had little effect on SEPA's overall operation, it did initiate one substantial change. Transfer to the Department of Energy required the PMAs to comply with the Administrative Procedure Act of 1947. Under this law, SEPA was obligated to make its policy development a public process. Administrator Harry F. Wright (1978-1981) supported the new procedures, saying, "The lack of public involvement is litigation." Up to this time, SEPA's marketing policies and contracts were negotiated directly between the primary parties although the policies had the potential to affect others. In 1978, SEPA published its "Procedure for Public Participation in the Formulation of Marketing Policy" in the Federal Register and then applied the process to developing the marketing policies for the Georgia-Alabama-South Carolina and Kerr-Philpott systems. Public involvement did not supplant the contract negotiation process, "but it did place [the negotiations] under a policy umbrella, after the umbrella itself had been subjected to public scrutiny."[26]

Until this time, SEPA also sold capacity with no energy to private utilities in the Georgia-Alabama-South Carolina and Kerr-Philpott systems. Those private utilities retained the right to schedule the power and deliver it to the federal power customers. The capacity sales helped offset the transmission services incurred by the utilities and, in return, lowered transmission rates for the federal power customers served in those areas. In 1984, for example, in areas where federal power was underutilized by preference customers, SEPA sold twenty-three percent of its capacity (less than one percent of its total energy) to private utilities.[27]

Following the issuance of the new Georgia-Alabama-South Carolina marketing policy in 1980, ElectriCities of North Carolina, Inc., a consortium of preference customers largely located in the Kerr-Philpott marketing area, filed a series of lawsuits against SEPA. First, they challenged the legality of developing marketing policies based on geographic boundaries. Secondly, ElectriCities alleged that selling capacity without energy to private utilities violated the preference clause of the 1944 Flood Control Act because it denied the use of the federal power to other preference customers, even if those customers were outside of a marketing policy's geographic boundaries. Through the ElectriCities lawsuits, the courts ruled in SEPA's favor and determined that the power marketing administrations have the discretion to set geographic boundaries for marketing power. Ultimately, ElectriCities was allocated power in the new Kerr-Philpott marketing policy issued in 1985.[28]

Notably, concurrent to the ElectriCities litigation, SEPA discontinued the practice of selling "capacity without energy" in the new marketing policies of the 1980s.



Reduced river flow could cut electricity from Thurmond Dam

By Robert Pavey
Columbia County Bureau Chief

A plan to offset low water levels at Thurmond Lake by reducing the Savannah River's flow through the dam this spring could cause complications for the federal agency that markets electricity produced by the project.

The Corps of Engineers decided this week that the river's already-reduced flow will be cut from 5,400 cubic feet per second to 3,600 cfs on April 16. The river's normal flow of 7,000 cfs was cut to 5,400 in November.

Corps spokesman Gay Orr of the Savannah District Office said the 30 percent reduction is expected to help raise lake levels during what meteorologists predict will be another drought-like summer. The cutbacks also will affect Russell and Hartwell lakes.

"Our hydrologists are saying the drought is going to continue, and the lakes have only a small probability of refilling this summer unless we get some major rainfall in the next 60 days," she said.

The reduction of water flow through the dam is expected to cut into the project's ability to generate large amounts of hydroelectric power marketed by the Southeastern Power Administration, she said.

SEPA – an arm of the U.S. Energy Department based in Elberton, Ga. – administers contracts through which power from Thurmond and nine other Corps projects in the South are sold to municipal and private customers. Proceeds help repay the U.S. Treasury for funds appropriated to build the projects.

If Corps projects cannot provide enough power to fulfill SEPA's contracts, SEPA must purchase power elsewhere for resale, according to hydraulic engineer Harold Jones of SEPA's Power Operations Division.

"This would have an effect on us, in that if they cut back to 3,600 cfs, it would reduce generation and won't produce our contract minimums," he said. "Therefore, we'll have to purchase unless conditions improve elsewhere."

SEPA has faced such a predicament at least three times since the current drought cycle originated in 1980, he said. SEPA purchased $900,000 in power in 1987, $10 million in 1986 and about $1.8 million in 1981.

Jones said a "worst-case scenario" developed by SEPA in anticipation of continued drought conditions and extended reduced-flow periods indicates the agency may have to purchase up to $16 million in power later this year.

He cautioned, however, that such an estimate is flexible and depends largely on conditions at the nine projects that generate power marketed simultaneously with that produced at Thurmond Dam.

"We know the minimum amount we have to have available," he said. "The big question is what dams will produce those amounts. We'll have to purchase what's left."

Corps officials plan to schedule public hearings in Augusta and Anderson, S.C., later this spring to discuss the effects the flow cutbacks will have on industry, recreational users of the lake and the public.

*SEPA must meet the contractual obligations of its customers, even if it means purchasing replacement power in times of severe drought (*Augusta Chronicle, *March 30, 1988).*

Developed under the new public involvement procedures, the new policies were designed to supply all of the available federal power (capacity and energy) to preference customers and only contract with private utilities for transmitting power. Another significant marketing policy change of this period included the expansion of SEPA's customer base in the Cumberland System. Prior to the new Cumberland System marketing policy, issued in 1983, SEPA had traditionally allocated the majority of the federal power to the TVA and some preference customers just outside of the TVA service area, with TVA providing transmission. The new policy allocated power to new prefer-

ence customers within the Kentucky Utilities (KU) service area provided that transmission could be negotiated with the investor-owned utility. The development of the three marketing policies during the early 1980s represented a time of intense and near constant negotiation between SEPA, the federal power customers, as well as private utilities, and through those negotiations, the agency developed long-term arrangements that, by and large, are still in place today.[29]

In addition, by this time, some preference customers had begun to consolidate their interests. Two of these included the Oglethorpe Power Corporation, made up of rural electric cooperatives, and the Municipal Electric Authority of Georgia (MEAG), comprising municipal electric systems. No longer were preference customers relying on federal power for a majority of their electrical load. They began contracting with private utilities to acquire additional capacity and had even partnered with them to construct nuclear or other power-generating facilities as well as transmission lines. SEPA, however, continued to provide highly valued peaking power.[30]

THE DRY YEARS

During the 1980s, SEPA faced a number of challenges, but perhaps none as great as seven years of drought. The drought of 1980-1982 was one of the most severe up to that time and forced the agency to purchase approximately $1.8 million in replacement power in 1981 alone. Despite the severity of that drought, it was surpassed by the dry years of 1984-1989. SEPA's 1986 annual report called the latter "unprecedented" with a particularly devastating effect on the region's agriculture. Water levels dropped so low that the Corps of Engineers' Nashville District entered into an agreement with SEPA to reduce power generation at the nine hydroelectric projects in the Cumberland System. To meet contractual obligations with its customers, SEPA had to purchase supplemental power, defer $46 million in interest, and raise rates. In the Georgia-Alabama-South Carolina system, the Corps developed a drought management plan that significantly reduced the amount of available water for power production. As with the Cumberland System, SEPA had to purchase expensive replacement power for its customers. From 1986-1988, SEPA purchased more than $24.5 million in replacement power, including $21 million in the GA-AL-SC System, $1.1 million in the Cumberland System, and $2.4 in the Jim Woodruff System.[31]

For SEPA, the droughts reduced the amount of available power, but these weather events also began to highlight other issues that would emerge repeatedly during the next two decades. Beginning with the Clarks Hill development on the Savannah River, the federal government assumed the responsibility to provide recreational facilities at its dams and impoundments.[32] By the early 1970s, Corps' dams enjoyed over 60 million visitors each year. In drought situations, however, other lake users such as boat owners, fishermen, and local water authorities raise concerns over the availability of water. Water discharges for power generation are sometimes viewed as wasteful. When politics enters the equation, interstate battle lines are drawn. Litigation over proper use of the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint basins, the so-called Tri-State "water wars," began as a result of the 1980s droughts. The proper allocation of water, specifically needed for contracted electricity demand, is a key component of that

ongoing litigation. Over the next two decades, SEPA customers would be an important stakeholder in the litigation efforts as well as the development of water allocation studies.

Politically, SEPA encountered another external challenge during the 1980s. Faced with growing federal deficits, President Ronald Reagan's administration proposed privatizing or selling the PMAs to non-federal entities. This notion first appeared in the Grace Commission Report of 1984, which was designed to recommend government cost-saving efforts. The ideology behind PMA divestiture harkened back to the public power debates of the 1950s, that the limited role of government did not include power production or marketing. Congress, supported by rural electric cooperatives and municipal preference customers, opposed the proposal and responded by refusing the executive branch any funds to study the idea further. However, the President's Fiscal Year (FY) 1988 budget included selling all five PMAs with SEPA and APA prioritized for accelerated divestiture. While these proposals were eventually struck from the final FY 1988 year budget, the concept would re-appear multiple times in budget proposals of the FY 1990s and beyond.[33]

During its first 40 years, even as the organization assumed responsibility for marketing power at additional hydro projects, it did so while keeping operating costs low and maintaining a small workforce. During the 1960s, SEPA engaged no more than 40 employees. By 1990, this number was virtually unchanged. Automation and technology certainly helped employees do more with less, but the organization also relied heavily on the expertise of a stable workforce. These long-time employees benefitted from, in some cases, decades of experience and developed strong working relationships with public power customers and the Corps partners. By 1990, SEPA employees were responsible to 297 customers, including 127 cooperatives and 164 public bodies.[34]

SUCCESS IN THE FACE OF AWESOME OPPOSITION

In 1990, SEPA celebrated its 40th anniversary and adopted the theme "Forty Going on Fifty." The newly appointed administrator, John A. McAllister, Jr., remarked, "We recognize the importance of our customers, and will continue to strive to meet their future needs." In tribute to its first 40 years, the agency distributed copies of Gus Norwood's history of SEPA, *Gift of the Rivers: Power for the People of the Southeast*. "The life story of SEPA is at once improbable, remarkable and interesting," Norwood wrote, "It is a heartwarming story of success in the face of awesome opposition."[35]

Norwood noted that SEPA was "created at an exciting, dynamic time," but the organization's life story had only begun by 1990.[36] *Gift of the Rivers* closed when the drought years ended and a new administrator arrived in Elberton. SEPA began the new decade by embarking on a bold initiative, to re-energize and improve its existing relationships with the customers and the Corps. This proved to be a fortuitous business decision. Over the next 20 years, chronicled in this history, the organization faced additional years of drought, aging and sometimes unserviceable hydroelectric units, and new stringent industry standards. From 1990 to 2010, this small but powerful federal agency headquartered in Elberton, Georgia witnessed and initiated far-reaching changes.

ENDNOTES

[1] A fifth PMA, the Alaska Power Administration, was sold in 1996. For historical information on the various PMAs see Gus Norwood, *Gift of the Rivers: Power for the People of the Southeast. A History of the Southeastern Power Administration* (Washington, DC: US Government Printing Office, 1990); Gus Norwood, *Columbia River Power for the People: A History of Policies of the Bonneville Power Association* (Portland: Bonneville Power Administration [BPA], 1981); Western Power Administration (WAPA), *Serving the West: Western Power Administration's First 25 Years as a Power Marketing Agency*. Available online from January 27, 2010. http://www.wapa.gov/about/historyproj.htm; Erwin C. Hargrove and Paul K. Conkin, *TVA: Fifty Years of Grass-roots Bureaucracy* (Urbana: University of Illinois Press, 1983); *Southwestern Power Administration (SWPA), 50/50 Partnerships in Power, Southwestern Power Administration 50th Anniversary* (Tulsa: Southwestern Power Administration, 1993).

[2] "Theodore Roosevelt and the Conservation Movement," presented August 18, 1958, 85th Congress, 2nd Session (Washington, DC: United States Government Printing Office, 1958).

[3] William D. Rowley, *The Bureau of Reclamation: Origins and Growth to 1945, Volume 1* (Denver: US Department of the Interior, 2006), 82.

[4] Norwood, *Gift of the Rivers.* For discussions on the origins of public power, see Phyllis Komarek De Luna, *Public Versus Private Power during the Truman Administration: A Study of Fair Deal Liberalism* (New York, Peter Lang Publishing, 1997); and John Richard Waltrip, *Public Power during the Truman Administration* (New York: Arno Press, 1979).

[5] The River and Harbors Acts of 1890 and 1899 attempted to address the increasing number of private dams that were interfering with navigation. The acts required approval by the US Army Corps of Engineers and the Secretary of War for these private dams on navigable rivers; still Congress issued some 30 permits between 1896 and 1906. See David P. Billington, Donald C. Jackson and Martin V. Melosi, *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams* (Denver: US Department of the Interior, Bureau of Reclamation, 2005), 36-37.

[6] Preliminary Report of the Inland Waterways Commission.

[7] Norwood, *Bonneville Power Administration.*

[8] de Luna, *Public versus Private Power*, 2-7; also Billington, Jackson and Melosi, *History of Large Federal Dams*, 131-133.

[9] Norwood, *Gift of the Rivers*, 14-16; also Norwood, *Bonneville Power Administration*, 69-77.

[10] Alex Radin, "Public or Private Power," *The Rotarian* (November 1954): 22, 58-60; Ben Moreel, *Our Nation's Water Resources: Policies and Politics*, (New York: Arno Press, Inc., 1956 [reprinted 1972]), 188. For additional information on the public power debate, Waltrip, *Public Power;* de Luna, *Public versus Private Power*; and Alex Radin, *Public Power-Private Life* (Washington, DC: American Public Power Association, 2003).

[11] James C. Cobb, *The Selling of the South: The Southern Crusade for Industrial Development, 1936-1990*. 2nd ed. (Urbana, IL: University of Illinois Press, 1993). For the industrial power needs for Atlanta, see Lori I. Coleman, "Our Whole Future is Bound up in this Project: The Making of Buford Dam," Master's Thesis (Atlanta: Georgia State University, 2008), 30-34. For post-war utility supply and demand, see Wade H. Wright, *History of the Georgia Power Company, 1855-1956* (Atlanta: Foote and Davies, 1957), 324-336; Robert F. Durden, *Electrifying the Piedmont Carolinas: The Duke Power Company, 1904-1997* (Durham, NC: Carolina Academic Press, 2001); Jack Riley, *Carolina Power and Light Company, 1908-1958* (Raleigh: Edwards and Broughton Company, 1958). For specific calls to US Army Corps of Engineers owned facilities in the Southeast, see "Hartwell Termed 'Urgent': More Power Urged for Savannah Basin," *Augusta Chronicle* February 18, 1952.

[12] As Dale Hollow was entering the last stages of construction, the Secretary of the Interior, charged with marketing the power, proposed transferring the Cumberland system power over to the Tennessee Valley Authority. Subsequently, this was found to be in violation of the 1944 Flood Control Act and marketing responsibilities were transferred to SEPA. See Norwood, *Gift of the Rivers*, 23-27. For additional information on the Cumberland River basin projects, see Leland R. Johnson, *Engineers on the Twin Rivers: A History of the Nashville District Corps of Engineers* (Nashville: US Army Corps of Engineers, 1978); also, Leland R. Johnson, *The Ohio River Division US Army Corps of Engineers: The History of a Central Command* (Louisville: US Army Corps of Engineers, 1992).

[13] Norwood, *Gift of the Rivers*, 35.

[14] de Luna, *Public versus Private Power*, 81-83. De Luna's work provides an excellent study of the development of public power and details the controversies over the creation of the federal power marketing agencies.

[15] de Luna, *Public versus Private Power*, 95; also, Waltrip, *Public Power*. The renewed opposition of public utilities after World War II was one of many contributing factors to SEPA's failure to acquire transmission capabilities. The Southwestern Power Administration, created in 1943, did manage to acquire funding for approximately 1,700 miles of transmission lines, but was forced to find other alternatives as well, and ultimately, developed an important wheeling contract with the Texas Power and Light Company. However, Waltrip (130-135) notes that by the time a southeastern marketing administration became necessary in the late 1940s, the country had lost its appetite for public works. In addition, the Korean Conflict and the increasing national debt had crept into the public consciousness and, as a result, Congress began slashing PMA budgets. This, combined with the pressure from southern investor-owned utilities and the wheeling precedent set by SWPA, virtually eliminated calls for federal transmission line construction in the Southeast.

[16] de Luna, *Public versus Private Power*, 95-97; also "New Millen REA Plant Opens: Federal Official is Heard," *Augusta Chronicle*, October 11, 1950; Norwood called these early conflicts the "Battle at Clarks Hill," see *Gift of the Rivers*, 43-55.

[17] The Southwestern and Bonneville Power Administrations also opposed the contracts, contending that such agreements would jeopardize any federal transmission of power over existing or proposed lines, of which they were owners. See de Luna, *Public versus Private Power*, 96-97. For a legal discussion, see L. Clifford Adams, Jr., Clinton A. Vince, and Alan I. Robbins, "Federal Electric Preference Power Marketing in the 1980s: Developing Legal Trends," 4 *Energy Law Journal* (1983).

[18] Wright, *Georgia Power Company*, 342-343. Ironically, Georgia Power's subsidiary, the Savannah River Electric Company, held a Federal Power Commission license to construct a small power plant at Clarks Hill. They surrendered the license in 1932, favoring construction of a steam plant. In fact, Georgia Power proposed to sell its reservoir rights at cost in return for the government selling power at a reasonable price. Georgia Power's opposition to federal power at Clarks Hill began once the 1944 Flood Control Act required the power to be marketed first to public bodies and cooperatives. See Norwood, *Gift of the Rivers*, 29-30.

[19] Norwood, *Gift of the Rivers*, 39-41. This was not the case with Carolina Power and Light, which owed much of its success to the election of President Dwight Eisenhower in 1952. Far less supportive of public power than the previous administration, Eisenhower's Secretary of the Interior ordered SEPA to sell its power outright to Carolina Power & Light (CP&L). CP&L would, in turn, sell power to the cooperatives. See also de Luna, *Public versus Private Power*, 97-100. For more information on Corps projects in the Roanoke River basin, see Ronald B. Hartzer, *To Great and Useful Purpose: A History of the Wilmington District US Army Corps of Engineers* (Wilmington: US Army Corps of Engineers, 1984).

[20] When the Department of Interior proposed the Greenwood line, it was again met by bitter opposition and litigation, this time from the Duke Power Company and South Carolina Electric and Gas. See Norwood, *Gift of the Rivers*, 45, 51-53; also de Luna, *Public versus Private Power*, 100-104.

[21] Norwood, *Gift of the Rivers*, 45, 51-53; also de Luna, *Public versus Private Power*, 100-104.

[22] Norwood, *Gift of the Rivers*, 23-27, 51-53.

[23] Table originally appears in Norwood, *Gift of the Rivers*, 26, and has been updated to reflect current installed (nameplate) capacity.

[24] The Keowee-Toxaway Hydroelectric Project includes two hydro developments, one conventional (Keowee) and the other a pumped-storage unit (Jocassee), both of which were integral to a broader Keowee-Toxaway Energy Project that included the proposed Oconee Nuclear Station (ONS). The two hydroelectric projects were designed to balance the base load generated at the ONS and Lake Keowee would provide cooling water for the nuclear station; Norwood, *Gift of the Rivers*, 69-74; also, Durden, *Electrifying the Piedmont Carolinas*, 136-139.

[25] Terrence R. Fehner and Jack M. Hall, *Department of Energy, 1977-1994: A Summary History* (Washington, DC: US Department of Energy, 1994), 21-24; see also, WAPA, *Serving the West*.

[26] Norwood, *Gift of the Rivers*, 74-76.

[27] Clinton A. Vince and Nancy A. Wodka, "Recent Legal Developments and Legislative Trends in Federal Preference Power Marketing," *Energy Law Journal* 7, no. 1 (1986): 11-14, 38-37, 43-46.

[28] Vince and Wodka, "Recent Legal Developments," 38-37, 43-46; also phone interview with Leon Jourolmon, October 1, 2012.

[29] Norwood, *Gift of the Rivers*, 79-81; also phone interview with Leon Jourolmon interview, October 1, 2012

[30] Norwood, *Gift of the Rivers*, 79-81.

[31] Johnson, *Ohio River Division*, 354; also, Norwood, *Gift of the Rivers*, 79-83; SEPA, *Annual Report*, 1986; *Augusta Chronicle*, March 30, 1988. Additional data and numbers provided by J.W. Smith, SEPA.

[32] Planned or not, recreation was a natural byproduct of reservoir construction. As Leland R. Johnson notes in his history of the Pittsburgh District, because of increased use of automobiles and more leisure time, there was an "unexpected surge" of recreational use of Corps lakes following World War II. See Leland R. Johnson, *The Headwaters District: A History of the Pittsburgh District, US Army Corps of Engineers* (Pittsburgh, Pennsylvania: US Army Corps of Engineers, 1979), 302. Clarks Hill, under the purview of the South Atlantic Division, was the first federal reservoir specifically authorized to provide recreational benefits. In fact, as part of the planning process, the Corps held public meetings in both South Carolina and Georgia to solicit feedback from local stakeholders. See Henry E. Barber and Allen R. Gunn, *A History of the Savannah District US Army Corps of Engineers* (Savannah: US Army Corps of Engineers, 1989), 428-430.

[33] *Energy Law Journal*, ed., "Report of the Committee on Power Marketing Agencies," 8 *Energy Law Journal* (1987), 159-190; *Energy Law Journal*, ed., "Report of the Committee on Power Marketing Agencies," 9 *Energy Law Journal* (1988), 239-257; *Energy Law Journal*, ed., "Report of the Committee on Power Marketing Agencies," 9 *Energy Law Journal* (1990), 141-152.

[34] Norwood, *Gift of the Rivers*, 64.

[35] Southeastern Power Administration, *Annual Report*, 1990, 1; Norwood, *Gift of the Rivers,* ix. In 1967, Gus Norwood became the first administrator of the Alaska Power Administration. A graduate of the US Naval Academy, he served in the Navy during WWII and was on the carrier *USS Hornet* during the Battle of Midway and at Guadalcanal. In addition to writing the first history of the Southeastern Power Administration, Norwood used his knowledge to draft a comprehensive history of the Bonneville Power Administration in 1980, *Columbia River: Power for the People*. He passed away at the age of 90 on May 2, 2006.

[36] Norwood, *Gift of the Rivers*, 16.


Advance
Promoting
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PARTNERS *Advancing* CLEAN ENERGY

Relations between the Corps and Southeastern have not always been cordial. The droughts of the late 1980s put pressure on both organizations as well as our preference customers. I came to the realization that we could no longer litigate and legislate; we must negotiate and cooperate.

– ADMINISTRATOR JOHN A. MCALLISTER, JR. (1989-1995)[1]

PARTNERING, NOT POSTURING

In November 1989, a new administrator arrived in Elberton to lead SEPA. John A. McAllister, Jr., "Johnny," was a native South Carolinian dedicated to public service through his membership in the National Guard. He was recommended for the Administrator's position by Senator Strom Thurmond (R-SC) a strong supporter of SEPA who happened to be one of the most powerful politicians in Washington, D.C. Thurmond recognized McAllister's abilities, from his experience in finance and marketing to his time in the Guard. Only 30 at the time of his appointment, McAllister brought a decidedly different culture to the Office of Administrator, including youth, a business background, and the "you" attitude of a business person.[2]

The droughts of the late 1980s, coupled with aging and unreliable hydropower assets, had strained the relationship between the Corps, SEPA, and the federal power customers. Caught between the power producer and the power consumer, SEPA was in the unenviable position of mediating concerns between the Corps' abilities, restrictions, authorization, and budget, and the customers' expectations for affordable and reliable power. As a marketing administration, SEPA did not have the authority to budget for repairs or rehabilitation or to balance the competing interests of the multi-purpose projects. SEPA could not request Congress to appropriate funds for repairs; the Corps' has the sole responsibility to seek and justify their maintenance budget. However, SEPA could negotiate revised rates when contracts expired, or advocate for changes in marketing policies.

Left: Developing the vision, mission, and goals of the Southeastern Federal Power Alliance.

As pressures mounted on the hydropower systems, the delicate dynamic between the three entities came under immense pressure. The preference customers were particularly bitter at what appeared to be a highly indifferent and structured environment at the Corps and an ambivalent intermediary at SEPA. Almost immediate to his arrival, McAllister recognized the need to change the culture of the organization internally and externally:

> *When I came to Southeastern, I found there was animosity that existed between Southeastern's customers and our partners at the Corps of Engineers. We were in a drought, which exacerbated the situation. One of the first meetings I attended was with one of our senior people at Southeastern, Harold Jones. It was a meeting of the Lake Hartwell Property Owners Association. They were blaming the Corps of Engineers, the Southeastern Power Administration, and the customers of Southeastern (the electric cooperatives and municipalities) for the lack of water in Lakes Hartwell, Russell, and Thurmond. I saw this as a real problem. There was obviously a lack of communication; there was a lack of information flow. [I realized] we had to improve the way we did business and we had to change our business practices. With that, I called a national consultant, Dr. Sheila Sheinberg.*[3]

In 1992, SEPA, the Corps, and the federal power customers of the Cumberland System met in Lexington, Kentucky to develop the Team Cumberland partnership.

Dr. Sheila Sheinberg founded the Center for Life Cycle Sciences in Houston, Texas in 1984. As an analyst of organizational and human development, Sheinberg recognized the challenges faced by organizations, specifically their responsiveness to changing social, cultural, economic, and political environments. Other important catalysts to an organization's sustainability, according to Sheinberg, include those internal factors such as company growth, employee awareness, and changing customer expectations.

On July 13, 1991, McAllister organized a communication session facilitated by Dr. Sheinberg. Held in Atlanta, Georgia, attendees included representatives from the Corps' South Atlantic Division (SAD), SEPA, and the southeastern federal power customers in the SAD service area.[4] The goals of the session were to identify the differences between the three stakeholder groups, but more importantly, define their common causes as to the economic operation of hydropower. Quite literally, the participants sat around a table and openly discussed perceptions of each organization and specific concerns about their working relationship. According to some of the attendees, that first meeting was somewhat awkward, with everyone initially standing, testing the atmosphere. Sheinberg guided the participants through a number of team building exercises, and facilitating the discussion to identify what led to some of the broken relationships. After three days, SEPA, the Corps, and the federal power customers developed the framework for a partnership, the Southeastern Federal Power Alliance (Alliance), with the shared vision of "Partners Advancing Clean Reliable Hydropower."[5]

John McAllister, Jim Vann (Alabama Electric Cooperative), and General John Sobke (SAD) display the Alliance logo following the creation of one of the agency's key partnerships.

On July 13, 1991, our relationship changed. On that day Southeastern, the Corps of Engineers, and the preference customers crafted a shared vision: Partners Advancing Clean Reliable Hydropower. Simultaneously a new working arrangement was developed: The Southeastern Federal Power Alliance. As Vision leaders, it is our duty to keep the Vision alive throughout the transformation process. Alliance meetings are important rituals to enable us to celebrate milestones, encourage full participation, and keep the partners enthusiastically involved throughout the change process.

John A. McAllister to Alliance Partners, December 19, 1992

Immediately, SEPA promoted the development of a parallel organization for the Cumberland System. In February 1992, officials from SEPA, the Corps' Great Lakes and Ohio River Division (LRD), and the Cumberland System power customers, met in Lexington, Kentucky to create a vision and strategy for future communication for their own multilateral relationship.[6] Again facilitated by Dr. Sheinberg, the participants created "Team Cumberland," with a shared vision of "Partners Advancing Responsible Hydropower." For both partnerships, McAllister and the Corps officials realized that establishing the relationships represented only the first of many steps, and that continued implementation, with measured metrics and regular meetings were necessary for their sustainability.[7]

McAllister, along with General John Sobke (SAD) and General Albert Genetti (LRD), emphasized that leadership started at the top of the organizations, and found that customer participation in meetings increased when the senior officers and senior executives were in attendance. As Administrator, McAllister also spent a great deal of time visiting with the Corps, and strengthening relationships with Generals Sobke and Genetti. He attended Corps functions such as change of command ceremonies, and other important events. In turn, the Corps attended events for SEPA. "It's easier to trust people with whom you've had a cup of coffee or shared a meal. I didn't see that as being the case before." To empower all the participants, SEPA crafted medallions for the logos of the Alliance and Team Cumberland.[8]

One of the most important milestones achieved from the newly christened Alliance relationship was a Memorandum of Understanding (MOU) developed between SEPA and SAD. Executed on June 20, 1991, the MOU reiterates each agency's independent authorized responsibilities, operational expectations, and most importantly, emphasizes cooperation and communication:

> *It is recognized that the preference customers of the Southeastern Federal Power Program have an interest in the maintenance, operation and maintenance expense, and funding. It is the intent of the parties to develop a relationship of mutual respect and trust between the parties and the preference customers and to resolve controversial issues through discussion rather than confrontation.*[9]

The partnerships primarily grew out of the extreme drought situations of the late 1980s, but they were vital to many of the major issues that have emerged since and continue to be held on a semi-annual basis or when needed. "It was a good tool for keeping lines of communication open," noted Administrator Charles Borchardt. "It started a level of trust for the customers to tell us [SEPA and the Corps] how our actions affected them," said Jon Worthington. "There are candid and direct lines of communication – that's helpful."[10]

During the 1990s, the partnerships were crucial to traversing the challenges of the Corps' maintenance and rehabilitation backlog of its hydropower assets.[11] While the aging generating units were, in many cases, in dire need of major repairs, the Alliance and Team Cumberland members worked with the Corps to proactively identify issues that would prevent forced unit outages and power interruptions and to identify those project components that were in need of rehabilitation. The partnership meetings helped the Corps to understand the rate systems, contract terms, and the interrelationship with investor owned utilities regarding transmission services. In addition, the meetings facilitated discussions regarding any phased rehabilitations, so that the power reductions could have the least amount of impact to contractual obligations. An important result of the Team Cumberland partnership was an initiative to develop alternative methods of financing rehabilitation, specifically "customer-funding." While SEPA cannot advocate or lobby Congress for such actions, the customers can, and proved to be an important voice in having a "customer-funding" provision incorporated into the Water Resource Development Act of 2000.[12]

Donald Norris (East Kentucky Power Cooperative), John McAllister, and General Albert Genetti (LRD) with the Team Cumberland Logo.

For projects affecting customers in the South Atlantic Division, the Alliance has been an "exceptional partnership," where the Corps and the customers can openly discuss topics with SEPA as the facilitator. Joel Seymour, Deputy Administrator for Human Resources and Administration at SEPA, was trained as a facilitator during the early 1990s and has helped lead the meetings for nearly two decades. During the last twenty years, drought has been a frequent topic and the meetings allow the Corps to communicate their water management issues directly to the customers so they can plan for decreased power production and develop workable solutions. Additionally, the water management challenges resulting from the Tri-State Water Wars have been a recurrent topic for Alliance members over the past twenty years. While SEPA cannot have an official position in those discussions, they can facilitate the conversation and ensure the customers' concerns regarding rate impacts are addressed with equal attention paid to restrictions on the Corps' operations due to ongoing litigation.[13]

The Alliance was completed by a previously formed customer organization, the Southeastern Federal Power Customers (SeFPC), Inc., incorporated in 1991. The SeFPC, a trade group of electric cooperatives and municipal power companies served by SEPA, represents more than six million federal power customers in the Southeast and helps to raise awareness about hydroelectricity. This group serves as a consolidated voice to advocate for the protection and reliability of public power. For Alliance meetings, the SeFPC selects representatives to attend from among its membership.[14]

In addition to the collaborative meetings, in 1991 SEPA began publication of a customer-oriented newsletter, *Powerline*, which provided information on water conditions, associate profiles, industry changes, training, workshops, status of outages or repairs, conservation tips, and rate changes. The newsletters were mailed not only to customers, but to organizations such as the Corps and other PMAs. With the advancement in technology, SEPA now houses electronic versions of the newsletter on its website. The newsletter is a simple way to maintain the communication between SEPA, the Corps and the customers.

A CONTINUOUS PATH TO QUALITY

The relationship changes facilitated by SEPA paralleled a new initiative proposed by President Bill Clinton in 1993, when he proposed the National Performance Review (NPR), later called the National Partnership for Reinventing Government. In President Clinton's words, "Our goal is to make the entire Federal Government both less expensive and more efficient, and to change the culture of our national bureaucracy from complacency and entitlement toward initiative and empowerment. We intend to redesign, to reinvent, [and] to reinvigorate the entire National Government."[15] NPR promoted four general principles: cutting red tape, putting customers first, empowering employees to get results, and getting back to basics. Over the course of fifty years, SEPA had evolved into a highly technical, and arguably, highly-structured organization. Even small government agencies, such as SEPA, could afford to redefine the way they conducted business.

If we're going to stay in business, we have to maintain continuous improvement in the organization.

Administrator John McAllister

NPR was not the first attempt to reform the federal government; indeed, it was the latest of nearly a dozen such efforts in the twentieth century alone. However, it did come on the heels of decades of government growth in infrastructure and regulation, and represented an opportunity for agencies to pause and take inventory. In the Corps of Engineers, for example, the exponential growth of projects and infrastructure constructed between the end of World War II and the 1980s dropped off precipitously. The challenge for the Corps transitioned from one largely focused on design and construction to maintenance, repair, rehabilitation, and customer satisfaction.[16]

Under McAllister's leadership, SEPA began a Total Quality Management (TQM) initiative in 1991. A popular management philosophy adopted by the private sector during the 1980s and early 1990s, TQM advocated the concept of process improvement. TQM eventually made its way into the federal government, triggered by the NPR. Championed by the US Secretary of Energy Hazel O'Leary, the DOE adopted TQM in 1993. Developed by W. Edwards Deming, TQM focused on customer satisfaction, performance metrics, and employee empowerment. The TQM principles empowered employees to assume greater responsibilities in their roles and team development.[17]

Prior to TQM's implementation at SEPA, the organization was highly static; personnel were largely assigned individual tasks or programs. With such broad responsibilities for a large region, and with relatively few full-time employees at the agency, the absence of an employee or employees for a day or more could delay getting vital information to the customers, the individual hydro project operators, or the Corps. Through TQM, SEPA's goal was to "soften the organization" and "cross-functionalize" employees, thereby making it a more flexible organization to maintain consistent operation. During the early years of this program, all SEPA employees attended training programs led by trained TQM instructors.[18]

McAllister focused on continuous improvement within the organization, and at the end of his tenure, restructured the agency's hierarchy. During the 1980s, as SEPA approached the fifty-year mark, it operated under an organizational structure that had been in place since the mid-1950s. It included the Office of the Administrator, with human resources, legal affairs, and administrative functions as direct reports, and divisions for each Fiscal Operations, Power Sales, and Power Resources.[19] In 1988, Administrator Harry Geisinger reorganized the agency to include the Office of Administrator supported by three divisions, each headed by a director: Power Resources, Power Marketing, and Administrative Management.[20] While there have been evolutionary tweaks since that 1988 reorganization, the structure is largely the same.

McAllister felt the organization had become highly structured, almost operating under a "stove pipe" management style. In 1994, he took the organizational structure, added one division (Legal Affairs), and developed a "Core Team" concept to improve

My time at Southeastern was limited. But one thing I recognized about the men and women at Southeastern is the amount of pride they have in what they do. It was a great place to work.

Administrator Jon Worthington (2006-2008)

functionality. At the top, the Administrator was supported by the four division directors, re-named deputy administrators; at that time they included Joel Seymour (Human Resources and Administration), Lee Rampey (Legal Affairs), Jim Lloyd (Power Resources), and Leon Jourolmon (Finance and Marketing). This leadership core team was pressed to develop a consensus on key decisions to exhibit a sense of unity.

At lower levels of the organization, work teams were established across the various functions (such as engineering, rates, operations, and billing) to improve production and communication. In addition, a key component of the process improvement included developing teams among various grade levels of employees. By integrating the senior staff with entry level employees, communication and interaction were encouraged and became institutionalized. McAllister believed limiting communication to equal pay grades or function was a common fault with government and private industry; it led to very hierarchical organizations. Each of the work teams reported to a designated core team representative, a process designed to eliminate supervisory redundancies that often lead to diluted accountability. To facilitate the TQM transformation process, SEPA held team-building activities such as TQM Family Day and emphasized continuous training.[21]

STRATEGIC PLANNING

Throughout the 1980s and 1990s, SEPA faced the retirement of a number of long-time employees, many of whom had been with the agency for over two decades. Without changing the hierarchical nature of the organization and developing a new breed of employee, SEPA faced losing the embedded knowledge and skill sets of the very employees who helped build the organization through a dynamic period of rapid growth. Under TQM, and the team concept, younger employees were empowered to effect change within the agency. McAllister initiated a continuing education program, and all employees took part in regular technical training. In addition, employees were invited to participate in the Strategic Planning sessions to focus on workload, priorities, and staffing.

SEPA holds periodic Strategic Planning sessions to identify long-term directives and policies, key issues, action plans, and performance indicators. In recent years, the Strategic Planning sessions included an emphasis on succession planning. SEPA's aging staff has been a recurring theme during the last twenty years, although the average age has declined due to a number of retirements during the 1990s. Still, in 2010 alone, four of the five senior staff members (Administrator, and division directors for Human Resources and Administration, Finance and Marketing, Power Resources and Legal Affairs) were eligible for retirement.

Current Employees with at least 25 years of SEPA Service (as of 2012)

Name	Began Service
Joel Seymour	1958
Jane Crenshaw	1979
Carol Rice	1981
J.W. Smith	1986
Judith Worley	1986
Nancy Hill	1987

Retired with at least 25 years of SEPA Service

Name	Years of Service
Evie Coogler	1952-1978
Seaborn Lawrence	1951-1979
Julian Brown	1950-1980
Florine Hopkins	1951-1981
Harry Wright	1951-1981
Clifford Bond	1952-1982
George Risner	1950-1982
Elbert Rucker	1950-1982
Curtis Bell	1952-1984
Mirtie Clark	1952-1984
Martha Hewell	1951-1984
Melvin Geter	1952-1988
Dee Dee Mixon	1952-1988
Elise Frierson	1951-1989
Mary George Bond	1950-1989
Kenelm Rucker	1952-1990
Lawrence Johnson	1957-1991
Sidney Cleveland	1952-1991
John Mixon	1962-1991
Patsy Griffith	1957-1993
Harold Jones	1952-1995
Richard Torina	1968-1995
Marie Coogler	1961-1995
Charles Neal	1960-1995
Lonnie Blackwell	1968-1995
E. B. Crenshaw	1957-1996
Alvin Christian	1957-1997
Frances Hubbard	1967-1999
Blanche Adams	1967-2003
Donnie Cordell	1967-2003
Wade Gaines	1968-2007
Brenda Langston	1984-2010
Leon Jourolmon	1981-2011
Fred Easom	1972-2011
Gail Dickerson	1980-2011
Lee Rampey	1981-2011

AT HOME IN ELBERTON

During the 1980s, Administrator Harry Geisinger proposed moving SEPA's headquarters to Atlanta. But, because of the local community's political support, the agency remained in its present location. Unlike the other PMAs, which are headquartered in larger urban areas, SEPA is at home in the small rural town of Elberton in northeast Georgia.[22] Although traveling and preparing for partnership meetings might be easier if the agency was situated in a larger city, with modern technology and telecommunications, even rural areas such as Elberton can be convenient business locations. Elberton is home to less than 5,000 residents, and is known world-wide for its granite quarrying and manufacturing industry. Perhaps because of its relative size and obscurity, the agency and the city have bonded. Many long-time employees of SEPA are originally from Elberton, and the organization often promotes open positions to the local community. Of those employees who call Elberton home, many have extended their public service to the City Council, the Elberton Chamber of Commerce, the National Guard, local historical society, and other civic organizations.

The people of SEPA are very proud of what they do and have a passion for the organization. "That's not something you hear associated with governmental entities very often," noted former Administrator John McAllister. "We're good because we have a pride in who we are and where we are." The composition of the staff has changed over the last twenty years, though; one-quarter of SEPA's staff now reside in surrounding counties. Because of a greater emphasis on electric reliability and requirements for more highly technical skill sets, the PMA employment landscape has evolved. Some of the more technical positions require SEPA to look beyond Elberton into other federal organizations for qualified individuals. Sometimes it is a challenge to entice outside individuals to move into a rural, blue-collar community like Elberton.[23]

FROM A HISTORIC HOTEL TO ATHENS TECH DRIVE

During the last twenty years, one of SEPA's major accomplishments was moving its headquarters from an outdated building into a brand new facility. For nearly four decades, SEPA was headquartered in the Samuel Elbert Building, located on the southwest corner of the historic downtown square in Elberton. Completed in 1924, its inception was a community-wide effort to provide accommodations for visitors. Designed in the Tudor Revival Style by the Atlanta-based architectural firm of Pringle and Smith, it was named after the Revolutionary War hero, and later Governor of Georgia, Samuel Elbert. The hotel closed during the Great Depression but was purchased by prominent local citizen and state representative, Peyton S. Hawes, Sr. Hawes, who later served on the Georgia Supreme Court, was an instrumental supporter of the Richard B. Russell project on the Savannah River.[24]

SEPA moved its headquarters into the Samuel Elbert Building in September 1968, and became a fixture of the town's downtown district. By the early 1990s, however, general program expansion, new Energy Policy Act requirements, and the need for an Operations Center made the old building inadequate for modern DOE work space.

Administrator John McAllister began the process of finding a new home for the agency as part of the quality management improvement process. In 1993, SEPA requested additional space from the General Services Administration (GSA) and was promptly turned down. For the next few years, SEPA returned repeatedly to GSA as well as the Office of Management and Budget (OMB) to overcome the political process to extricate itself from the outdated building.

By 1995 SEPA had also established an off-site Operations Center in a space once occupied by a Belks department store, but it was clear that changes in the energy industry, including advances in technology and requirements for reliability, far outpaced the organization's current accommodations.[25] For GSA to approve a new headquarters facility, SEPA had to prove it needed 4,000 square feet more than was available in the Samuel Elbert Building and the necessary rehabilitation efforts and upgrades would be detrimental to the historic structure. Moreover, SEPA would have to vacate the building while the required upgrades were completed, perhaps up to a year. GSA finally agreed the organization needed additional space. Because Elberton had limited availability of the required 22,000 square feet, SEPA worked with the DOE and OMB to request GSA go on the market to have a dedicated office building constructed. The initial preferred locations for the new building were in close proximity to downtown Elberton; however, a new development was underway approximately three miles west of town on Athens Tech Drive and a deal was reached with the owner to sell the property for $50,000.

Originally constructed as a hotel in 1924, the Samuel Elbert Building served as the headquarters for SEPA from 1968–2001.

Ribbon cutting for the new headquarters building in 2001 (Clifford Adams, Sr., Attorney, Municipal Electric Authority of Georgia [MEAG]); Charles Borchardt, Administrator, SEPA; Iola Stone, Mayor, City of Elberton; and Elliott Caudell, Caudell Realty Company (then owner of the SEPA building).

By the mid-1990s, SEPA had outgrown its home on the square and embarked on a protracted campaign to acquire a new headquarters. The agency moved into a new state-of-the-art facility on Athens Tech Drive in 2001.

Elberton Responds to the Move

In 2003, Elberton celebrated its bicentennial. As part of the celebration, they had a fashion show of clothing from 1803 to 2003. There were a couple of elderly ladies there who wanted to show their fashions, but were unable to make it down to the theater. So, I was in charge of driving them there and back. On the way home, one turned to me and asked, "You're that SEPA guy, aren't you?" and I said that I was. Then she said, "Let me tell you something, we don't like the fact that SEPA moved off of the square. That was a bad move." A lot of people didn't like us moving; there was a great deal of loyalty to Judge Hawes, whose family owned the building, but we had been there for almost forty years. It was time to move.

Administrator Charles Borchardt (1995-2006)

While SEPA worked with GSA to acquire the new property, the agency faced internal discontent as well. Many of the employees were attached to the downtown location, the availability of restaurants, and proximity to their homes. Once the decision was made to move on the outskirts of town, everyone had an opinion on how the new building should be designed, perhaps one of the greatest challenges of having such a small and intimate organization. Some wanted offices around the outside of the building; others wanted water fountains and restrooms at certain locations. "It was a great internal struggle," according to Joel Seymour, who helped spearhead the new building, "as to who got what and how they wanted it. We went to the drawing board time and time again. But, we were able to get into a first-class facility and it has been very beneficial to the employees and the organization."[26]

CUSTOMER FOCUS: INTEGRATED RESOURCE PLANNING

In 1986, the DOE initiated an Integrated Resource Planning (IRP) process that instructed utilities (private or federal) to evaluate and select energy resources from supply-side or demand-side options. Because the PMAs are not directly responsible for planning or acquiring energy resources, their IRP strategies have focused almost exclusively on encouraging and assisting their customers' IRP efforts.

During the early 1990s, SEPA held a number of workshops and energy efficiency activities to support its customer groups. In addition, over eighty percent of SEPA's customers participated in a nation-wide survey that addressed federal power customer IRP needs. Those needs were then incorporated with the needs of other federal power customers into a Resource Planning Guide (RPG), developed cooperatively between WAPA, SWPA, and SEPA. The RPG included software the customers could use to assess their storage, delivery and demand options, as well as the potential to incorporate renewable energy resources in the future. Deregulation of the energy

industry, spearheaded by the 1992 Energy Policy Act, opened new markets and opportunities for the southeastern federal power customers. SEPA held contracts and risk management workshops and provided information on industry direction of bulk power and retail electric rates. Through an Advancement of IRP in Public Power Project, SEPA customers leveraged assistance from various trade associations to supplement their training budgets by approximately $80,000.[27]

In another example of their IRP involvement, in 1994, SEPA worked with Oak Ridge National Laboratory, the DOE, and Clayton Homes to study and improve energy efficiency in manufactured housing, a type of housing that accounts for a significant portion of the homes in SEPA's residential energy load. The organization also provides basic energy efficiency tips to its customers through the *Powerline* newsletter and holds regular workshops to promote conservation. During the mid-1990s, SEPA changed its IRP program to the more customer-focused Competitive Resource Strategies (CRS) program. The CRS program more accurately reflected the needs of competition as the energy industry evolved through deregulation. Customers had access to PMA-sponsored databases and forecasting models to assist in balancing peak loads. As the technology allowed, customers also had access to E-learning, available twenty-four hours a day on the internet, which helped reduce travel costs. Following the passage of the 2005 Energy Policy Act, the program evolved into the Energy Efficiency and Renewable Energy Program (EERE), which focused on promoting DOE climate change directives and energy efficiency among its customers by holding training sessions and workshops.

PUBLIC POWER UNDER ATTACK

The debate of the federal government's role in the sale of electricity dates back to the initial concept of the "preference customer" during the early twentieth century. In the Southeast, the argument reached its vocal peak during the 1940s and 1950s as the US Army Corps of Engineers engaged in a massive flood control program. This program resulted in the construction of dozens of government-owned multi-purpose projects, many including a hydropower component, across the nation. The power, sold through the newly established power marketing administrations, was set aside for the preference customers, publicly-owned rural cooperatives and municipalities. Public power continued to evolve during the latter half of the most recent century, but the debate over its legality and necessity is never-changing.

In June 1982, President Ronald Reagan signed Executive Order 12369, which established the President's Private Sector Survey on Cost Control (PPSSCC). The PPSSCC authorized an investigation of waste and inefficiency for a variety of programs in the federal government. Led by businessman J. Peter Grace, the commission was composed of over 150 private sector executives. The Grace Commission released a series of reports, including one in 1984 on the privatization of government assets. This report raised one of the first serious proposals to de-federalize the PMAs and based their judgment on two reasons, cost-savings and elimination of government's role in power production.[28]

From an ideological perspective, the report questioned the government's need to continue providing low-cost power. The report noted when "multi-purpose dams were first built, the original projects were in rural or less-developed parts of the country that did not have investor-owned utilities to provide electricity," but by the 1980s that landscape had changed.[29] In other words, the Commission argued, the government was saddled with the archaic role of meeting certain social needs that could now be addressed more efficiently by the private sector. Regarding the financial argument, the report speculated by selling the PMAs, the government would eliminate operating deficits and avoid future capital expenditures. In addition, the one-time sale of the PMAs and their transmission capabilities would yield $25 billion over five years. Further, after all assets were sold, the reduction in net outlays for capital investment and interest subsidies combined with the collection of user fees and interest, would result in an additional $5 billion in savings and revenue after the sixth year of the sale.[30]

Although facing a headwind of opposition from Congress, in his FY 1987 budget the President proposed selling the five existing PMAs to private interests by FY 1991. The proposal met with vehement opposition by the American Public Power Association (APPA), which questioned the assumed deficit savings and argued public power customers would be disproportionally affected by sharp increases in wholesale electric rates. Congressional support of the budget proposal was scarce and eventually a supplemental appropriations bill provision forbade funds to study the proposal further. For the moment, the issue was dormant, but would re-emerge under a new administration. SEPA's Public Utilities Specialist, J. W. Smith, recalled, "For the first ten years that I worked here, there was at least one proposal every year, sometimes more, that I had to evaluate."[31]

Notably, privatization proposals have been bipartisan political efforts, as have the efforts to retain the government's role in the sale of electricity.[32] In 1995, President Bill Clinton's administration was the second to broach the divestiture issue with any serious consideration. Backed by the Speaker of the House, Newt Gingrich (R-GA) and a bipartisan coalition, President Clinton pushed for the sale of the Western Area, Southwestern, and Southeastern Power Marketing Administrations in the FY 1996 budget. As proposed, the process would involve the divestiture of not only the hydropower components, but the entirety of the projects, reservoirs included. In addition to strong opposition from public power interests in the western United States, stakeholders in the Southeast fought the revived proposal.

While divestiture of federal assets makes for an intriguing sound bite among government reform proponents, the process is far more complex than even most politicians are aware. For any sale of a power marketing administration, even the smallest PMA, a complex negotiation between multiple agencies on many specific issues would have to take place. For instance, in the absence of a new law granting waivers, the sale of each PMA would require applicable studies under federal law, such as the National Environmental Policy Act (NEPA). With the Corps' multi-purpose projects, each authorized purpose has a constituency of stakeholders, whose concerns are taken into account during the analysis.

Representative Charlie Norwood (R-GA) was an ardent supporter of SEPA during the 1990s when the PMAs were targeted for federal divestiture.

Opponents to privatization in the Southeast argued the recreational value of the lakes, in many cases a Congressionally authorized purpose, would be threatened if shorelines fell under the purview of a private utility. In the Cumberland System area, television advertisements aired during the Kentucky gubernatorial race even suggested privatization might threaten public fishing use of the lakes. Southeastern federal power customers worried about how the sales could impact rates and the reliability of the systems. In particular, the customers served by projects in the Corps' South Atlantic Division wondered how potential new owners would finance the backlog of necessary rehabilitation efforts. Congressman Charlie Norwood (R-GA), representing a key northeast Georgia district, including Elberton, and an ardent opponent of PMA sales, said "That was one of the problems…nobody really had answers to lots of questions. It was just 'Oh, it's a good idea to privatize the thing.'"[33]

While the Clinton proposal met with a sound defeat, it reemerged only a year later when a General Accountability Office (GAO) report found that hydropower plants in the Southeast were far less reliable than their private investor-owned utility counterparts. A later bill, proposed to Congress during its 1997 session, scaled divestiture back to only selling the hydropower components, such as turbines, generating equipment, and transmission capabilities. According to Norwood, such an authorization would have created "a logistical nightmare trying to figure out who's responsible for what."[34] Again, the divestiture proposals were defeated.

Proponents of the privatization, however, were encouraged by a small victory. The tiny Alaska Power Administration had been under scrutiny since the early 1980s and, with the other PMAs, was recommended for divestiture in the 1983 Grace Commission Report. Unique among the PMAs, the APA owned, operated and maintained two hydroelectric projects that were constructed for a single purpose, power production. Unlike the Corps and Bureau projects in the lower forty-eight states, they were not the result of water resource management plans and were not intended for indefinite federal control. In fact, APA owned all of the generating equipment and infrastructure. The two projects, Eklutna and Snettisham along with their watersheds, are located entirely within the state of Alaska and were designed to serve specific communities.[35] Ultimately, municipalities and cooperatives purchased APA's assets. The single-purpose authorization of the two projects made the divestiture process somewhat easier and they were authorized for sale in the Alaska Power Administration Sale and Termination Act of 1995. The APA transferred the Eklutna Project on October 2, 1997 and the Snettisham Project on August 19, 1998.[36]

PROPOSALS TO CHANGE RATES

Proposals to sell the PMAs, with SEPA a frequent target because of its lack of transmission infrastructure, occasionally emerge as the federal government seeks ways to increase its revenue and streamline its operation. Many public power opponents often seize on the "low rates" offered by the PMAs as an argument the federal government has no role in subsidizing electricity, or they view the PMAs as being potential revenue sources for the government as a whole. While divestiture proposals stalled during the late 1990s, a coalition of lawmakers from the Northeast and Mid-west, areas largely void of access to public power, proposed legislation to reform PMA rate-setting practices. The legislation, various forms of which never made it out of committee, proposed changing the rate structure from "cost-based" to "market-based." But, opponents interpret the preference customer rates as the lowest "cost-based" rates, when rates are actually the lowest possible based on "sound business principles" according to enabling legislation. This is a key misinterpretation of the law; in fact, PMA rates are not guaranteed by law to be lower than private utilities, and may vary according to amount of available water and other conditions.[37]

In 2005, President George W. Bush's administration also targeted the PMA rate structure. Rather than selling the PMAs, the administration proposed in its FY 2006 budget that PMAs charge market-based rates, which it believed would generate increased revenues for the government. This proposal, considered by many to be a back-door tax hike, had the potential to raise preference customer rates an average of 20% annually until adequately balanced with private utility rates. Preference customers in the Northwest, where BPA supplies nearly 40% of the region's total power portfolio, would have been particularly hard hit. One Northwest lawmaker suggested the annual 20% rate increase amounted to a one billion dollar tax increase on the population. In the Southeast, one public power customer in South Carolina, the Central Electric Power Cooperative, estimated the proposal would cost its customers up to $15 million dollars. Even at a time of dramatically increasing federal deficits, the proposal had little support in Congress.[39]

AVERAGE REVENUE PER KWH OF WHOLESALE POWER SOLD

CENTS/KILOWATT HOUR
(ADAPTED FROM A 1996 GAO REPORT)[38]

	1990	1991	1992	1993	1994
Western	1.50	1.67	1.75	1.81	1.82
Southwestern	1.27	1.59	1.37	1.23	1.49
Southeastern	*1.58*	*1.86*	*2.12*	*1.89*	*1.98*
IOUs*	4.17	3.58	3.57	3.40	3.50
POGs**	3.78	3.78	3.90	3.80	3.90

** Investor-owned utilities*
*** Publicly-owned generating utilities*

While proposals for market-based rates or divestiture were defeated, the investigations of the PMA rate systems did result in one substantial change for SEPA. In a 1996 report on cost recovery, the GAO identified several primary power-related costs the PMAs had not yet recovered through electricity revenues. The report noted that the Reclamation Project Act of 1939 and the Flood Control Act of 1944 required PMAs to recover costs through their power rates, but the acts did not specify which costs had to be recovered.[40] The PMAs, required to recover some Operation and Maintenance costs under subsequent DOE orders, generally excluded the costs of Civil Service Retirement System (CSRS) pensions and post-retirement health benefits. Those costs were being funded through the US Office of Personnel Management as unfunded liabilities.[41] For SEPA, the GAO estimated the unrecovered costs of pensions and post-retirement health care at $71 million cumulative and $2.8 million annually.[42] On July 1, 1998, the DOE General Counsel determined the CSRS and post-retirement benefits were legitimate power-related costs and should be incorporated in rates consistent with current law. During that year, SEPA was the first PMA to amend its rate structures so that revenues would collect those incurred costs.[43]

Historically, when the federal government has run deficits or required increased revenues, the PMAs become a target, for outright divestiture as well as higher energy rates. The complexity of issues coupled with pressures from customers has prevented the proposals from gaining traction; that may not always be the case. The Corps and Bureau of Reclamation are no longer constructing large multi-purpose projects that generate hydropower, but as the nation grows so does energy demand. Today, the energy comes from other sources provided by private interest, and public power is becoming a smaller percentage of the energy portfolio.[44]

In addition to absorbing the CSRS costs, SEPA's rate structures with customers have evolved in other significant ways since 1990. By law, the PMAs are required to evaluate and modify rates as appropriate at least once every five years. Historically, SEPA negotiated most contracts with fixed five-year rate structure

AVERAGE SYSTEM RATES FOR SELECT YEARS, 1990-2010*

	1990	1995	2000	2005	2010
GA-AL-SC	2.51	2.55	2.66	3.39	3.70
Cumberland	1.60	2.51	2.63	2.94	n/a**
Kerr-Philpott	1.52	1.86	1.86	1.96	2.98
Jim Woodruff	2.70	5.13	5.51	6.95	13.06

** Rates reflect capacity charge in cents per kilowatts/month and do not reflect transmission or other ancillary services.*
*** Due to emergency operational restrictions imposed by the Corps in 2006 on both the Wolf Creek and Center Hill projects, SEPA implemented an Interim Operating Plan for the Cumberland System to provide customers with energy that did not include capacity. The energy charge for 2010 was 12.67 mills per kWh.*

periods with no adjustments. One drawback to that system included substantial increases during subsequent adjustments that were negotiated under the new contracts. These increases were felt acutely by the customers. An inflexible rate structure also hampered the ability of the agency to recover rates during the severe droughts of the 1980s that impacted the Georgia-Alabama-South Carolina system. As the older fixed five-year contracts expired, SEPA negotiated new contracts with stipulations that allowed for more flexibility in rate adjustments. Some contracts allowed for rate adjustments when needed, others limited any adjustments to specific dates or stipulated a single change during a twelve month period. This new flexible system resulted in incremental and more palatable increases to customer rates as well as a more efficient and predictable cost-recovery for payments into the Treasury.[45]

New non-discriminatory transmission regulations issued by the Federal Energy Regulatory Commission (FERC) in 1996 also affected rate schedules.[46] Under the new "open access tariffs," transmission providers must pre-file transmission rates with the FERC. The new open access regulations helped SEPA stabilize the transmission costs passed through to the customers resulting in more consistent rates. While transmission has always been a "pass-through" cost, SEPA adjusted its rate schedules to do the same with purchased power. Prior to 2002, SEPA collected purchased power as a cost included in the basic capacity and energy charge. When these increased purchased power costs occurred, it required activation of a continuing (emergency) fund to provide extra funds. The purchased power costs, often significant during periods of drought, accumulated as deficits and were subsequently included in the next rate adjustment. At the urging of the OMB to recover costs more quickly, SEPA established rate schedules allowing for a "pass-through" of Net Purchased Power Cost during the month when the purchase occurred.[47] SEPA modified the rate schedules to reflect this new process for the Georgia-Alabama-South Carolina System in 2002, the Kerr-Philpott System in 2006, the Cumberland System in 2008, and the Jim Woodruff System in 2011.[48]

NET-ZERO FINANCING

With the exception of the Bonneville Power Administration, which has self-financing and borrowing authority through its enabling legislation, the PMAs are required to deposit their power-sales revenues into the US Treasury. Each year, PMA operations and expenses are financed through annual Congressional appropriations and Congress identifies what program expenses are covered, how much money may be spent, and the authority for using the revenue receipts. SEPA's expenses are typically smaller than the organization's revenues because the revenues include Corps of Engineers' costs. However, with appropriated budgets, if SEPA had insufficient funds to cover unexpected expenses, such as power purchases required as a result of drought or equipment failure, it would have to return to Congress for a supplemental appropriation or activate a continuing (emergency) fund. For an agency that operated with real-time obligations (getting power to its customers), an appropriated budget environment was a challenging fiscal policy.

Small Agency Budget Woes

SEPA's budget is so small that it increases in terms of thousands. In the early 2000s, the agency's annual expenses were, for example, $5.1 million. With the budgeting process, that gets rounded down to $5 million. The next year, they asked for $5.2 million, and again it was rounded downward for the budget estimate. When I was at the Washington [PMA] Liaison Office, I had to fight with OMB and the DOE Budget Office to explain that a rounding error for such a small budget was very significant to an agency's operating expenses. Those rounding errors caused SEPA's budget to remain stagnant for a number of years and when I got to SEPA [in 2006], they were having significant budget issues. They couldn't even buy new computers; we ended up getting used computers from Southwestern Power Administration. We would drive to meetings early in the morning rather than have the hotel expenses. We finally got those budget issues corrected so that we had adequate operating expenses.

Administrator Jon Worthington

It's really a three-fold issue. Not only is the budget scrutinized by OMB and DOE, but the customers will question expenses, too. The dollars we collect [through rates] – we have to show where they're going.

Administrator Charles Borchardt

During the late 1990s and early 2000s, the PMAs studied the idea of a revolving fund, similar to the way Bonneville operates, and "net-zero" budgeting. In 2006, the PMAs formally proposed "net-zero," also called self-financing. Net-zero budgeting allowed for the PMAs to use revenues to repay annual program costs as the revenues are generated early in the fiscal year. The PMAs would go through a normal budgeting and approval process, but would use revenues to repay annual costs as the revenues are generated, resulting in a net-zero appropriation at year's end. Although the concept was approved by OMB, the DOE and Congress rejected the idea for several years. Finally, in the FY 2010 budget, the PMAs were appropriated and authorized to repay their budget using net-zero financing. Finance and Marketing Division Director Leon Jourolmon noted, "The more business-like we can be, the better. We have argued for this over the years. It was a big step."[49] For SEPA, which had a relatively small annual budget of approximately $7.6 million in FY 2010, net-zero allows it to pay its annual appropriated cost within one or two months of the new fiscal year, with the flexibility of available revenues in the case of a system emergency or unanticipated costs.

TWENTY YEARS OF LEADERSHIP: SEPA ADMINISTRATORS, 1990-2010

John A. McAllister, Jr. (1989-1995)

A native South Carolinian, John McAllister earned his undergraduate degree at the Citadel, the Military College of South Carolina in 1980. Later educational pursuits led him to business management programs at the University of North Carolina-Chapel Hill as well as the John F. Kennedy School of Government at Harvard. Commissioned in the South Carolina Army National Guard as an Engineer Officer in July 1980, he completed the Army Engineer Officer Basic Course in 1981, the Army Engineer Officer Advance Course in 1982, and studies at the Army Command and General Staff College in 1992.

Following his commission in the National Guard, he was General Manager of Blue Branch Farms, his family timber and cattle business in Mount Carmel, South Carolina. He later became associated with Cooper Communities of Bentonville, Arkansas in the sales and promotion of Savannah Lakes Village, a retirement community of Lake Thurmond. He was appointed Administrator of the Southeastern Power Administration in 1989 and retired from the organization in 1995 when he returned to the private sector.

Charles A. Borchardt (1995-2006)

A native of Miami, Oklahoma, Charles Borchardt graduated from Oklahoma University in 1963. He was on active duty in the Air Force from 1966-1970 during the Vietnam Conflict, including one tour in Thailand. Following his service, he used the G.I. Bill to attend law school at the University of Tulsa. Borchardt worked as a lawyer with the US Army Corps of Engineers Tulsa District from 1974-1978 before transferring to the Southwestern Power Administration where he served as Chief Counsel from 1981-1995. He was appointed Administrator of the Southeastern Power Administration in 1995 and served until 2006 when he retired and returned to his native Oklahoma.

Jon Worthington (2006-2008)

A native of Boise, Idaho and a 1978 graduate of Westminster College in Utah, Jon Worthington began his career in the federal government in 1982 as a Public Utilities Specialist with the Bonneville Power Administration (BPA). Subsequently, he worked at the Department of Energy headquarter office in Washington, D.C, the Rural Electrification Administration, BPA's National Relations Office, the Federal Energy Regulatory Commission, the Western Power Administration and the Southwestern Power Administration. Mr. Worthington was appointed Administrator for the Southeastern Power Administration on October 1, 2006 and served until 2008 when he was appointed Administrator for Southwestern Power Administration. In 2012, Mr. Worthington was named the Deputy Assistant Secretary for Permitting, Siting, and Analysis in DOE's Office of Electricity Delivery and Energy Reliability.

Kenneth Legg (2008-present)

The second native Oklahoman to head the Southeastern Power Administration, Kenneth Legg was born and raised in Bartlesville, Oklahoma, and graduated from Oklahoma State University with a degree in electrical engineering. He began his career in 1974 as an engineer with the US Army Corps of Engineers Tulsa District and then became an electrical engineer at Southwestern Power Administration in 1978. He was promoted to public utilities specialist in 1980 and then became Assistant to the Administrator in 1988. He was serving as Director of Engineering and Planning for Southwestern before moving to Elberton in 2003 to become Assistant Administrator, Division of Power Resources. He was appointed Administrator at Southeastern in July 2008.

ENDNOTES

[1] Letter from John A. McAllister, Jr. to COL George Cajigal, Wilmington District, US Army Corps of Engineers, August 13, 1995 (RG 1015, SEPA Archives).
[2] Joel Seymour (SEPA), interview by Patricia Stallings, February 25, 2010; Bob Prince (SAD), interview by Patricia Stallings, January 19, 2011.
[3] John A. McAllister, Jr. (SEPA-retired), interview by Patricia Stallings, March 29, 2011
[4] McAllister interview. The three marketed power systems in the South Atlantic Division are the Georgia-Alabama-South Carolina, Kerr-Philpott, and the Jim Woodruff systems.
[5] Seymour interview; Prince interview; McAllister interview; SEPA, *Powerline*, November 1991.
[6] In a 1997 re-organization, the US Army Corps of Engineers merged the North Central Division and the Ohio River Division to form the Great Lakes and Ohio River Division (LRD). Prior to the 1997 consolidation, SEPA marketed power from hydro projects within the Ohio River Division.
[7] SEPA, *Powerline*, Summer 1992.
[8] Seymour interview; McAllister interview.
[9] *Memorandum of Understanding Between the US Army Corps of Engineers South Atlantic Division and the Southeastern Power Administration*, June 20, 1991.
[10] Interview with Charles Borchardt (SEPA-retired) and John Worthington (SEPA/SWPA) by Patricia Stallings, September 15, 2010.
[11] See Chapter 3 for further discussion of the issues related to aging hydropower structures and customer funding.
[12] Prince interview; Seymour interview.
[13] Prince interview; "Testimony of Robert W. Claussen before the House Resources Subcommittee on Water and Power Resources, July 26, 1996," in SEPA Archives, RG5104 (Planning, Programming, and Budgeting: Congressional Briefings." The Water Wars are discussed exclusively in Chapter 4; Seymour interview.
[14] A parallel, but more structured organization had been formed for customers of the Southwestern Power Administration, called the Southwestern Power Resources Association. Bonneville and Western also have customer-oriented groups. Ultimately, the SeFPC became a major stakeholder in the "Water Wars" and as one of the primary litigants against the Corps' water allocation practices (see Chapter 4).
[15] For an analysis of the governmental reforms of the 1990s, see Jeffrey L. Brudney, F. Ted Hebert, and Deil S. Wright, "Reinventing Government in the American States: Measuring and Explaining Administrative Reform," *Public Administration Review* 59:1 (January-February 1999); "Remarks by President Clinton Announcing the Initiative to Streamline Government, March 3, 1993." Internet online at http://govinfo.library.unt.edu/npr/library/speeches/030393.html.
[16] Brockington and Associates, Inc., *History of the South Atlantic Division US Army Corps of Engineers, 1945-2011* (Atlanta: US Army Corps of Engineers, 2012)
[17] For more on TQM in the Department of Energy, see Terrence R. Fehner and Jack M. Holl, *Department of Energy,* 92-93.
[18] Seymour interview.
[19] In this reorganization, Power Sales included contracts, billing, and information technology.
[20] In the reorganization, billing was transferred to Power Resources, contracts went to Power Marketing; IT transferred to the Human Resources and Administration division.
[21] McAllister interview; SEPA, *Powerline*, various issues.
[22] By statute, the PMAs headquarters have to be located within the area that they serve. Previous administrators had proposed moving SEPA not only to Atlanta, but to other locations, including Asheville, North Carolina. None of these proposals had the political support to make them viable options. Kenneth Legg, interview by Patricia Stallings, February 25, 2010; also interview with Borchardt and Worthington.
[23] McAllister interview; Seymour interview.
[24] Joyce M. Davis, *Images of America: Historic Elberton* (Charleston: Arcadia Publishing, 2002).
[25] The Operations Center is described in further detail in Chapter 5.

[26] Seymour interview; McAllister interview; Borchardt and Worthington interview.
[27] SEPA, *Annual Reports*, 1990-2010; SEPA, *Powerline*, Summer 1992; for more information on DOE IRP history and policy, see Dennis L. White and Philip E. Mihlmester, *US Department of Energy Integrated Resource Planning Program: Accomplishments and Opportunities* (Oak Ridge, TN: Oak Ridge National Laboratory, December 1993).
[28] President's Private Sector Survey on Cost Control, *Report on Privatization* (Washington, DC: 1983).
[29] President's *Report on Privatization*, vi.
[30] Western Area Power Administration, *Serving the West: Western Area Power Administration's First 25 Years as a Power Marketing Agency* (Denver: US Department of Energy, 2002), 95-103. History available online at http://www.wapa.gov/about/historyproj.htm. Available from February 18, 2010. See also President's *Report on Privatization*, 39-71.
[31] WAPA, *Serving the West*, 95-103; President's *Report on Privatization*; J.W. Smith interview.
[32] During the mid-1990s, a bi-partisan Northeast-Midwest Congressional Coalition, led by Representative Bob Franks (D-NJ), held hearings on subsidized federal power. Franks argued that the federal power available to communities in the South and West placed other areas of the country at an economic disadvantage. He declared, "It's time to stop pouring tax dollars from hard-working New Jerseyans that's unnecessary and pits states and regions against one another in the competition for businesses and jobs" (Statement by Congressman Bob Franks NJ Coalition to End Federal Power Subsidies, July 15, 1996).
[33] "Southeast Hydropower Plants are Becoming More Unreliable," *Marietta Daily Journal*, July 29, 1996; "Utilities, Co-ops Worry that Clinton Plan would Hike Electric Rates," *Waycross Journal-Herald*, February 28, 1995.
[34] "Privatization Plan Under Fire," *Augusta Chronicle*, February 24, 1997.
[35] The 30 MW Eklutna project was built in 1955 to serve Alaska and Matanuska Valley areas, and the 78 MW Snettisham project, built to serve Juneau, was completed in 1975; both were also fed by glacier-melt.
[36] When the APA ceased to exist as a federal agency, the responsibility for maintaining its records was transferred to SEPA.
[37] Leon Jourolmon (SEPA), interview by Patricia Stallings, February 25, 2010; J. W. Smith (SEPA), interview by Patricia Stallings, March 10, 2010. Also, General Accounting Office, *Power Marketing Administrations: Cost Recovery, Financing and Comparison to Nonfederal Utilities* (Washington, DC: Report # GAO/AIMD-96-145), hereafter cited as GAO, *Cost Recovery*. The PMA rate-reform legislation was introduced as H.R.3515 in 1998 and H.R. 1486 in 1999.
[38] GAO, *Cost Recovery*, page 106.
[39] Jourolmon interview; "Leaders say Bush's Plan Would Raise Power Rates," *The Idaho Statesman*, February 8, 2005; "Budget Would Hike Hydropower Rates," *Living in South Carolina: The Magazine for Cooperative Members* 57:3 (March 2005), 9.
[40] GAO, *Cost Recovery.* Additional unrecovered costs were identified in the report, but primarily related to irrigation and transmission, and are exclusive to WAPA SWPA. One other unrecovered for SEPA, included the capital investment and accumulated interest for the Richard B. Russell pumped-storage units in the Georgia-Alabama-South Carolina System. Because of environmental litigation and operational delays, the federal costs associated with the units had not been incorporated into the system's rate structure until 1992. By the end of FY 1995 alone, this amounted to $488 million in unrecovered costs (capital investment and accumulated interest). The Richard B. Russell Project delays are discussed in greater detail in Chapter 3.
[41] To clarify what costs should be recovered, Department of Energy Order RA 6120.2 (September 20, 1979; revised October 1, 1983) required PMA revenues to cover all Operation and Maintenance (O&M) expenses during the year they were incurred, in addition to requiring recovery of transmission and irrigation capital costs within a fifty-year period.
[42] GAO, *Cost Recovery*.

[43] The President's FY 1998 budget called for the PMAs to begin covering those rates; after challenges by the federal power customers, the DOE made the July 1, 1998 determination, which was also upheld by the Federal Energy Regulatory Commission (which has rate approval authority); also, J.W. Smith interview.
[44] Jourolmon interview.
[45] J.W. Smith interview.
[46] FERC Order 888 requiring transmission providers to offer non-discriminatory (or open access) transmission rates is discussed in further detail in Chapter 5.
[47] Net Purchased Power Cost is calculated as the purchased power obligation less any revenue from sales to the energy provider.
[48] J.W. Smith interview.
[49] Jourolmon interview; Legg interview.

THE SYSTEM MATURES

Dam Safety, Aging Equipment, and Alternative Funding

A large portion of the value derived from any resource is obtained from the invested capital and the resulting fixed and operating expenses. There is no line of development of natural resources so universally safe that such development must not be regarded as largely speculative and subject to many risks and contingencies.

DANIEL WEBSTER MEAD, *WATER POWER ENGINEERING*, 1920

The Rivers and Harbors Act of 1925 authorized the US Army Corps of Engineers to study potential flood control projects throughout the United States. The following year, they recommended further investigations of 200 rivers in House Document 308-69/1. The studies were authorized during the next Congressional sessions and the subsequent "308 Reports" laid the foundation for massive civil works projects in the United States, including the multi-purpose projects of the Southeast.[1]

Following World War II, the Corps began dozens of multi-purpose civil works projects in the southeastern United States based on those surveys. Twenty-two of the projects included a hydropower component, the energy from which would ultimately be marketed by the Southeastern Power Administration.[2] The first generating units came online in 1948 at Dale Hollow in Tennessee and over the next few decades, more federal power was generated for the preference customers.

Like any piece of equipment, hydroelectric structures and components have a limited life-cycle. Many are estimated to have fifty years' worth of reliable service. By the 1990s, the electrical equipment and associated systems supplying power to the people of the Southeast began to show signs of age-related wear and tear. Fatigued units failed and half-century old dams sprouted leaks primarily due to the limited technology and engineering practices at the time of construction. When units fail or water quantity is restricted, federal power is not produced or sold. Contractual obligations must be met with replacement power and repayments to the treasury are deferred. Those projects managed by the South Atlantic Division were some of the hardest hit in the federal

Left: Like any piece of equipment, hydropower projects suffer from age-related wear. Over the last two decades, project reliability issues affected SEPA's ability to get power to the preference customers (Corps photo).

REPAYMENT STATUS OF ALL PROJECTS AS OF SEPTEMBER 30, 2012[3]

System	Initial Year of Repayment Studies	Cumulative Revenue	Cumulative Expenses and Interest	Total Investment to be Repaid	Investment Repaid to Date	Unpaid Balance of Investment
GA-AL-SC	1950	$3,629	$3,282	$1,720	$347	$1,373
Jim Woodruff	1957	$195	$175	$71	$20	$51
Cumberland	1949	$1,336	$1,048	$415	$288	$127
Kerr-Philpott	1953	$497	$406	$186	$91	$95
Total*		$5,657	$4,911	$2,392	$746	$1,646

** all dollars are in millions*

SEPA MARKETING AND SALES, 1990-2010[4] (BY FISCAL YEAR)

Fiscal Year	# Customers	KW Capacity	KWH Sold	Total Sales
1990	297	3,134,100	8,656,881,880	$136,568,985.21
1991	297	3,323,100	7,830,508,381	$145,861,205.49
1992	293	3,047,100	6,889,231,185	$146,212,253.86
1993	293	3,047,100	8,744,817,519	$164,857,959.06
1994	293	3,047,100	7,887,226,630	$155,932,438.08
1995	294	3,047,100	6,828,571,435	$155,298,716.73
1996	293	3,047,100	8,602,216,245	$164,455,717.06
1997	306	3,049,100	8,146,136,356	$163,433,202.38
1998	306	3,049,100	8,752,401,964	$168,993,561.84
1999	306	3,049,100	5,708,038,648	$147,920,567.47
2000	306	3,049,300	4,639,479,904	$142,229,319.14
2001	306	3,049,300	5,007,001,910	$142,279,362.21
2002	306	3,248,324	5,541,106,192	$151,990,777.64
2003*	495	3,363,203	8,936,876,134	$196,678,584.35
2004	495	3,363,203	7,887,523,782	$217,196,292.28
2005	494	3,363,203	8,730,070,426	$220,116,056.64
2006	493	3,365,032	5,255,629,053	$204,277,265.35
2007	492	3,365,032	5,028,335,961	$218,891,510.06
2008	491	2,416,732	4,510,972,561	$263,434,169.78
2009	491	2,416,732	5,962,980,684	$239,830,202.25
2010	489	2,416,732	7,714,721,242	$246,896,821.55
Totals		**64,256,793**	**147,260,728,092**	**$3,793,354,968.43**

** Method of categorizing customers changed in 2003*

The Secretary of War, through the Corps of Engineers of the United States Army, and the Federal Power Commission are jointly hereby authorized and directed to prepare and submit to Congress an estimate of the cost of making such examinations, surveys, or other investigations as in their opinion, may be required of those navigable streams of the United States, and their tributaries, whereon power development appears feasible and practicable, with a view to the formulation of general plans for the most effective improvement of such streams for the purposes of navigation and the prosecution of such improvement in combination with the most efficient development of the potential water power, the control of floods, and the needs of irrigation.

Rivers and Harbors Act, 1925

inventory. At one point, the power sales revenues from the Jim Woodruff system barely covered operations and maintenance costs and no return was made on the federal investment. As far as structural and mechanical integrity, the 1990s certainly challenged SEPA in facilitating the delivery of reliable power to its customers.

THE GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM

The Georgia-Alabama-South Carolina System consists of ten Corps hydroelectric projects across three river basins. It is the largest of the four systems marketed by SEPA in terms of both capacity (2,184.2 MW) and total investment for repayment ($1.72 billion). As of 2010, the 2,184 MW of power generated at these projects served 204 preference customers in Alabama, Georgia, Florida, Mississippi, North Carolina, and South Carolina. As of 2010, $347 million of the total federal repayment costs for the system have been fulfilled. In 1993, SEPA began renegotiation proceedings for a new system power marketing policy. The former policy, established in 1980, warranted revision due to the addition of new capacity, the expiration of contracts, and new Department of Energy requirements for implementing the National Environmental Policy Act and the Energy Act of 1992. The new policy went into effect in 1994 and established its service area, allocations throughout the system, as well as anticipated capacity expected to come online with the new pumpback units at Richard B. Russell.[5]

The Savannah River Basin projects grew out of the Corps' 308 surveys completed by the Savannah District in May 1933. The Corps proposed as many as eleven multi-purpose projects in the basin, but the first of these, Clarks Hill, was not authorized until the Flood Control Act of 1944. As with other public power projects during the post-war era, Clarks Hill faced stiff opposition from one of the regional private utilities. The Georgia Power Company had once owned rights to the Clarks Hill site and maintained ownership of some of the property proposed for acquisition. As federal construction of the Clarks Hill project slowly got underway, Georgia Power appealed the condemnation proceedings and tried to usher a bill through Congress that would require a joint

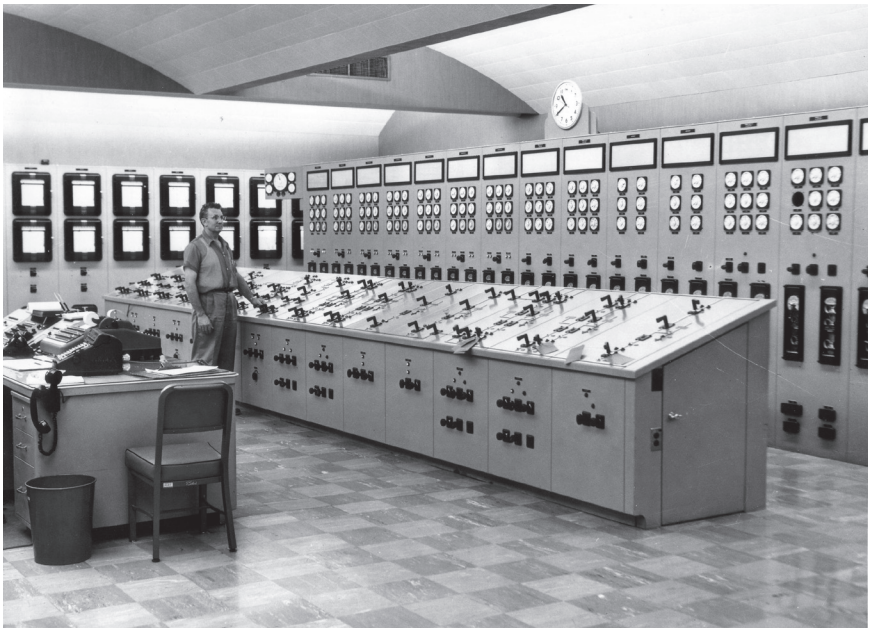
GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM, SALES AND REPAYMENT (BY FISCAL YEAR)

Fiscal Year	MW (capacity)	MWH (sold)	% Avg. Generation	Power Sales Revenue	Repayment to Treasury*
1990	1,953.3	4,385,000	125%	$84,300,000	$4,800,000
1991	2,142.3	3,350,087	96%	$92,119,402	$15,800,000
1992	1,865.0	3,259,730	89%	$95,200,000	$20,400,000
1993	1,800.0	4,705,986	129%	$110,500,000	$30,100,000
1994	1,866.3	3,228,795	87%	$99,700,000	$14,400,000
1995	1,866.3	3,575,447	100%	$102,900,000	$19,400,000
1996	1,866.3	4,168,199	115%	$106,400,000	$25,600,000
1997	1,868.3	3,476,850	101%	$101,500,000	$15,700,000
1998	1,868.3	4,531,204	126%	$110,000,000	$29,000,000
1999	1,868.5	2,628,874	67%	$98,000,000	$19,000,000
2000	1,868.5	2,330,771	53%	$97,000,000	-$3,200,000
2001	1,868.5	2,534,100	58%	$97,000,000	-$8,000,000
2002	2,067.5	2,468,463	56%	$98,000,000	$5,000,000
2003	2,182.4	3,864,082	103%	$127,800,000	$18,000,000
2004	2,182.4	3,116,359	82%	$142,700,000	$23,900,000
2005	2,182.4	4,407,686	116%	$147,500,000	$29,500,000
2006	2,182.4	2,763,285	73%	$149,400,000	$100,000
2007	2,182.4	2,631,827	65%	$168,300,000	$7,900,000
2008	2,182.4	2,612,436	59%	$215,300,000	-$18,200,000
2009	2,182.4	2,800,242	68%	$177,600,000	$3,400,000
2010	2,184.2	4,169,029	110%	$170,500,000	-$300,000

** Accounts for funds available following project operation and maintenance expenses, depreciation, wheeling, purchased power, interest, and (after FY 1999) retirement benefits*

public-private venture of the hydropower component of the project. The bill was defeated and construction continued slowly until the first unit went online in 1952. The Clarks Hill project was renamed J. Strom Thurmond Dam and Lake at Clarks Hill in 1988 to honor the long-serving US Senator from South Carolina.[6]

During the early 1990s, the project began to show signs of age-related wear and suffered from multiple forced outages of generating equipment and the transformers. In 1995, the Savannah District began a major rehabilitation effort at Thurmond, including rewinding all seven generators, replacement of the transformers and turbines, and the refurbishment and replacement of various pieces of peripheral equipment. As an added environmental benefit, the project also incorporated new Auto-Venting Turbines, which increased the dissolved oxygen levels downstream and



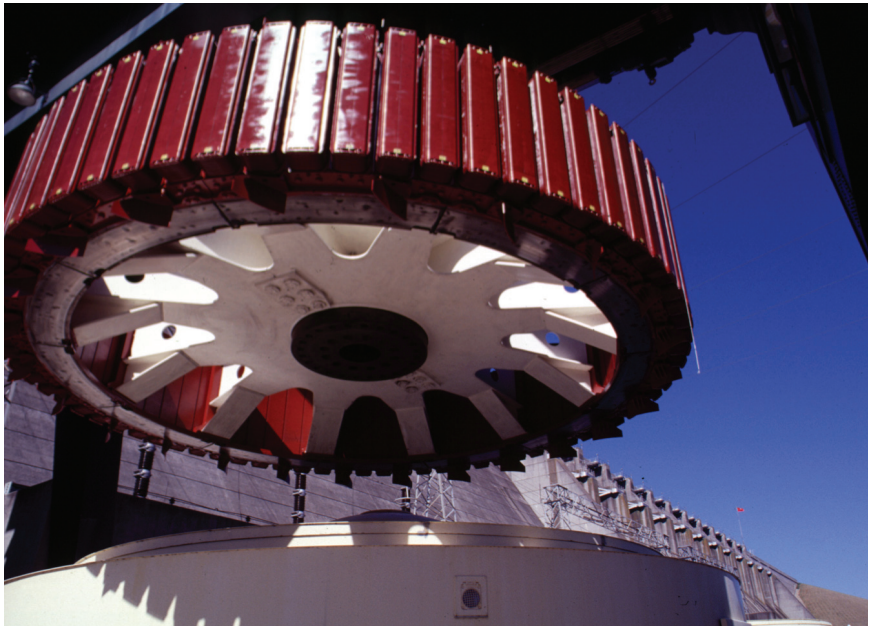
Clark Hill powerhouse control room, shortly after completion (Corps photo).

Major rehabilitation efforts at the J. Strom Thurmond project included new aquatic habitat enhancing turbines. In the center of the photo, US Congressman from Georgia, Charlie Norwood is flanked left by SEPA Administrator Charles Borchardt and right by Savannah District Commander Colonel Roger A. Gerber (Corps photo).

significantly improved habitats for the aquatic community. The rehabilitation work, which added approximately $70,000,000 to the capital repayment costs, increased capacity of each generating unit from 40 MW to 52 MW, raising total nameplate capacity from 280 MW to 380 MW.[7]

The upstream Hartwell project was authorized in 1950 at an estimated cost of $68.5 million, although project costs increased to nearly $90 million by the time construction began in 1955. The original design of the plant included five penstocks for the installation of four 66 MW units; a fifth 80 MW unit went online in 1986. Hartwell was one of the projects identified by the South Atlantic Division as needing major repairs. Forced outages during the late 1980s and early 1990s impaired the project's reliability and increased operation and maintenance costs. One unit stayed offline for nearly three years until repairs could be funded through traditional appropriations. Because of the project's decreasing reliability, the Corps approved proposals to refurbish the generators in 1993, and Congressional funding was allocated two years later; construction began on the major rehabilitation efforts in 1997. The work included rewinding of the four original generators, replacement of the transformers, and the replacement or refurbishment of other electrical equipment. The repairs, completed in 2007, increased the capacity of the four original generating units from 66 MW to 85.5 MW, or 33 percent.[8]

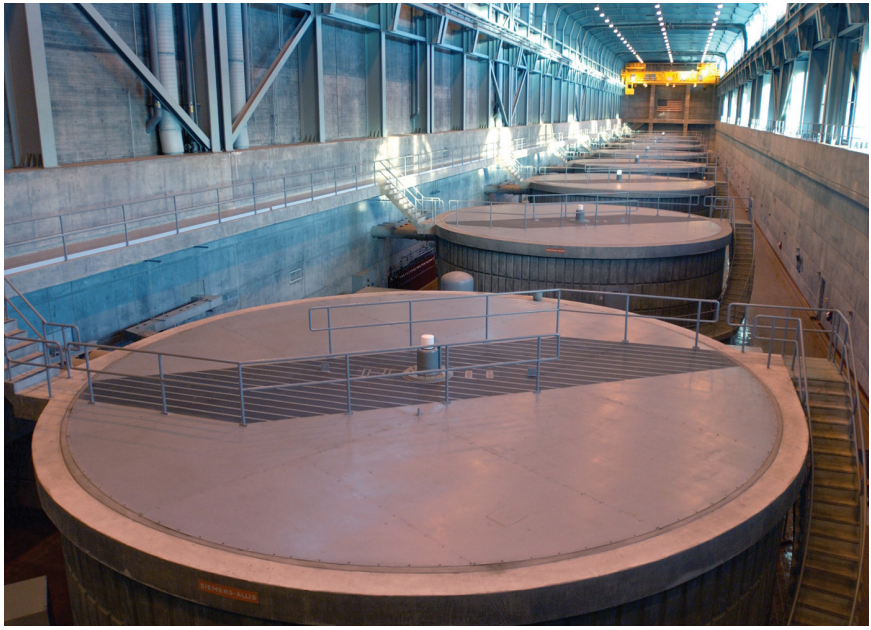
The last of the Savannah River basin projects, Richard B. Russell, went through the greatest amount of public and environmental scrutiny. The multi-purpose project, the



In 2007, the Corps completed refurbishment and uprating of Hartwell's generating units. In this photo, a 300-ton generator is lifted and moved into position (Corps photo).

largest Corps-operated plant east of the Mississippi River, was authorized in 1966 at a time of increased environmental legislation and awareness. In 1976, a lawsuit was filed to stop the project because opponents alleged the Corps violated multiple federal environmental laws. Ultimately, the project moved forward slowly to accommodate the completion of studies and mitigation efforts related to wildlife, cultural resources, water-quality, natural resources management, environmental impact statements, and geologic seismicity. In 1984, the reservoir reached its anticipated full pool level for the first time and the four conventional generating units went into service the following year.[9]

The most controversial aspect of the project, though, was a 1976 proposal by the Savannah District to add four pumped storage (reversible pump turbines) units at the dam, which would double the project's installed capacity to 600 MW.[10] In 1988, the Federal District Court of Charleston, South Carolina granted an injunction against the Corps to stop the installation of the reversible pump turbines. The states of Georgia and South Carolina, the Georgia and South Carolina Wildlife Federations, and the National Wildlife Federation charged that the Corps had failed to comply with the National Environmental Policy Act and the Fish and Wildlife Coordination Act.[11] Environmental groups, who called the project "The Big Boondoggle," were concerned about fish populations in the Savannah River. Similar pumped storage units on the Missouri River and Lake Michigan resulted in massive fish kills when the units drew water in from the tailraces. The Corps believed studies completed during the 1980s and fish protection measures adequately ensured a safer environment at the project.[12]



The reversible pumpback units at Richard B. Russell went through nearly two decades of environmental review before they were allowed to operate on a limited schedule in 2002 (Corps photo).

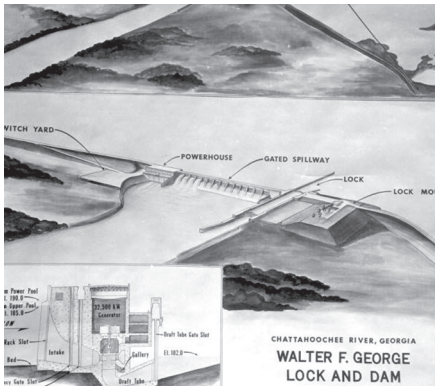
An appeals court lifted the injunction in part to allow construction of the units to begin, but the injunction was contingent upon the Corps' completion of additional environmental studies and demonstration that operation of the units would not negatively impact fish habitats. The delays resulted in a financial impact to both the project and to the government. When the conventional units began operation in 1986, the capital investment costs were incorporated into the customers' rate structure. However, until the pump units began generating power, all costs associated with their construction were transferred into a Construction Work in Progress (CWIP) account and held with accruing interest. For federal repayment costs, the delays were costly.

After fourteen years of litigation and additional environmental studies, the Corps identified suitable operating procedures under which the facility could be managed while protecting native fish habitats. In FY 2002, SEPA and the Corps signed an MOU that established the operational restrictions. These included strict compliance to nighttime pumping, limited pumping during the springtime, generation requirements for conventional pumping preceding start-up of the reversible units, requirements for fish attraction lights and sound repulsion systems, and multi-year monitoring. Following execution of the MOU, the four reversible pumped storage units at Richard B. Russell went operational for commercial power on August 30, 2002.[13] The installation of a downstream aquatic habitat enhancement system in 2011 eliminated the seasonal pumping restrictions, resulting in the full annual benefit of an additional 300 MW of critical peaking energy.

In the ACF river system, four SEPA marketed power projects were constructed as part of the Corps' efforts to improve navigation and flood control. The River and Harbors Act of 1945 approved a general plan for the basin and subsequent pieces of legislation authorized Buford Dam, Jim Woodruff Lock and Dam, Walter F. George Lock and Dam, and West Point Dam. Near the headwaters of the Chattahoochee River, construction began on Buford Dam and Lake Sidney Lanier Reservoir began in 1950 and the first generating units went online in 1957. The plant operates three units, one 7 MW and two of 62 MW each for a total nameplate capacity of 131 MW. Due to cavitation, the two larger units operate at 60 MW each. The small unit operates continually to meet downstream flow requirements.

Further downstream, West Point Dam was authorized by the Flood Control Act of 1962. Although managed today by the Mobile District, responsibility for land acquisition, design, and construction fell to the Savannah District. Construction of the multi-purpose project began in 1966 and the powerhouse generated its first power in 1975. The design of the dam included the Corps' first use of a slurry trench, a backfilled trench of Bentonite and water designed to prevent seepage below the dam structure. The West Point project was also the Corps' first usage of hydraulic, rather than mechanical, spillway gates. The project operates three units, one 3 MW unit and two of 42 MW each, with a total nameplate capacity of 87 MW.[14]

Work began on the 130 MW Walter F. George Lock and Dam in late 1955 and the first power came online in 1963. Even as construction was underway, the



Construction began on the Walter F. George Lock and Dam during the late 1950s (Courtesy of State Archives of Florida).[16]

Corps noticed sinkholes and boils along the downstream toe of the dam. Temporary repairs were made during the late 1960s and efforts continued to eliminate seepage into the 1980s; by the late 1990s, the Corps decided to install a permanent cutoff wall upstream of the main dam structure. Because Walter F. George Dam is a multi-purpose project within a broader system of impoundments along the Chattahoochee River, the decision to construct an upstream wall was a significant challenge. The Corps decided to move forward with a method of construction that included underwater diving. That allowed for construction while the reservoir was at full pool, meaning minimal interruptions to navigation and to hydropower. Planning on the project began in 1997 and was completed in 2004.[15] The Walter F. George Project operates four 42 MW generating units.

Construction on the Carters earth-filled dam required temporarily diverting stream flows through an adjacent mountain (Corps photo).

In the Alabama-Coosa River basin, the two northernmost hydroelectric projects are Carters and Allatoona. Recommended for funding in 1940, Allatoona was one of the first projects authorized in the basin, but the project was suspended during World War II. After the war, the Corps expedited its completion and contracts were let in 1946 and the project went online in 1951. The Carters plant, authorized by the Rivers and Harbors Act of 1945, is located on the Coosawattee River, a tributary of the Coosa. Construction on Carters Dam began in 1962 and was not completed until 1979, although it began producing electricity as early as 1975. Construction of the earth-filled dam involved an intricate method of diverting the water around the dam site by blasting a tunnel through the adjacent mountain. Initially, Carters was intended to operate as a 40 MW conventional plant, but the Corps later changed its design plans to incorporate four 125 MW units, two conventional and two reversible. The plant operates at a nameplate capacity of 500 MW and an operating capacity of 600 MW.

Located downstream on the main stem of the Alabama River, the Robert F. Henry and Miller's Ferry projects are both run-of-the-river facilities authorized for power production and navigation by the Rivers and Harbors Act of 1945. Site selection for the facilities began in 1956, but several years passed before construction was initiated. Construction of Robert F. Henry began in 1966 and initial funding focused on completion of the channel locks, but funding delays postponed completion of the navigational structures until April 1972. Contracts for the powerhouse, called Jones Bluff powerhouse at Robert F. Henry Lock and Dam, were let later that year and the first generating units went online in 1975. The project consists of four 20.5 MW units with a nameplate capacity of 82 MW.

Interior of the Robert F. Henry powerhouse (Corps photo).

Work began on Miller's Ferry in 1963, and while the total project was not completed for nearly 10 years, it began limited power production in 1970. The project's three generating units operate at 30 MW each, with a total operating capacity of 90 MW. Since its completion, Miller's Ferry has been plagued by operational problems. As soon as the first units went online, workers noticed unusually high noise and vibration, which over time, strained the units and accelerated deterioration. In addition, because the noise levels were hazardous to workers, the Corps enclosed the generators, but these noise abatement measures resulted in higher operating temperatures of the units, again shortening their lifespan. Though less than 20 years old, the generating units started to fail as early as the late 1980s. Unit 3 failed in 1987; Unit 1 failed in 1992; and Unit 2 failed in 1995. While repairing the units, forced outages ranged from just under a month to almost four years. SEPA estimated these outages resulted in a loss of 31 MW of energy capacity between 1987 and 1995. Contracts for long-term repairs were funded in 1996 and were completed in 1998, greatly improving the plant's reliability.[17]

THE JIM WOODRUFF SYSTEM

The Jim Woodruff Lock and Dam is a multi-purpose Corps project managed by the Mobile District on the Apalachicola River. Located at the base of Lake Seminole at the Georgia-Florida border, Jim Woodruff is the smallest of SEPA's marketed systems and serves six preference customers, all in northern Florida, in addition to one investor-owned utility, Progress Energy Florida (Florida Power Corporation). Authorized by the Flood Control Act of 1944, construction began on the run-of-the-river plant in 1947. The

During the 1970s, the original variable pitch turbines at the Jim Woodruff project were periodically shut down due to severe vibration. In 2002, the Corps completed a major rehabilitation effort, greatly improving the plant's efficiency (Corps photo).

project, containing three generating units with a combined nameplate capacity of 30 MW, began producing power in 1957.[18]

As a result of its initial design, the power plant has been beset by multiple operational problems since it went into operation. The plant was constructed with three variable pitch turbines, designed primarily for run-of-the-river facilities; the design allowed for the variable blades to operate at various positions to improve efficiency across a range of water flow conditions. Years of downstream channel erosion, however, increased the operating head of the dam and the turbines were unable to be submerged for optimal periods. This resulted in severe vibration of the blades. Consequently, beginning in the late 1970s, units were frequently shut down for repairs ranging from a few days to almost a year.

To limit the number and severity of the outages, the Corps welded the blades in-place during the late 1980s, which increased overall reliability but reduced efficiency

JIM WOODRUFF SYSTEM, SALES AND REPAYMENT, FY 1990 – FY 2010

Fiscal Year	MW (capacity)	MWH (sold)	% Avg. Generation	Power Sales Revenue	Repayment to Treasury*
1990	36.00	211,193	77%	$3,000,000	$0
1991	36.00	215,797	84%	$3,500,000	$800,000
1992	36.00	222,214	87%	$4,700,000	$2,280,000
1993	36.00	206,042	77%	$5,030,000	$1,680,000
1994	36.00	217,614	88%	$5,600,000	$2,300,000
1995	36.00	218,892	86%	$5,600,000	$2,300,000
1996	36.00	216,843	87%	$5,300,000	$2,600,000
1997	36.00	218,735	85%	$5,400,000	$2,200,000
1998	36.00	200,686	74%	$5,300,000	$1,500,000
1999	36.00	205,107	69%	$5,200,000	-$500,000
2000	36.00	183,728	28%	$5,000,000	-$2,000,000
2001	36.00	185,961	47%	$5,200,000	-$2,000,000
2002	36.00	193,683	61%	$5,300,000	$400,000
2003	36.00	228,141	93%	$6,270,000	$300,000
2004	36.00	232,747	99%	$6,400,000	$1,100,000
2005	36.00	242,256	101%	$8,300,000	$1,600,000
2006	36.00	233,133	91%	$8,300,000	$900,000
2007	36.00	212,486	77%	$7,500,000	-$1,400,000
2008	36.00	230,323	73%	$7,800,000	-$3,200,000
2009	36.00	213,290	76%	$7,700,000	-$3,300,000
2010	36.00	223,662	68%	$13,200,000	$400,000

** Accounts for funds available following project operation and maintenance expenses, depreciation, wheeling, purchased power, interest, and (after FY 1999) retirement benefits.*

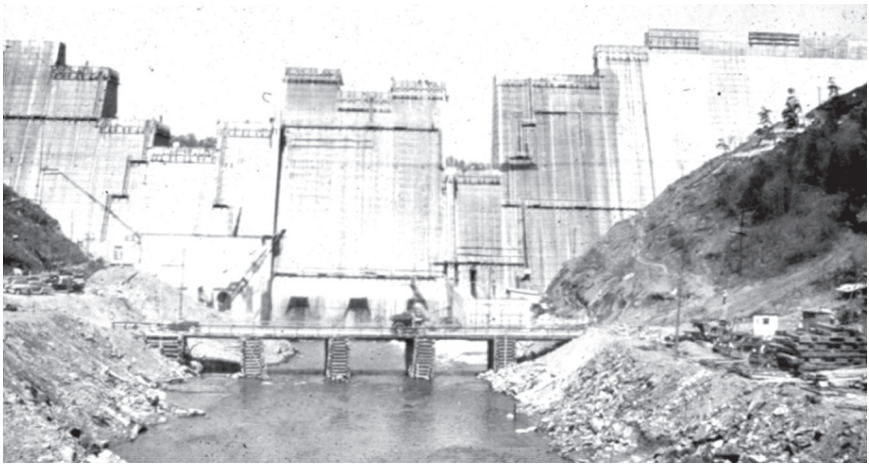
because the blades could not be adjusted to capitalize on variable water releases required for navigation at the dam site. The plant's annual power generation dropped by seventeen percent and jeopardized SEPA's ability to fulfill contracts with its customers. During the late 1980s and early 1990s, drought, the loss of available power, and increased operations and maintenance costs, resulted in a lack of revenue for the project and repayment costs to the US Treasury were deferred. Drought was not the only weather contribution for loss of available power. During the summer of 1990, because of high flow events, the Corps passed some water through a single unit to generate power, while the remainder was released downstream to prevent excessive vibration of the other two units. For two billing months in 1990, for example, revenue loss at the project reached nearly $200,000 and replacement power was purchased. To alleviate the deficits, SEPA was forced to raise the wholesale rate for its customers. Between 1991 and 1993, the average rate for Jim Woodruff customers increased by nearly 100 percent.[19]

The Corps began a rehabilitation study in 1991. The final report, completed in 1993, recommended replacement of the turbines, rehabilitation of the generators, and replacement of the transformers. Because Jim Woodruff necessitated major rehabilitation efforts, several years passed before Corps Headquarters approved of the engineering plan. Finally, in November 1995, Congress appropriated initial funding of the project. Early rehabilitation costs for the project were estimated at $30.6 million. The rehabilitation was completed in 2002 and the new units went online, bringing the plant's operating capacity to 43.35 MW. As of 2010, Jim Woodruff revenues had contributed $20 million or 28% to the total federal repayment costs.

KERR-PHILPOTT SYSTEM

In 1934, the Corps' Norfolk District completed a survey of the Roanoke River Basin, but the federal government found that comprehensive development of the area was not justified at the time. Following a 1940 flood of the Roanoke River, the government asked the Corps to reevaluate the earlier study and provide recommendations for basin redevelopment. The Flood Control Act of 1944 authorized John H. Kerr (then called Buggs Island) and Philpott as the initial steps of the project. The John H. Kerr project lies in Virginia and North Carolina; it was completed in 1953 at a cost of $87 million. Philpott dam and reservoir lies wholly within Virginia and was completed in October 1956. Initially, Norfolk District managed both projects, but a Corps reorganization in 1961 shifted the district's boundaries northward, transferring responsibility of the projects to Wilmington District. The marketing policy for the Kerr-Philpott system was established in 1985 and as of 2010, the power generated at the projects was marketed to 76 preference customers in North Carolina and Virginia. To date, the system has paid $91 million or forty-eight percent of the total $186 million federal capital repayments.[22]

The John H. Kerr project underwent rehabilitation in 2004. The work included installing new transformers, generator breakers, switchyard breakers, 115 kV cables,



Construction of the Philpott project on the Smith River in Virginia during the early 1950s (Corps photo).

aerating turbines and generator windings. The work added $95 million to the capital investment, but increased reliability and increased the nameplate capacity to 295 MW. Philpott has never been authorized for a major rehabilitation effort, though various components, such as transformers, have been replaced as necessary.

THE CUMBERLAND SYSTEM

Even before legislation authorizing the 308 Reports was passed, the Cumberland River basin had received the attention of the Corps' Nashville District.[23] The earliest recommendations, in 1923, suggested federal construction of the locks and dams at three locations with private power development at those sites. Subsequent 308 surveys for the Tennessee River recommended several dams along the main stem and its tributaries; seven of those would be high-head with the ability to generate power. In 1933, Congress stripped the Corps of flood control powers in much of the Tennessee basin when the TVA was created. As Norwood noted, part of the reason for this was because the Corps had failed at Wilson Dam at Muscle Shoals to adequately market the hydroelectricity at a rate sufficient to repay federal capital investment. The recipient of the power, Alabama Power Company, made huge profits by selling the low-cost federal electricity at more than a two-to-one margin. Establishing the TVA was the "first step" in relieving the Corps of marketing responsibilities and ultimately led to the creation of power marketing administrations.[24]

The Flood Control Act of 1938 instructed the Corps to study the Cumberland River and planned the first of four power-producing dams: Wolf Creek, Dale Hollow, Center Hill, and J. Percy Priest. In 1941, Congress authorized the upstream storage reservoir, Wolf Creek. When the United States entered World War II, Wolf Creek, Dale Hollow

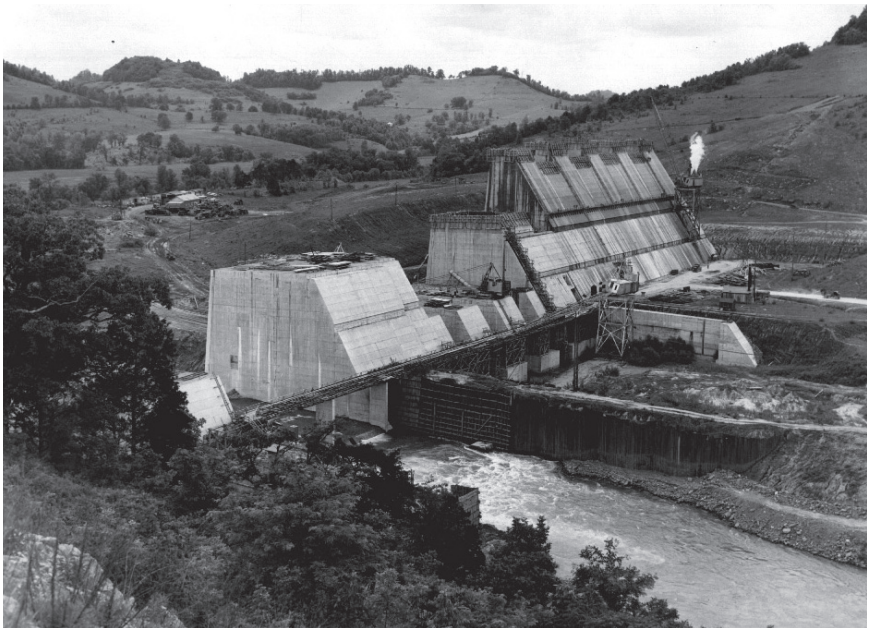
KERR-PHILPOTT SYSTEM, SALES AND REPAYMENT, FY 1990 – FY 2010

Fiscal Year	MW (capacity)	MWH (sold)	% Avg. Generation	Power Sales Revenue	Repayment to Treasury*
1990	196.50	597,006	120%	$11,700,000	$2,600,000
1991	196.50	524,883	121%	$11,100,000	$2,600,000
1992	196.50	339,000	78%	$11,200,000	$2,400,000
1993	196.50	629,258	145%	$13,300,000	$4,400,000
1994	196.50	499,283	114%	$12,300,000	$3,200,000
1995	196.50	381,159	87%	$11,300,000	$2,200,000
1996	196.50	591,441	136%	$12,700,000	$3,200,000
1997	196.50	558,349	129%	$12,600,000	$2,400,000
1998	196.50	622,325	142%	$13,000,000	$3,400,000
1999	196.50	220,631	51%	$9,100,000	-$200,000
2000	196.50	327,317	75%	$9,800,000	$700,000
2001	196.50	235,676	54%	$9,100,000	$1,400,000
2002	196.50	149,705	25%	$10,600,000	-$2,200,000
2003	196.50	835,851	191%	$15,800,000	$4,000,000
2004	196.50	483,490	107%	$12,900,000	$600,000
2005	196.50	451,442	103%	$10,800,000	$600,000
2006	196.50	262,066	58%	$9,400,000	$1,200,000
2007	196.50	417,364	93%	$13,300,000	$2,300,000
2008	196.50	211,999	48%	$13,100,000	-$1,300,000
2009	196.50	295,100	73%	$11,400,000	-$3,300,000
2010	196.50	615,814	137%	$19,000,000	$200,000

** Accounts for funds available following project operation and maintenance expenses, depreciation, wheeling, purchased power, interest, and (after FY 1999) retirement benefits.*

and Center Hill received priority funding for national defense. Due to labor and material shortages, the Corps suspended construction at Wolf Creek and Center Hill, with work at Dale Hollow focused on flood control only. In 1948, Dale Hollow was the first of the projects to begin producing power, followed by Center Hill in 1950, and Wolf Creek in 1951. The remaining six projects in the Cumberland River basin, Old Hickory, Cheatham, Barkley, J. Percy Priest, Cordell Hull, and Laurel came online during the next two decades.[25]

When the Cumberland projects first came online in 1948, the Secretary of the Interior transferred marketing and transmission responsibilities to TVA at least until 1968. With more projects coming into the system, and Congressional freezing of the TVA service area, SEPA sought renegotiation of the contract in 1963. The new contract enabled SEPA to serve customers outside of the TVA service area, with TVA providing transmission services. This met with some resistance by the private



Completion of Center Hill was prioritized for national defense during World War II, but due to material shortages construction did not commence in earnest until the late 1940s (Tennessee State Library photo).

Dale Hollow was the first of the Cumberland basin projects to begin producing power in 1948 (Tennessee State Library photo).

CUMBERLAND SYSTEM, SALES AND REPAYMENT, FY 1990 – FY 2010

Fiscal Year	MW (capacity)	MWH (sold)	% Avg. Generation	Power Sales Revenue	Repayment to Treasury*
1990	948.30	3,463,484	113%	$37,600,000	$15,100,000
1991	948.30	3,739,741	120%	$39,200,000	$16,500,000
1992	948.30	3,068,206	100%	$35,100,000	$10,650,000
1993	948.30	3,203,531	104%	$35,900,000	$11,500,000
1994	948.30	3,941,534	126%	$38,300,000	$13,400,000
1995	948.30	2,651,714	87%	$35,400,000	$8,800,000
1996	948.30	3,624,576	115%	$40,000,000	$13,800,000
1997	948.30	3,892,202	124%	$44,000,000	$15,500,000
1998	948.30	3,398,187	109%	$40,900,000	$12,800,000
1999	948.30	2,653,427	86%	$38,300,000	$4,000,000
2000	948.30	1,797,663	61%	$30,600,000	$3,500,000
2001	948.30	2,051,165	68%	$31,100,000	$5,000,000
2002	948.30	2,729,255	89%	$38,000,000	$2,700,000
2003	948.30	4,008,802	127%	$46,800,000	$18,100,000
2004	948.30	4,054,926	136%	$55,200,000	$19,700,000
2005	948.30	3,628,687	122%	$53,600,000	$19,000,000
2006	948.30	1,997,145	70%	$37,100,000	$4,800,000
2007	948.30	1,766,660	63%	$29,800,000	$7,200,000
2008	**n/a	1,456,215	53%	$27,300,000	-$6,600,000
2009	n/a	2,654,349	92%	$43,100,000	$4,600,000
2010	n/a	2,706,215	93%	$44,100,000	-$2,300,000

** Accounts for funds available following project operation and maintenance expenses, depreciation, wheeling, purchased power, interest, and (until FY 1999) retirement benefits*
*** Capacity varied due to ongoing dam safety remediation*

Kentucky Utilities, which charged that TVA's agreement to transmit power outside of its service area was not an authorized use of its power. The Federal courts intervened and ruled that SEPA's power was only limited by the coverage area dictated by the Secretary of the Interior.

The rate design for the Cumberland System diverged from SEPA's traditional use of a two-part demand and energy rate pattern. In the Cumberland System, the TVA contract allowed for variation of an annual charge based on stream flows discharged from the storage basin at Wolf Creek. A second difference is the use of a demand-energy rate pattern with a capacity/energy split, which allocated 40 percent of the generation costs to capacity and 60 percent to energy. In 1994, SEPA conducted a repayment study and determined that the rates in use at the time were not sufficient to repay capital investments of the projects. Since 1994, customers have received

1,500 hours of energy per kW that was included with the capacity charge and paid an additional energy charge for all energy received above 1,500 hours per kW. Customers outside the TVA system pay for the TVA transmission charge. That rate design remained largely in place until capacity at Wolf Creek and Center Hill were impaired by dam safety issues and the reservoir levels were lowered in 2007 for emergency repairs.

The total installed capacity of the Cumberland projects is 914 MW, which generates an average of 3,114,000 MWh annually. In FY 2010, the power generated at the projects was sold to approximately 25 preference entities and 213 preference customers. The Cumberland System customers are located in Tennessee, Kentucky, Mississippi, North Carolina, Alabama, Georgia, Virginia, and southern Illinois. As of FY 2010, project revenues have contributed $288 million or 27 percent toward the total $1.048 billion federal repayments.[26] The Cumberland System projects have been well-maintained by the Corps, and although they represent some of the oldest structures in the system, have been subjected to relatively few emergency outages.

LAST IN-FIRST OUT: THE STONEWALL JACKSON PROJECT

The Stonewall Jackson Project, located on the West Fork River in North Central West Virginia, was authorized by the Flood Control Act of 1966. The project was delayed first by lawsuits claiming the Corps failed to conduct an adequate environmental analysis and second by negotiations with the state of West Virginia regarding cost-sharing. Construction began during the 1980s. The Corps of Engineers installed a single 300 kW unit to operate the station and it estimated an annual excess of 1.4 million kWh that could be marketed to preference customers. The project went online on August 30, 1994 and became SEPA's 23rd project for marketing power. SEPA initially determined that the new project would be placed into the Cumberland System of projects; however, no preference customers in the area were able or willing to receive the power and SEPA sold the excess electricity to a private utility, the Monongahela Power Company. Stonewall Jackson was de-authorized as a federal power project in 2006 and its excess energy was no longer under the purview of SEPA. As of 2011, other private utilities are looking to capitalize on the clean energy and are in the process of applying with the FERC for permission to further develop the project.[27]

A NEW ERA FOR HYDROPOWER

A second Corps flood control project at Bluestone Dam in Hinton, West Virginia also received attention for possible hydroelectric development. Bluestone Dam was authorized by the Flood Control Act of 1938 and completed as a flood control project in 1949. When the Corps began work on the project in the 1940s, penstocks were included but the power generating facilities were not constructed. In February 1992, the Hinton-White Sulphur Springs-Philippi Power Authority (now the Tri-Cities Power Authority) entered into an agreement with the Corps to

The Corps' Pittsburgh District began construction of the Stonewall Jackson Dam project during the 1980s. This was the last project to enter SEPA's market, and the first to be de-authorized (Corps photo).

The future for untapped potential? Since 1992, the Tri-Cities Power Authority has studied the feasibility for developing power generation facilities at the Corps' Bluestone Dam near Hinton, West Virginia (Corps photo).

study the feasibility of developing hydropower potential at the Bluestone Dam. The Water Resources Development Act, passed by Congress in 2000, modified the project's authorization to permit construction of hydroelectric facilities at the dam by the Power Authority. As proposed, the Power Authority would construct the facilities, deed title to the Corps, and excess power would be marketed by SEPA for the purpose of reimbursing the Power Authority. By 2010, despite government support, the project had not moved beyond the feasibility stage.[28]

Section 1834 of the Energy Policy Act of 2005 required the Secretary of the Interior, the Secretary of the Army, and the Secretary of Energy to "conduct a study assessing the potential for increasing electric power production at federally owned or operated water regulation, storage, and conveyance facilities." The study found that 64 of 871 federal dams warranted additional study and had the potential to add 1,230 MW of additional capacity and 1,283 MW of capacity available through refurbishment of existing facilities.[29] Hydropower generation facilities require a tremendous amount of capital investment. Moreover, in 2008, the nation entered an economic recession and funding for new government construction of civil works is highly unlikely. However, new clean energy tax credits and a more restrictive operating environment for coal-fired plants may encourage private hydropower development at existing federal dams. As the nation's demand for electricity grows, there are certainly opportunities for public-private partnerships at existing dams. As the federal government's designated marketing administration in the Southeast, SEPA will likely play a role in getting power to the people, whether directly or indirectly.

PROJECT AGE AND RELIABILITY

During the 1990s, many of the Corps' hydroelectric projects in the Southeast began reaching the end of their expected life-span. In 1992, SEPA reported that 348 MW, or one-sixth of the total 2,154 MW capacity of South Atlantic Division operated dams, was either unavailable or operated at less than optimal because of needed repairs. These included outages required to rewind two of the conventional units at Carters, and failure of the stator clamping bolts, both of which were repaired in 1993. Other outages that year were due to the rewinding of the units at R. F. Henry and Millers Ferry.[30]

Unit reliability became an increasing issue to federal power customers as well as for SEPA, which worked on behalf of its customers to purchase replacement power

AVERAGE AGE OF CORPS, BUREAU, AND PRIVATELY-OWNED HYDRO UNITS, 1999 (FROM GAO REPORT)

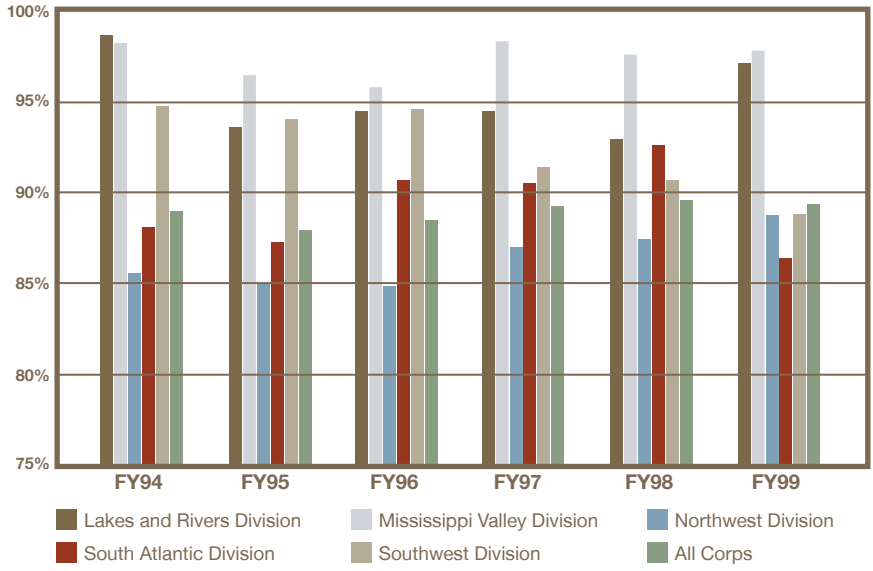
Agency	Average age of generating units (years)	Number of generating units	Nameplate capacity (MW)	Average nameplate capacity (MW)
Bureau of Reclamation	41	188	14,515	77
Corps of Engineers	33	349	20,720	59
Nonfederal	48	570	34,770	61

to meet contractual obligations. In 1996, the US GAO issued a report regarding the reliability of 11 federal hydropower plants in the Southeast.[31] The 11 plants included those operated by the South Atlantic Division in the Georgia-Alabama-South Carolina and Jim Woodruff systems. Together, these plants constituted approximately 71 percent of the total power sales revenues in FY 1995 and 63 percent of SEPA's total generating capacity. In testimony to Congress, the southeastern federal power customers summed up their frustrations:

> *The lack of funds to maintain, operate, and rehabilitate these infrastructure facilities is not justified. Not only is the restoration of the nation's infrastructure one of this Administration's priorities, but the power marketing program is one of the few federal programs where the consumer repays the federal investment. Appropriated funds for the operation and maintenance of Corps projects are reimbursed through rates hydropower customers pay to SEPA. In fact, funds have already been paid through rates – for rehabilitation and replacement which has not yet been performed.*[32]

One of the chief causes of federal power being less reliable is because of the funding process. Revenue generated from power sales goes directly to the US Treasury and the monies cannot be reserved for repairs or upgrades. Funding for repairs are typically obtained through Congressional appropriations for Corps Civil Works Operations and Maintenance general budgets. According to the GAO, because of the lengthy budgeting

SOUTH ATLANTIC DIVISION'S HYDRO UNIT RELIABILITY, FY 1994 – 1999



and justification process, the "funding for repairs can take years to obtain and is uncertain. As a result, the agencies delay repairs and maintenance until funding becomes available" resulting in "inconsistent, unreliable performance." Major rehabilitation efforts require intensive field studies to justify the capital expenditures to the Department of the Army. The initial studies for the Jim Woodruff rehabilitation work began in 1991, but because of multiple reviews and required revisions to project justification, the project was not approved and funded until the mid-1990s. Complicating the effort, the Corps had a "No New Starts" policy in place during the early 1990s for Construction General Funding. Any major rehabilitation effort was a challenge to get funded.[33]

In the early 2000s, West Point dam experienced outages of three generators that remained offline for nine months for a loss of 127,700 MWh. In working within existing budgets to quickly bring downed units back online, repairs were frequently reactive and short-term solutions. In some cases, repairs that were undertaken merely delayed required major rehabilitation efforts. For example, in 1989, the Hartwell Project's Unit Number 1 failed; the Corps conducted intermediary repairs to bring the unit back online, but at a reduced capacity. By early 1990, the unit was shut down for nearly two months while a part was replaced, but the unit failed again in 1992, and thereafter was not operated until wholesale rehabilitation efforts could be funded. The Corps determined the units failed because of the turbines were oversized, not atypical of contemporary turbine design, and capable of overloading the generator. Corps and SEPA management routinely operated and marketed Hartwell generators at 125% and 135% of nameplate rating, which they understood would shorten the expected machine lifetime. Major repairs for the Hartwell plant were finally undertaken during the late 1990s and were completed in 2007.

Corps contractors rehabilitate one of the units at the Thurmond project in the Georgia-Alabama-South Carolina System (Corps photo).

Meanwhile, the preference customers are left with no choice but to purchase expensive replacement power through private, investor-owned utilities. For example, between 1989 and 1990 alone, wholesale power rates increased 22 percent for customers in the Georgia-Alabama-South Carolina system. Between March 1990 and March 1992, forced outages at the Carters units forced preference customers in Alabama, Georgia and Mississippi to purchase $8.6 million in replacement power. In the Jim Woodruff system, the unreliability of the units combined with severe drought in the region, resulted in a nearly 100 percent wholesale rate increase. Further, the purchased power is often generated from polluting fossil fuel plants rather than renewable resources.[34]

DAM SAFETY: WOLF CREEK, CENTER HILL, AND THE EFFECT ON CUSTOMERS

While age affected the reliability of equipment, recent concerns regarding dam safety has impacted power production at two SEPA projects in the Cumberland system. The federal government owns nearly 4,000 dams and though that is a relatively small percentage (4.7%) of all dams in the United States, many of the federal dams are large and represent iconic engineering projects of the early to mid-twentieth century. Of the 692 dams managed by the Corps, more than half have reached 50 years of age. Because many of the dams were also built for flood control purposes, any potential for structural failure is a calculated risk.[35]

Though concerns over dam safety are not new to the federal government, a heightened awareness emerged following the terrorist attacks of September 11, 2001. In addition, the power of Hurricane Katrina in August 2005, which compromised the structural integrity of the complex levee system surrounding the city of New Orleans, revealed the power of nature against the nation's man-made infrastructure, particularly those built using outmoded engineering methods. Following Katrina, the Corps evaluated its infrastructure and prioritized structures in need of repair. Two hydroelectric dams serving SEPA customers, Wolf Creek and Center Hill, were designated Class I Action (urgent and compelling) for dam safety remediation by the Corps.[36]

Since their completion in the early 1950s, Wolf Creek and Center Hill have suffered repeatedly from leakages and seepage beneath the dam structures due to a natural system of voids in the limestone karst foundation. While the dams were designed and constructed according to standard practices of the 1930s and 1940s, the voids then were simply filled with residual soil. Over time, the high head of the reservoir pressured the infill, and the water scoured out larger holes within the limestone karst foundation. Larger holes resulted in a higher velocity of water and greater erosion. Ultimately, sinkholes appeared as surface material was undercut by erosion. As early as 1967, Nashville District detected leakages under the Wolf Creek dam where the earthen and concrete sections connected. Emergency grouting temporarily alleviated the problem and included drilling large holes into the dam, two hundred feet down to bedrock, with each

hole filled with a steel casing and concrete. These emergency repairs saved the dam, but engineers realized that long-term stabilization would require major rehabilitation efforts.

Piezometers to measure leakages were installed throughout embankments at both projects in the late 1960s. In 1975, Nashville District began construction on a large concrete cutoff or diaphragm wall at Wolf Creek. The work, which cost more than the original construction cost, took five years to complete.[37] Work also commenced on an embankment grouting program at Center Hill in the 1980s. Despite the remediation measures conducted at both structures since the 1960s, sinkholes and significant seepage continued. In 1991, during a record high pool, the Corps calculated that 3,823 square meters of chert (sedimentary rock) and clay discharged from one seepage at Center Hill, resulting in a sinkhole 25 feet in diameter. New sinkholes appeared at Wolf Creek in 2004.

According to the Corps' more dire predictions, a breach or failure at Wolf Creek or Center Hill could have caused a similar, if not greater, impact on downstream lives and property than Hurricane Katrina in lower Louisiana. Lake Cumberland, impounded by Wolf Creek dam, is the largest reservoir east of the Mississippi River and with 6.1 million acre-feet of water is the ninth largest reservoir in the United States. The Corps estimated that floodwaters could reach the city of Nashville, located 280 miles downstream, within 24 hours and inundate most of the downtown area. To prevent a catastrophic failure, the Corps began a nearly $600 million emergency rehabilitation project to implement long-term structural integrity.[38]

Structural repairs on Wolf Creek began in March 2006 with new grouting (injecting cement-like material) of the caverns and constructing a cutoff wall below the base of the caverns down into the bedrock foundation. To release stress on the dam structure while repairs were underway, on January 22, 2007, the Corps made an

A sinkhole opened at Wolf Creek in 1968. This small hole represented big problems (Corps photo).

emergency decision to lower the level of Lake Cumberland from 723 feet mean sea level to 680 feet mean sea level. At Wolf Creek, a minimum of 673 mean sea level is required to generate power and the new elevations resulted in a lower headwater and operational restrictions on the generating units. Maintaining the new pool level required discharging excess water during high inflow events and a loss of potential power. Because Wolf Creek is near the head of the Cumberland system of projects, reducing the amount of water in the storage pool impacted all downstream uses, including recreation, fish and wildlife, water quality, and navigation.

For hydropower, Wolf Creek holds the majority of the system's water storage; downstream run-of-the-river projects are dependent upon regular releases of water. In addition, because it is one of nine hydropower facilities in the Cumberland basin marketed collectively to the regional preference customers, in effect, that results in rationing of the available power. As a result of the interim operating procedures, SEPA revised its marketing strategy to provide power to customers as it became available, which represented a significant impact on the preference customers. Hydropower is a valuable commodity in that it can be turned on (or off) quickly. In times of high energy demand, such as winter mornings or summer afternoons, hydropower is the cleanest, greenest and most reliable generating resource to offset expensive peaking costs from other alternative sources.

In 2007, SEPA estimated (for Wolf Creek and Center Hill) that several hundred megawatt hours would be lost, and would require acquisition on the open market. Cost estimates for replacement power ranged from $20 to $40 million dollars annually. Moreover, this was a difficult time for water management in the Cumberland Basin because it was recently removed from a period of severe drought, which added to power generation challenges. The first stage of the Wolf Creek

Nashville District contractors work on the Wolf Creek cutoff wall (Corps photo).

remediation project, grouting, was completed in the fall of 2008 and the Corps estimated the cutoff wall would be completed in FY 2014. The work at Center Hill, also a combination of grouting and a cutoff wall, began in November 2006 and is estimated to be completed in FY 2015.

The full financial impact on customers will not be realized until the two dam safety projects are complete and the costs are transferred back to the hydro projects. The Corps estimated in FY 2009 that rehabilitation and construction costs for both projects would exceed $800 million. Under Section 1203 of the Water Resources Development Act of 1986, the Corps will determine whether the rehabilitation work qualifies for recovery expenses either through the Dam Safety Major Rehabilitation Program, the Dam Safety Assurance program, or perhaps both. For the Cumberland System customers, rates could increase between $3.3 million (7%) and $22 million (45%) annually depending on the qualifying costs.[39]

A BOLD STEP: CUSTOMER FUNDING

Many hydropower projects are reaching 50 years of age and their equipment and infrastructure is reaching the end of its life expectancy. Because of budget cuts, non-routine maintenance and rehabilitation work on Corps hydropower projects has not been conducted. The TVA and the BPA operate on a different financial foundation than the remaining PMAs. Their enabling legislation allows those two agencies to fund projects through general revenues and have borrowing authority approved by Congress. That authority provides greater flexibility in terms of financing non-routine capitalized projects. Historically, the smaller PMAs (WAPA, SWPA, and SEPA) have relied on the Corps to request capital funds for hydro operation and maintenance, requests that then require Congressional approval. As federal hydro facilities aged and operational and maintenance expenses increased, the reliability of federal power decreased and SEPA negotiated replacement power on the open market to secure contracted loads for the preference customers. Alternatives for financing federal hydro rehabilitations had been studied in the past. Such alternatives included placing a percentage of power sales into a "trust fund" or a "revolving fund," but because these type funds could be politically challenging, the ideas were ultimately abandoned.[40]

Because of the outages at South Atlantic Division hydro facilities during the 1990s, SEPA and the southeastern federal preference customers began searching for a mechanism to fund hydropower repairs and maintain the reliability of each system. In July 1996, the Army General Counsel wrote an opinion that the Corps had limited authority to accept customer funding, except in cases where the work was considered part of normal Corps maintenance. Secondly, the Army determined, the Corps could not undertake any work that would increase the capacity or efficiency ("uprating") of the units unless the uprating fell within the Congressionally authorized capacity of the project itself. In the Water Resources Act of 1996, two proposals were submitted for hydropower work. The first was to allow funding from the preference customers and the second would allow the Corps to uprate its

In carrying out this section, the Secretary may accept and expend funds provided by preference customers under Federal law relating to the marketing of power.

Water Resource Development Act of 2000, Section 212.

hydropower facilities. Ultimately, Congress rejected the customer funding option, but allowed the Corps to seek unit uprating as long as the funds were made available through appropriation acts.[41]

Finally, the Section 212 of the Water Resources Development Act of 2000 (WRDA 2000) authorized the Secretary of the Army to accept funds provided by preference customers for use in the maintenance, rehabilitation, or modernization of equipment at the hydroelectric projects owned by the Corps. The framework and authorization for the responsibilities are established in Memoranda of Agreement (MOAs) among the customers, the Corps, and the PMA. Typically, the MOAs establish minimum and maximum benchmarks for the projects and the documents can be terminated or revised as needed. Individual sub-agreements detail specific work items to be performed, how the work will be executed, and how it will be funded. SWPA was the first PMA to develop such an agreement under WRDA 2000. That MOA, established among SWPA, the Corps and the City of Jonesboro, Arkansas, provided for customer funding of non-routine maintenance actions. Under the SWPA arrangement, the three partners prioritized maintenance projects and discussed the progress of those underway. Between 2000 and 2005, SWPA customers provided $36 million for funded projects.[42]

In December 2004, after more than a decade of discussions, SEPA, the Corps, and the federal power customers signed an MOA establishing the framework for customer funding-projects in the Georgia-Alabama-South Carolina system. Under the agreement, the participating customers provide one hundred percent of an agreed upon funding requirement, specified in the individual sub-agreements for work items. During the MOA negotiations, one of the customers' greatest concerns was the ultimate financial liability for individual work items, particularly given the age of many of the hydro projects. The MOA stipulates that if the Corps anticipates funding changes before or during construction, it will notify the customers who must unanimously approve of the modification or the sub-agreement is terminated.[43]

Similar MOAs were negotiated with the Cumberland and Kerr-Philpott systems in 2007.[44] The Cumberland System funding efforts began as short-term agreements until a long-term agreement was negotiated in August 2011. The 2011 Cumberland System MOA provided for up to $25 million to address the decreasing reliability of the nine aging projects in that system. The Cumberland System contains 28 individual units generating 3,114 gigawatt hours (GWh) annually. The decreasing reliability of these units, compromised by age and deferred maintenance due to limited funding, led to a comprehensive system-wide evaluation of each hydroelectric project. The second phase of the evaluation identified 242 work orders, which were prioritized based on (1) the potential for catastrophic or extended outages and (2) the return on investment.[45]

In the Cumberland System you have nine projects and, in reality, all of them need rehab. It is a significant expense. But, through the years, the Cumberland System has done a good job of maintaining their equipment. You can be a victim of your own good work, though, and there's only so many miles that you can put on the equipment. It's been a challenge to make sure the program moves forward. We're relying on customer funding, particularly in the Cumberland System. They're all businessmen and they know the value of a dependable resource. It's not in their best interests to let the systems decay.

Herb Nadler, Assistant Administrator of Power Resources, SEPA

In many ways, the funding mechanism represents a true partnership between the federal government and the preference customers. "The biggest advantage is that it puts the customers at the table. They are part of a team," noted Leon Jourolmon. Whereas the Corps historically was accused of making autonomous decisions on repairs, and the costs ultimately passed to the customers through rates, now the customers provide critical input and participation in the decision-making process. A Project Review Committee (PRC) composed of representatives of the Corps, the customers, and SEPA, evaluates and prioritizes individual work items for a particular fiscal year. Individual selected work items may be individually funded or combined with other tasks being funded through conventional appropriations.[46] The work items are outlined in a sub-agreement to the MOA and none begin until all parties have signed the document.

According to the Corps, SEPA, and the federal power customers, the value of customer-funding cannot be overstated. It represented a different framework under which to operate and inject much-needed financing of capital improvements. Between 2000 and 2010, customer-funding provided financing for three marketed systems in the Southeast federal power region. Negotiations also began for a customer funding MOA for the Jim Woodruff System by the end of 2012. Given the economic recession that began in 2008 and the anticipated reduction of federal expenditures, the Corps will face the challenge of funding its Civil Works program on a skeleton budget. In addition to its hydropower responsibilities, the Corps Civil Works program manages navigation locks, recreation facilities, and environmental programs; funds will be rationed and some programs, such as recreation or navigation, may operate on a limited schedule.[47] Fortunately, through their successful dialogue, the public power customers and their federal partners have established a framework for unconventional financial mechanisms to support reliable power.

While customer funding has narrowed the gap of funds necessary to stabilize the reliability of units, hydropower facilities continue to age. In FY 2010, the median age of Corps hydropower projects nationwide was 47 years, with 90 percent of the projects over 34 years of age. The Corps' goal for unit availability is 95 percent, but according to a 2008 report, none of the Corps Divisions reached that number. In SAD, hydropower

PROJECTS FUNDED BY SEPA CUSTOMERS, FY 2004 - FY 2010

Year Funded	System	Project	Work Item	Funded Cost
2004	Cumberland	Center Hill	Rehabilitate Powerhouse Crane	$5 Million
		Wolf Creek	Rewind Generator 6 Asbestos & Lead Abatement	
2005	Cumberland	Basin Wide	Condition Assessment Study	$8 Million
		Barkley	Replace Transformer Cooling System	
		Center Hill	Replace Coolers & Bearings Generator 2	
		Old Hickory	Rehabilitate Powerhouse Crane Replace Generator Cooling Piping	
		Wolf Creek	Replace Coolers Generators 4 & 6 Replace Generator Thrust Bearing Lift Pumps	
2006	Cumberland	Basin Wide	Program Management & Contingency Reserve	$7 Million
		Dale Hollow	Repair & Replace Intake Gate Hoists & Cables	
2007	GA-AL-SC	Allatoona	Replace Transformers	$3 Million
		Carters	Generator Cooling Water Study	
		West Point	Replace Excitation Systems Generators 2 & 3	
2008	Cumberland	Basin Wide	Replace Transformers Replace Turbine Governors	$21 Million
		Barkley	Rehabilitate Powerhouse Crane	
		Center Hill	Repair Penstock & Water Passages	
		Old Hickory	Replace Turbine & Generator Design	
	GA-AL-SC	Allatoona	Replace Switchyard Components	
		Carters	Repair Excitation Generator 4	
		Hartwell	Repair Rotor Rim Generator 5	
		R.B. Russell	Realign Generator 2 Install Circuit Breakers Generators 1-4	
		W.F. George	Replace Transformers	
2009	Cumberland	Basin Wide	Replace Generator Circuit Breakers	$22 Million
		Barkley	Rewind Generator 1	
		Center Hill	Replace Turbine & Generator Design	
		Old Hickory	Rewind Generator 4	
	GA-AL-SC	R.B. Russell	Repair & Realign Generators 5-8	
	Kerr-Philpott	John H. Kerr	Replacement 115kV Oil Filled Pipe Cables	
2010	GA-AL-SC	Allatoona	Replace Generator Control System	$20 Million
		Carters	Replace 230kV Reversing Switch Rewind Generators 3 & 4	
		Hartwell	Repair Stator Winding Generator 3	
		R.B. Russell	Replace Switchyard Components Replace Draft Tube Trash Rack Screens	
	Kerr-Philpott	Philpott	Replace Breakers, Exitation & Governors	

CUSTOMER FUNDING TOTALS BY SYSTEM (FY 2000 – FY 2010)

Georgia-Alabama-South Carolina	Kerr-Philpott	Cumberland
$54,862,509	$8,450,000	$74,314,385

units hovered below 85 percent reliability. Between FY 2000 and FY 2008, total generation continued to decrease. The downward trend for appropriations directed to hydropower infrastructure rehabilitation is not expected to change and, therefore, customer funding will continue to play an important role in filling the gap of federal funding.[48]

ENDNOTES

[1] For a more detailed discussion of the implementation of the 308 Reports, see Barber and Gann, *Savannah District*; Jeane and Harvey, *Mobile District*; Johnson, *Ohio River Division*; Johnson, *Engineers on the Twin Rivers*; and Ronald B. Hartzer, *To Great and Useful Purpose: A History of the Wilmington District Corps of Engineers* (Bloomington, Indiana: David A. Clary and Associates, 1984).
[2] During a brief period, SEPA marketed power from a twenty-third Corps project, Stonewall Jackson in West Virginia. That project has since been de-authorized.
[3] SEPA, *Annual Report*, 2010.
[4] The data presented in this table was compiled from SEPA's *Annual Reports*, 1990-2010.
[5] SEPA, *Annual Report*, 2010.
[6] For a detailed history of the hydroelectric projects in the Georgia-Alabama-South Carolina system, see Barber and Gann, *Savannah District,* 419-464; and Jeane and Harvey, *Mobile District.*
[7] COL Mark S. Held, *Testimony Before the Committee on Resources Subcommittee on Water and Power, US House of Representatives*, September 27, 2004.
[8] Barber and Gann, *Savannah District*, 434-442; Held, *Testimony*; USACE News Release No. 07-14.
[9] The R. B. Russell project is detailed more thoroughly in Barber and Gann, *Savannah District*, 442-452. Some of the more significant pieces of legislation include the Fish and Wildlife Coordination Act (1958), the National Historic Preservation Act (1966), the Wild and Scenic Rivers Act (1968), National Environmental Policy Act (1969), and the Clean Air Act (1972). As part of the massive mitigation efforts, for example, the Corps conducted large-scale archaeological studies that identified approximately 600 prehistoric sites and 70 historic sites. The Corps also conducted interviews with residents and archival research to assist in preserving the cultural heritage of the area.
[10] The pumped storage process allows for water discharged during conventional hydro operations to be stored in a lower (below dam) reservoir, and then drawn back into the turbines and re-used in generating electricity at peak demand times.
[11] Barber and Gann, *Savannah District*, 442-452. In addition to fish protection issues, the project also raised concerns from local governments because it included a 300-foot setback for private development along the shoreline; however, the Corps responded that "economic development" was not an authorized project purpose and that all Corps lakes completed after 1974 implemented shoreline protection measures.
[12] Barber and Gann, *Savannah District;* Brockington and Associates*, South Atlantic Division*.
[13] For information on cost recovery at Richard B. Russell, see GAO, *Cost Recovery*, 32-34; COL Roger A. Gerber to Charles Borchardt, 30 August 2002 (SEPA archives).
[14] For additional information on West Point, see Barber and Gann, *Savannah District*, 455-463. Although the project was under the jurisdiction of the Mobile District, Savannah District managed the design and construction phases of the project. This was part of a broader Corps effort to balance the workloads of their districts, see Brockington and Associates, Inc., *South Atlantic Division*.
[15] For more on the Walter F. George project, see Jeanne and Harvey, *Mobile District*, 151, 155; for details on the cutoff wall construction, see Donald E. Simpson, Marilyn Phipps, and Arturo L. Ressi di Cervia, "Constructing a Cutoff Wall in Front of Walter F. George Dam in 100 Feet of Water," in *Hydro Review* (March 2006), 2-4.
[16] Obtained from *Florida Memory*, http://floridamemory.com/items/show/57549.
[17] US General Accounting Office, *Testimony. Federal Power: Outages Reduce the Reliability of Hydroelectric Power Plants in the Southeast*. Report GAO/T-RCED-96180, July 25, 1996. Hereafter cited as GAO, *Outages*. Miller's Ferry actually has a total nameplate capacity of 101.4MW (33.8 MW per unit), but operates at 90 MW due to temperature limits.
[18] For more on the Jim Woodruff project, see Jeanne and Harvey, *Mobile District*, 145, 151.
[19] GAO, Outage. Also, John A. McAllister, Jr. to Colonel Michael. F. Thuss, September 19, 1990, RG6400, SEPA Archives.

[20] During the early 1990s, the Corps had a policy of "No New Starts" for Construction General Funding, which compounded the issue of rehabbing many of the projects.
[21] SEPA, *Annual Report,* 2010.
[22] For a complete history of the Kerr and Philpott hydroelectric projects, see Hartzer, *To Great and Useful Purpose*.
[23] For a complete history of the hydroelectric construction projects in the Cumberland System, see Johnson, *Engineers on the Twin Rivers*.
[24] Norwood, *Gift of the Rivers*, 20-24; Johnson, *Engineers on the Twin Rivers*, 181-186.
[25] Norwood, *Gift of the Rivers*, 20-25; Johnson, *Engineers on the Twin Rivers*, 198, 200-231.
[26] SEPA, *Annual Report,* 2010.
[27] For more information on the Stonewall Jackson project, see Johnson, *The Headwaters District;* also Johnson, *Ohio River Division*.
[28] See SEPA, *Annual Report*, 1992; Water Resources Development Act 2000 (Public Law 106–541: Section 547); Rick Moorefield, "Tri-Cities Power Authority Holds Historic Meeting," *The Hinton News*, December 20, 2005; "Flood-control Dams Eyed for Energy Potential," *Associated Press*, December 31, 2008.
[29] US Department of the Interior, US Department of the Army, and US Department of Energy, "Potential Hydroelectric Development at Existing Federal Facilities," May 2007.
30 Southeastern Power Report, December 4, 1992. Found in "Regional Associations: Southeastern Federal Power Group, 1990-1993," RG1262, SEPA Archives.
[31] GAO, *Outages.*
[32] Testimony of Robert W. Claussen on behalf of the Southeastern Federal Power Customers, Inc. to the Committee on Appropriations Subcommittee on Energy and Water Development, March 22, 1994 in RG1262, Regional Associations, Southeastern Federal Power Customers Group, 1993-1997, SEPA Archives.
[33] US General Accounting Office. *Federal Power: Implications of Reduced Maintenance and Repairs of Federal Hydropower Plants*. Report GAO/RCED-99-63, March 1999, hereafter cited as GAO, *Implications*
[34] GAO, *Implications,* 33; also, GAO, *Outages*," 6; also "Testimony of Robert W. Claussen before the House Resources Subcommittee on Water and Power Resources, July 26, 1996," in SEPA Archives, RG5104 (Planning, Programming, and Budgeting: Congressional Briefings."
[35] Congressional Research Service (CRS). *Aging Infrastructure: Dam Safety*. March 25, 2008; also Billington, Jackson, and Melosi, *Large Federal Dams*, 406-407.
[36] CRS, *Aging Infrastructure*. A third dam in the Cumberland System, J. Percy Priest was designated Class II Action. Although the dam had not exhibited signs of immediate problems, its underlying karst foundation is similar to Wolf Creek and Center Hill and has the potential to develop seepage issues in the future (USACE, Nashville District, News Release, February 24, 2009). Also, Brockington and Associates, Inc. *South Atlantic Division*, 167-168.
[37] US Army Corps of Engineers, *Wolf Creek Dam Consensus Report: Engineering Risk and Reliability Analysis*. April 11, 2007.
[38] Ann Paine, "Nashville Could Flood if Far-off Dam Fails," *The Tennessean* (November 2, 2006).
[39] According to the Corps, the Major Rehabilitation Program allows "accomplishment of significant, costly, one-time structural rehabilitation or major replacement work" (e.g., cutoff wall). For design deficiencies, the Dam Safety Assurance Program provides for "modification of completed Corps of Engineers dam projects which are potential safety hazards in light of current engineering standards and criteria." See US Army Corps of Engineers Pamphlet No.1110-2-13, "Dam Safety Preparedness." Also, SEPA News Release, "Southeastern Power Administration Prepares Preliminary Estimates on Rate Increase," January 7, 2010.
[40] Al Pless, "Alternative to Federal Appropriations: Federal Hydropower Rehab in the Southeast," in *Proceedings of the 2005 Georgia Water Resources Conference, April 25-27, 2005*, Institute of Ecology, The University of Georgia, Athens.

[41] South Atlantic Division Corps of Engineers, Memorandum: "Hydropower Customer Funding – Draft Memorandum of Agreement," September 10, 1997, SEPA Archives; Department of the Army, Office of General Counsel, Memorandum: "Authority to Implement and Accept Contributions Towards Work on Hydropower Facilities," July 3, 1996; Department of the Army, Office of General Counsel, Memorandum: "Authority to Accept Contributions Towards Replacements and Rehabilitations on Hydropower Facilities," July 7, 1997. SEPA Archives.

[42] Pless, "Alternative to Federal Appropriations."

[43] "Memorandum of Agreement Between the United States Department of the Army, the United States Department of Energy and Southeastern Power LLC Representing Certain of the Preference Customers Served by the Southeastern Power Administration," December 2, 2004, SEPA Archives.

[44] In the Cumberland System, an MOA was developed between the Corps' Lakes and Rivers Division, SEPA, and the preference customers. A parallel MOA was also developed between SEPA, the customers, and the Corps' South Atlantic Division, to cover customer-funding for the Georgia-Alabama-South Carolina System, the Kerr-Philpot system, and the Jim Woodruff System.

[45] James F. Sadler, "Financing: Partnering to Rehabilitate Federal Hydro Plants Using Non-Federal Funding," *Hydro World*, September 1, 2011.

[46] Jourolmon phone interview, 2012; In the Cumberland System, this is called the Project Coordination Committee; for the projects operated by the South Atlantic Division, it is called the Project Review Committee.

[47] Brockington, *South Atlantic Division;* also Prince interview.

[48] US Army Corps of Engineers Institute for Water Resources, "Outlook for the US Army Corps of Engineers Hydropower Program," November 2010 (revised March 21, 2011), 9. As noted in the Corps' "Outlook" report, hydropower facilities are not the only federal infrastructure assets to suffer from underinvestment. Other public works needing reinvestment include transportation, education, water, recreation and sanitation.

THE CUMBERLAND SYSTEM

Laurel River Dam on the Laurel River in Kentucky was completed in 1974. Production of hydropower began in 1977.

Wolf Creek Dam on the Cumberland River in Kentucky began hydropower production in 1951.

THE CUMBERLAND SYSTEM

Located on the Obey River along the borders of Kentucky and Tennessee, Dale Hollow Dam began hydropower production in 1948.

Cordell Hull Lock and Dam on the Cumberland River in Tennessee, was completed in 1972.

THE CUMBERLAND SYSTEM

Completed in 1948, Center Hill Dam impounds the Caney Fork and the Falling Water River in Middle Tennessee.

Located on the Cumberland River in Tennessee, Old Hickory Lock and Dam was completed in 1954 with the first hydropower produced in 1957.

THE CUMBERLAND SYSTEM

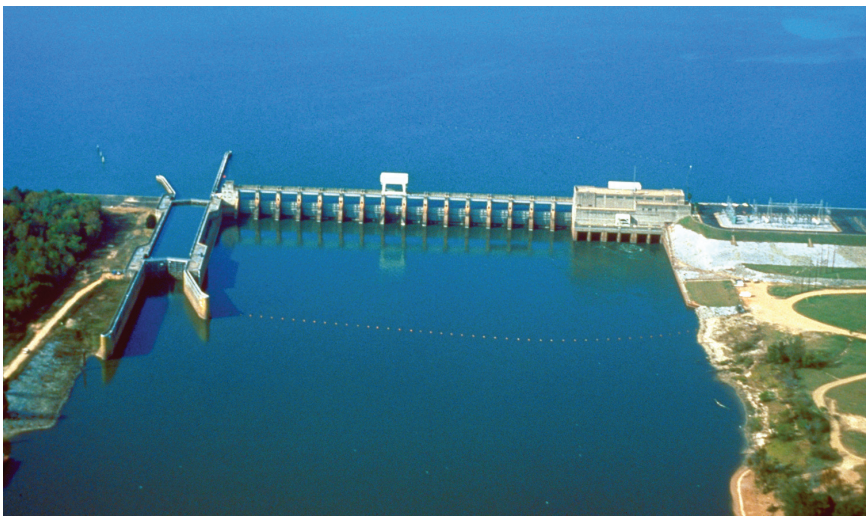
J. Percy Priest Dam on the Stones River in Tennessee was completed in 1968.

Cheatham Lock and Dam, a run-of the river plant located on the Cumberland River in Tennessee went into full commercial operation in 1960.

THE CUMBERLAND SYSTEM

Located on the Cumberland River in Kentucky, Barkely Lock and Dam began hydropower operation in 1966.

JIM WOODRUFF SYSTEM



Jim Woodruff Lock and Dam holds back the waters of the Chattahoochee and Flint rivers along the Georgia-Florida border. The power plant came online in 1957.

GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM

Carters Dam and Lake, on the Coosawattee River in North Georgia, was completed in 1977.

Located on the Etowah River in North Georgia, the Allatoona power plant began operation in 1950.

GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM

Completed in 1975, the run-of-the-river Robert F. Henry Dam is located on the Alabama River.

The Miller's Ferry Project began producing hydropower in 1970.

GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM

Buford Dam, impounding the Chattahoochee River in North Georgia, was completed in 1956.

Located on the Chattahoochee River, the West Point Dam power plant came online in 1975.

GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM

Walter F. George Lock and Dam impounds the Chattahoochee River along the Georgia-Alabama border; it began producing hydropower in 1963.

The Hartwell Project on the Savannah River began commercial operation in 1962.

GEORGIA-ALABAMA-SOUTH CAROLINA SYSTEM

Impounding the Savannah River, the Richard B. Russell Project began operation of its conventional hydro units in 1986, but litigation postposed use of the reversible units until 2002.

Originally known as Clarks Hill Dam and Lake and renamed in 1988, the J. Strom Thurmond Project on the Savannah River, began commercial operation in 1954.

KERR-PHILPOTT SYSTEM

The Philpott Project is located on the Smith River in Virginia; it began producing hydroelectricity in 1953.

The John H. Kerr Project is located on the Roanoke River in Virginia; it was completed in 1953.

THE WAR *Over* WATER

Balancing the Demands of a Limited Resource

Eventually, all things merge into one, and a river runs through it.
NORMAN MACLEAN

During the 1980s, two separate drought periods in the Southeast resulted in reduced power generation at the US Army Corps of Engineers' dams. Those droughts, while severe, highlighted an issue that emerged in subsequent and more devastating droughts between 1990 and 2010. Hydropower is not the only product demanded of Corps projects. Water supply, flood control and navigation also vie for a certain percentage of each project. In addition, the lakes have become popular destinations for recreational activities, such as boating, fishing, hiking, swimming, secondary homes and resorts.[1] These "competing uses" of a single natural resource represent one of the great challenges faced by SEPA during the last two decades.

For federal hydropower production in the Southeast, SEPA must insure its contractual obligations to customers. Drought conditions limit the inflow into the reservoirs, increase the amount of evaporation, and can have a detrimental effect on the ability to produce hydroelectricity at peaking hours when it is needed most. When that happens, SEPA must purchase replacement power, the added costs of which are rolled into the customers' electrical rates. All Corps-managed reservoir projects have varying authorized uses and have been subjected to increasing demands resulting from population growth and environmental issues not fully understood when the projects were constructed during the mid-twentieth century. Populations require water for consumption, and recreational users desire full lake levels for docks and other activities. When droughts occur and lake levels drop, controversies often erupt over the prioritization of each use. Discharges for hydropower, or even for downstream water quality or habitat requirements, are often seen as wasteful releases. The most illustrative example of competing uses is that of the so-called "Water Wars" between the states of Georgia, Alabama, and Florida. Because of the complexity of issues involved, the water wars are at once a fascinating and troubling study of balancing the demands of limited resource.

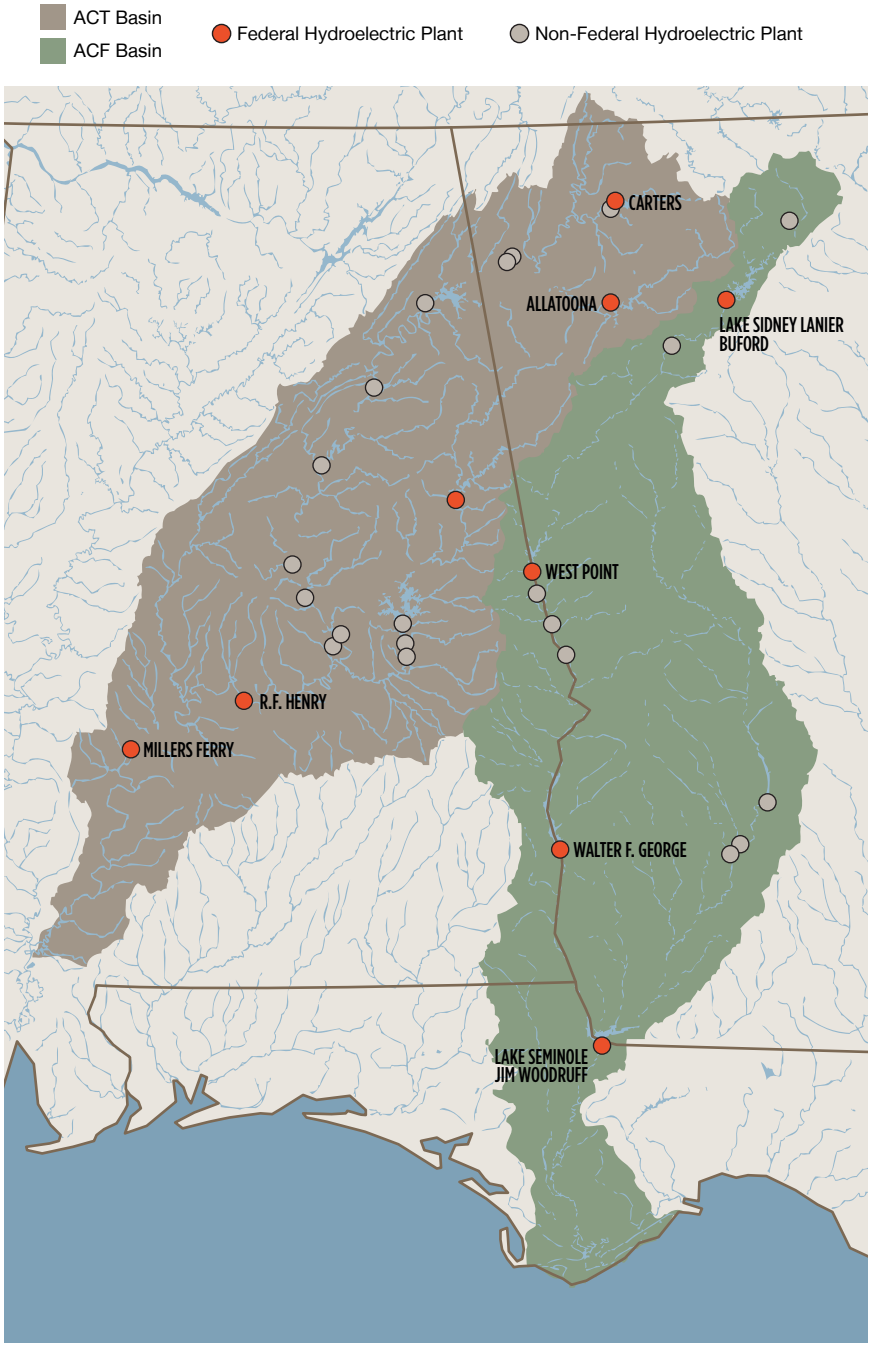
Left: A young trout angler tries his luck downstream of Hartwell. SEPA customers depend on Corps lakes for energy storage, but are in competition with various other competing uses. As the population grows, the war over water will likely continue (Corps photo).

THE ACT-ACF BASINS: DIVERSITY AND DEMAND

To understand the water wars controversy, it is necessary to understand those river systems that have been captured in this social, political, and ecological tug of war for over twenty years.[2] First, the Apalachicola, Chattahoochee, and Flint rivers form what is called the ACF basin. Each river has a very distinct watershed and each is represented by different urban, agricultural and ecological constituents. The Chattahoochee River stems from the Appalachian Mountains and ultimately deposits into Lake Seminole at the junction of Georgia, Florida and Alabama. On its journey, the river traverses metropolitan Atlanta, home to nearly five million residents, and serves as the geographical boundary between Georgia and Alabama. The majority of the river is impounded, with thirteen reservoirs in all, three of which support hydropower projects owned by the Corps of Engineers and, thus, provide power to SEPA preference customers. These projects include Buford, West Point, and Walter F. George.

The Flint River originates south of Atlanta, near Hartsfield-Jackson International Airport, and flows through and supports the prime agricultural land in southwest Georgia. It is fed by two creeks, Kinchafoonee and Ichawaynochaway, as well as a system of underground aquifers. Unlike the Chattahoochee, the Flint runs largely unimpeded, with only Lake Blackshear between the headwaters and its terminus at Lake Seminole.[3]

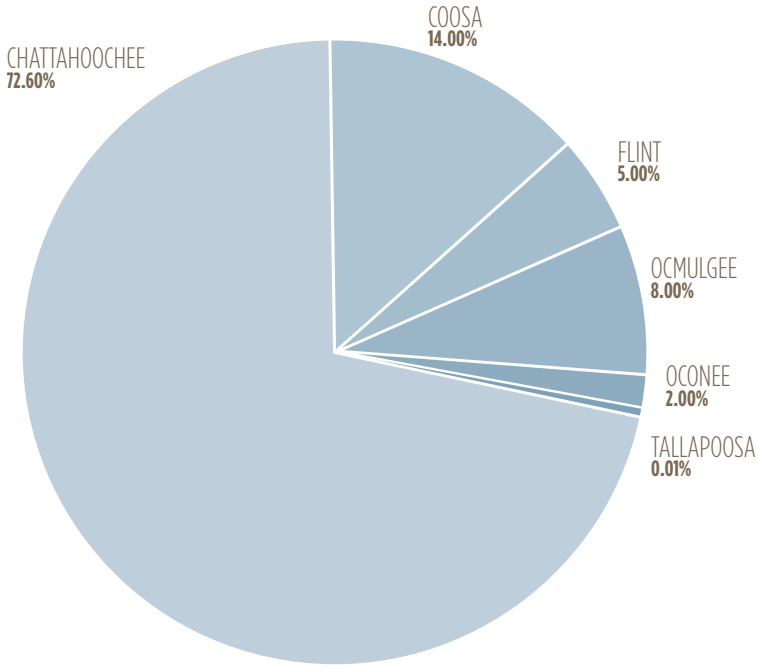
During periods of drought, battle lines are often drawn over competing uses of water at the multi-purpose Corps projects (Corps photo).



For over two decades, the ACT/ACF basins have been the central focus of the Tri-State Water Wars.

Formed by the Flint and Chattahoochee rivers at Lake Seminole, the Apalachicola River and its estuary are home to one of the most delicate and biologically diverse ecosystems in the United States. Although altered by Corps dredging to retain navigational channels, the Apalachicola River is largely protected by conservation and low population density. More than ten percent of the nation's oysters originate in Apalachicola Bay, and it serves as the habitat for numerous endangered species. This habitat requires a delicate balance between the river's freshwater origins and the saltwater of the Gulf of Mexico. At the lower end of Lake Seminole, the Corps operates the Jim Woodruff hydroelectric project.

The second river system at the heart of the water wars is the Alabama-Coosa-Tallapoosa, or ACT, basin.[4] The ACT basin drains approximately 22,820 square miles in portions of Tennessee, northwest Georgia, and Alabama. The Coosa and Tallapoosa rivers form in northwest Georgia and include two major tributaries, the Coosawattee River and the Etowah River. The Coosa and Tallapoosa merge near Montgomery, Alabama to form the Alabama River, which deposits into the Gulf of Mexico near Mobile. There are 18 dams in the basin, 6 federal and 12 non-federal. The reservoirs impounded by those dams serve a variety of purposes, including navigation, hydropower, flood control, water supply, and recreation. Four of the federal dams



The Chattahoochee River supplies the majority of water for the Metro Atlanta District (adapted from Atlanta Regional Commission findings).

support the production of hydroelectricity that is marketed by SEPA. These include Carters on the Coosawattee River and Allatoona on the Etowah River in Georgia, and Millers Ferry and R. F. Henry on the Alabama River between Montgomery and Mobile. Like the ACF basin, the headwaters of the ACT, including Carters Lake and Lake Allatoona, provides part of the the water supply for the metropolitan areas northwest of Atlanta. Downstream, the Alabama River supports a substantial agricultural economy, navigation, industry, and a delicate ecosystem.[5]

Since 1950, the city of Atlanta grew to become the economic and population center of the South. With nearly five million metropolitan residents today, the city's water demands have outstripped the available supply. Originating as a railroad hub, Atlanta is one of the few major cities in the United States without the benefit of a large body of flowing water or an aquifer to support its needs. Part of the city's problem is simple geography. Situated along a ridgeline at the foothills of the Appalachian Mountains, Atlanta is located near the headwaters of two watersheds. Water west of the city flows towards the Gulf of Mexico and water east of the city deposits into the Atlantic Ocean. Thus, the Chattahoochee River, with its relatively small drainage basin, is the only substantial water source near Atlanta. At present, the river meets three-fourths of the city's water-supply demands and is also the recipient of sewage discharges and storm water runoff. This puts a tremendous strain on the river system and affects all downstream users.[6]

Officials gather for ground-breaking ceremonies of Buford Dam on March 1, 1950. Because of its relatively small drainage basin and demands of downstream water consumers, Lake Lanier has been at the forefront of the Tri-State Water Wars (Corps photo).

"THERE ARE NO EASY SOLUTIONS, ONLY TOUGH DECISIONS"

Water flows pay no attention to political boundaries, but the rights to those flows become politically contentious and the sources of litigation. When it was authorized and constructed, the Buford Dam impoundment (named Lake Lanier) was not anticipated to be a source for water-supply withdrawals, except for the cities of Gainesville and Buford. While the idea of using the reservoir for Atlanta's water-supply needs was bandied about at the time Mayor William B. Hartsfield scoffed at the idea of contributing to the project's construction costs. "In view of other possible sources of Atlanta's future water," he wrote, "we should not be asked to contribute to a dam which the Army Engineers have said is vitally necessary for navigation and flood control on the balance of the river." Ultimately, with the lack of participation from Atlanta, Buford Dam's primary authorized purposes were hydroelectric power, navigation, and flood control. As the city of Atlanta continued to grow over the next few decades, however, the Corps began to negotiate temporary contracts to allow water-supply withdrawals from metropolitan communities, particularly in times of drought.[7]

In the early 1970s, the Corps initiated a study of Atlanta's water resources. Published in 1981, the Metropolitan Atlanta Area Water Resources Management Study (MAAWRMS) evaluated three long-range water supply alternatives, including the construction of a re-regulation dam six miles below Buford Dam, the reallocation of the storage supply at Lake Lanier, or dredging the downstream Bull Sluice Lake at Georgia Power's Morgan Falls Dam. At the time of the study's publication, Lake Lanier provided more than 90 percent of metropolitan Atlanta's water supply, a drastic departure from the original authorized uses. Of particular note, the City of Atlanta had not contributed to the original project costs. That burden lay with federal hydropower customers, who through their purchases of electricity, bore "the lion's share of the costs," more than $44 million by 1981.

The study was published just as the ACF basin was experiencing a severe drought. Lake levels dropped and limited the amount of water available for all users, including hydropower. SEPA purchased replacement power for its customers and metropolitan communities began requesting temporary water-supply arrangements with the Corps. These competing uses strained the available supply at Lake Lanier and, as a result, Congress and the Corps considered the MAAWRMS re-regulation dam option. As planned, the downstream re-regulation dam would capture peak hydroelectric power discharges from Buford Dam on the weekends and then release them uniformly during the week. Congress authorized the study and construction of the dam in the 1986 Water Resources Development Act (WRDA). In 1988, however, the Corps abruptly abandoned the new re-regulation dam in favor of studying the reallocation of water storage. The Corps determined that a re-regulation dam was not economically feasible and that reallocating 20 percent of the water stored for hydropower (300,000 cubic feet) to a water-supply role would adequately supply the region's needs for the next twenty years.[8]

This decision came at a critical moment for SEPA customers, who throughout the droughts of 1981 and 1986 had to absorb the cost of replacement power supply. The customers were concerned that their authorized purposes were being consistently and unjustly usurped by unauthorized purposes. For example, in late 1987, when studies anticipated a prolonged drought the following year, the Corps began preemptively withholding discharges. One group of preference customers affected, represented by the Southeastern Power Resources Committee, expressed its concerns to SEPA:

> *It is from our efforts that these projects were built in the first place. Because of our hard fought efforts, multi-purpose projects have been constructed providing water and producing much needed hydroelectricity. Over the years, we have been paying the majority of the costs associated with the ownership, operation and maintenance costs of these multi-purpose projects.*[9]

The Corps' position was that contractual obligations were an important component of the water allocation equation, but it was not the only demand being brought upon the dwindling water supply of the late 1980s. Water supply, water quality, fish and wildlife and recreation were putting increased pressure on the systems and the Corps recognized the importance of other uses. In testimony before Congress in 1988, the Corps' South Atlantic Division admitted, "We believe, as good stewards, we are obligated to protect all users as much as possible. During such [droughts], we must weigh and balance the public interest among these multiple purposes. There are no easy solutions, only tough decisions."[10]

COST ALLOCATION BY PROJECT FUNCTIONS AS OF SEPTEMBER 30, 1988[11]

Project	Total	Power	Navigation	Flood Control	Fish and Wildlife	Recreation	Other
Allatoona	$48,002,055	62.53%		18.40%		18.58%	0.48%
Buford	$67,318,112	72.02%	3.17%	7.06%		17.75%	
Carters	$129,974,401	84.25%		10.42%		5.33%	
J. S. Thurmond	$953,636,908	83.15%	4.73%	4.36%		7.75%	
W. F. George	$128,627,191	53.83%	40.35%		27.00%	5.55%	
Hartwell	$132,021,596	89.29%	2.42%	3.06%		5.22%	
R. F. Henry	$89,552,289	26.36%		13.07%			
Millers Ferry	$73,482,027	53.26%	41.28%		5.36%		
West Point	$150,471,623	38.69%	1.74%	13.24%	10.76%	35.57%	
R. B. Russell	$536,741,719	97.31%		30.00%		2.39%	
Total	**$1,451,827,931**	**77.73%**	**8.15%**	**3.92%**	**1.14%**	**9.04%**	**2.00%**

There is a finite quantity of water. When you have good water years there is no problem, but when you have droughts, there are certain priorities.

Jim Lloyd, SEPA Power Resources

The 1988 decision to reallocate a full 20 percent of water-storage for non-authorized purposes, cast in the middle of yet another severe drought, alarmed federal power customers who were already paying additional costs for replacement power. Between January and May 1988, the ten projects in the Georgia-Alabama-South Carolina System generated approximately 60 percent less power than what would have been produced in an average water year for those same months. For calendar year 1988, SEPA estimated the purchase of between approximately $14 and $16 million in replacement power costs.[12] In 1989, the Atlanta Regional Commission negotiated with SEPA to compensate federal power customers for lost revenues that would result from the Lake Lanier reallocation proposal.

THE WAR GOES TO COURT: TRI-STATE WATER RIGHTS LITIGATION

As the struggle over the ACT/ACF water storage began, SEPA and the Corps' South Atlantic Division developed an important framework for their partnership. When he arrived at SEPA in 1989, Administrator John McAllister recognized the broken dynamic between the agency, the Corps and the preference customers. As discussed in Chapter 2, McAllister established a goal of improving those relationships. Beginning in 1990, he began fostering an improved partnership through the Southeastern Federal Power Alliance. Through that new partnership, the three entities developed an MOU, signed on June 20, 1991, that clarified the agencies' respective roles in the management of water resources for hydropower. SAD Commander Major General John Sobke remarked, "Recent droughts have highlighted conflicts among the projects' purposes and caused strain among the various users. We're hopeful this agreement will ease those strains when we face such tough times in the future."[13]

SEPA customers praised the framework as a positive step. One wrote, "We congratulate you on the successful negotiation of this document which we believe will provide a sound basis of understanding between the parties and will be beneficial to us as preference customers of SEPA. The hard work you and others have put forth in addressing relationships…is much appreciated." The refreshed partnership between the agencies was crucial to participation in later summit meetings with the ACT/ACF stakeholders to discuss the water allocation options development by the various states. As Harold Jones recalled, "some of those meetings were pretty lively."[14]

The so-called "Water Wars" began in earnest in 1989. Just days after the Georgia Department of Natural Resources and the West Georgia Regional Water Authority proposed a new reservoir on the Tallapoosa River near the Alabama state line, the

state of Alabama filed suit against the Corps to prevent Atlanta from withdrawing additional water from the Chattahoochee River. Because of the delicate ecology of the downstream Apalachicola River, Florida joined the suit with Alabama. Georgia sided with the Corps, believing that it had a sovereign right to manage those portions of the river systems that lay within its borders. In 1991, Alabama agreed to allow additional withdrawals from Carters Lake and Lake Allatoona if Georgia would not pursue its proposed reservoir on the Tallapoosa River. During the following year, 1992, the three states developed an MOA stipulating a Joint Comprehensive Study of the two river basins. The agreement was designed as a truce until compact agreements, including a reallocation formula, could be developed for the ACT and ACF basins.[15]

Because water reallocation constituted a major operational change, the Corps was required to conduct detailed analyses under NEPA. As the lead federal agency, the Corps' Mobile District initiated Environmental Impact Statements (EIS) for water allocation alternatives for both the ACT and ACF. The purpose of the EIS was to assist the Corps in their future decision making for the basins' water allocation and also to assist the numerous federal agencies involved with their own specific management programs within the basins. For the ACT/ACF Water Allocation EISs, SEPA was one of ten federal agencies participating in the process.[16] In reviewing the EIS documents, SEPA was responsible for focusing on water quantity available for hydropower under the document's various management scenarios, including high, moderate, and low flow conditions. The reports detailed average annual

During the drought of the late 1990s, lake levels throughout the Southeast receded again. This image of J. Strom Thurmond Lake in the Savannah River Basin poignantly illustrates the water as a finite resource (Corps photo).

energy production, energy loss and direct financial impacts under each of the three flow conditions. In consideration of possible reductions in federal power supply, SEPA also proactively opened negotiations with private utility operators, including Southern Company, to establish contract provisions for its customers associated with the Georgia-Alabama-South Carolina system of projects.[17]

Ultimately, the compact negotiations, originally to be resolved by 1998, stymied between the three states, and deadlines were extended more than a dozen times. By 2000, Georgia and Alabama agreed to a water sharing formula for the ACT basin that would allow for eventual construction of the proposed West Georgia Regional Reservoir. In the ACF basin compact, though, Florida refused to accept the proposed minimum flows, and Georgia balked at Florida's proposed limitations for irrigation by Georgia agricultural interests. On August 31, 2003, the compact expired and the impasse resulted in a web of lawsuits.

Between 1998 and 2002, as compact negotiations reached a critical stage, parts of Georgia experienced four more years of drought, including extreme low flows on the Flint River. As during the 1980s, Georgia petitioned the Corps to allow additional releases for water supply from Lake Lanier, which had fallen to record lows. A group of federal power customers, Southeastern Federal Power Customers, Inc. (SeFPC) responded with a 2000 lawsuit in the District of Columbia charging that because the Corps was improperly allocating water to unauthorized uses, federal power customers were paying disproportionately more for their share of the overall project costs. When the Corps denied Georgia's initial reallocation request in 2001, Georgia filed suit against the Corps and, ultimately, additional lawsuits and appeals were filed. In January 2003, the SeFPC, the Corps, and the Georgia water supply parties negotiated a temporary water allocation settlement. The settlement allocated 240,858 acre-feet (estimated as 22 percent of conservation storage) to water supply and allowed for once-renewable 10-year interim contracts. If approved by Congress, the water supply contracts could be converted into permanent storage. To satisfy the power customers, Georgia agreed to higher rates for water withdrawals, with the income applied as a "credit" against the hydropower rates. According to the agreement, SEPA, not the Corps, "would be responsible for determining the amount of credit" reflected in the hydropower rates and that "the Army [would] defer to SEPA's determination of credits."[18]

Alabama and Florida immediately filed an injunction to prevent implementation of the agreement, which was followed by subsequent appeals. In 2008, the D.C. Court of Appeals reversed a lower court's decision, and invalidated the agreement on the basis that under the Water Supply Act, the Corps cannot make operational changes to its projects without prior study and Congressional approval. According to the Court, reallocating Lake Lanier's storage capacity represented a major operational change.

Another set of lawsuits resulted from the Corps' 2006 Interim Operations Plan (IOP) that used a "sliding scale" for its water releases, which were designed to protect endangered species in the Apalachicola River. Faced with another drought in 2006, Georgia responded that the IOP failed to consider extreme drought situations. Florida,

also disappointed with the IOP, sought an injunction based on the contention that implementation of the IOP's decreased flow would threaten endangered species. Eventually, in March 2007, the Judicial Panel on Multidistrict Litigation transferred all of the ACF cases to the Middle District of Florida for final adjudication.[19]

The Tri-State Water Rights Litigation was assigned to Judge Paul A. Magnuson of Minnesota, who had served as the presiding judge in cases involving water rights along the Missouri River. Judge Magnuson determined that the central question of the suits was whether Atlanta had a right to depend on Lake Lanier for its water supply. In July 2009, the Court ruled that water supply was not an authorized use of the reservoir. The Court also established a three-year time limit for the Corps to return its operation to "baseline operations" of the mid-1970s, specifically 600 cubic feet per second (cfs) for off-peak flow.[20]

In June 2011, however, the 11th Circuit Court of Appeals reversed the Magnuson ruling, and declared that water supply was indeed an authorized use of Lake Lanier. The 11th Circuit Court remanded the case back to district court and vacated the three-year deadline. Specifically, the ruling allowed the Corps to "accommodate net withdrawals of 190 million gallons per day annually from Lake Lanier, and to ensure flows of at least 1381cfs downstream at Atlanta." In a June 2012 legal opinion, US Army Corps of Engineers Chief Counsel Earl H. Stockdale determined while the courts have established legal authority for allowing downstream water withdrawals, "it does not in any manner indicate the Corps must, should, or will exercise [that] discretion to…meet that request." Similarly, any credit "that might be afforded to the hydropower purpose for the projects would be a function of operations that the Corps may choose to adopt, and electricity rates that [SEPA] in its discretion may establish."

During the drought of 2006–2008, the shoreline of Lake Lanier receded to record levels (Corps photo).

Once again, in 2012, the Corps began the process of updating its water operating manual based on the affirmed allocation allowances.[21]

SEPA will continue to provide voice to the customers' concerns over allocations that have the potential to effect contractual obligations of power. The Magnuson ruling, while reversed on legal grounds, highlighted critical water management issues that will continue to loom over the region. He also criticized local governments for allowing unchecked growth and local citizens with poor resource conservation. "The problems faced in the ACF basin," he wrote, "will continue to be repeated throughout this country, as the population grows more and undeveloped land is developed. Only by cooperating, planning and conserving can we avoid the situations that gave rise to this litigation."[22]

DROUGHT AND THE IMPACT ON SEPA

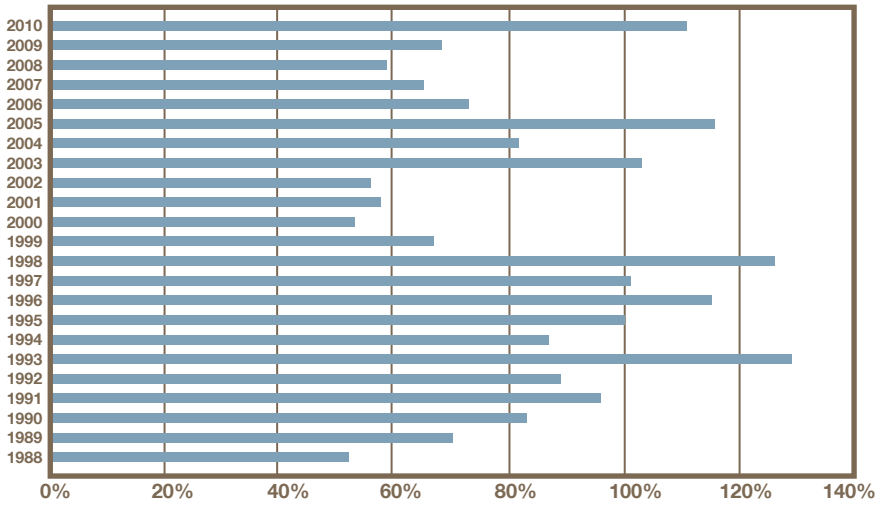
As the compact negotiations continued, Corps projects in the Southeast faced droughts as severe as those in the 1980s. Rainfall for the region fell below normal in the spring of 1998 and dry conditions continued through 2002. SEPA began purchasing replacement power for its systems in May 1999. The Georgia-Alabama-South Carolina system was the hardest hit. Generation in FY 1999 represented 67 percent of average annual generation and SEPA purchased 28,989 MWh of replacement energy to meet contractual obligations. This was a dramatic departure from FY 1998, when power production in the same system was above average and no replacement power was purchased. In FY 2000, the same system's generation was 53 percent of average (195,705 MWh purchased replacement energy); in FY 2001, 58 percent of average generation (309,434 MWh purchased); and in FY 2002, 56 percent of average generation (400,860 MWh purchased). Low flow conditions during this drought period also reduced generation in the Cumberland and Jim Woodruff systems, although Jim Woodruff experienced compounding reductions due to major rehabilitation projects.[23]

From 2006 to 2008, the Southeast experienced another prolonged period of unprecedented dry conditions. According to the US Department of Agriculture (USDA) Drought Monitor, during 2007-2008, significant portions of Georgia, Alabama, South Carolina and North Carolina were in "exceptional drought" conditions. Lake levels fell dangerously low for power generation and water-supply withdrawals. For example, the two main generating units at Buford Dam can operate with a pool level minimum of 1035 feet. In November 2007, the water pool level at Lake Lanier dropped to 1055 feet. At Walter F. George, the situation was even more precarious. There, the units can operate at a pool level of 184 feet and by November 2007 the lake had dropped to 185.25 feet.[24]

In 2007, with no anticipation of significant rainfall, the Corps' Mobile District issued a statement that "these lakes must meet a lot of needs and, under the current drought conditions it will not be possible to meet all of them completely. It now becomes a balancing act." SEPA worked with Mobile District, Savannah District, and other Corps partners to reduce demands for hydropower "while the drought persists." In the ACT/ACF basin, because the Corps operates several dams, the "temptation to blame [the

GENERATION AS PERCENTAGE OF AVERAGE, GA-AL-SC SYSTEM, 1988-2010

(Numbers include reduced generation from drought as well as unit outages; numbers also include generation from pump units at Carters and Russell).



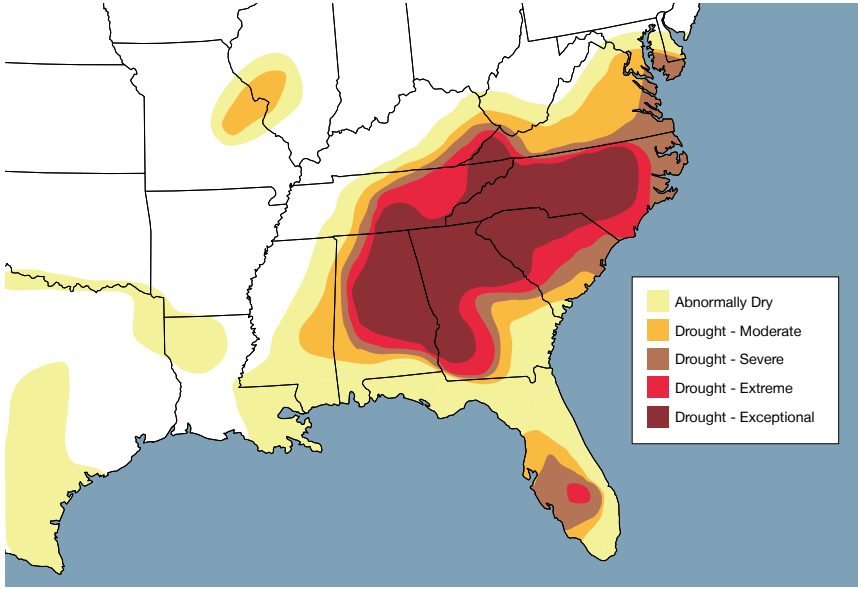
agency] is strong." As the lake pool levels in the ACT/ACF basin dropped in 2007 and 2008, water releases at Corps dams, even if required for downstream ecological support, made news headlines of "man versus mussels." At Lake Hartwell in 2008, a portion of the old paved US Highway 29, submerged when the Corps impounded the area during the 1950s, was exposed in the dry lakebed. Opponents to discharges during the drought conditions suggested a gradual release of the water over a longer period, but gradual releases do not meet federal power customer requirements for peak electrical loads. Electricity, unlike water, cannot be stored for later use.[25]

During the 2006-2008 drought, power generation for the Georgia-Alabama-South Carolina system was well below average. The system operated at 73 percent of the average in FY 2006, 65 percent in 2007, and 59 percent in 2008. Generation rebounded to 68 percent by FY 2009. While some projects, such as Walter F. George, were also undergoing major rehabilitation work during this period and would have operated below average even in a normal water year, the numbers generally reflect the extreme drought conditions. Because of the lowered generation during 2006-2008, SEPA activated its continuing (emergency) fund to purchase replacement power. SEPA recovers continuing (emergency) fund purchases by passing costs through to the customers in the month immediately following the purchase, which improves cash flow to the Federal Treasury. In FY 2006, SEPA used its continuing (emergency) fund to finance $9.9 million in drought-related power purchases. In FY 2008, SEPA purchased drought-related replacement power in the amount of $44 million to meet contractual obligations.[26]

Despite the fact that these droughts occurred amidst the water wars controversy, SEPA and its customers benefited from the open relationships forged during the early 1990s. In

their regular meetings, SEPA, the Corps and the customers engaged in open and frank discussions related to water quantity, power generation, and the integration of the hydro projects. Former SEPA Administrator Jon Worthington explained, "We operate the river *system* and on the river there are multiple dams and you cannot just operate one of those dams in the middle of the system independently of the rest of the system." During drought years, he noted, it is important that SEPA and the Corps speak as one voice in regard to operating the system and the contractual obligations for hydropower. In recent years, if below normal rainfall is anticipated for the upcoming year, proactive agreements have been reached to purchase power on the open market earlier in the year when rates are lower. This helps to conserve the lake levels and store the water for power production later in the summer when peak power is more expensive.[27]

At present, the Corps is preparing an updated water control manual for the ACT and ACF basins. As with earlier studies, each is evaluated through the NEPA process for detailed environmental analysis, with input from many stakeholders, including SEPA and the federal power customers. SEPA's position remains the same, that any operational changes negatively affecting the production of hydropower should be accompanied by fair and proportionate compensation to the federal power customer. The hydropower costs account for a high percentage of the total project costs, which must be repaid to the US Treasury. As for the customers, the power generated at federal dams represents a small, yet important component of their electrical supply. Further, peaking power is expensive to procure on the open market. SEPA's customers are acutely aware that the needs of the basin have to be balanced and they are willing to consider changes as long as those changes do not negate the originally authorized project purposes and that they are compensated for their losses.[28]



In 2007, portions of the Southeast suffered from "exceptional drought" (map based on USDA data).

ENDNOTES

[1] As noted in Chapter 1, the Clarks Hill project, constructed between 1946 and 1954, was the first Corps project in the Southeast authorized for recreation. For more information on the increasing role of recreation in authorized projects, see Barber and Gann, *Savannah District*, 428-430; Jeane and Harvey, *Mobile District*, 157-158; also, interview with Harold Jones (SEPA-Retired) by Patricia Stallings, March 4, 2010.

[2] For summary information on the water wars and the respective basins involved, see Jonathan Watts Hull, "The War over Water," Prepared for the Council of State Governments, Southern Legislative Conference (October 2000); J. B. Ruhl, "Water Wars, Eastern Style: Divvying up the Apalachicola-Chattahoochee-Flint River Basin." Paper presented at the Universities Council on Water Resources Conference, July 2004. For more detailed information on each basin, see US Army Corps of Engineers, *Draft Environmental Impact Statement: Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin, Alabama and Georgia, Main Report*. Prepared by the US Army Corps of Engineers, Mobile District, September 1998. Available online at http://www.sam.usace.army.mil/pd/actacfeis/actmain.pdf (hereafter cited as USACE, *Draft EIS: ACT*); US Army Corps of Engineers, *Draft Environmental Impact Statement: Water Allocation for the Apalachicola-Chattahoochee-Flint (ACF) River Basin, Alabama and Georgia, Main Report*. Prepared by the US Army Corps of Engineers, Mobile District, September 1998. Available online at http://www.sam.usace.army.mil/pd/acftacfeis/acfmain.pdf (hereafter cited as USACE, *Draft EIS: ACF*).

[3] Completed in 1930, the Lake Blackshear project was designed to provide hydropower for the citizens of Crisp County, Georgia. It remains one of the very few county-owned hydroelectric facilities in the United States.

[4] The ACT discussion is adapted from USACE, *Draft EIS: ACT*.

[5] Hull, "The War over Water," 2.

[6] Alyssa S. Lathrop, "A Tale of Three States: Equitable Apportionment of the Apalachicola-Chattahoochee-Flint River Basin," 36 *Florida State University Law Review* (2009): 865-902.

[7] This historical discussion on allocated costs and project authorization is largely derived from the 2009 US District Court (Middle District of Florida) decision of Judge Paul A. Magnuson, *Memorandum and Order, Tri-State Water Rights Litigation*, No. 3:07-MD-1-PAM (M.D. Fla. 2009). For Hartsfield quote, see *Memorandum and Order, Tri-State Water Rights Litigation,* 13. For a general history of the construction of Buford Dam, see Lori I. Coleman, "Our Whole Future is Bound up in this Project: The Making of Buford Dam," (Georgia State University, Master's Thesis, 2008). Available online at http://digitalarchive.gsu.edu/history_theses/30.

[8] For a discussion on the re-regulation dam, see *Memorandum and Order, Tri-State Water Rights Litigation*, p. 41-45; also,

[9] Letter from F. F. Stacy, President of the Southeastern Power Resources Committee to SEPA Administrator Harry C. Geisinger, December 1987 (Program Coordination and Evaluation: Drought Management, 1986-1988, RG 5020, SEPA Archives).

[10] Testimony of US Army Corps, South Atlantic Division, Division Engineer Major General C. Earnest Edgar, March 2, 1988, (Program Coordination and Evaluation: Drought Management, 1986-1988, RG 5020, SEPA Archives).

[11] From SEPA, *Annual Report*, 1988.

[12] Memorandum from SEPA Administrator Harry C. Geisinger, June 13, 1988 (Program Coordination and Evaluation: Drought Management, 1986-1988, RG 5020, SEPA Archives).

[13] Memorandum of Understanding Between the US Army Corps of Engineers, South Atlantic Division and the Southeastern Power Administration, June 20, 1991 (on file, SEPA archives).

[14] SEPA, *Powerline Newsletter*, Spring 1992; Letter from Talquin Electric Cooperative, Inc. to John A. McAllister, July 30, 1991; Harold Jones interview.

[15] For legal studies of the tri-state water wars, see Joseph W. Dellapenna, "Interstate Struggles over Rivers: The Southeastern States and the Struggle over the 'Hooch," *New York University Environmental Law Journal* 12 (2005): 828-900; Douglas L. Grant, "Interstate Allocation of Rivers Before the United States Supreme Court: The Apalachicola-Chattahoochee-Flint River System," 21 *Georgia State Law Review* (2004):401-427; Charles T. DuMars and David Seeley, "The Failure of the Apalachicola-Chattahoochee-Flint River Basin and the Alabama-Coosa-Tallapoosa River Basin Compacts and a Guide to the Successful Establishment of Interstate Water Compacts," 21 *Georgia State University Law Review* (2004): 373-400; Alyssa S. Lathrop, "A Tale of Three States: Equitable Apportionment of the Apalachicola-Chattahoochee-Flint River Basin," 36 *Florida State University Law Review* (2009): 865-902.

Additional information on the Water Wars was gleaned through interviews with SEPA's Chief Counsel, Denver L. Rampey, February 25, 2010; Jim Lloyd, March 4, 2010; Herb Nadler, March 4, 2010; Neil Purcell (SAD, prepared parallel to this SEPA history); also Jones interview.

[16] For the ACT and ACF water allocation EIS documents, Mobile District served as the lead Federal agency. Cooperating agencies included the Environmental Protection Agency, Fish and Wildlife Service, Maritime Administration, National Marine Fisheries Service, National Ocean Service, National Park Service, Natural Resources Conservation Service, Southeastern Power Administration, and the US Geological Survey.

[17] Letter from SEPA Administrator John A. McAllister, Jr. to Senator Sam Nunn of Georgia (Management and Administration, McAllister Correspondence, Record Group 1015, SEPA Archives), November 21, 1994. SEPA's role in the NEPA process had been clarified by DOE compliance guidelines, "Compliance With the National Environmental Policy Act," effective May 26, 1992. In August 1992, SEPA held a five-day workshop for its employees in applying the NEPA process and writing NEPA documents. See SEPA, *Powerline Newsletter*, Fall 1992.

[18] *Memorandum and Order, Tri-State Water Rights Litigation* (2009); Department of the Army, US Army Corps of Engineers, Office of the Chief Counsel, Memorandum for the Chief of Engineers: "*Authority to Provide for Municipal and Industrial Water Supply from the Buford Dam/Lake Lanier Project, Georgia,*" June 25, 2012.

[19] Lathrop, *A Tale of Three States*. All cases involving the ACT basin were temporarily suspended, pending the outcome of the ACF litigation.

[20] *Memorandum and Order, Tri-State Water Rights Litigation* (2009). Original baseline operations also allowed for the cities of Buford and Gainesville to withdraw water from Lake Lanier for water supply. Magnuson wrote, "The Court recognizes this is a draconian result. It is, however, the only result that recognizes how far the operation of the Buford project has strayed from the original authorization."

[21] See Office of the Chief of Counsel, "*Authority to Provide*," June 25, 2012; also, US Army Corps of Engineers, Mobile District, News Release, "USACE Issues Legal Opinion to the 11th Circuit Court of Appeals," June 26, 2012.

[22] See *Memorandum and Order, Tri-State Water Rights Litigation* (2009). One of the more humorous suggestions concurrent to the drought was a proposal to revise the Georgia-Tennessee state line. According to Georgia State Senator David J. Shafer, surveyors incorrectly established the boundary marker one mile south of the 35th parallel, the Congressionally approved border. Therefore, a correct border would allow Georgia to tap into the Tennessee River. Schafer's resolution passed the Georgia Assembly, but was eventually dismissed. See Shaila Dewan, "Georgia Claims a Sliver of the Tennessee River," *The New York Times*, February 22, 2008.

[23] Data extracted from SEPA, *Annual Reports*, 1998-2002. It should also be noted that droughts are not the only weather extreme that can negatively impact power generation at the projects. For instance, because authorization for the multi-purpose projects always includes "water management," the Corps may be required at head developments to use the reservoirs to store heavy water inflows, or even restrict normal outflows to prevent downstream flooding. At run-of-the-river facilities, heavy inflows will, at a certain volume, naturally restrict the generating capacity. In both cases, SEPA may have to purchase replacement power on behalf of the preference customers. However, drought tends to draw the most public scrutiny because of visually diminishing shorelines; Kenneth Legg, interview by Patricia Stallings, Elberton, GA, February 25, 2010.

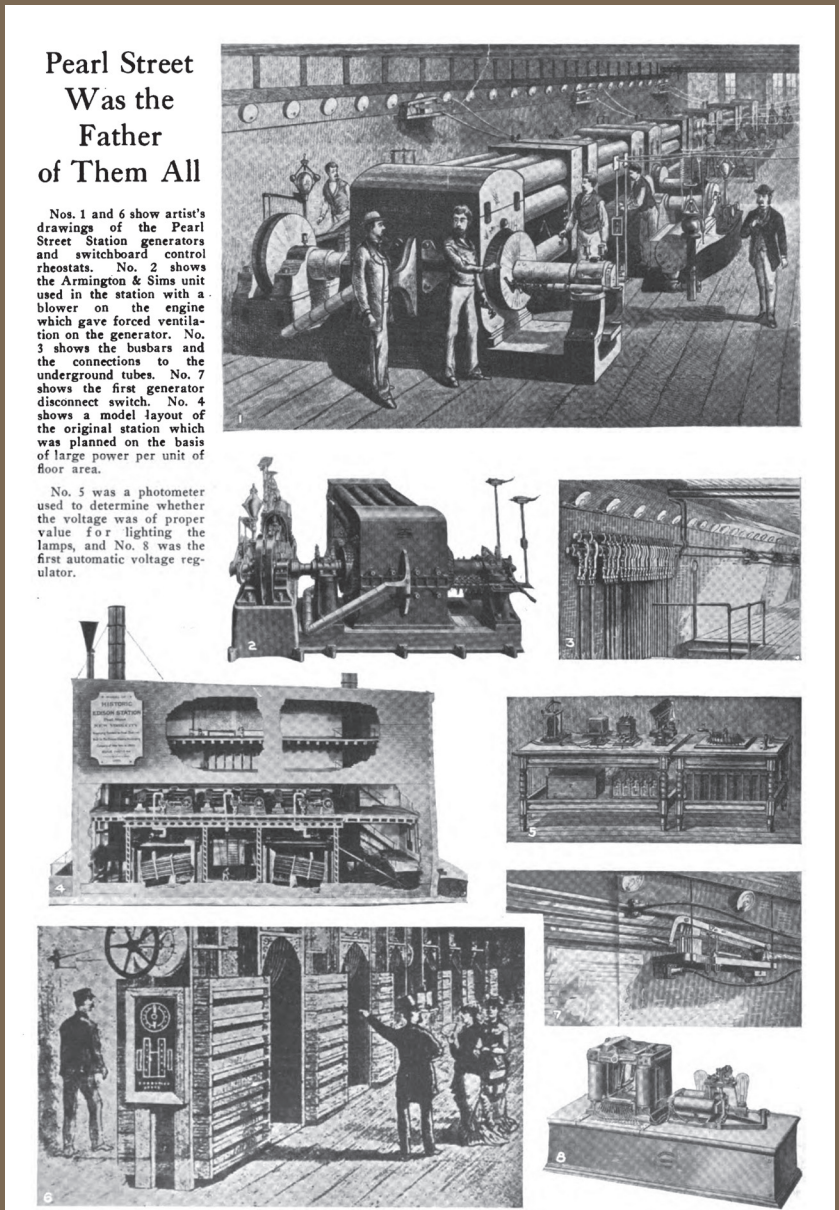
[24] Congressional Research Service, *Apalachicola-Chattahoochee-Flint (ACF) Drought: Federal Reservoir and Species Management*, November 14, 2007, p. 13.

[25] "Corps of Engineers Prepared for Possible Long Drought." US Army Corps of Engineers Mobile District, News Release 4 June 2007; Shaila Dewan and Brenda Goodman, "New to Being Dry, the South Struggles to Adapt." *New York Times*, October 23, 2007; Peter Whoriskey, "Three States Compete for Water From Shrinking Lake." *The Washington Post*, October 27, 2007; *Associated Press*, "Forgotten Lake Shows South's Tough Drought," December 20, 2008.

[26] Data derived from SEPA, *Annual Reports*, 2006-2009; also Statement of "Jon C. Worthington Before the Subcommittee on Water and Power, Committee on Natural Resources, United States House of Representatives, Oversight Hearing on the Proposed Fiscal Year 2008 Budget," March 8, 2007.

[27] Worthington interview; Prince interview.

[28] Southeastern Federal Power Customers, Inc. to US Army Corps of Engineers Mobile District, October 20, 2008, *Alabama-Coosa-Tallapoosa Water Control Manual Update and Environmental Impact Statement, Final Scoping Report: Appendix L*. Prepared by US Army Corps of Engineers, Mobile District, January 2009. Internet online at http://www.sam.usace.army.mil//pa/act-wcm/docs.htm.



In 1882, Thomas Edison's Pearl Street generating system was a landmark effort in the electrical industry. The station provided power for the financial district in Manhattan, New York (from Electrical World, *July 1, 1922).*

DEREGULATION

A New Era of Reliability and Standards

Electricity is a cornerstone on which the economy and the daily lives of our nation's citizens depend. This essential commodity has no substitute. Unlike most commodities, electricity cannot be easily stored, so it must be produced at the same instant it is consumed. The electricity delivery system must be flexible enough, every second of the day and every day of the year, to accommodate the nation's ever changing demand for electricity.

DOE, NATIONAL GRID STUDY, 2002

UNTANGLING A CENTURY-OLD WEB: DEREGULATING THE ELECTRIC POWER INDUSTRY

By the late eighteenth century, the scientific community understood the concept of electricity. In 1808, Sir Humphrey Davy had invented the arc lamp, and within the next few decades, other international electrical pioneers had developed battery powered motors. These inventions, however, remained little more than "laboratory curiosities" until the late nineteenth century when a trio of European scientists, Zenobe Gramme, Antonio Pacinotti, and William Siemans, developed solutions to transmission in the form of dynamos that converted mechanical power into electricity. Concurrently, other scientists, including Charles Brush and Thomas Edison, developed arc and incandescent lighting. Edison's Pearl Street electrical generating system went online September 4, 1882, and proved to be the most influential development for the industry. It demonstrated the holistic viability of generation, distribution, an end use (incandescent lighting for Manhattan's financial district), in addition to competitive rates.[1]

From its beginning, the electric power industry evolved at the most local level. Long distance transmission remained the biggest hindrance to industry expansion, because arc and incandescent lighting operations were limited by the typically high line losses associated with low voltage direct current. The Westinghouse Electric Company, formed in 1886 by George Westinghouse, overcame this limitation with the refinement of high-voltage alternating current systems and transformers. Westinghouse's new system proved itself when matched with the Niagara Falls

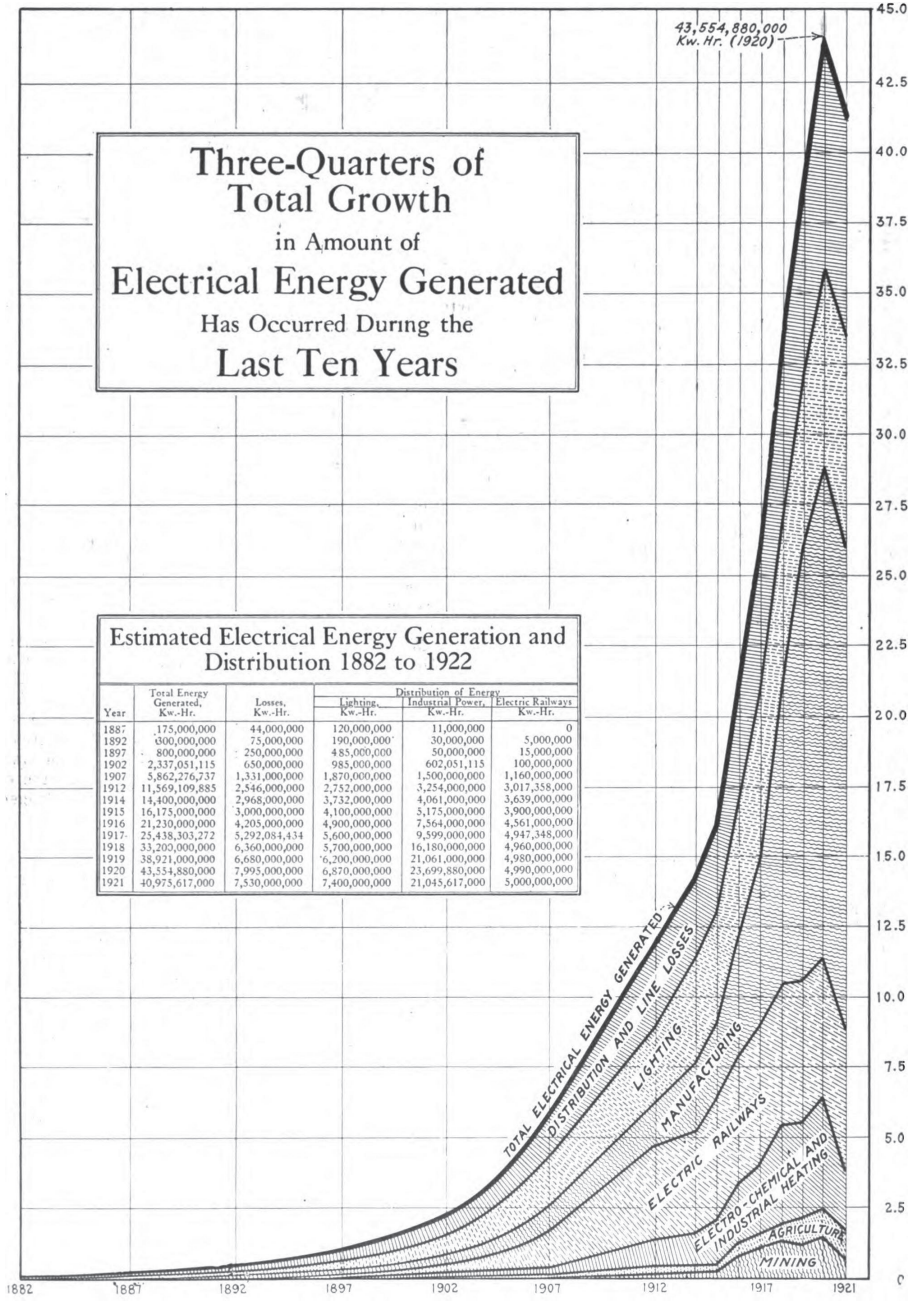
hydroelectric development, whose 180-foot head would produce more energy than could be consumed locally. Detractors maintained that alternating current was inherently unsafe and there was no effective way to market and distribute the excess generation sites such as Niagara. In response, Westinghouse devised a "universal" distribution system of transmission lines and transformers that could match Niagara's output with the individual voltage needs of distant consumers. In August 1895, generators went online at Niagara Falls, the largest hydroelectric plant in the world at the time and transmitted power twenty miles away to Buffalo, New York.[2]

Once Westinghouse demonstrated long-distance transmission, the electric utility industry advanced quickly into the early twentieth century. Many of the early private utilities evolved out of the electrical demands of the day, namely street lighting and trolley systems. Also of note, these emerging independent utilities typically owned all facilities related to the electric industry: generation, transmission, as well as distribution. These "vertically-integrated" utilities were, by their very nature, monopolies. The Sherman Antitrust Act of 1890 outlawed monopolies, however, and the private utilities were subject to state regulation. By 1907, three states (Georgia, New York, and Wisconsin) had developed public utility commissions; within just a few decades, twenty other states followed suit. The emerging private utilities generally operated in franchised areas or "service territories." The early limitations of electrical engineering combined with the typical local consumption demands of the industry resulted in an electric power grid that evolved from small municipal or commercial clusters.[3]

While most of the early electrical systems were powered with hydro mechanical energy, private utilities began looking beyond water power to steam turbines for generation of additional power. Because of advancements in the industry, coupled with competition from numerous smaller, localized utilities, nominal electrical rates remained relatively low during the first three decades of the twentieth century. As demand increased, it also became necessary to interconnect multiple service areas with high-voltage transmission lines. Ultimately, many of the smaller utilities were purchased or consolidated into larger holding companies. At one point, during the late 1920s, 75 percent of total electrical generation in the United States was controlled by only sixteen holding companies.[4]

TRANSMISSION NEGOTIATIONS IN THE SOUTHEAST

As discussed in Chapter 1, the era of federal involvement in the electric industry began as early as 1906, when the Bureau of Reclamation was authorized by Congress to sell excess power from its irrigation projects in the US west to local municipalities. Against a headwind of private utility development, consolidation, and political influence, the federal government slowly stamped its power onto the electrical industry. The 1920 Federal Power Act (FPA) codified the role of the United States' in the development of hydroelectric power at beneficial sites. By the 1930s, passage of the Tennessee Valley



Estimated Electrical Energy Generation and Distribution 1882 to 1922

Year	Total Energy Generated, Kw.-Hr.	Losses, Kw.-Hr.	Distribution of Energy		
			Lighting, Kw.-Hr.	Industrial Power, Kw.-Hr.	Electric Railways Kw.-Hr.
1887	175,000,000	44,000,000	120,000,000	11,000,000	0
1892	300,000,000	75,000,000	190,000,000	30,000,000	5,000,000
1897	800,000,000	250,000,000	485,000,000	50,000,000	15,000,000
1902	2,337,051,115	650,000,000	985,000,000	602,051,115	100,000,000
1907	5,862,276,737	1,331,000,000	1,870,000,000	1,500,000,000	1,160,000,000
1912	11,569,109,885	2,546,000,000	2,752,000,000	3,254,000,000	3,017,358,000
1914	14,400,000,000	2,968,000,000	3,732,000,000	4,061,000,000	3,639,000,000
1915	16,175,000,000	3,000,000,000	4,100,000,000	5,175,000,000	3,900,000,000
1916	21,230,000,000	4,205,000,000	4,900,000,000	7,564,000,000	4,561,000,000
1917	25,438,303,272	5,292,084,434	5,600,000,000	9,599,000,000	4,947,348,000
1918	33,200,000,000	6,360,000,000	5,700,000,000	16,180,000,000	4,960,000,000
1919	38,921,000,000	6,680,000,000	6,200,000,000	21,061,000,000	4,980,000,000
1920	43,554,880,000	7,995,000,000	6,870,000,000	23,699,880,000	4,990,000,000
1921	40,975,617,000	7,530,000,000	7,400,000,000	21,045,617,000	5,000,000,000

Demand for electricity spiked in the first two decades of the twentieth century, and power companies responded with increased generation and the development of independent transmission systems (from Electrical World, *July 1, 1922).*

Authority Act and the Bonneville Power Act further integrated federal involvement in the generation, transmission, and sale of electricity. The Public Utility Holding Company Act of 1935, the first major legislative milestone in deregulating the electric industry, authorized the Securities and Exchange Commission to regulate utility (gas and electric) holding companies.

The national electrical grid began to take its modern-day shape by World War II, through the gradual, albeit limited, interconnection of independent systems over high-voltage transmission lines. The interconnections were necessary to, first, supply excess generation to different service areas that may have a supply-demand imbalance, as well as to integrate the developing federal power system and the subsidized rural electric cooperatives.[5] In 1935, federal legislators proposed that the FPA include provisions to order mandatory transmission if the Federal Power Commission deemed it "necessary or desirable in the public interest." In a move almost surprising given the rash of legislation regulating private industry during the New Deal, Congress rejected the provisions in favor of allowing investor-owned utilities (IOUs) to voluntarily determine the best usage of their interstate transmission lines.[6] The FPA of 1935 did codify the regulation of interstate wholesale transmission of electrical power, and delegated that to the Federal Power Commission. It would take another sixty years for Congress to adopt the principles of 'mandatory wheeling' for wholesale transmission.

As the federal government began generating electricity from its hydropower projects, it constructed transmission lines to serve the new federal power customers. Construction of federal transmission lines by the BPA, TVA, and the Bureau of Reclamation in the West, continued from the New Deal through the World War II period. Faced with renewed opposition of public power by private utilities (and public sentiment) during the post-War period, the newly created Southwestern Power Administration and the Southeastern Power Administration were left with either a stunted or non-existent transmission system.

During the early 1950s, in the Southeast, where a sufficient network of high and low voltage transmission lines already existed, regional investor-owned utilities convinced Congress that the construction of new federal transmission lines was an excess expense and that electricity customers would, essentially, pay twice for transmission service. The controversy stemmed first from the initial construction of a transmission line connecting the Clarks Hill development and the town of Greenwood, South Carolina, and secondly from a Department of the Interior proposal to construct approximately 375 miles of 230kV transmission lines interconnecting and relaying power from the Corps' Savannah River projects. In 1952, Duke Power Company and the South Carolina Electric and Gas Company filed suit in the US District Court for the Middle District of Florida arguing that construction of the Greenwood line was illegal. In January 1953, the Court ruled in the utilities' favor and, ultimately, the Interior Department Appropriation Act of 1953 authorized the Secretary of the Interior to sell the transmission line, which it did on August 4, 1953 to the Greenwood County Electric Power Commission.[7]

Public Power Transmission Lines Held Up

$6.7 Millions Sought By Southeast Authority Cut From Truman Budget

By A Special Correspondent

WASHINGTON, March 24—Southeastern Power Administration's plans for construction of a giant network of transmission lines interconnecting federal hydroelectric plants in the Southeast have become a casualty of the new administration.

Interior Secretary Douglas McKay, in the course of trimming down by $50 million the budget proposed by former President Truman for the Interior Department during fiscal 1954, wiped out all the $6.7 million sought by SEPA for construction during the year.

The fact that all proposed SEPA construction funds have been eliminated from the proposed new budget was revealed by the House Appropriations Committee today as it released transcripts of testimony before its interior subcommittee earlier this month.

The Greenwood Transmission Line became a source of contention between private utilities and public power advocates in the Southeast. Ultimately, private interests won, leaving SEPA to contract transmission services for the preference customers (from Charleston News and Courier, March 25, 1953).

As the battle with regional investor-owned utilities was waged in the halls of Congress and in the courtroom, SEPA was obligated by law to transmit power to the preference customers. With Georgia Power Company already buying the output from Allatoona Dam, the utility also proposed purchasing the electricity generated from Clarks Hill, Jim Woodruff, Buford and others, and then re-sell it to the preference customers with a transmission charge. SEPA declined the offer, and as more projects went online in the early 1950s, began contracting power purchase agreements with area preference customers, contingent upon service delivery. The two entities remained at a standoff until 1955, when the US Attorney General, Herbert Brownell, Jr., issued an opinion that defined the relationship between the federal government and the preference customer. Brownell noted that the preference clause of the 1944 Flood Control Act is obligated to sell power to the preference customer so long as the customer has the "means to take and distribute the power" either through its own transmission system or contracts with third-party transmission providers. The government could not delegate a private entity to re-sell power to the preference customer.[8]

OPENING THE DOOR FOR TRANSMISSION ACCESS

In 1973, the Organization of Petroleum Exporting Countries (OPEC) banned oil exports to the United States, resulting in a decade of heightened awareness of energy issues and action in Congress to pass industry reforms. These reforms included the creation of a national Department of Energy in 1977 and the passage of the National Energy Act of 1978. Signed by President Jimmy Carter, the Act consisted of five separate statutes, including the Public Utility Regulatory Policies Act (PURPA), generally heralded as the most significant of the laws. An integral component of PURPA, designed to spur energy independence and a competitive wholesale marketplace, was the creation of a new class of "non-utility" generators. Section 210 of PURPA required utilities to interconnect and buy capacity (at rates not exceeding their own costs) from non-utility qualifying facilities.[9] PURPA was intended to provide a guaranteed marketplace for non-utilities generating wholesale power.

An additional provision in PURPA allowed for utilities to obtain an order from FERC requiring another utility to transmit power. The criteria for justifying such an order were relatively limited and had little impact on transmission access. In fact, one of the first transmission requests requiring a FERC decision involved SEPA and the Kentucky Utilities Company (KU) in 1984. SEPA had requested that KU transmit power to eight of the federal preference customers, but FERC found that the transmission order would displace nearly twenty percent of power that KU was already selling to those eight customers on independent contracts with the private utility. FERC determined that the transmission request by SEPA did not meet one of the criteria, that of "reasonably preserving existing competitive relationship."[10]

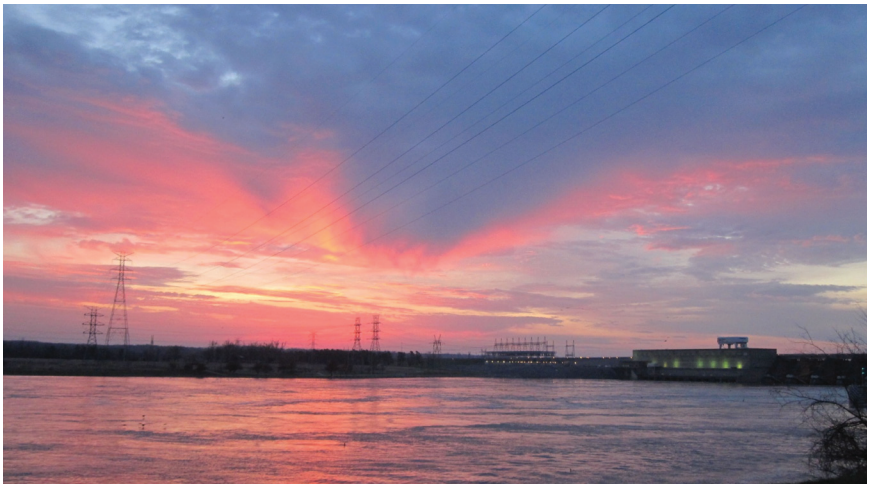
Energy Policy Act, 1992

An order under section 211 shall require the transmitting utility subject to the order to provide wholesale transmission services at rates, charges, terms, and conditions which permit the recovery by such utility of all the costs incurred in connection with the transmission services and necessary associated services, including, but not limited to, an appropriate share, if any, of legitimate, verifiable and economic costs, including taking into account any benefits to the transmission system of providing the transmission service, and the costs of any enlargement of transmission facilities. Such rates, charges, terms, and conditions shall promote the economically efficient transmission and generation of electricity and shall be just and reasonable, and not unduly discriminatory or preferential.

ENERGY POLICY ACT OF 1992 (EPACT): FACILITATING NON-DISCRIMINATORY TRANSMISSION ACCESS

While PURPA provided a framework for deregulation, it was not until the passage of the Energy Policy Act (EPACT) of 1992 that the deregulation process accelerated. EPACT 1992 had the effect of "functionally unbundling" utilities. Traditionally, most utilities were "vertically-integrated." In other words, the utility owned all assets related to the three primary legs of the electric industry: generation, transmission, and distribution. EPACT 1992, and its orders implemented by FERC, opened the wholesale transmission marketplace by requiring utilities to make spare transmission capacity available to power sellers, buyers or traders.[11]

As private corporations, many IOUs were still reluctant to make spare capacity available. Vertically-integrated utilities relied heavily on their own generation capacity or contracts with neighboring utilities to make decisions regarding electricity production. By controlling their own transmission capacity, the companies could control costs and rates in transmission contracts and restrict competition in their service area. Wholesale transmission was a relatively closed market. In 1996, to implement wholesale access, FERC issued Order Number 888, which represented a fundamental policy shift for the electric utility industry. Order 888 mandated all public utilities that owned, controlled, or operated transmission lines to pre-file an open access non-discriminatory transmission tariff. The Open Access Transmission Tariff (OATT) would, first, provide for a consistent wholesale rate and, second, identify the terms under which the utility's transmission system would be used. With the introduction of non-discriminatory rate setting, OATT allowed all transmission customers the opportunity to use an IOU's transmission facilities based on spare capacity.



SEPA has no transmission assets. The Corps owns the switchyards and ancillary equipment at the hydro projects, and the external transmission lines are owned by private utilities (Corps photo).

Historically, SEPA was able to successfully negotiate transmission service with independent transmission providers, but no law existed to compel area utilities (TVA, IOUs, or even the cooperatives) to provide transmission service. Under OATT, SEPA can now request transmission service simply by filing with FERC, which enables the agency to better estimate transmission costs and build the non-discriminatory service more accurately into the customers' rate schedule. As the regional IOUs began filing transmission tariffs with FERC during the late 1990s, SEPA entered contract negotiations to ensure that the federal power customers were receiving the competitive transmission rates. In 1997, SEPA signed a new contract with Duke Energy, Tennessee Valley Authority, and the Tennessee Valley Public Power Association. The contract was amended in 1999 to provide service for the Cumberland System customers outside the TVA service area. In the Kerr-Philpott service area, SEPA signed a new contract with Dominion Virginia Power (Dominion) in 1998. In addition to providing consistent rates for firm power loads, the tariffs also benefit the preference customers when SEPA purchases replacement power.[12]

OATT also resulted in responsibility shifts for SEPA power operators. First, under OATT, SEPA provides less overall transmission support for the preference customers. Because the IOUs pre-file tariffs with FERC, customers can independently request transmission service from independent providers and do not need SEPA to negotiate the rates or tariffs under a general contract. However, smaller customers still require SEPA's assistance. Under OATT, a customer cannot request a firm load less than 1 MW. To obtain the cost benefits of the pre-filed tariffs, many of the smaller customers choose to operate collectively with SEPA providing assistance for centralized coordination and contracting efforts.[13]

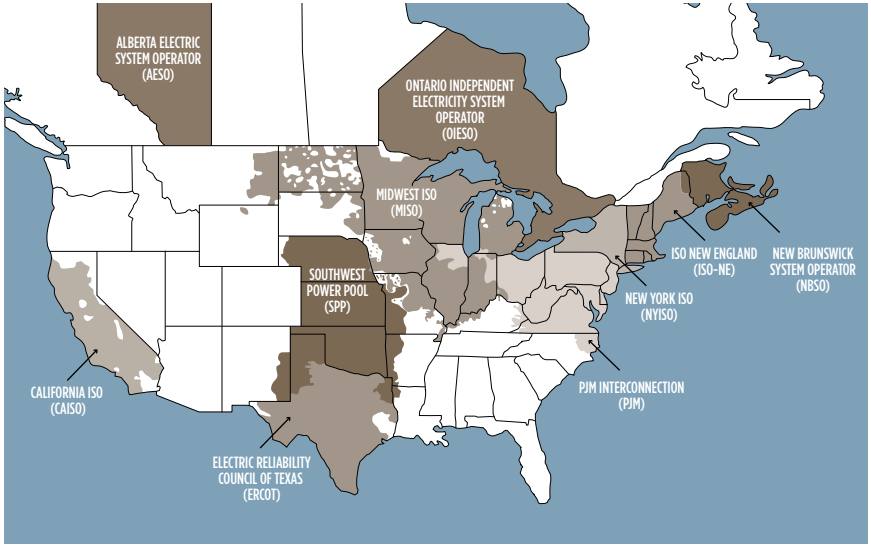
The second major impact from OATT for SEPA was the introduction of the Open Access Same Time Information System (OASIS), an electronic system designed to make a transmission system's capacity and availability transparent to potential buyers. The North American Electric Reliability Corporation (NERC) improved on the system and introduced an electronic tagging system that allowed for the incorporation of additional data. The e-tagging system uses nodes or "tags" as a means of identifying all the power schedules on the grid for firm or non-firm loads across multiple power systems. The schedules include data to identify the source of power, the balancing area, and the transaction's priority level. With the transmission grid now openly available, the transmission system operators need to be able to account for each of the individual power transactions. This helps operators identify firm and non-firm power loads, and gauge the available capacity of the lines to prevent congestion issues and ensure reliability. Essentially, the tags are point-to-point identifiers for individual loads of purchased power. SEPA participated in tag modeling for NERC and its delegated regional partner, the Southeastern Electric Reliability Council (SERC).[14]

The tagging system, introduced by NERC in 1999, resulted in an increased workload for SEPA operators. While the process is conducted entirely through an electronic inter-face, SEPA operators have to tag the nodes in each customer's weekly schedule, and as of 2010, SEPA had 37 scheduling entities. On the national level, the tagging system also exposed flaws in the power grid, originally designed and constructed by a number of individual companies over the course of the twentieth century. Tagging illustrated the difficulty in purchasing power at areas from afar, the lack of voltage support, and the need to develop a national smart-grid. While lines may still become overloaded, the system allows reliability coordinators to take corrective action on areas of potential concern.[15]

REGIONAL TRANSMISSION ORGANIZATIONS

To further facilitate competitive wholesale transmission costs and improve reliability of the national electric grid, FERC issued Order Number 2000 in December 1999. Order No. 2000 called for the voluntary formation of Regional Transmission Organizations (RTOs), or the concept of organizing operation, control and possible ownership of the transmission grid across wide geographical regions. The Order was based on the premise that regionalizing the grid with independent organizations would eliminate any remaining discriminatory transmission rates as well as help balance the demands of the grid rather than relying on IOUs to independently coordinate across multiple service areas.

Being completely voluntary organizations, RTOs have been slow to develop at the national level. Since first recommended in 1999, ten RTOs/ISOs have been recognized: Alberta Electric System Operator (AESO); California ISO; Midwest Independent Transmission System Operator (MISO); New Brunswick System Operator (NBSO); Pennsylvania, New Jersey, Maryland (PJM) Interconnection; ISO New England; New York ISO; Ontario Independent Electricity System Operator; Electric Reliability



There are 10 Regional Transmission Organizations in North America.

Council of Texas (ERCOT) ISO and the Southwest Power Pool. Inherently complex, RTOs require transmission providers to transfer control, but not ownership, of the transmission corridors. Consequently, IOUs or independent transmission providers bear the financial burden of siting and construction of the corridors and must be made economically whole from the capital investment.[16]

In April 2001, SEPA and the Corps' South Atlantic Division developed an amendment to their June 1991 MOU. This amendment established policies pertaining to including Corps-owned transmission assets (switchyards) into an RTO and coordinated operation of the Corps hydroelectric plants with the RTO. This amendment applied specifically to the federal power projects located within Georgia-Alabama-South Carolina, Jim Woodruff, and Kerr-Philpott systems.

Even though it is a transmission-dependent utility, SEPA has participated as a stakeholder in discussions surrounding formation of several RTOs penetrating its service area, but is currently in coordination with only one regional group, the PJM Interconnection. PJM was the nation's first power pool when it joined the transmission system of three utilities, Philadelphia Electric, Public Service Electric and Gas of New Jersey, and Pennsylvania Power and Light in 1927.[17] Following the FERC orders of the 1990s, PJM became the nation's first ISO in 1997 and the first functioning RTO in 2001.

On October 1, 2004 SEPA began negotiations with Dominion to integrate the Philpott and Kerr projects into the PJM Interconnection. Prior to this agreement, SEPA provided Dominion capacity and energy from the Kerr-Philpott system and Dominion delivered firm capacity and energy to the Kerr-Philpott federal power customers. Kerr Project is located immediately upstream from two of Dominion's

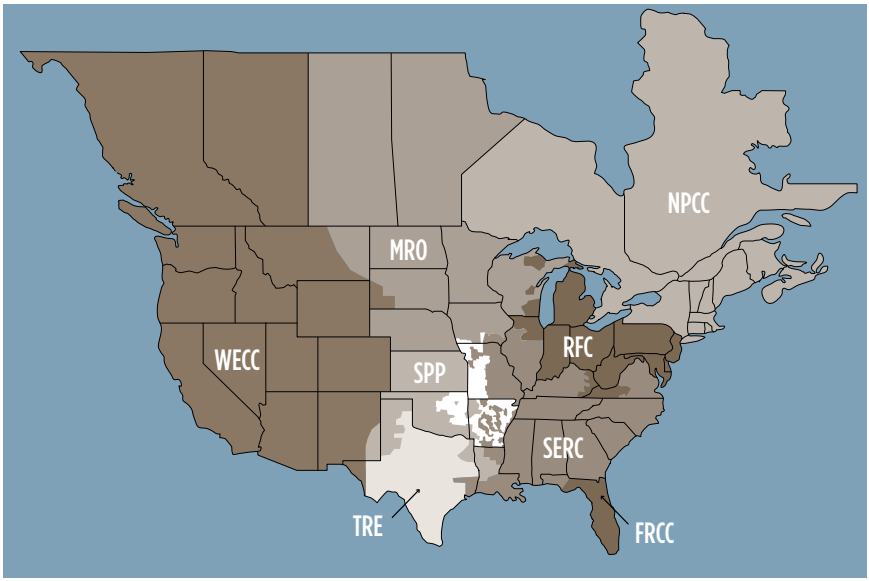
hydroelectric projects and generation at the three plants is coordinated closely. On May 1, 2005, Dominion and SEPA began operations in the PJM Interconnection. The agreement designated Dominion as the scheduler of the three projects and guaranteed SEPA's customers would receive their contract allocations. When Dominion unbundled its transmission services under OATT and received approval from the Commonwealth of Virginia State Corporation Commission to transfer control of its transmission facilities to PJM in 2005, functionally, SEPA became a PJM customer under a network integration service agreement.[18]

As of 2012, the area marketed by SEPA has only two established RTOs, the PJM Interconnection and MISO. FERC Order 2000, establishing the concept of RTOs, encouraged all investor-owned utilities to join an RTO by late 2001. That year, a number of IOUs in the Southeast, including Southern Company, began planning a proposed SeTrans RTO. Ultimately, the proposal was blocked by several regional public service commissions that expressed concern over potential cost impacts to customers in a region with historically low electric rates.[19] It remains to be seen whether electric utilities in the Southeast will attempt to form another RTO, but should they do so, SEPA will participate as a stakeholder to ensure that the federal power customers are integrated into the system.

IN THE SHADOW OF BLACKOUTS: RELIABILITY STANDARDS

From the end of World War II until the Energy Crisis of the 1970s, the electric utility industry benefitted from an unprecedented level of prosperity. Throughout the 1950s, electrical generation responded to increased demand in new housing and industry. Despite President Dwight Eisenhower's "no new starts" policy, previously authorized federal power projects gradually came online, and by 1957, federal generation reached its historical peak of providing more than 17 percent of total generation. The growth of other public power sources (rural electric cooperatives and municipalities) and the gradually diversifying energy portfolios of investor-owned utilities contributed to nominally low electricity rates. By the late 1960s, though, the industry struggled to keep pace with increased demand, technological advancements, and the increased generation costs brought about, in part, from new environmental regulations.[20]

In 1965, the industry reached a critical juncture. On November 9, most of the Northeast experienced one of the largest blackouts in United States history. The affected area included 80,000 square miles and impacted 30 million people in the United States and Canada. In some areas, including New York City, the blackout lasted for up to 13 hours. The cause was pinpointed to a backup protective relay on one of five 230 kV transmission lines stemming from the Sir Adam Beck No. 2 Hydroelectric Plant on the Niagara River in Ontario. The tripped relay reversed the power flow from north to south, resulting in massive electrical surge in the northeastern United States. The 1965 blackout highlighted the fact that increased electrical demand and pressures on the grid were no longer local or isolated issues, but required a regional



The North American Electric Reliability Corporation was formed in 1968 in response to a massive blackout in the northeastern United States. The organization is an independent group recognized by the federal government for establishing reliability standards.

approach. Consequently, regional councils were formed to coordinate generation and transmission for their members. In 1968, the NERC was established to provide a nation-wide coordination effort.[21]

Over the next three decades, NERC set reliability standards for generation, transmission, and operation. Adherence to these standards, though strongly encouraged, remained a voluntary action. Significant blackouts in the Western United States in 1996 and in the Northeast and Midwest in 2003 resulted in calls to establish mandatory criteria. The Energy Policy Act of 2005 authorized an "electric reliability organization (ERO)" that would set and enforce reliability criteria in the United States. In 2006, FERC certified NERC as the designated ERO, and required that it delegate authority for proposing and enforcing reliability standards to a subset of regional councils. In the southeastern United States, NERC delegated that authority to the SERC and the Florida Reliability Coordinating Council (FRCC), the entities with which SEPA works in close coordination in regard to its Operations Center and Control Areas.

THE FEDERAL OPERATIONS CENTER

During the 1990s, as the electric utility industry was subjected to additional federal regulations and orders, SEPA realized that even as a transmission dependent entity, the organization needed to change its normal operations. During the early 1990s, NERC notified SEPA that the three Savannah River projects were not in what was defined as a load "control area" and

It was obvious to me that we needed [the operations center] for our function to coordinate the operation with our customers and our clients.

John McAllister

that, for purposes of reliability, the projects needed to be interconnected.[22] NERC defines a control area as "An electrical system bounded by interconnection (tie line) metering and telemetry. It controls its generation directly to maintain its interchange schedule with other control areas and contributes to frequency regulation of the Interconnection." In short, the control areas are responsible for the safe and reliable operation of their portion of the electric system and each control area coordinates with neighboring control areas.

In 1995, SEPA established a Federal Operations Center, which would be the focal point and administrative headquarters for a subsequent Control Area. The Operations Center personnel were responsible for declaring, scheduling, and dispatching energy and capacity at the hydroelectric projects in SEPA's marketing area. The development of an Operations Center was a critical decision for SEPA in order for it to adhere to the industry changes. To comply with NERC requirements, SEPA had to establish or arrange for a control area for the Hartwell, Russell, and Thurmond projects. SEPA attempted to negotiate with Southern Company to integrate the three Savannah River projects into an existing regional control area, but as an IOU, Southern Company wanted to be reimbursed for the service, a cost that SEPA would have been required to fund either through an annual appropriations request or a pass-through cost to its customers. Ultimately, SEPA established interim separate control areas for the three projects on July 1, 1995 and the areas were certified by NERC in October of the same year. The Control Area responsibilities were assumed by the Operations Center staff and included dispatching, energy accounting, and other administrative duties related to the three Savannah River projects. Concurrently, in consultation with the Corps and the preference customers, SEPA also began studying the formation of a consolidated Control Area to monitor and regulate the ten projects of the Georgia-Alabama-South Carolina System.[23]

Because SEPA does not own the hydroelectric projects, but is responsible for meeting NERC requirements for dispatching power, establishing the Federal Operations Center required close coordination with the Corps of Engineers. In 1997, to formalize the operational and funding responsibilities, SEPA and the Corps amended the June 1991 MOU. The amendment stipulated that SEPA was responsible for the planning, design, construction, and operation of the Federal Operations Center and that operation of generation within the Federal Control Area rested with the Corps. In November 1998, SEPA had completed the necessary equipment installation, including remote terminal units at each of the plants, in order to consolidate the three Savannah River projects into one Control Area.[24]

A Not-So-Simple Operation

Operations Center employees are responsible for declaring, scheduling, and accounting for energy and capacity generated at the 22 hydroelectric projects in SEPA's 11-state marketing area. With the establishment of the control area for the Georgia-Alabama-South Carolina System, new contractual relationships driven by FERC, orders on Open Access Transmission and open communication between utilities, control area employees are responsible for dispatching energy, transmission tagging, and other administrative duties.

We were in one big room on the ground floor and we had curtains in the glass display windows at the front. There was a picket fence over in the corner of the building and Papa's Pizza was right next door.

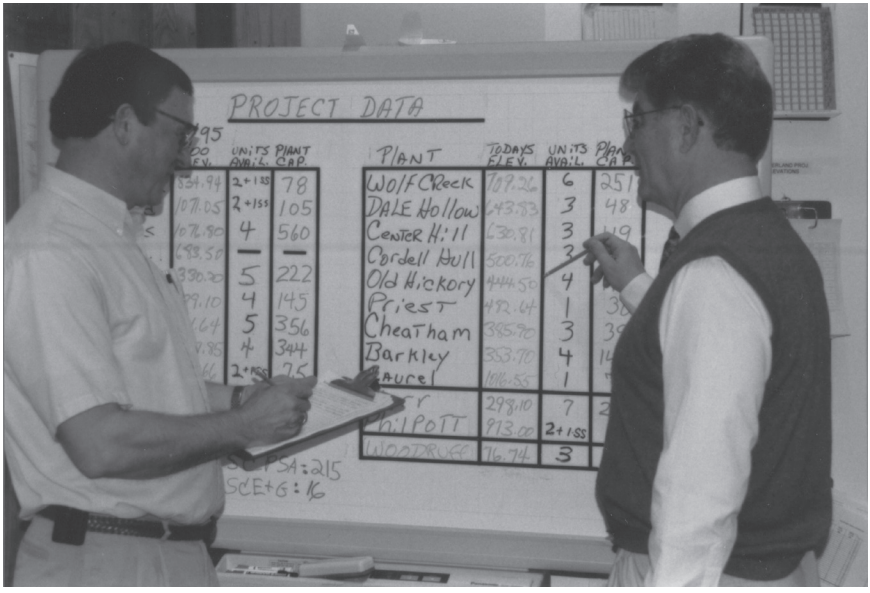
Darlene Heard, on the original Operations Center.

Initially, the Operations Center was established off-site from SEPA's administrative headquarters, at that time located in the old Samuel Elbert Building. The available space was located several hundred feet away from the agency's headquarters in a former Belks Department Store in downtown Elberton. SEPA developed all of the necessary computer software that allowed for real-time project monitoring, control of the project operations to meet load and frequency requirements as well as the emergency management system. In 1997, the Center moved into the Samuel Elbert Building, where it remained until 2001 when SEPA constructed its new headquarters building on Athens Tech Drive. The new headquarters building was designed to accommodate the administrative tasks of the agency as well as the space and technology requirements for a secured Federal Operations Center.

As recently as the 1980s, SEPA did not dispatch the power; that responsibility was delegated to the individual project control areas. For its role, SEPA worked weekly with the Corps on a project-by-project basis and would give the local Corps powerplant operators a power energy declaration (or 'schedule') for the individual customers. SEPA also arranged transmission with the IOUs or other transmission providers to schedule the power around an existing load of peak needs. [25]

Once the control areas were administratively centralized through the new Federal Operations Center, SEPA became responsible for setting the schedule, coordinating that schedule with the Corps operators, and then consolidating the information into a final energy schedule for the week. With SEPA now responsible for dispatching the energy, the paradigm shifted, and required regular and direct communication with the Corps project operators so that the available power at the projects matched the customers' schedule. As Donnie Cordell, one of the original operators remembered,

The original operations center was located off-site from SEPA headquarters in an old Belks Department Store and required interior rehabilitation work before the agency could occupy it in 1995.

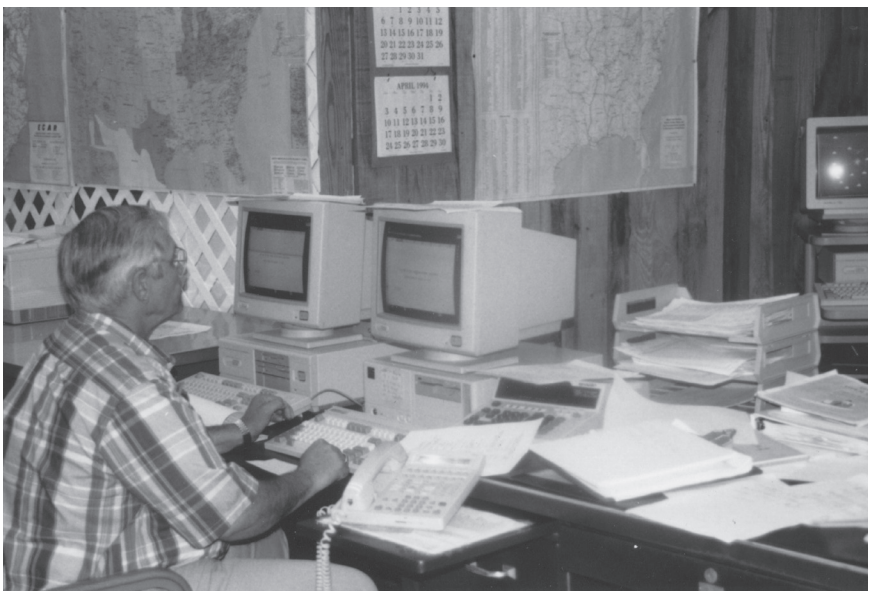


Before computers, the day's project data was hand-written on a dry erase board (pictured: Sonny Knighton and Jim Lloyd).

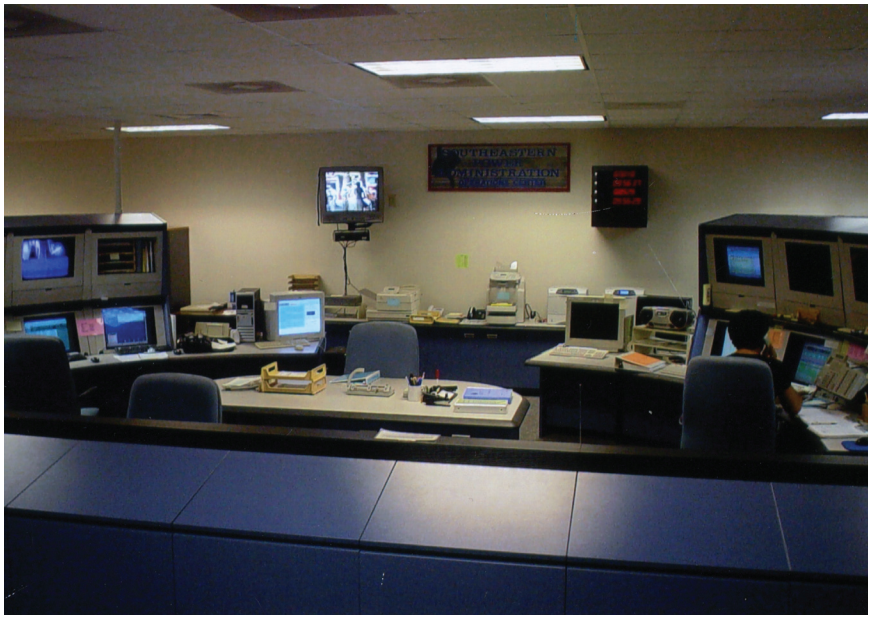
"It took time to get the software working consistently." It was also a culture change for the customers that historically were able to 'block' or reserve a set power amount at the units, some of which would go unused. Under the new coordinated system, the power schedules allowed for the available capacity to be used more efficiently.[26]

STAFFING THE OPERATIONS CENTER

With federal government reductions of the 1990s, SEPA was limited in the number of full-time employees (FTEs) it could have, but the agency managed to staff its new Operations Center without hiring additional personnel. SEPA's senior leadership, including Jim Lloyd, the Assistant Administrator for Power Resources at the time, made the decision to transition several administrative assistants into Power Resources. This was made possible in part from the technological advancements such as voice mail, e-mail, and computer systems that gradually relieved much of the administrative and accounting workload. "We were [also] fortunate at SEPA to have some outstanding employees who were adept at mathematics," recalled Administrator Charles Borchardt, and those individuals transitioned easily to the needs of the Operations Center. When the Operations Center went online in 1995, there were six designated operators. Because there was such a substantial change in the technology and coordination efforts, even the older personnel had to overcome a learning curve of running the Center. At the time it opened, the Center did not operate on a twenty-four hour schedule, but did keep operators on-call for overnight hours. Beginning in 1996, SEPA staffed the center twenty-four hours a day.[27]



Alvin Christian working at one of the computer terminals in the original Operations Center.



The new operations center, integrated within the current headquarters building, is fully automated and manned 24 hours a day.

Computer terminals in the new operations center.

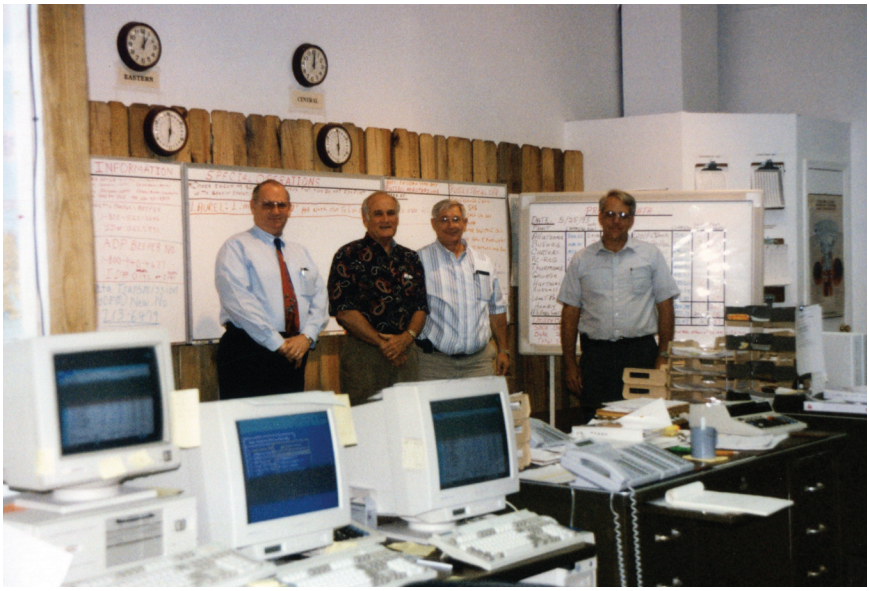
SEPA's Original Operators

- Donnie Cordell
- Darlene Heard
- Sonny Knighton
- Brenda Langston
- Connie Dixon
- Alvin Christian
- Herb Nadler

As part of the formalization of reliability standards, NERC requires bulk power system owners, operators, and users to register in its Compliance Registry. Registered groups are subject to adhere to NERC approved reliability standards. NERC determines the criteria under which the registrants must comply. In April 2007, NERC notified SEPA that it was being registered as Balancing Authority, Purchasing-Selling Entity, Resource Planner, Transmission Operator, and as a Transmission Service Provider for ten of the hydroelectric projects that fall within the Corps' South Atlantic Division boundaries. SEPA requested that it be removed as Resource Planner, Transmission Operator, and Transmission Service Provider because the organization has no jurisdictional control over the transmission facilities, which are owned by the Corps of Engineers.[28]

After a thorough review of SEPA's roles and responsibilities for the ten projects, NERC agreed that it did not meet the criteria for being defined as Resource Planner or Transmission Service Provider. NERC also determined that because SEPA "coordinates outages with interconnected utilities as requested by the Corps, grants permission to the Corps to conduct outages, and requests that the Corps reschedule outages," that it did meet the requirements for registration as a Transmission Operator.[29] SEPA is currently a NERC-registered Balancing Authority, Purchasing-Selling Entity, and Transmission Operator for the SERC area, and a Purchasing-Selling Entity in the FRCC area. SEPA must maintain compliance with all of the NERC reliability standards for those positions, which includes specific training for its system operators.

Beginning in 1998, all operators working in the SEPA Operations Center were required to become NERC certified. Initial certifications were good for five years, subject to re-testing at regular intervals. As of 2010, the certifications remained valid for three years with no new testing unless the individual operator transitions to a different reliability level (based on the NERC Compliance registration). Operators are required to complete 160 hours of continuing education every three years, through web-based programs and seminars. SEPA operators also attend regional workshops and conferences to discuss lessons learned with other agencies and utilities.[30]



SEPA employees (Bob Goss, Billy Neal, Alvin Christian, and Donnie Cordell) in the newly refurbished operations center, late 1990s.

ENDNOTES

[1] Duncan Hay, *Hydroelectric Development in the United States, 1880-1940 (Washington, DC: Edison Electric Institute, 1991): 5-12.*

[2] Hay, *Hydroelectric Development; also, Thomas P. Hughes, Networks of Power: Electrification in Western Society, 1880-1930 (Baltimore: Johns Hopkins University Press, 1983): 18-46; also Energy Information Administration (EIA), The Changing Structure of the Electric Power Industry, 2000: An Update (Washington, DC: US Department of Energy, 2000); also EIA, The Changing Structure of the Electric Power Industry, 1970-1991 (Washington, DC: US Department of Energy, 1993). Appendix A of the EIA: Changing Structure, Update report includes History of the US Electric Power Industry, 1882-1991, an excellent summary.*

[3] Hay, *Hydroelectric Development; Hughes, Networks of Power; EIA, Changing Structure: Appendix A.*

[4] EIA, *Changing Structure: Appendix A.*

[5] US Department of Energy, *National Transmission Grid Study (2002).*

[6] For more information on legislation effecting the transmission of power, see Joseph T. Kelliher, "Pushing the Envelope: Development of Federal Electrical Transmission Policy" *American University Law Review 2: 42 (1993): 543-606; Megan A. Wallace, "A Negotiated Alternative to Mandatory Wheeling," Energy Law Journal 10:99 (1989): 99-120; also EIA, Changing Structure: Appendix A, "History."*

[7] Norwood, *Gift of the Rivers, 43-54.*

[8] Norwood, *Gift of the Rivers, 43-54.*

[9] PURPA established criteria for what constitutes a "qualifying facility," including ownership, operational and efficiency criteria. See EIA, *Changing Structure, 32. Non-utilities are considered those entities that own electric generating capacity, but are not by law regulated as "utilities," meaning they do not have designed franchised service areas for retail services.*

[10] Wallace, "Negotiated Alternative," 99-120; also, Rampey interview.

[11] Available transmission capacity is calculated by subtracting transmission needed to serve a utility's native load obligation from its total transmission capacity.

[12] J.W. Smith interview; interview with Donnie Cordell (SEPA-Retired), March 10, 2010, Lloyd interview; SEPA, *Annual Reports, 1996-2001.*

[13] J.W. Smith interview.

[14] Cordell interview. Firm power includes rights to a contract amount of power; non-firm includes rights as the system is available.

[15] Cordell interview; interview with Darlene Heard, March 4, 2010. Also, see DOE, *National Transmission Grid Study*. Grid congestion occurs not because of line overloads or delayed power delivery, but to transactions that cannot be scheduled.

[16] DOE, *National Transmission Grid Study*.

[17] For more information on the development of PJM see Hughes, *Networks of Power*, 345-333; Bill Beck, *PP&L: 75 Years of Powering the Future. An Illustrated History of Pennsylvania Power and Light Company (Eden Prairie, MN: Viking Press, Inc., 1995),* 191-198.

[18] SEPA Archives, RG 1262, Regional Associations: PJM Membership.

[19] Todd Edwards, "Regional Transmission Organization Presence and Activities in Southern States," *Regional Resource (January 2004). Internet online at www.slcatlanta.org/Publications/EnergyEnvironment/Rtos.pdf.*

[20] EIA, *Changing Structure, 2000*, Appendix A.

[21] EIA, *Changing Structure, 2000*; EIA, *Changing Structure, 1970-1991.* Immediate to the outages, President Lyndon B. Johnson ordered the Federal Power Commission to investigate the blackout, noting that "Today's failure is a dramatic reminder of the importance of the uninterrupted flow of power to the health, safety and well, being of our citizens and the defense of our country." Federal Power Commission, "Report to the President on the Power Failure in the Northeastern United States and the Province of Canada of Ontario on November 9-10, 1965." December 6, 1965.

[22] McAllister interview, Lloyd interview; Borchardt interview.
[23] Borchardt interview; Lloyd interview.
[24] SEPA Archives, RG6700, "Power Resources: SEPA Control Area." "Amendment #1 to Memorandum of Understanding Between the US Army Corps of Engineers South Atlantic Division and the Southeastern Power Administration," February 3, 1997.
[25] Lloyd interview; Cordell interview; SEPA, *Annual Reports, 1995-1999.*
[26] Lloyd interview; Cordell interview.
[27] Cordell interview Lloyd interview; Heard interview; Borchart interview.
[28] Federal Energy Regulatory Commission, Docket No. RC08-1-000.

NERC defines these five categories as follows: A Balancing Authority "integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time." A Purchase-Selling Entity "purchases or sells, and takes title to, energy, capacity, and Interconnected Operations Services. Purchasing-Selling Entities may be affiliated or unaffiliated merchants and may or may not own generating facilities." A Resource Planner "develops a long-term (generally one year and beyond) plan for the resource adequacy of specific loads (customer demand and energy requirements) within a Planning Authority Area." A Transmission Operator is "responsible for the reliability of its 'local' transmission system, and that operates or directs the operations of the transmission facilities." A Transmission Service Provider "administers the transmission tariff and provides Transmission Service to Transmission Customers under applicable transmission service agreements." Definitions available on the NERC website at *www.**nerc**.com/files/Glossary_12Feb08.pdf*.

The ten projects for which SEPA is listed in the Compliance Registry are Alatoona, Buford, Carters, West Point, W. F. George, Millers Ferry, R. F. Henry, Hartwell, Russell, and Thurmond (collectively called the SEPA-TOP Projects).

[29] Federal Energy Regulatory Commission, Docket No. RC08-1-000.
[30] Heard interview.

OUT WITH *the* OLD

Technology and Automation

Information technology and business are becoming inextricably interwoven. I don't think anybody can talk meaningfully about one without talking about the other.

BILL GATES, FOUNDER OF MICROSOFT

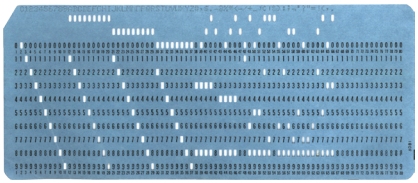
PUNCHING THROUGH THE PAST

When Gus Norwood completed SEPA's first history in 1990, the agency had only recently abandoned the use of punched cards for data compilation. As new desktop computers were purchased during the early 1990s, SEPA held regular workshops to introduce computer operations and programs. Later, the agency interconnected computer terminals through networks, introduced email, and eventually each staff member had their own desktop computer. The hydro projects were virtually connected through remote terminal units for real-time and accurate generation and scheduling information. In two short decades, SEPA transitioned from analog to digital operations. Information Technology (IT) was embraced and woven into all operational and functional aspects of the organization.[1]

Prior to automation, all of the maps, charts, and forms used by SEPA for operations, billing, and hydrology studies, were developed by hand. To develop rates for repaying the Federal Treasury, SEPA had to first determine the energy (MWH) and, more importantly, the dependable capacity (MW) available for sale at the projects. This was accomplished by calculating historic streamflows at each project using a desk calculator (Friden or Marchant) and a desk adding machine.[2]

This cumbersome and time-consuming process changed in 1962. At that time, a number of SEPA employees met with computer personnel at the University of Georgia Computer Center to see if the newly emerging computer era could perform these tedious hand-developed project simulations. As a result, several SEPA engineers, Elbert Rucker, Harold Jones, and Clifford Bond, took computer classes offered at the University.

Left: A SEPA employee uses an IBM key punch machine, late 1960s.



SEPA wrote computer programs on punch cards until the 1980s.

At first, a program language called Symbolic Programming was used. Soon thereafter, two much more sophisticated computer languages became available – FORTRAN and COBOL. Eventually, all of SEPA's simulated project operations were written in FORTRAN, while customer billing was better suited to COBOL. All of these programs used punch cards for program and data entry. Programs integrating many projects required thousands of statements (cards).[3]

During the 1960s, the agency began 'automating' data first with an IBM 1401 (and later an IBM 7094) mainframe computer owned by and housed at the University of Georgia, thirty miles away in Athens. The University's IBM 7094 was a large, bulky machine that monopolized an entire room and was used by the University to run grades and student schedules. In addition to the University and SEPA, other organizations used the machine as well, including the National Aeronautics and Space Administration (NASA) and the Georgia Department of Transportation (GDOT). SEPA had to 'get in line' with everyone else!

The computer itself operated by virtue of programs and data written on punched cards, which were inserted by stacks into the machine. During the 1960s and 1970s, punched cards were the most common method of developing programs and calculating data. The cards, punched on a separate key punch machine, typically included 80 columns and 12 rows of numbers (labeled 1-9). The number combinations were used to develop binary coding for the computer. Writing a program to the cards was tedious and could realistically require hundreds or even thousands of individual cards, but the process represented the latest computer technology at the time.

Prepping data for customer billing, 1970s (pictured: Wade Gaines, Donnie Cordell, Blanche Adams).

Crash Course in Computer Programming

When I came to work here [in 1968], I had never punched a card. I didn't know how to operate a punch machine. About 1969, SEPA's computer programmer left. My boss came in, handed me two books on FORTRAN [programming] and said 'You're it!' I said, 'I don't know this.' He said, 'You've got to learn it.' So, I had to learn computer programming on my own.

Wade Gaines, SEPA's First IT Manager

While the agency had not yet purchased its own primary computer, SEPA did own an IBM key punch machine. Employees wrote all of the computer programs in Elberton, including programs for stream flow studies, billing, and power operations. Once the programs were finalized, the staff drove boxes of cards to Athens and calculated the data on the UGA computer. "Sometimes we'd dump [the cards] out of the seat [of the car] into the floor," Donnie Cordell remembered. "That was a mess." Another employee remembered the cards absorbing moisture from the air when it rained, "and the card reader would sometimes jam and chew up 20 to 30 cards and cause real problems!" Because of the number of users on the one computer system, SEPA might only get two or three opportunities per day. According to Cordell, "Some days you wouldn't get much done. Some days you would. That's just how it was."[4]

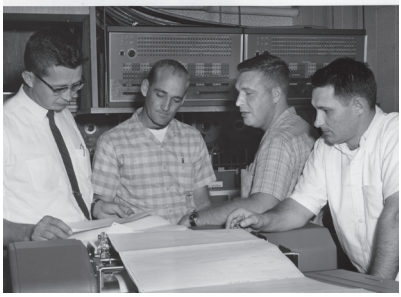
To complicate matters, the University periodically upgraded its computer and users, including SEPA, had to re-learn the system. Each computer upgrade required learning special Job Control Language (JCL), which could prove more difficult to master than the programming language. Also, much like modern computer systems,

Computerized billing operations, 1970s (pictured: Billy Neal, Clifford Bond, Mirtie Clark).

A Tedious Job

Before we came off the punch card system [in the early 1980s], we were up to 12,000 statements [cards] for both power operations and power sales. We took four or five boxes to the University of Georgia several days a week. You would spend all day with it because the University was running other things and had to work us in. We would turn the cards in, the University would run them through the machine, and we would wait for the output. Sometimes you'd get it back and everything would look pretty good except for one little glitch, so you'd have to sit down for an hour or so trying to correct it. It was not too hard to make an error because the machine was real particular – if you punched the wrong thing on the card it made it completely invalid. It was rather tedious.

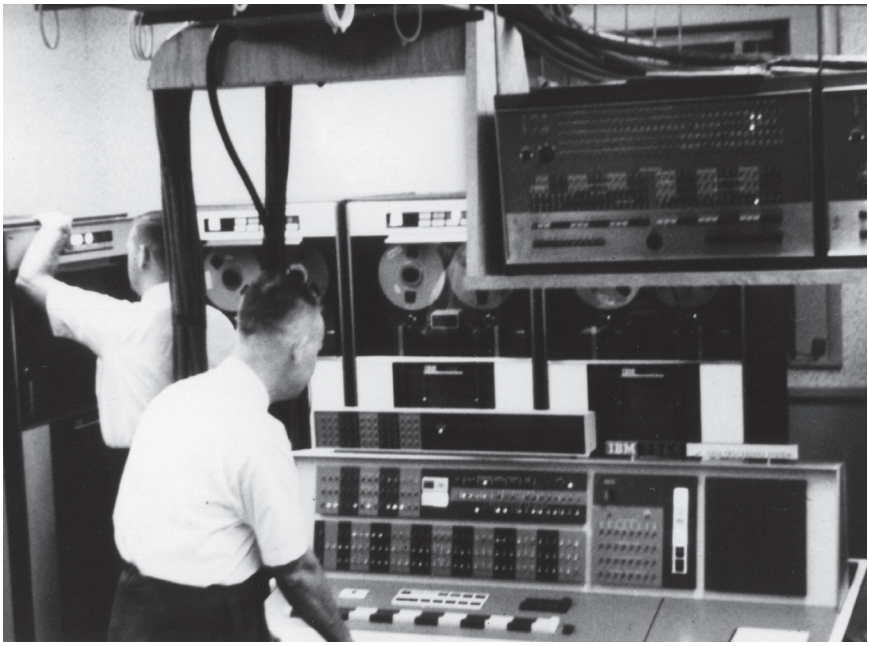
Harold Jones, SEPA (1952-1995)



Waiting on the output from UGA's computer, 1970s.

the early variants were limited to a certain amount of memory. One of the early computers at UGA was limited to 128 kilobytes, a miniscule amount of space compared to gigabytes found on modern computers. Some of SEPA's programs operated on so many kilobytes that the agency used the University's system at night so as to not interfere with other users.[5]

During the early 1980s, SEPA purchased an in-house computer capable of running most programs needed for accounting, power sales, and power operations. This new computer used tapes akin to cassettes or reels. Data was written to the tapes, re-wound, and read back because the memory system was limited.[6] In 1984, the same year that SEPA disposed of using punch cards, the agency purchased a Texas Instruments (TI) 990 that served until a new Prime computer was installed in 1990. During the late 1980s, SEPA purchased two 'desktop' or micro-computers, one for power sales and one for power operations. These included a Macintosh II (heralded as having the new feature of a color monitor) and a Compaq 386 PC, with five megabytes of Random Access Memory (RAM) and a processing speed of 20 megahertz. The new technology required instruction and classes were held in Disk Operating System (DOS), database management, word processing, graphics, spreadsheet, and telecommunications. Some training was conducted internally by SEPA employees, while other courses required bringing in outside experts from Athens Technical College, the University of Georgia, and Clemson University.[7] The agency was entering the IT era, but all administrative work was still largely conducted on calculators and typewriters.



John Mixon and Harold Jones working with the old UGA computer, 1970s.

Training for new computers in the early 1990s (pictured: Blanche Adams, Gail Dickerson, Mirtie Clark, Martha Hewell, and Frances Mixon).

NETWORKING

Billy Neal, Wade Gaines, and Bob Goss led SEPA's IT program in its infancy. With the increasing number of desktop computers, one of their early tasks included developing a server and integrating the machines into a 'network.' SEPA designed the system in addition to laying the required cables for a dedicated server room on the fourth floor of the old Samuel Elbert Hotel, then the agency's headquarters. "There was no looking back," remembered Gaines. "Networks came to be the most popular thing." SEPA installed its first NOVELL operating network in 1990, which interfaced with a Prime mini-computer. In 1994, the agency migrated to a Microsoft Windows network, dominating the market at the time, which was also used by other DOE organizations.[8]

Once the agency's computers were connected internally, SEPA tapped into external networks. During the early 1990s, the City of Elberton had no fiber optic internet capability and SEPA requested a T-1 line from the nearest availability in Athens. Therefore, the agency was connected to the internet before its host city. The external network enabled SEPA to participate in electronic mail (email) systems. During the early 1990s, both SEPA and SWPA connected with WAPA, which had tapped into the DOE network (DOE-Net), for email access. SEPA's first email had wapa.gov tag, but the agency received its own email tags in 1995. At that time, the internet was a dial-up system, accessed through a traditional phone cable. The agency "went online" at regular intervals to retrieve and transmit outside emails, although all internal emails were sent instantaneously. Further, in the early limited email environment at SEPA, employees shared computers for email access. It was a cumbersome, but effective, early system. SEPA even had email capability a full year before the Corps of Engineers.[9]

The new servers at SEPA take up only a few cubic feet of shelf space.

Beyond interconnecting traditional desktop computers, the agency recognized the importance of using the networks to communicate with the hydroelectric projects to obtain instant and accurate information on generation and scheduling. While each of the hydropower plants had computers at the time, none of the computers were connected externally or with each other. By having real-time data, SEPA could better monitor generation at the projects to ensure they met the contractual obligations of the customers.

Internally, SEPA assigned an ad-hoc team (SEPA-Corps Control Area Team [SCCAT]) to issue recommendations on the communication needs of the new Operations Center that would enable communication with six of the Corps' power projects (Hartwell, Thurmond, Russell, Carters, Millers Ferry, and Walter F. George). Because

Top management said, 'What are we going to do with [email]?' Now they couldn't do without it.

Wade Gaines

many of the long-term customer contracts were being re-negotiated at the time, an upgraded operations center became a priority effort to develop a more cost-effective service. The SCCAT provided specific recommendations on the types of connections (T-1 or 56kb) required for each of the six plants and estimated a total of approximately $50,000 for procurement and installation of the equipment.[10]

A Wide Area Network (WAN) was developed to link the projects and the concept was presented to the Corps. "[They] told us it wouldn't work," remembered Gaines, "and it wasn't easy due to the locations of some of the powerhouses." The SEPA IT Team designed the proposed network and set up a prototype mini-network at its headquarters in Elberton to prove the viability of the software. One of the first plants connected through SEPA's network was the Walter F. George project on the Chattahoochee River. Because the local telecommunications system in the nearby town of Fort Gaines, Georgia was so limited at the time, SEPA contracted with Sprint to install a T-1 line to a small building on the Georgia side of the dam. With the T-1 line in place, the IT Team installed the fiber optics in the dam and the powerhouse for the final connection.[11]

After installing computer terminals at the individual plants, SEPA used an early remote access software to link into the computer. "Today, it wouldn't come close to

From one computer to many. All employees have desktop computer stations.

meeting security requirements," Gaines noted, "but at the time nobody knew how to use it." The local Corps operators were instructed to put the generation schedule on their computer screen, and SEPA's operators could see the real-time data on their computers back in Elberton. Operators also used the notepad function to exchange messages.[12]

The remote terminal units were centrally linked to SEPA's Operation Center. When the Operations Center came online in 1994, it was originally located on the Fourth Floor of the old Samuel Elbert Building, and shared a single server with the entire organization. By 2010, SEPA had over seventy-five computers, multiple servers, and an emergency offsite center for continued operations.[13]

IMPROVING BUSINESS THROUGH TECHNOLOGY

When John McAllister arrived at SEPA in 1990, he took charge of an agency, not unlike other federal organizations, that still largely used adding machines and typewriters. SEPA's computers were large, but still able to fit on desktops. Automatic data processing was still in its infancy. "I saw the agency go from an analog entity to a digital entity," he recalled. "[Technology] was fully embraced."

Importantly, technology has allowed, and in some cases facilitated, improved business practices. With the hydro projects now virtually connected to SEPA through an Energy Management System (EMS), operators have access to real-time information in regard to generation, storage, switchyards, and even weather conditions. In scheduling power, SEPA receives a declaration from the Corps, or specifically the amount of energy available for an upcoming week (Saturday-Friday), compiles the capacity by system and estimates a percentage for the customers. With that information in hand, the customers schedule their energy for the week based on estimated peak demands. By 2010, all scheduling takes place electronically in the form of spreadsheets exchanged across the internet, a much quicker process even by 1994 standards when the Control Area went operational.[14]

Technology has become an even more critical asset as more individual preference customers elected to self-schedule their power declarations rather than receiving credits for government power through another parent power company. Since the Operations Center went online, more customers have chosen to schedule power individually, with SEPA providing transmission services. Coordinating additional weekly schedules resulted in an increased workload for SEPA operators, but one that is made far easier with real-time information. Additionally, the e-tagging process, specifically creating point-to-point identifiers for individual power transactions, is conducted entirely through an internet interface. Just as technology allowed for more precise energy storage information, it has also allowed for better accuracy in determining availability on the grid when SEPA requests transmission capability.[15]

In addition to benefitting power operations, the new electronic interfaces have expedited even the more basic tasks associated with power sales. Because of the expanding usage of the internet and availability of electronic interconnections, in 2001, the US Office of Management and Budget launched an "Electronic Government" (E-Government) initiative. An E-Government Task Force identified numerous ways to

We are in a paperless age. At one time we had to coordinate everything through phone calls, print it out on paper, and then fax it to everyone. Now everything is automated. When the schedule is set up, our software emails it to the appropriate people. Technology has really changed the way we access information.

Dee Smith, SEPA Power Operator

use IT to create efficiencies and facilitate citizens' and customers' interaction with the federal government. A variety of individual proposals for all branches of the government resulted from the initiative, including e-dockets for filing official paperwork, online grant submissions, web-based training seminars, and electronic records systems to name just a few. For an agency like SEPA that manages countless individual customer transactions on a daily basis, one of the most beneficial programs was Pay.gov, a web-based electronic funds transfer (EFT) system that allows customers to make payments online, allowing for quicker deposits into the Treasury. In February 2005, SEPA was the first DOE entity to institute the Pay.gov system.[16]

The IT revolution has even made the most mundane of tasks and communication more efficient, reliable, and user-friendly. In 2004, SEPA launched its first website. In addition to providing basic agency information, news releases, hydropower data, and copies of annual reports, the website facilitates procurement processes by directing users to DOE and federal acquisition websites. SEPA also uses the interface to collect Freedom of Information Act (FOIA) requests, information regarding proposed and finalized rate schedules, as well as employment opportunity links.

SECURED AND CONTINUED OPERATIONS

Because SEPA operates within a broader bulk electrical system, the DOE requires the agency to have an offsite Continued Operations (COOP) center should its primary control facility become dysfunctional. From a federal agency standpoint, SEPA also has contractual obligations that must be met on an hourly basis; a default on these obligations would result in substantial financial losses to both the federal government and the preference customers.[17]

COOP standards were established by NERC and compliance is achieved through routine audits and inspections. Each operations backup center must meet minimum standards for data communications, voice communications, physical and cyber security, as well as a source of power supply. According to current NERC standards, backup control areas must be capable of full operation within two hours of a primary system failure.[18]

SEPA established an initial COOP site in 1999. That first backup center was located in a one-room facility in Bogart, Georgia, west of Athens. Then, in 2002, SEPA moved the offsite center to Chase Street in Athens. The COOP center remains unmanned unless there is an emergency, but has all of the essential redundant components to become fully functional within a few hours. The facility has two T-1 data lines, a

Most people do not realize how far technology has come in the last twenty years.

Wade Gaines

conventional (land-based) phone system, generator, and networks to accommodate Doe.net and Corps.net electronic communications.[19] The backup systems are identical to those in the primary control area and are designed to provide replicated information that is immediately available to emergency system staff.

SEPA developed Standard Operating Procedures (SOP) to staff the facility with selected employees. The primary staff would include a power operations manager, power system operators (one or two per shift as needed), and a power operations specialist for accounting. Other staff that might be called in as needed include, a lead power operations specialist, an information technology specialist, contracting specialist, an accountant and an accounting technician. If the offsite center is required for a sustained period, other staff may be required for payroll, billing or supplies.[20]

Maintaining a COOP center is essential to both SEPA operations and ensuring reliability within the larger electrical power supply. SEPA conducts announced and unannounced evacuation drills at least twice per year. As part of the drills, operators are required to prepare a report identifying problems encountered during the mock evacuations as well as provide suggestions for improvement. The SEPA IT staff also conducts weekly equipment and communication checks on the primary systems.[21]

A NEW ERA: CYBER AND PHYSICAL SECURITY

When terrorists launched multiple attacks against homeland assets of the United States on September 11, 2001, the federal government required all of its agencies and organizations to take a fresh look at their procedures for physical security. Further, with the nation and the world more interconnected than ever through computers and the World Wide Web, cyber-attacks remain an imminent threat. Though it is a small organization with few physical assets, SEPA remains vigilant about cyber and physical security.

SEPA operates within a bulk electric power system. Unauthorized access to critical energy information (facilities, equipment, or systems) could have disastrous results. A breach in cyber-security resulting in interference of service could even affect the broader electrical power grid and put other critical infrastructure (military and civil) at further risk. Disruption could also cause the government to default on contractual loads of power to the preference customers. The SEPA IT Team established internal procedures and protocols to follow the applicable cyber-security standards administered by the DOE, NERC, SERC, FRCC, the National Institute of Standards and Technology (NISC), and Federal Information Processing Standards (FIPS). SEPA developed a Program Cyber Security Plan (PCSP) in 2005 to formalize its cyber-

Records Management

SEPA has diligently developed and maintained an electronic records system. Prior to the computer-era, the agency had a "mail log" program which tracked each piece of physical mail that entered the building. Today, logging correspondence is much more challenging as daily communication occurs primarily through email. The agency has also digitized an old manual records system for its archives and legal library. The records system was first digitized using the TI-990 computer and has been updated regularly with new software. Today, SEPA maintains an organized archival repository and comprehensive legal library. Importantly, the agency has also made an effort to scan its historical records, including administrative information, power sales, and power operations.

security policies. Additionally, the agency supplies annual reports to NERC, SERC, and the FRCC, and is audited on a regular basis to check for compliance with security standards. These standards are designed to prevent unwarranted access to data, hardware, software, or any part of the electrical system.[22]

SEPA also instituted additional protections for the physical security of its facilities. Traditional keys were replaced with secured electronic entries, and staff are required to escort approved visitors. The Operations Center, located within the headquarters building, is recognized as "critical energy infrastructure" by the DOE, and has additional security restrictions, limited access, and twenty-four hour monitoring systems.[23]

Ensuring cyber security requires constant vigilance as threats change and become more sophisticated. With the Corps owning the hydropower facilities and SEPA managing the Operations Center, it was critical for the two agencies to develop an agreement supporting the framework for cyber and physical security. In 2005, SEPA and the Corps signed an MOA in regard to hybrid system communications between SEPA's Operations Center and the Savannah and Mobile districts' Supervisory Control and Data Acquisition (SCADA) System. The document specified roles and responsibilities for each agency for security patch management, intrusion detection systems, network security (firewalls), physical access and clearance for personnel, software protection (spyware, anti-virus, and malware), and general system support.[24]

The Legal Library at SEPA

SEPA's Record Archive

ENDNOTES

[1] McAllister interview.
[2] Information provided by Harold Jones via email, September 13, 2012.
[3] Jones email, September 13, 2012.
[4] Cordell interview; also, personal communication via email with Wade Gaines, July 25, 2012.
[5] Interview with Wade Gaines (SEPA-Retired), March 4, 2010.
[6] Gaines interview; Jones interview.
[7] *SEPA Newsletter*, December 1988; also Gaines interview.
[8] Gaines interview.
[9] John Sewell, the IT Manager at WAPA, designed the email system that covered SEPA, SWPA, and WAPA; Gaines interview.
[10] August 1995 Memoranda in "Telecommunications: SEPA Operations Center," RG5301, SEPA Archives.
[11] Gaines interview.
[12] Ibid.
[13] Gaines interview; Seymour interview. For a detailed discussion of the creation of the Operations Center, see Chapter 5.
[14] Heard interview.
[15] Interview with Dee Smith, February 25, 2010. Also, SEPA, *Annual Reports*, 2000-2005. See Chapter 5 for a discussion of the e-tagging process.
[16] SEPA, *Annual Report*, 2005.
[17] "Emergency Plan," in SEPA Archives, RG4335, "Facilities Management: Building Security."
[18] Seymour interview. The current NERC standards for operations center backup systems are outlined in "Standard EOP-008-1: Loss of Control Center Functionality." Internet online at *www.ferc.gov/whats-new/comm-meet/2011/042111/E-7.pdf.*
[19] Gaines interview.
[20] "Emergency Plan," SEPA Archives; also Seymour interview.
[21] Gaines interview. See also North American Electric Reliability Corporation (NERC), "Readiness Audit: Southeastern Power Administration. September 29-30, 2004, Elberton, Georgia;" and NERC, "Balancing Authority/Transmission Operator Reliability Readiness Evaluation Report for the Southeastern Power Administration, Elberton, Georgia. February 26-March 1, 2007."
[22] Facility Security Plans, 1992-2007, in "Facilities Management: Building Security," RG4335, SEPA Archives. Also, "Southeastern Power Administration, Program Cyber Security Plan, August 2005," in "Data Processing Management: Cyber Security," RG1360, SEPA Archives.
[23] Gaines interview.
[24] SCADA systems monitor conditions and provide information for distributed networks of infrastructure or processes. See "Memorandum of Agreement Between US Army Corps of Engineers and the Southeastern Power Administration," 2005.

BIBLIOGRAPHY

A Note on Sources

In conducting the archival research for this history, the Southeastern Power Administration Public Affairs Office proved instrumental in gathering existing information, including files, briefings, news releases, fact sheets, and photographs. These materials are organized by record groups in the general SEPA archives housed in Elberton, Georgia. Unless noted in the text, all photographs were provided through the Public Affairs Office.

List of Interviews

Borchardt, Charles (SEPA-Retired). Interview by Patricia Stallings. Tulsa, OK, September 15, 2010.

Cordell, Donnie (SEPA-Retired). Interview by Patricia Stallings. Elberton, GA, March 10, 2010.

Gaines, Wade (SEPA-Retired). Interview by Patricia Stallings. Elberton, GA, March 4, 2010

Heard, Darlene (SEPA). Interview by Patricia Stallings. Elberton, GA, March 4, 2010.

Jones, Harold (SEPA-Retired). Interview by Patricia Stallings. Elberton, GA, March 4, 2010.

Jourolmon, Leon (SEPA). Interview by Patricia Stallings. Elberton, GA, February 25, 2010. Follow-up phone interview, October 1, 2012.

Legg, Ken (SEPA). Interview by Patricia Stallings. Elberton, GA, February 25, 2010.

Lloyd, Jim (SEPA-Retired). Interview by Patricia Stallings. Elberton, GA, March 4, 2010

McAllister, John A. Jr. (SEPA-Retired). Interview by Patricia Stallings. Columbia, SC March 29, 2011.

Nadler, Herb (SEPA). Interview by Patricia Stallings. Elberton, GA, March 4, 2010.

Prince, Bob (SAD). Interview by Patricia Stallings. Atlanta, GA, January 19, 2011.

Rampey, Denver "Lee" (SEPA). Interview by Patricia Stallings. Elberton, GA, February 25, 2010.

Seymour, Joel (SEPA). Interview by Patricia Stallings. Elberton, GA, February 25, 2010.

Smith, Dee (SEPA). Interview by Patricia Stallings. Elberton, GA, February 25, 2010.

Smith, J.W. (SEPA). Interview by Patricia Stallings. Elberton, GA, March 10, 2010.

Spencer, Douglas (SEPA). Interview by Patricia Stallings. Elberton, GA, February 25, 2010.

Worthington, Jon (SEPA-SWPA). Interview by Patricia Stallings. Tulsa, OK, September 15, 2010.

Works Cited

American Society of Civil Engineers. *Civil Works for Hydroelectric Facilities: Guidelines for Life Expansion and Upgrade*. Reston, Virginia: American Society of Civil Engineers, 2007.

Adams, Clifford, Jr., Clinton A. Vince, and Alan I. Robbins, "Federal Electric Preference Power Marketing in the 1980s: Developing Legal Trends."*Energy Law Journal* 4, no. 1 (1983): 1-57.

Apt, Jay, Lester B. Lave, Sarosh Talukdar, M. Granger Morgan, and Marija Ilic. "Electrical Blackouts: A Systemic Problem." *Issues in Science and Technology* (Summer 2004).

Arsenault, Raymond. "The End of the Long Hot Summer: The Air Conditioner and Southern Culture." *The Journal of Southern History* 50, no.43 (November 1984): 597-628.

Bailey, Ralph, Jr. and Charles F. Philips, Jr. *"As Mobile Goes, So Goes the Corps" A Look at Change Inside a Government Agency. The US Army Corps of Engineers Mobile District, 1985-2003*. Mobile, Alabama: U.S. Army Corps of Engineers, 2006.

Barber, Henry E. and Allen R. Gann. *A History of the Savannah District US Army Corps of Engineers, 1829-1989*. Savannah, Georgia: US Army Corps of Engineers, 1989.

Beck, Bill. *PP&L: 75 Years of Powering the Future. An Illustrated History of Pennsylvania Power and Light Company*. Eden, Prairie, Minnesota: Viking Press, Inc., 1995.

Billington, David P. and Donald C. Jackson. *Big Dams of the New Deal Era: A Confluence of Engineering and Politics*. Norman: University of Oklahoma Press, 2006.

Billington, David P., Donald C. Jackson, and Martin V. Melosi. *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams*. Denver, Colorado: US Department of the Interior Bureau of Reclamation, 2005.

Brockington and Associates, Inc. *History of the South Atlantic Division US Army Corps of Engineers, 1945-2011*. Atlanta: U.S. Army Corps of Engineers, 2012.

Brudney, Jeffrey L., F. Ted Hebert, and Deil S. Wright. "Reinventing Government in the American States: Measuring and Explaining Administrative Reform," *Public Administration Review* 59, no. 1 (January-February 1999): 19-30.

Cobb, James C.. *The Selling of the South: The Southern Crusade for Industrial Development, 1936-1990*. 2nd ed. Urbana: University of Illinois Press, 1993.

Coleman, Lori I. "Our Whole Future is Bound up in this Project: The Making of Buford Dam." Master's Thesis, Georgia State University, Atlanta, 2008.

Congressional Budget Office. *Should the Federal Government Sell Electricity?* Washington, D.C.: Congressional Budget Office, November 1997.

Congressional Research Service. *CRS Report for Congress. Aging Infrastructure: Dam Safety*. March 25, 2008.

Davis, Joyce M. *Images of America: Historic Elberton.* Charleston: Arcadia Publishing, 2002.

Dellapenna, Joseph W. "Interstate Struggles over Rivers: The Southeastern States and the Struggle over the 'Hooch," *New York University Environmental Law Journal* 12 (2005): 828-866.

de Luna, Phyllis Komarek. *Public versus Private Power during the Truman Administration: A Study of Fair Deal Liberalism*. New York: Peter Lang Publishing, 1997.

DuMars, Charles T. and David Seeley. "The Failure of the Apalachicola-Chattahoochee-Flint River Basin and the Alabama-Coosa-Tallapoosa River Basin Compacts and a Guide to the Successful Establishment of Interstate Water Compacts." *Georgia State University Law Review* 21, no.2 (2004): 373-400.

Durden, Robert F. *Electrifying the Piedmont Carolinas: The Duke Power Company, 1904-1997*. Durham, NC: Carolina Academic Press, 2001.

Energy Information Administration. *The Changing Structure of the Electric Power Industry, 1970-1911*. Washington, DC: US Department of Energy, 1993.

_____. *The Changing Structure of the Electric Power Industry, 2000: An Update*. Washington, DC: US Department of Energy, 2000.

Ezzell, Patricia Bernard. *TVA Photography, 1963-2008: Challenges and Changes in the Tennessee Valley*. Jackson: University Press of Mississippi, 2008.

Fehner, Terrence R. and Jack M. Hall. *Department of Energy, 1977-1994: A Summary History*. Washington, DC: Department of Energy, 1994.

Flanders, Archie, John McKissick, and Tommie Shepard. "Georgia Economic Losses Due to 2007 Drought." The University of Georgia, Center for Agribusiness and Economic Development, Report CR-07-10, July 2007.

Grant, Douglas L. "Interstate Allocation of Rivers Before the United States Supreme Court: The Apalachicola-Chattahoochee-Flint River System." *Georgia State Law Review* 21, no.2 (2004): 401-427.

Hargrove, Erwin C. *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990*. Princeton: Princeton University Press, 1994.

Hargrove, Erwin C. and Paul K. Conkin. *TVA: Fifty Years of Grass-roots Bureaucracy*. Urbana: University of Illinois Press, 1983.

Hartzer, Richard B. *To Great and Useful Purpose: A History of the Wilmington District Corps of Engineers*. Bloomington, Indiana: David A. Clary and Associates, 1984.

Hay, Duncan. *Hydroelectric Development in the United States, 1880-1940*. Washington, DC: Edison Electric Institute, 1983.

Hughes, Thomas P. *Networks of Power: Electrification in Western Society, 1880-1930*. Baltimore: Johns Hopkins University Press, 1983.

Hull, Jonathan Watts. "The War over Water." Prepared for the Council of State Governments, Southern Legislative Conference. Internet online: http://www.csg.org/knowledgecenter/docs/slc-0010-warwater.pdf. Available from 10 March 2010.

Jeane, Gregory and Bruce G. Harvey. *A History of the Mobile District Corps of Engineers, 1815-1985*. Mobile, Alabama: US Army Corps of Engineers, 2002.

Kelliher, Joseph T. "Pushing the Envelope: Development of Federal Electrical Transmission Policy." *American University Law Review* 42, no.2 (1993): 543-606.

Kufahl, Pam. "Privatization Alaska Offers a Lesson in How to Sell Power." *Transmission and Distribution World*, March 1, 1996.

Johnson, Leland R. *Engineers on the Twin Rivers: A History of the Nashville District Corps of Engineers*. Nashville, Tennessee: US Army Corps of Engineers, 1978.

_____. *The Headwaters District: A History of the Pittsburgh District, US Army Corps of Engineers*. Pittsburgh: US Army Corps of Engineers, 1979.

_____. *The Ohio River Division US Army Corps of Engineers: The History of a Central Command*. Cincinnati, Ohio: US Army Corps of Engineers, 1992.

Lathrop, Alyssa S. "A Tale of Three States: Equitable Apportionment of the Apalachicola-Chattahoochee-Flint River Basin." *Florida State University Law Review* 36 (2009): 865-902.

Moreel, Ben. *Our Nation's Water Resources: Policies and Politics.* New York: Arno Press, Inc., 1956.

Norwood, Gus. *Gift of the Rivers: Power for the People of the Southeast. A History of the Southeastern Power Administration*. Washington, D.C.: Government Printing Office, 1990.

_____. *Columbia River Power for the People. A History of Policies of the Bonneville Power Association*. Portland: US Department of Energy, Bonneville Power Association, 1981.

Nye, Peter. "Hydropower Leaks." *Rural Electric Magazine* (January 2009), 28-32.

Pless, Al. "Alternative to Federal Appropriations: Federal Hydropower Rehab in the Southeast." *Proceedings of the 2005 Georgia Water Resources Conference*, April 25-27, 2005, University of Georgia.

Radin, Alex. "Public or Private Power." *The Rotarian* (November 1954).

_____. *Public Power-Private Life*. Washington, DC: American Public Power Association, 2003.

Riley, Jack. *Carolina Power and Light Company, 1908-1958*. Raleigh: Edwards and Broughton, 1958.

Ruhl, J.B. "Water Wars, Eastern Style: Divvying Up the Apalachicola-Chattahoochee-Flint River Basin." Paper presented at the Universities Council on Water Resources Conference, July 2004. Available online at http://opensiuc.lib.siu.edu/ucowrconfs_2004/102/.

Rowley, William D. *The Bureau of Reclamation: Origins and Growth to 1945, Volume 1*. Denver: Bureau of Reclamation, US Department of the Interior, 2006.

Sadler, James F. "Financing: Partnering to Rehabilitate Federal Hydro Plants using Non-Federal Funding." *Hydro World*, September 1, 2011.

Senate. "Theodore Roosevelt and the Conservation Movement." *Senate Document No. 121*. 85th Congress, 2nd session. Washington, DC, 1958.

Shallat, Todd. *Structures in the Stream: Water, Science, and the Rise of the US Army Corps of Engineers*. Austin: University of Texas Press, 1994.

Simpson, Donald E., Marilyn Phipps, and Arturo L. Ressi di Cervia, "Constructing a Cutoff Wall in Front of Walter F. George Dam in 100 Feet of Water." *Hydro Review* (March 2006).

United States District Court: Middle District of Florida. Memorandum and Order. Tri-State Water Rights Litigation, Case No. 3:07-md-01, Filed July 17, 2009.

U.S. General Accounting Office. *Federal Power: Outages Reduce the Reliability of Hydroelectric Power Plants in the Southeast*. July 25, 1996. Report GAO/T-RCED-96-180.

_____. *Power Marketing Administrations: Cost Recovery, Financing, and Comparison to Nonfederal Utilities*. September 1996. Report GAO/AIMD-96-145.

_____. *Federal Power: Issues Related to the Divestiture of Federal Hydropower Resources*. March 1997. Report GAO/RCED-98-48.

_____. *Federal Power: Implications of Reduced Maintenance and Repairs of Federal Hydropower Plants*. March 1999. Report GAO/RCED-99-63.

_____. *Federal Power: The Evolution of Preference in Marketing Federal Power*. February 2001. Report GAO-01-373.

Vince, Clinton A. and Nancy A Wodka. "Recent Legal Developments and Legislative Trends in Federal Preference Power Marketing."

Wallace, Megan A. "A Negotiated Alternative to Mandatory Wheeling," *Energy Law Journal* 99, no. 10 (1989): 99-120.

Waltrip, John Richard. *Public Power during the Truman Administration*. New York: Arno Press, 1979.

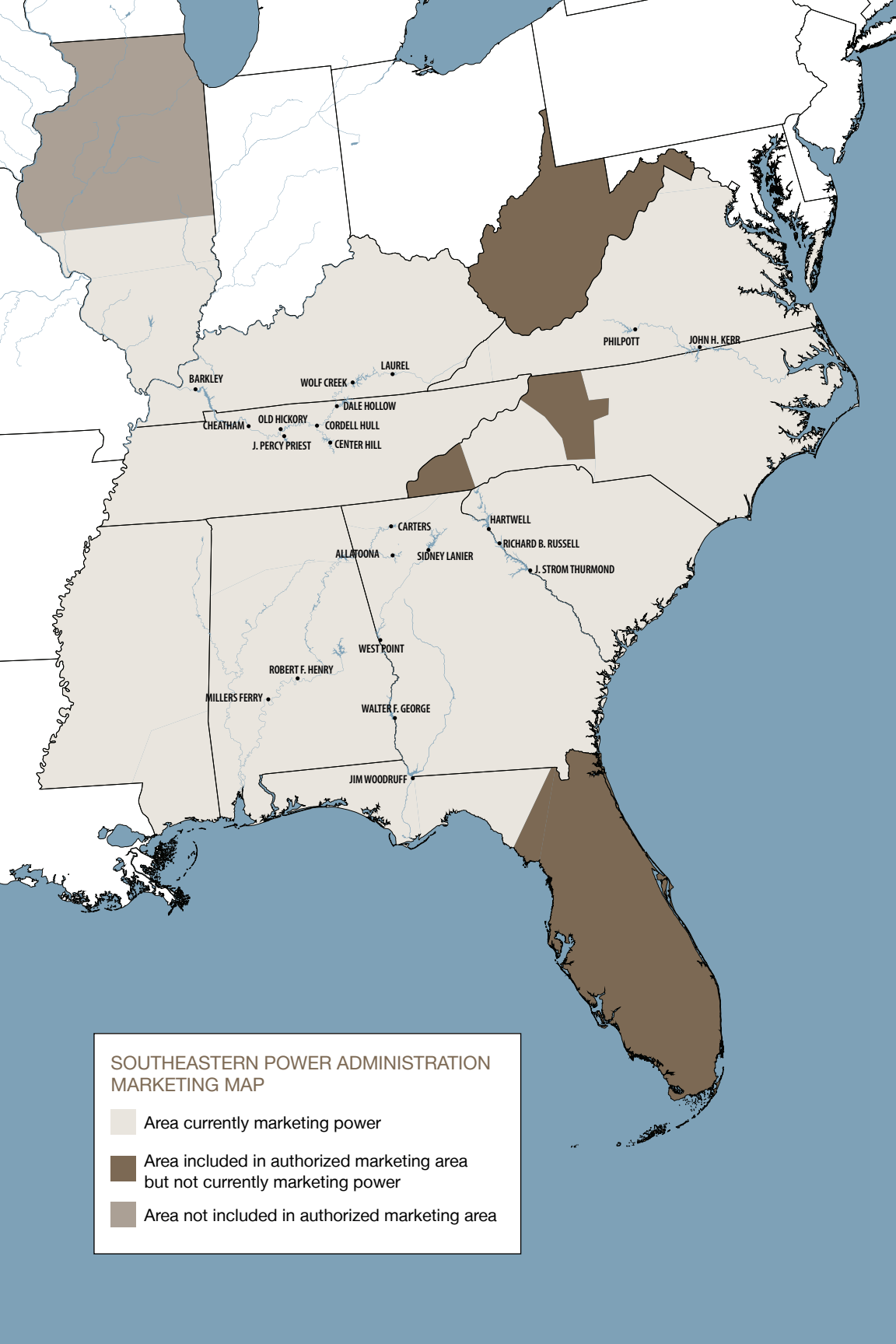
Western Power Administration. *Serving the West: Western Power Administration's First 25 Years as a Power Marketing Agency*. Available online from January 27, 2010. http://www.wapa.gov/about/historyproj.htm

White, Dennis L. and Philip E. Mihlmester. *US Department of Energy Integrated Resource Planning Program: Accomplishments and Opportunities.* Oak Ridge: Oak Ridge National Laboratory, December 1993.

Willoughby, Lynn. *Flowing Through Time: A History of the Lower Chattahoochee.* Tuscaloosa: University of Alabama Press, 1999.

Wright, Wade H. *History of the Georgia Power Company, 1855-1956*. Atlanta: Foote and Davies, Inc., 1957.

SYSTEM MAPS *and* DATA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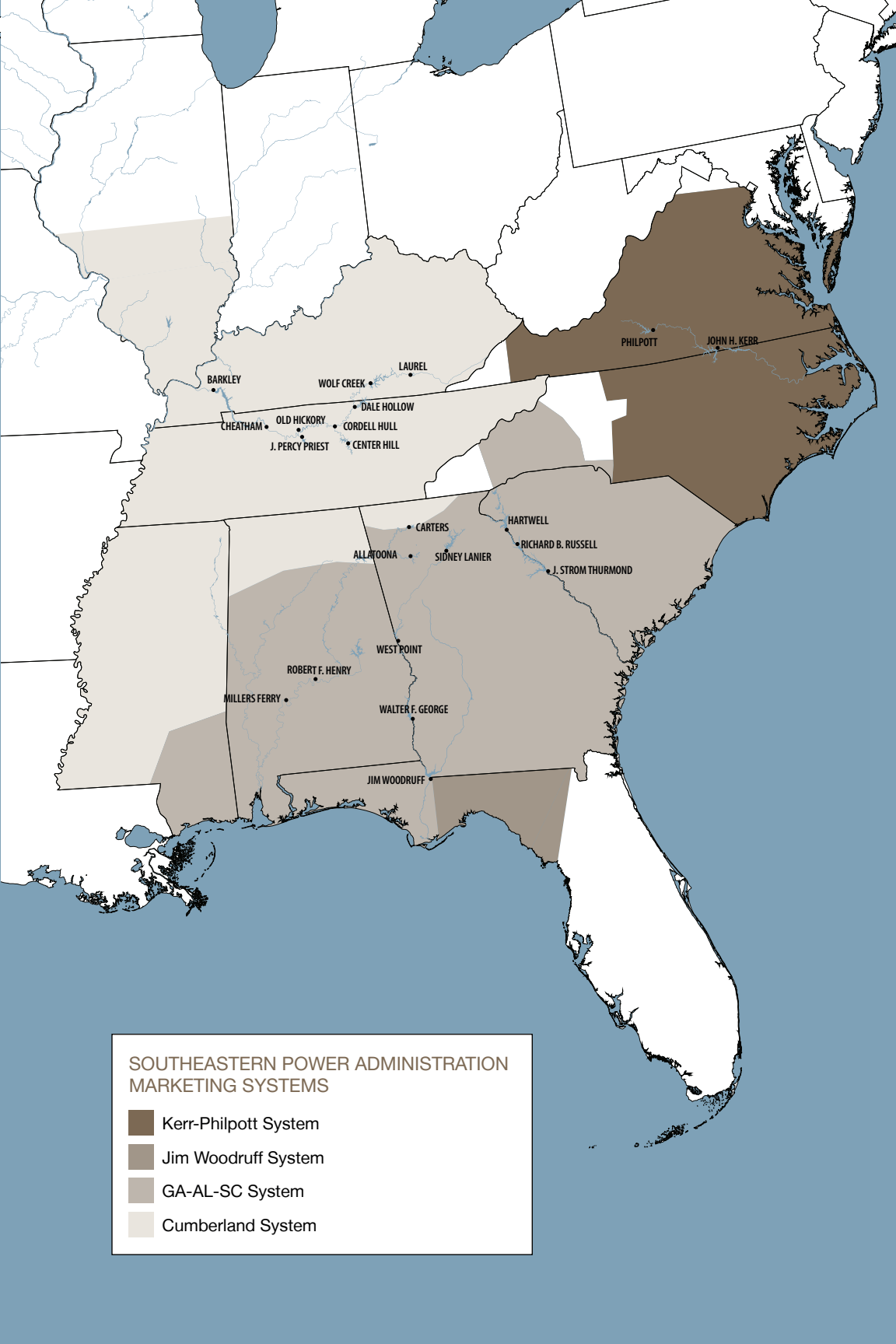
Area currently marketing power
Area included in authorized marketing area but not currently marketing power
Area not included in authorized marketing area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Kerr-Philpott System
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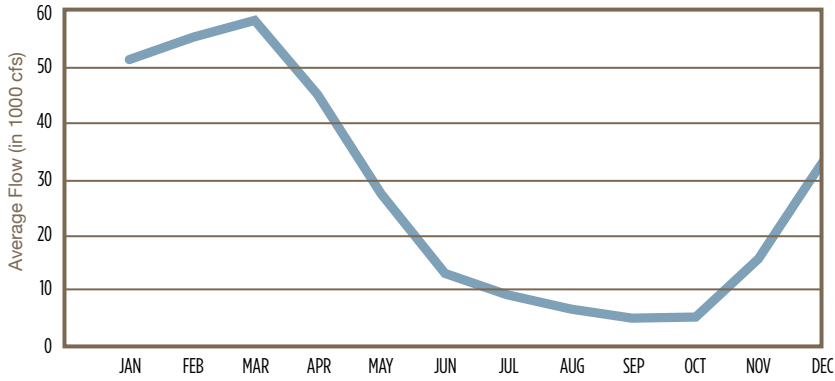
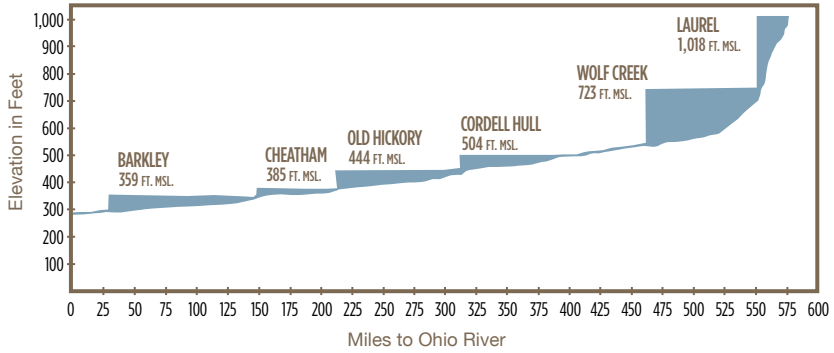
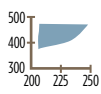
SOUTHEASTERN POWER ADMINISTRATION
CUMBERLAND SYSTEM

MONTHLY AVERAGE FLOW OF CUMBERLAND RIVER BELOW BARKLEY DAM

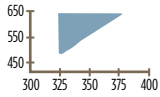


CUMBERLAND RIVER PROFILE





J. PERCY PRIEST
490 FT. MSL.



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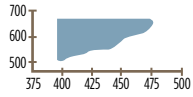

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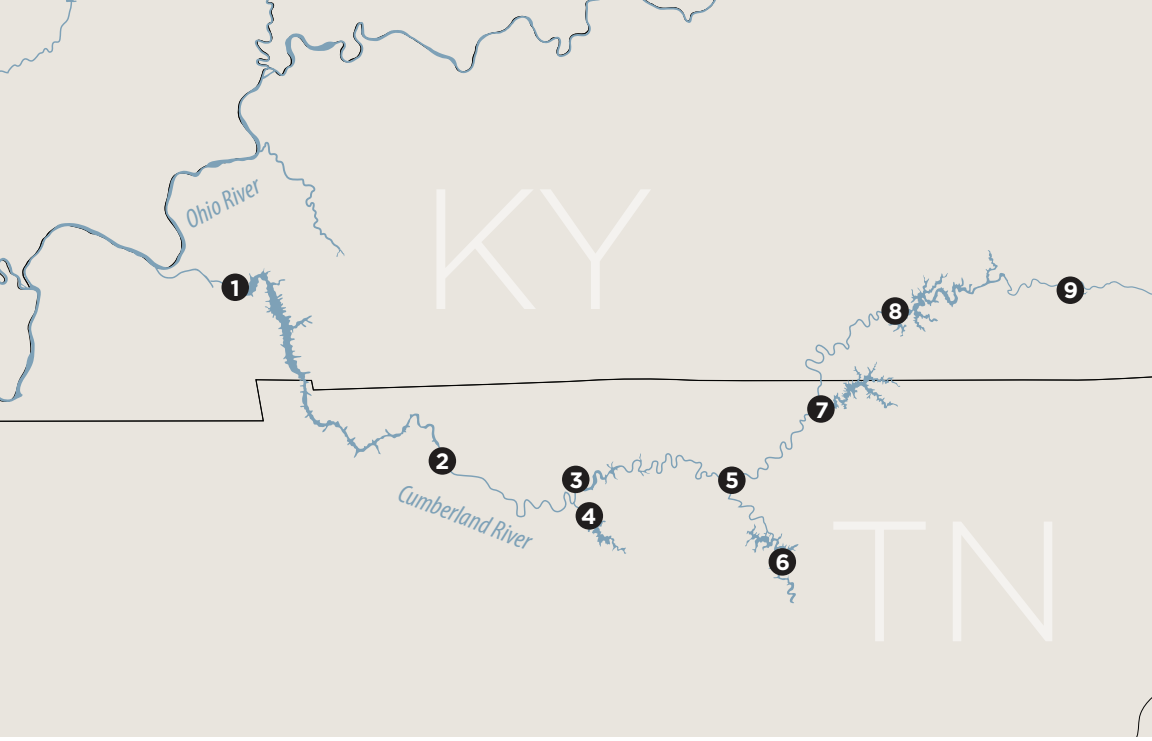


1 BARKLEY DAM

INITIAL YEAR OF OPERATION
1966

GENERATING UNITS
4

SUMMER POOL
359 FT. MSL.

PLANT CAPACITY
148 MW

AVERAGE ENERGY
601,000 MWH

2 CHEATHAM DAM

INITIAL YEAR OF OPERATION
1959

GENERATING UNITS
3

SUMMER POOL
385 FT. MSL.

PLANT CAPACITY
41 MW

AVERAGE ENERGY
163,000 MWH

3 OLD HICKORY DAM

INITIAL YEAR OF OPERATION
1957

GENERATING UNITS
4

SUMMER POOL
444 FT. MSL.

PLANT CAPACITY
116 MW

AVERAGE ENERGY
470,000 MWH

4 J. PERCY PRIEST DAM

INITIAL YEAR OF OPERATION
1970

GENERATING UNITS
1

SUMMER POOL
490 FT. MSL.

PLANT CAPACITY
30 MW

AVERAGE ENERGY
71,000 MWH

5 CORDELL HULL DAM

INITIAL YEAR OF OPERATION
1973

GENERATING UNITS
3

SUMMER POOL
504 FT. MSL.

PLANT CAPACITY
114 MW

AVERAGE ENERGY
355,000 MWH

6 CENTER HILL DAM

INITIAL YEAR OF OPERATION
1950

GENERATING UNITS
3

SUMMER POOL
648 FT. MSL.

PLANT CAPACITY
156 MW

AVERAGE ENERGY
370,000 MWH

7 DALE HOLLOW DAM

INITIAL YEAR OF OPERATION
1948

GENERATING UNITS
3

SUMMER POOL
651 FT. MSL.

PLANT CAPACITY
62 MW

AVERAGE ENERGY
121,000 MWH

8 WOLF CREEK DAM

INITIAL YEAR OF OPERATION
1951

GENERATING UNITS
6

SUMMER POOL
723 FT. MSL.

PLANT CAPACITY
312 MW

AVERAGE ENERGY
899,000 MWH

9 LAUREL DAM

INITIAL YEAR OF OPERATION
1977

GENERATING UNITS
1

SUMMER POOL
1,018 FT. MSL.

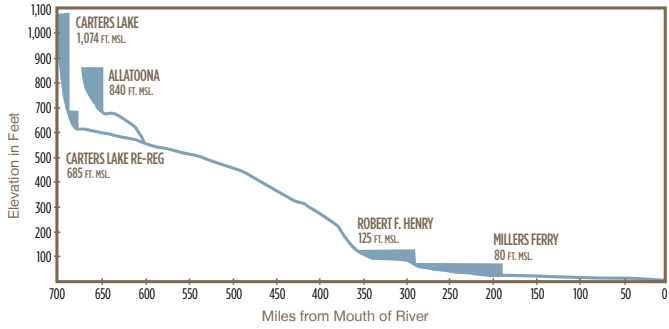
PLANT CAPACITY
70 MW

AVERAGE ENERGY
64,000 MWH

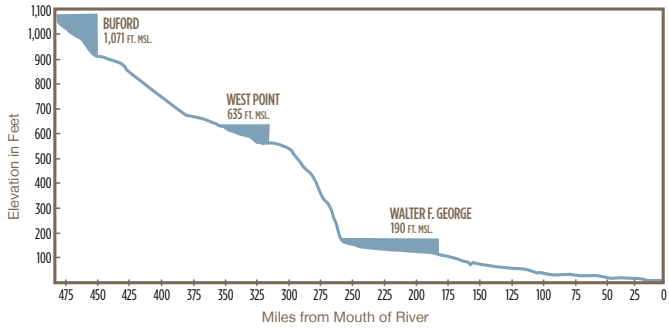
SOUTHEASTERN POWER ADMINISTRATION

GA-AL-SC SYSTEM

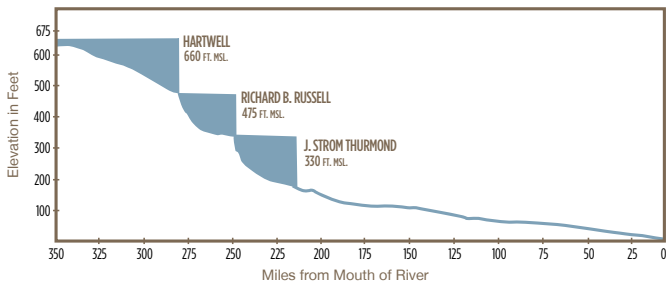
ALABAMA-COOSA RIVER PROFILE



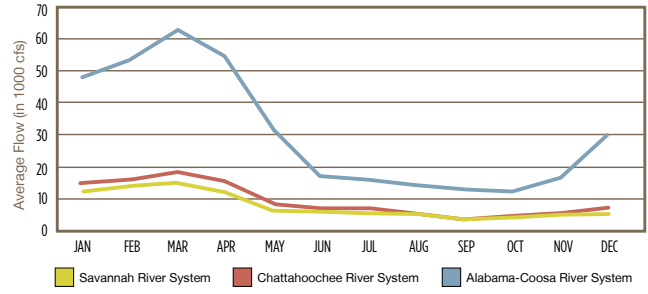
CHATTAHOOCHEE RIVER PROFILE

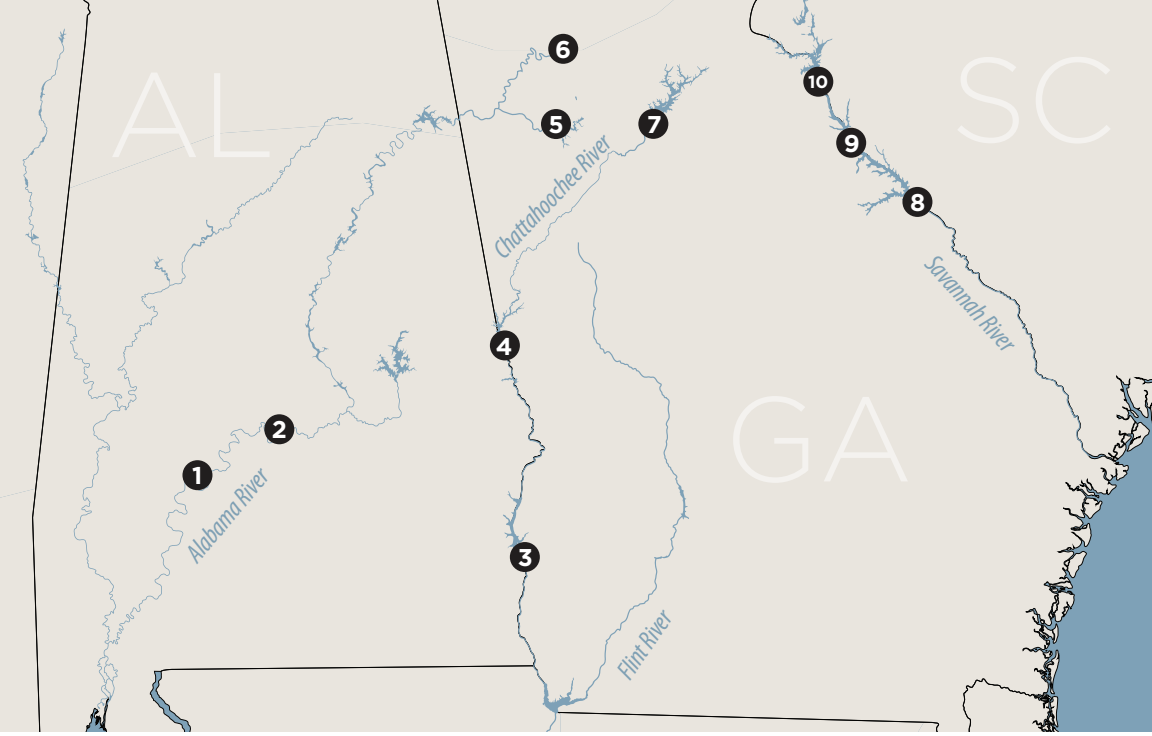


SAVANNAH RIVER PROFILE



MONTHLY AVERAGE FLOWS OF RIVERS BELOW LAST DAM





1 MILLERS FERRY DAM

INITIAL YEAR OF OPERATION
1970

GENERATING UNITS
3

SUMMER POOL
80 FT. MSL.

PLANT CAPACITY
90 MW

AVERAGE ENERGY
384,000 MWH

2 ROBERT F. HENRY DAM

INITIAL YEAR OF OPERATION
1975

GENERATING UNITS
4

SUMMER POOL
125 FT. MSL.

PLANT CAPACITY
82 MW

AVERAGE ENERGY
335,000 MWH

3 WALTER F. GEORGE DAM

INITIAL YEAR OF OPERATION
1963

GENERATING UNITS
4

SUMMER POOL
190 FT. MSL.

PLANT CAPACITY
168 MW

AVERAGE ENERGY
438,000 MWH

4 WEST POINT DAM

INITIAL YEAR OF OPERATION
1975

GENERATING UNITS
3

SUMMER POOL
635 FT. MSL.

PLANT CAPACITY
87 MW

AVERAGE ENERGY
202,000 MWH

5 ALLATOONA

INITIAL YEAR OF OPERATION
1950

GENERATING UNITS
3

SUMMER POOL
840 FT. MSL.

PLANT CAPACITY
82 MW

AVERAGE ENERGY
151,000 MWH

6 CARTERS DAM

INITIAL YEAR OF OPERATION
1975

CONVENTIONAL GENERATING UNITS
2

PUMP TURBINE UNITS
2

SUMMER POOL
1,074 FT. MSL.

PLANT CAPACITY
606 MW

AVERAGE ENERGY
405,000 MWH

7 BUFORD DAM

INITIAL YEAR OF OPERATION
1957

GENERATING UNITS
3

SUMMER POOL
1,071 FT. MSL.

PLANT CAPACITY
127 MW

AVERAGE ENERGY
186,000 MWH

8 J. STROM THURMOND DAM

INITIAL YEAR OF OPERATION
1953

GENERATING UNITS
7

SUMMER POOL
330 FT. MSL.

PLANT CAPACITY
364 MW

AVERAGE ENERGY
707,000 MWH

9 RICHARD B. RUSSELL DAM

INITIAL YEAR OF OPERATION
1985

CONVENTIONAL GENERATING UNITS
4

PUMP TURBINE UNITS
4

SUMMER POOL
475 FT. MSL.

PLANT CAPACITY
664 MW

AVERAGE ENERGY
685,000 MWH

10 HARTWELL DAM

INITIAL YEAR OF OPERATION
1962

GENERATING UNITS
5

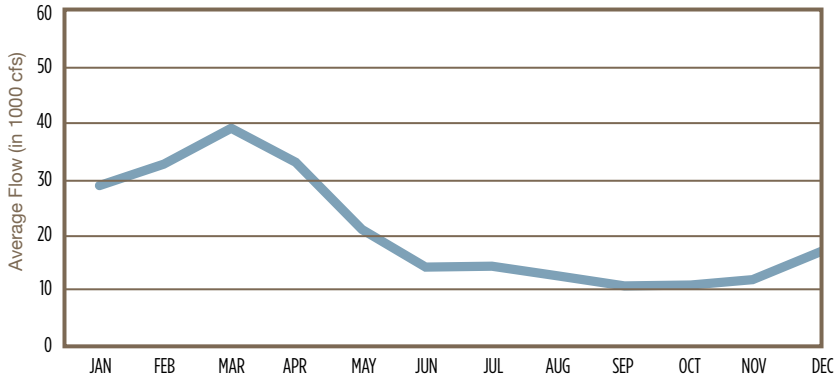
SUMMER POOL
660 FT. MSL.

PLANT CAPACITY
432 MW

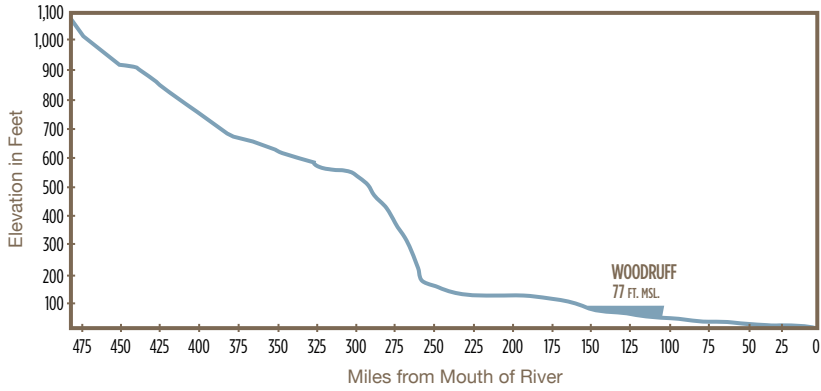
AVERAGE ENERGY
470,000 MWH

SOUTHEASTERN POWER ADMINISTRATION
WOODRUFF SYSTEM

MONTHLY AVERAGE FLOWS OF RIVERS BELOW WOODRUFF DAM



CHATTAHOOCHEE RIVER PROFILE



1 JIM WOODRUFF DAM

INITIAL YEAR OF OPERATION
1957

GENERATING UNITS
3

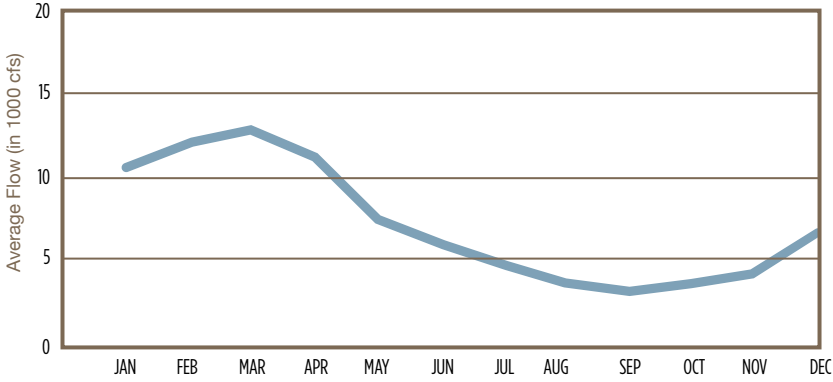
SUMMER POOL
77 FT. MSL.

PLANT CAPACITY
43 MW

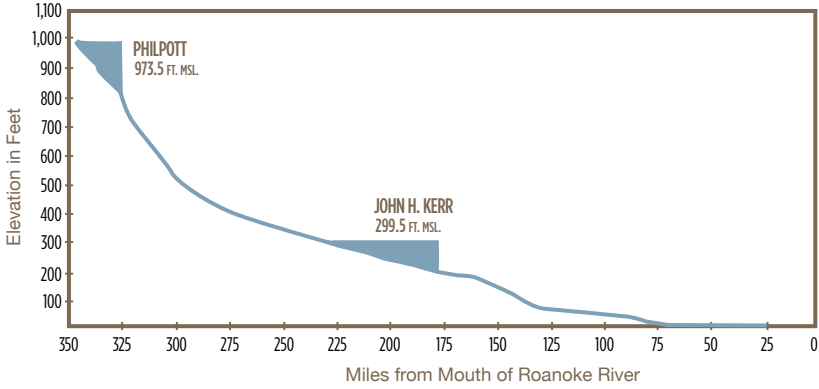
AVERAGE ENERGY
233,000 MWH

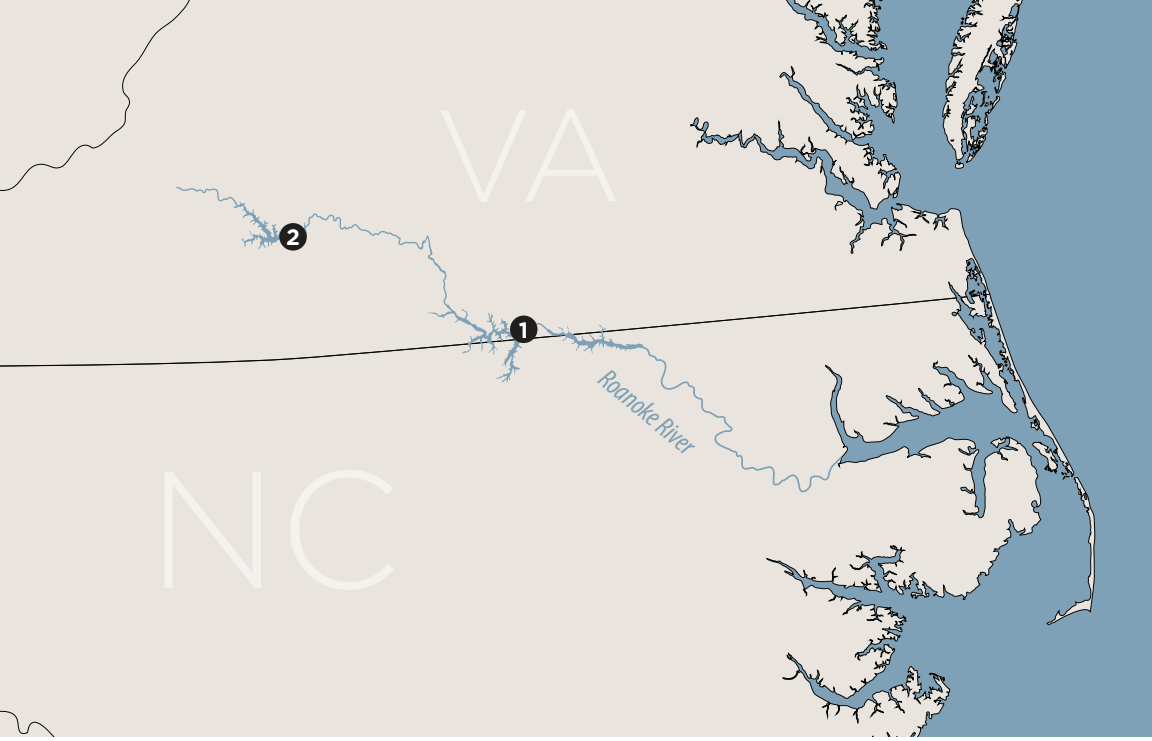
SOUTHEASTERN POWER ADMINISTRATION
KERR-PHILPOTT SYSTEM

MONTHLY AVERAGE FLOW OF ROANOKE RIVER BELOW JOHN H. KERR DAM



ROANOKE-DAN-SMITH RIVER PROFILE





1 JOHN H. KERR DAM

INITIAL YEAR OF OPERATION
1952

GENERATING UNITS
7

SUMMER POOL
299.5 FT. MSL.

PLANT CAPACITY
267 MW

AVERAGE ENERGY
437,000 MWH

2 PHILPOTT DAM

INITIAL YEAR OF OPERATION
1953

GENERATING UNITS
3

SUMMER POOL
973.5 FT. MSL.

PLANT CAPACITY
15 MW

AVERAGE ENERGY
25,000 MWH

SEPA
SouthEastern Power Administration